Ecological Soil Screening Levels for Barium

Interim Final

OSWER Directive 9285.7- 63

U.S. Environmental Protection Agency
Office of Solid Waste and Emergency Response
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

November 2003

This page intentionally left blank

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 SUMMARY OF ECO-SSLs FOR BARIUM 1

3.0 ECO-SSL FOR TERRESTRIAL PLANTS 3

4.0 ECO-SSL FOR SOIL INVERTEBRATES 3

5.0 ECO-SSL FOR AVIAN WILDLIFE 3

6.0 ECO-SSL FOR MAMMALIAN WILDLIFE 6
- 6.1 Mammalian TRV 6
- 6.2 Estimation of Dose and Calculation of the Eco-SSL 6

7.0 REFERENCES 10
- 7.1 General Barium References 10
- 7.2 References Used for Derivation of Plant and Soil Invertebrate Eco-SSLs 10
- 7.3 References Rejected for Use in Derivation of Plant and Soil Invertebrate Eco-SSLs 10
- 7.4 References Used for Derivation of Wildlife TRVs 12
- 7.5 References Rejected for Use in Derivation of Wildlife TRV 13

LIST OF TABLES

Table 2.1 Barium Eco-SSLs (mg/kg dry weight in soil) 2

Table 3.1 Plant Toxicity Data - Barium 4

Table 4.1 Soil Invertebrate Toxicity Data - Barium 5

Table 6.1 Mammalian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV) - Barium 7

Table 6.2 Calculation of the Mammalian Eco-SSL for Barium 9

LIST OF FIGURES

Figure 2.1 Typical Background Concentrations of Barium in U.S. Soils 2

Figure 6.1 Mammalian TRV Derivation for Barium 8

LIST OF APPENDICES

Appendix 6-1 Mammalian Toxicity Data Extracted and Reviewed for Wildlife Toxicity Reference Value (TRV) - Barium

1.0 INTRODUCTION

Ecological Soil Screening Levels (Eco-SSLs) are concentrations of contaminants in soil that are protective of ecological receptors that commonly come into contact with soil or ingest biota that live in or on soil. Eco-SSLs are derived separately for four groups of ecological receptors, plants, soil invertebrates, birds and mammals. As such, these values are presumed to provide adequate protection of terrestrial ecosystems. Eco-SSLs for wildlife are derived to be protective of the representative of the conservative end of the distribution in order to make estimates for local populations. The Eco-SSLs are conservative and are intended to be applied at the screening stage of an ecological risk assessment. These screening levels should be used to identify the contaminants of potential concern (COPCs) that require further evaluation in the site-specific baseline ecological risk assessment that is completed according to specific guidance (U.S. EPA, 1997 and U.S. EPA, 1998). The Eco-SSLs are not designed to be used as cleanup levels and the United States (U.S.) Environmental Protection Agency (EPA) emphasizes that it would be inappropriate to adopt or modify these Eco-SSLs as cleanup standards.

The detailed procedures used to derive Eco-SSL values are described in separate documentation (U.S. EPA, 2003). The derivation procedures represent the effort of a multi-stakeholder group consisting of federal, state, consulting, industry, and academic participants led by the U.S. EPA Office of Solid Waste and Emergency Response.

This document provides the Eco-SSL values for barium and the documentation for their derivation. This document provides guidance and is designed to communicate national policy on identifying barium concentrations in soil that may present an unacceptable ecological risk to terrestrial receptors. The document does not, however, substitute for EPA's statutes or regulations, nor is it a regulation itself. Thus, it does not impose legally-binding requirements on EPA, states, or the regulated community, and may not apply to a particular situation based upon the circumstances of the site. EPA may change this guidance in the future, as appropriate. EPA and state personnel may use and accept other technically sound approaches, either on their own initiative, or at the suggestion of potentially responsible parties, or other interested parties. Therefore, interested parties are free to raise questions and objections about the substance of this document and the appropriateness of the application of this document to a particular situation. EPA welcomes public comments on this document at any time and may consider such comments in future revisions of this document.

2.0 SUMMARY OF ECO-SSLs FOR BARIUM

Barium is a yellowish-white, soft metal that is strongly electropositive. In nature, barium occurs in a combined state, the principal forms being barite (barium sulfate) and witherite (barium carbonate). Barium is also present in small quantities in igneous rocks such as feldspar and micas and may also be found as a natural component of fossil fuel. The production and use of various barium compounds in pyrotechnic devices, ceramics, paints, enamels, optical glasses, and as a getter to remove traces of gas from vacuum and television tubes may result in its release to the

environment through various waste streams. Barium is emitted into the atmosphere mainly by the industrial processes involved in the mining, refining, and production of barium and barium-based chemicals and as a result of combustion of coal and oil (http://toxnet.nlm.nih.gov).

Particulate phase barium is expected to be physically removed from the air by wet and dry deposition. Soluble barium compounds, such as barium nitrate, barium cyanide, barium permanganate, and barium chloride, are expected to be mobile in the environment. Soluble barium can react with sulfates and carbonates in water forming insoluble barium sulfate and barium carbonate salts (http://toxnet.nlm.nih.gov).

The solubility and mobility of barium is greater in sandy soil increasing with decreased pH and decreased organic matter content. Barium can react with metal oxides and hydroxides in soils, thus limiting its mobility and increasing adsorption. Barium mobility decreases in soils with high sulfate and calcium carbonate content. In biological organisms, barium possesses chemical and physiological properties that allow it to compete with and replace calcium in processes normally mediated by calcium, particularly those relating to the release of adrenal catecholamines and neurotransmitters, such as acetylcholine and noradrenaline (http://toxnet.nlm.nih.gov).

The Eco-SSL values derived to date for barium are summarized in Table 2.1.

Table 2.1 Barium Eco-SSLs (mg/kg dry weight in soil)

Plants	Soil Invertebrates	Wildlife	
		Avian	Mammalian
NA	330	NA	1000

NA = Not Available. Data were insufficient to derive an Eco-SSL.

Eco-SSL values for barium were derived for soil invertebrates and mammailian wildlife. Eco-SSLs could not be derived for plants or avian wildlife. For these receptor groups, data were insufficient to calculate an Eco-SSL. The Eco-SSLs for barium for soil invertebrates and mammalian wildlife are 330 mg/kg dry weight (dw) soil and 1000 mg/kg dw, respectively. The Eco-SSL for barium for soil invertebrates is lower than the 75th percentile for background concentrations in eastern and western U.S. soils (Figure 2.1). The mammalian Eco-SSL for barium is higher than the 75th percentile for background concentrations in eastern and western U.S. soils (Figure 2.1).

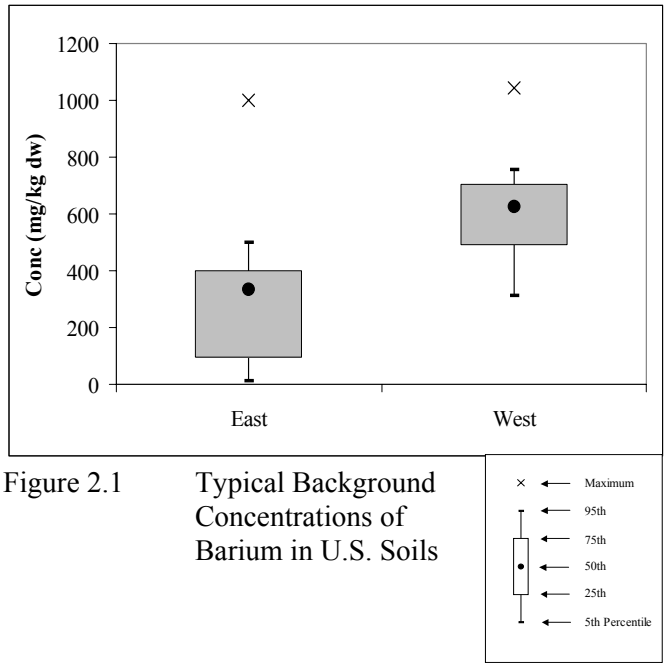


Figure 2.1 Typical Background Concentrations of Barium in U.S. Soils

The reported background concentrations of metals in U.S. soils are described in Attachment 1-4 of the Eco-SSL guidance (U.S. EPA, 2003).

3.0 ECO-SSL FOR TERRESTRIAL PLANTS

Of the papers identified from the literature search process, 30 were selected for acquisition for further review. Of those papers acquired, three met all 11 Study Acceptance Criteria (U.S. EPA 2003; Attachment 3-1). Each of these papers were reviewed and the studies were scored according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 3-2). One study received an Evaluation Score greater than ten. This study is listed in Table 3.1. An Eco-SSL could not be derived for barium according to the Eco-SSL guidance because only one study result is available for one test species with an Evaluation Score greater than ten (US EPA, 2003; Attachment 3-2).

4.0 ECO-SSL FOR SOIL INVERTEBRATES

Of the papers identified from the literature search process, 152 papers were selected for acquisition for further review. Of those papers acquired, four met all 11 Study Acceptance Criteria (U.S. EPA 2003; Attachment 3-1). Each of these papers were reviewed and the studies were scored according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 3-2). Three studies received an Evaluation Score greater than ten. The data from these studies are provided in Table 4.1.

The data in Table 4.1 were sorted by bioavailability score and all study results with a bioavailability score of two are used to derive the plant Eco-SSL for barium according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 3-2). The Eco-SSL is the geometric mean of the EC_{20} values reported for each of three test species under three separate test conditions of pH and is equal 330 mg/kg dw.

5.0 ECO-SSL FOR AVIAN WILDLIFE

The derivation of the Eco-SSL for avian wildlife is completed as two parts. First the toxicity reference value (TRV) is derived according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 4-5). Second the Eco-SSL (soil concentration) is back calculated for each of three surrogate species based on the wildlife exposure model and the TRV (U.S. EPA, 2003).

The literature search completed according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 4-2) identified 837 papers with possible toxicity data for either mammalian or avian species. Only a single paper (Johnson et al., 1960) with data on the toxicity of barium to one avian species was identified; therefore, a TRV could not be derived and an Eco-SSL could not be calculated for avian wildlife (calculation requires a minimum of three results for two test species) (Johnson et al., 1960).

Table 3.1 Plant Toxicity Data - Barium

Reference	Study ID	Test Organism		Soil pH	OM%	Bio-availability Score	ERE	Tox Parameter	Tox Value (Soil Conc. mg/kg dw)	Total Eval. Score	Eligible for Eco-SSL Derivation?	Used for Eco-SSL?
Chaudhry, A., 1977	a	Bush bean	*Phaseolus vulgaris*	7.1 - 8.4	1.0 - 2.4	0	GRO	MATC	1,414	11	Y	N

ERE = Ecologically relevant endpoint
GRO = growth
LOAEC = Lowest observed adverse effect concentration
MATC = Maximum acceptable toxicant concentration. Geometric mean of NOAEC and LOAEC.
N = no
NOAEC = No observed adverse effect concentration
OM = Organic matter content
Y = yes
Bioavailability Score described in *Guidance for Developing Eco-SSLs* (U.S. EPA, 2003)
Total Evaluation Score described in *Guidance for Developing Eco-SSLs* (U.S. EPA, 2003)

Table 4.1 Invertebrate Toxicity Data - Barium

Reference	Study ID	Test Organism		Soil pH	OM %	Bio-availability Score	ERE	Tox Parameter	Tox Value (Soil Conc. mg/kg dw)	Total Eval. Score	Eligible for Eco-SSL Derivation?	Used for Eco-SSL?
Kuperman et al., 2002		Pot worm	*Enchytraeus crypticus*	4.36 - 5.29	1.2	2	REP	EC_{20}	585	17	Y	Y
Phillips et al., 2002		Springtail	*Folsomia candida*	4.47 - 5.29	1.2	2	REP	EC_{20}	165	18	Y	Y
Simini et al., 2002		Earthworm	*Eisenia fetida*	4.26 - 5.29	1.2	2	REP	EC_{20}	370	17	Y	Y
								Geometric Mean	330			

EC_{20} = Effect concentration for 20% of test population
ERE = Ecologically relevant endpoint
OM = Organic matter content
REP = Reproduction
Y = yes
Bioavailability Score described in *Guidance for Developing Eco-SSLs* (U.S. EPA, 2003)
Total Evaluation Score described in *Guidance for Developing Eco-SSLs* (U.S. EPA, 2003)

6.0 ECO-SSL FOR MAMMALIAN WILDLIFE

The derivation of the Eco-SSL for mammalian wildlife was completed as two parts. First, the TRV was derived according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 4-5). Second, the Eco-SSL (soil concentration) is back-calculated for each of three surrogate species based on the wildlife exposure model and the TRV (U.S EPA, 2003).

6.1 Mammalian TRV

The literature search completed according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 4-1) identified 837 papers with possible toxicity data for either mammalian or avian species. Of these studies, 826 were rejected for use as described in Section 7.5. Of the remaining papers ten contained data for mammalian species. These papers were reviewed and data extracted and scored according to the Eco-SSL guidance (U.S. EPA, 2003; Attachment 4-3 and 4-4). The results of the data extraction and review are summarized in Table 6.1. The complete results are included as Appendix 6 -1.

Within the ten papers there are 27 results for biochemical (BIO), behavior (BEH), physiology (PHY), pathology (PTH), reproduction (REP), growth (GRO), and survival (MOR) endpoints with a total Data Evaluation Score of > 65 that were used to derive the TRV. These data are plotted in Figure 6.1 and correspond directly with the data presented in Table 6.1. The no-observed adverse effect level (NOAEL) results for growth and reproduction are used to calculate a geometric mean NOAEL. This mean NOAEL is examined in relationship to the lowest bounded lowest bounded lowest observed adverse effect level (LOAEL) for reproduction, growth and survival to derive the TRV according to procedures in the Eco-SSL guidance (U.S. EPA, 2003; Attachment 4-5).

A geometric mean of the NOAEL values for growth and reproductive effects was calculated at 51.8 mg barium/kg bw/day. This value is higher than the lowest bounded LOAEL for either reproductive, growth and survival (Figure 6.1). Therefore, the TRV is equal to the geometric mean of the NOAEL values for reproduction and growth (Figure 6.1) and is equal to 51.8 mg barium/kg bw/day.

6.2 Estimation of Dose and Calculation of the Eco-SSL

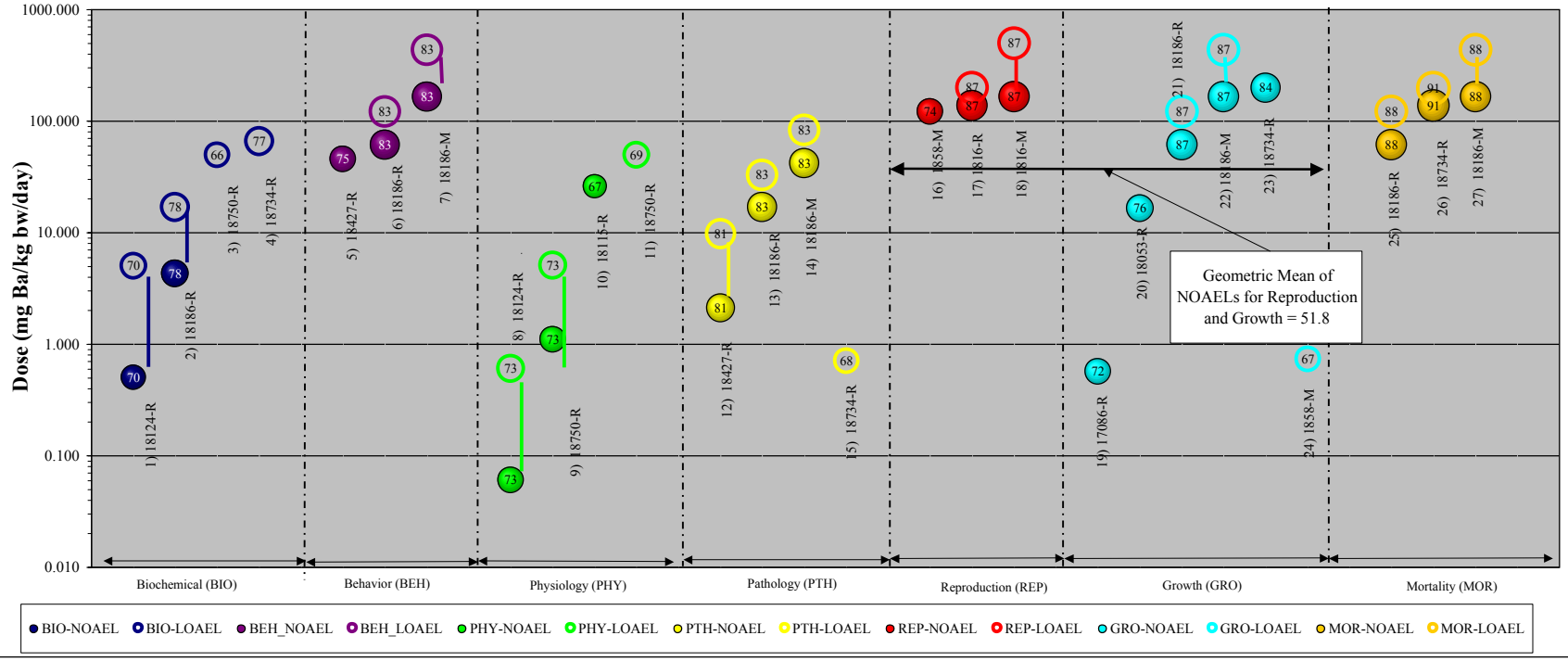
Three separate Eco-SSL values were calculated for mammalian wildlife, one each for three surrogate species representing different trophic groups. The mammalian Eco-SSLs derived for barium are calculated according to Eco-SSL guidance (U.S. EPA, 2003) and are summarized in Table 6.2.

Table 6.1 Mammalian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)
Barium

Result #	Reference	Ref No.	Test Organism	# of Conc/ Doses	Method of Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Effect Type	Effect Measure	Response Site	NOAEL Dose (mg/kg bw/day)	LOAEL Dose (mg/kg bw/day)	Data Evaluation Score
Biochemical																		
1	Perry et al, 1983	18124	Rat (*Rattus norvegicus*)	4	U	DR	16	mo	NR	NR	JV	F	CHM	ATPT	HE	0.506	5.1	70
2	Dietz et al, 1992	18186	Rat (*Rattus norvegicus*)	6	UX	DR	92	d	43-44	d	JV	F	CHM	PHOS	SR	4.3	17.0	78
3	Perry et al, 1989	18750	Rat (*Rattus norvegicus*)	2	U	DR	16	mo	NR	NR	JV	F	ENZ	Other	HE		49.8	66
4	Borzelleca et al, 1988	18734	Rat (*Rattus norvegicus*)	5	U	GV	10	d	37	d	JV	F	CHM	UREA	BL		66	77
Behavioral																		
5	Tardiff et al, 1988	18427	Rat (*Rattus norvegicus*)	4	M	DR	13	w	4	w	JV	B	FDB	FCNS	WO	46		75
6	Dietz et al, 1992	18186	Rat (*Rattus norvegicus*)	6	UX	DR	92	d	43-44	d	JV	M	FDB	WCON	WO	61.1	121	83
7	Dietz et al, 1992	18186	Mouse *(Mus musculus)*	6	UX	DR	92	d	43-44	d	JV	M	FDB	WCON	WO	165	436	83
Physiology																		
8	Perry et al, 1983	18124	Rat (*Rattus norvegicus*)	4	U	DR	8	mo	NR	NR	JV	F	PHY	BLPR	WO	0.060	0.60	73
9	Perry et al, 1989	18750	Rat (*Rattus norvegicus*)	4	U	DR	8	mo	NR	NR	JV	F	PHY	BLPR	WO	1.1	5.1	73
10	McCauley et al, 1985	18115	Rat (*Rattus norvegicus*)	2	U	DR	5	mo	NR	NR	NR	NR	PHY	HTRT	HE	26.0		67
11	Perry et al, 1989	18750	Rat (*Rattus norvegicus*)	2	U	DR	16	mo	NR	NR	JV	F	PHY	BLPR	WO		49.7	69
Pathology																		
12	Tardiff et al, 1988	18427	Rat (*Rattus norvegicus*)	4	M	DR	8	w	4	w	JV	M	ORW	SMIX	AR	2.1	9.7	81
13	Dietz et al, 1992	18186	Rat (*Rattus norvegicus*)	6	UX	DR	92	d	43-44	d	JV	F	ORW	ORWT	KI	17.0	32.9	83
14	Dietz et al, 1992	18186	Mouse *(Mus musculus)*	6	UX	DR	92	d	43-44	d	JV	M	ORW	SMIX	LI	41.9	82.9	83
15	Schroeder and Mitchener, 1975	1858	Mouse *(Mus musculus)*	2	U	DR	520	d	19-20	d	JV	B	HIS	EDMA	WO		0.71	68
Reproduction																		
16	Dietz et al, 1992	18186	Rat (*Rattus norvegicus*)	6	UX	DR	92	d	43-44	d	JV	M	REP	RHIS	TE	121		74
17	Borzelleca et al, 1988	18734	Rat (*Rattus norvegicus*)	5	U	GV	10	d	37	d	JV	F	REP	RHIS	OV	138	198	87
18	Dietz et al, 1992	18186	Mouse *(Mus musculus)*	6	UX	DR	92	d	43-44	d	JV	F	REP	RHIS	TE	165	499	87
Growth																		
19	Schroeder and Mitchener, 1975	17086	Rat (*Rattus norvegicus*)	2	U	DR	520	d	21	d	JV	B	GRO	BDWT	WO	0.57		72
20	Stoewsand et al, 1988	18053	Rat (*Rattus norvegicus*)	2	U	FD	29	d	NR	NR	JV	M	GRO	BDWT	WO	16.5		76
21	Dietz et al, 1992	18186	Rat (*Rattus norvegicus*)	6	UX	DR	92	d	43-44	d	JV	M	GRO	BDWT	WO	61.1	121	87
22	Dietz et al, 1992	18186	Mouse *(Mus musculus)*	6	UX	DR	92	d	43-44	d	JV	M	GRO	BDWT	WO	165	436	87
23	Borzelleca et al, 1988	18734	Rat (*Rattus norvegicus*)	5	U	GV	10	d	37	d	JV	B	GRO	BDWT	WO	198		84
24	Schroeder and Mitchener, 1975	1858	Mouse *(Mus musculus)*	2	U	DR	10	d	19-20	d	JV	F	GRO	BDWT	WO		0.74	67
Survival																		
25	Dietz et al, 1992	18186	Rat (*Rattus norvegicus*)	6	UX	DR	92	d	43-44	d	JV	M	MOR	MORT	WO	61.1	121	88
26	Borzelleca et al, 1988	18734	Rat (*Rattus norvegicus*)	5	U	GV	10	d	37	d	JV	F	MOR	MORT	WO	137	197	91
27	Dietz et al, 1992	18186	Mouse *(Mus musculus)*	6	UX	DR	13	d	43-44	d	JV	M	MOR	MORT	WO	165	436	88

AR=adrenal; ATPT = adenosine triphosphate; B = both; BDWT = body weight changes; BL = blood; BLPR = blood pressure; bw = body weight; CHM = chemical; d = days; DR = drinking water; EDMA = edema; ENZ = enzyme; F = female; FCNS = food consumption; FD = food; FDB = feeding behavior; GRO = Growth; GV=gavage; HE= heart; HIS = histology; HTRT = heart rate; JV = juvenile; kg = kilogram; KI = kidney; LI = liver; LOAEL = lowest observed adverse effect level; M = measured; M = male; mg = milligram; mo = months; MOR = effects on survival; MORT = mortality; NOAEL = no observed adverse effect level; NR = not reported; ORW = organ weight changes; ORWT = organ weight; OV = ovary; PHOS = phosphate; PHY = physiology; REP = reproduction; RHIS = reproductive organ histology; Score = Total Data Evaluation Score as described in US EPA (2003; Attachment 4-3); SMIX = organ weight changes relative to body weight; SR = serum; TE = testes; U = unmeasured; UREA = urea; UX = reported as measured but measurements not reported; w = weeks; WCON = water consumption; WO = whole

Figure 6.1 Mammalian TRV Derivation for Barium



Result number → 1) 10 - C

Reference Number

Test Species

Test Species Key

M = Mouse
R = Rat

83 — Data Evaluation Score

Lowest-Observed Adverse Effect Dose

Paired values from same study when joined by line

No-Observed Adverse Effect Dose

Wildlife TRV Derivation Process

1) There are at least three results available for two test species within the growth, reproduction, and mortality effect groups. There are enough data to derive a TRV.

2) There are are at least three NOAEL results available for calculation of a geometric mean.

3) The geometric mean of the NOAEL values for growth and reproductive effects equals 51.8 mg barium/kg BW/day.

4) The geometric mean NOAEL value is lower than the lowest bounded LOAEL for reproduction, growth, or mortality effects

5) The mammalian wildlife TRV for barium is equal to 51.8 mg barium/kg bw/day which is the geometric mean of the NOAEL values for growth and reproduction.

Table 6.2 Calculation of the Mammalian Eco-SSL for Barium						
Surrogate Receptor Group	**TRV_j (mg dw/kg bw/d)**	**Food Ingestion Rate (FIR) (kg/kg/d)**	**P_s**	**T_{ij}**	**T_{ver}**	**Eco-SSL (mg/kg dw) ($Soil_j$)**
Mammalian herbivore (vole)	51.8	0.28	0.029	0.156	NA	1000
Mammalian ground insectivore (shrew)	51.8	0.2	0.03	0.091	NA	2100
Mammalian carnivore (weasel)	51.8	0.1	0.04	0.091	0.001	12,900*

Sources and derivation of the exposure parameters (FIR, P, and T) are provided in U.S. EPA (2003) Attachment 4-1.
The process for derivation of wildlife TRVs is described in Attachment 4-5 of U.S. EPA (2003).
NA = Not Applicable

Eco-SSL = $Soil_j$ - TRV_j / FIR * [P_s +T_{ij}] (Equation 4-8; U.S. EPA, 2003) or *Eco-SSL_{pred} = TRV_j / FIR * [P_s + (T_{ij} + T_{ver})] (Equation 4-9; U.S. EPA, 2003)

where:

$Soil_j$	=	Contaminant concentration for contaminant (j) in soil (mg/kg dry weight),
FIR	=	Food ingestion rate (kg food [dry weight]/ kg body weight (bw) [wet weight] /d),
P_s	=	Soil ingestion as proportion of diet,
TRV_j	=	Toxicity reference value for contaminant (j) (mg [dry weight]/kg bw [wet weight] /d) for contaminant (j),
T_{ij}	=	Soil-to-biota bioaccumulation factor (BAF) for contaminant (j) for biota type (i),
T_{ver}	=	Diet to biota BAF.

This Page Intentionally Left Blank

7.0 REFERENCES

7.1 General Barium References

Johnson, D., A.L. Mehring and H. W. Titus. 1960. Tolerance of Chickens for Barium. *Proceedings of the Society for Experimental Biology and Medicine*. 104: 436-438. Ref ID: 25921.

http://toxnet.nlm.nih.gov. National Library of Medicine. Hazardous Substances Database (HSBD).

United States Environmental Protection Agency (US EPA). 2003. *Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs).* OSWER Directive 92857-55. Office of Solid Waste and Emergency Response. April.

United States Environmental Protection Agency (U.S. EPA). 1998. *Guidelines for Ecological Risk Assessment.* Risk Assessment Forum. U.S. Environmental Protection Agency, Washington DC. EPA/630/R-95/002F. April. May 14, 1998 Federal Register 63(93): 26846-26924.

United States Environmental Protection Agency (U.S. EPA). 1997. *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments.* Interim Final. U.S. Environmental Protection Agency, Environmental Response Team (Edison, NJ). June 5, 1997.

7.2 References Used for Derivation of Plant and Soil Invertebrate Eco-SSLs

Chaudhry, F. M., Wallace, A., and Mueller, R. T. 1977. Barium Toxicity in Plants. *Commun.Soil Sci.Plant Anal*. 8[9], 795-797

Kuperman, R.G., Checkai, R.T., Phillips, C.T., Simini, M., Speicher, J.A., Barclift, D.J. 2002. *Toxicity Assessments of Antimony, Barium, Beryllium, and Manganese for Development of Ecological Soil Screening Levels (Eco-SSL) Using Enchytraeid Reproduction Benchmark Values*. Technical Report No. ECBC-TR-324. U.S. Army Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD.

Simini, M., Checkai, R.T., Kuperman, R.G., Phillips, C.T., Speicher, J.A., Barclift, D.J. 2002. *Toxicity Assessments of Antimony, Barium, Beryllium, and Manganese for Development of Ecological Soil Screening Levels (Eco-SSL) Using Earthworm (Eisenia fetida) Benchmark Values.* Technical Report No. ECBC-TR-325. U.S. Army Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD.

Phillips, C.T., Checkai, R.T., Kuperman, R.G., Simini, M., Speicher, J.A., Barclift, D.J. 2002. *Toxicity Assessments of Antimony, Barium, Beryllium, and Manganese for Development of Ecological Soil Screening Levels (Eco-SSL) Using Folsomia Reproduction Benchmark Values.* Technical Report No. ECBC-TR-326. U.S. Army Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD.

7.3 References Rejected for Use in Derivation of Plant and Soil Invertebrate Eco-SSLs

These references were reviewed and rejected for use in derivation of the Eco-SSL. The definition of the codes describing the basis for rejection is provided at the end of the reference sections.

Ecol, Mix Ravikovitch, S. and Margolin, M. 1959. The Effect of Barium Chloride and Calcium Sulphate in Hindering Selenium Absorption by Lucerne. *Emp.J.Exp.Agric*. 27, 235-240

FL Bruinsma, J. R. 1940. Field Tests with Potassium, Sodium, and Barium. Meded.Inst.Suikerbiet., Bergen op Zoom, Netherlands 10, 141-167

Media Chaney, W. R. and Strickland, R. C. 1984. Relative toxicity of heavy metals to red pine pinus-resinosa pollen germination and germ tube elongation. J Environ Qual 13[3], 391-394

No Dose Cipollini, M. L. and Pickering, J. L. 1986. Determination of the Phytotoxicity of Barium in Leach-Field Disposal of Gas Well Brines. Plant Soil 92[2], 159-169

Media Clark, R. B., Pier, P. A., Knudsen, D., and Maranville, J. W. 1981. Effect of Trace Element Deficiencies and Excesses on Mineral Nutrients in Sorghum. J.Plant Nutr. 3[1-4], 357-374

Media Debnath, R. 1982. Toxic Action of Barium Chloride on Germination, Growth and Metabolism of Rice (*Oryza sativaL.*). Environ Exp Bot 22[2], 203-210

Media Debnath, R. Bpaba and Mukherji, S. 1982. Barium effects in Phaseolus aureus, Cephalandra indica, Canna indica, Beta vulgaris, Triticum aestivum and Lactuca sativa (mung beans, beets, wheat, lettuce, air pollutants deleterious concentration influencing growth and respriation). Biol.Plant. 24[6], 423-429

No COC Grace, J. K. 1990. Oral toxicity of barium metaborate to the eastern subterranean termite Isoptera Rhinotermitidae. J ENTOMOL SCI.Journal of Entomological Science.25 (1).1990.112-116. 25[1], 112-116

No Dose Guyette, R. P. and Cutter, B. E. 1994. Barium and manganese trends in tree-rings as monitors of sulfur deposition. Water Air Soil Pollut. 73[1/4], 213-223

No Dur Hope, B., Loy, C., and Miller, P. 1996. Uptake and Trophic Transfer of Barium in a Terrestrial Ecosystem. Bull.Environ.Contam.Toxicol. 56[5], 683-689

Media Iqbal, J. and Rafique, N. 1987. Toxic Effects of BaCl2 on Germination, Early Seedling Growth, Soluble Proteins and Acid Phosphatases in Zea mays L. Pak.J.Bot. 19[1], 1-8

Media Ke, Hueli Yang David, Anderson, Wendy L., Moncrief, Robyn M., Rayson, Gary D., and Jackson, Paul J. 1994. Luminescence studies of metal ion-binding sites on Datura inoxia biomaterial. Environ.Sci.Technol. 28[4], 586-591

Media Lane, I. and Puckett, K. J. 1979. Responses of the Phosphatase Activity of the Lichen Cladina rangiferina to Various Environmental Factors Including Metals. Can.J.Bot. 57, 1534-1540

Mix Lawrey, J. D. 1979. Boron, Strontium, and Barium Accumulation in Selected Plants and Loss During Leaf Litter Decomposition in Areas Influenced by Coal Strip Mining. Can J Bot 57[8], 933-940

Species Marsh, C. D., Alsberg, C. L., and Black, O. F. 1912. The Relation of Barium to Loco-Weed Disease 37997. U.S.Dep.Agric.Bur.Plant Ind.Bull.No.246

OM, pH Marsh, C. D. 1912. Absorption of Barium Chloride by Aragallus lamberti. Bot.Gaz. 54, 250-252

OM, pH McFarland, M. L., Ueckert, D. N., Hons, F. M., and Hartmann, S. 1992. Selective-placement burial of drilling fluids ii. Effects on buffalograss and fourwing saltbush. J Environ Qual 21[1], 140-144

OM, pH McHargue, J. S. 1919. Effect of Certain Compounds of Barium and Strontium on the Growth of Plants. J.Agric.Res. 16, 183-194

Score Miller, R. W., Honarvar, S., and Hunsaker, B. 1980. Effects of Drilling Fluids on Soils and Plants 1. Individual Fluid Components. J.Environ.Qual. 9[4], 547-552

Media Minton, G. A. and Wilson, R. H. 1973. Effect of Ba Ions on the Growth and Mitochondrial Metabolism of Mung Bean Seedlings. Plant Soil 39[3], 611-617

pH Nyarai-Horvath, F., Szalai, T., Kadar, I., and Csatho, P. 1997. Germination characteristics of pea seeds originating from a field trial treated with different levels of harmful elements. Acta Agron.Hung. 452[147-154]

Ecol, Mix Ravikovitch, S. and Margolin, M. 1959. The Effect of Barium Chloride and Calcium Sulphate in Hindering Selenium Absorption by Lucerne. *Emp.J.Exp.Agric*. 27, 235-240

Media Reddy, T. and Vaidyanath, K. 1978. Mutagenic Potentiating and Antimutagenic Activity of Certain Metallic Ions in the Rice Genetic System. Curr Sci 47[14], 513-515

In Vit Siegel, S. M. 1977. The Cytotoxic Response of Nicotiana Protoplast to Metal Ions: A Survey of the Chemical Elements. Water Air Soil Pollut 8[1-4], 293-304

Mix Smith, K. A. 1971. The Comparative Uptake and Translocation by Plants of Calcium, Strontium, Barium and Radium. II. Triticum vulgare (Wheat). Plant Soil 34[3], 643-651

Media Steinberg, R. A. 1936. Effects of Barium Salts upon Aspergillus niger, and Their Bearing upon the Sulphur and Zinc Metabolism of the Fungus in an Optimum Solution. Bot.Gaz. 97, 666-671

Mix Tolle, Duane A., Arthur, Mickey F., Chesson, Jean, and Van Voris, Peter. 1985. Comparison of pots versus microcosms for predicting agroecosystem effects due to waste amendment. Environ.Toxicol.Chem. 4[4], 501-509

Rev Vanselow, A. P. 1966. Barium. In: H.D.Chapman (Ed.), Diagnostic Criteria for Plants and Soils, University of California, Berkeley, CA , 24, 31-24, 32

OM, pH Voelcker, J. A. 1917. Pot-Culture Experiments, 1917. I. The Hills' Experiments - The Influence of Barium Compounds on Wheat. J.R.Agric.Soc. 78, 232-248

Media Wallace, A. and Romney, E. M. 1971. Some Interactions of Ca, Sr, and Ba in Plants. Agron.J. 63[2], 245-248

Media Wettlaufer, S. H., Osmeloski, J., and Weinstein, L. H. 1991. Response of polyamines to heavy metal stress in oat seedlings. Environ Toxicol Chem 10[8], 1083-1088

Media Wilson, R. H. and Minton, G. A. 1974. The comparative uptake of barium ions and other alkaline earth metals by plant mitochondria. Biochim.Biophys.Acta 333[1], 22-27

7.4 References Used for Derivation of Wildlife TRVs

Borzelleca J.F., Condie L.W.,Jr., and Egle J.L.,Jr. 1988. Short-term toxicity (one- and ten-day gavage) of barium chloride in male and female rats. *J. Am. Coll. Toxicol* 7(5): 675-686. Ref ID: 18734

Dietz, D. D. M. R. Elwell W. E. Davis Jr. and E. F. Meirhenry. 1992. Subchronic toxicity of barium chloride dihydrate administered to rats and mice in the drinking water. *Fundam. Appl. Toxicol.* 19(4):527-37. Ref ID: 18186

McCauley, P. T. B. H. Douglas R. D. Laurie and R. J. Bull. 1985. Investigations into the effect of drinking water barium on rats. *Adv. Mod. Environ. Toxicol.* 9(Inorg. Drinking Water Cardiovasc. Dis.): 197-210. Ref ID: 18115

Mercado, R. C. and Bibby, B. G. 1973. Trace element effects on enamel pigmentation incisor growth and molar morphology in rats . *Arch Oral Biol* 18(5): 629-635. Ref ID: 757

Mitchell, P. H. Jr., S. J. Kopp M. W. Erlanger and E. F. Perry. 1983. Cardiovascular effects of chronic barium ingestion. *Trace Subst. Environ. Health* 17: 155-64 . Ref ID: 18124

Perry, H. M. Jr, Kopp, S. J., Perry, E. F., and Erlanger, M. W. 1989. Hypertension and associated cardiovascular abnormalities induced by chronic barium feeding. *Journal of toxicology and environmental health* 28(3): 373-88. Ref ID: 18750

Schroeder, H. A. and Mitchener, M. 1975. Life-term effects of mercury, methyl mercury, and nine other tracemetals on mice. *Journal of Nutrition* 105(4): 452-458. Ref ID: 1858

Schroeder, Henry A. and Mitchener, Marian. Life-term studies in rats. Effects of aluminum, barium, beryllium, and tungsten. *J. Nutr.* 105(4):421-7. Ref ID: 17086.

Stoewsand, Gilbert S., Anderson, Judy L., Rutzke, Michael, and Lisk, Donald J. 1988. Deposition of barium in the skeleton of rats fed Brazil nuts. *Nutr. Rep. Int.* 38(2): 259-62. Ref ID: 18053

Tardiff, R. G., Robinson, M., and Ulmer, N. S. 1980. Subchronic oral toxicity of BaCl2 in rats. *Journal of Environmental Pathology and Toxicology.* 4(5-6): 267-75. Ref ID: 18427

7.5 References Rejected for Use in Derivation of Wildlife TRVs

These references were reviewed and rejected for use in derivation of the Eco-SSL. The definition of the codes describing the basis for rejection is provided at the end of the reference sections.

Unrel 1972. *Acta Physiologica Polonica*. Volume 23, Number 1, 1972

Diss Autografts and allografts of the anterior cruciate ligament of the knee: experimental study of its revascularization and histology original title: aloinjertos y autoinjertos de ligamento cruzado anterior de la rodilla: estudio experimental de su revascularizacion e histologia 01358818

Diss *Calcium-activated Potassium Channels from Rabbit Renal Brush Border Membrane Vesicles in Planar Lipid Bilayers: Basic Single-channel Properties, Block by Amiloride Analogs and the Effect of Magnesium on Calcium-activation (Calcium Activation)* 01233575 ORDER NO: AAD92-21462

Diss a Characterization of the Effects of Cannabinoids in Rat Hippocampus (Marijuana, M Current, Win 55,212-2, Gaba) 01647233 ORDER NO: AAD98-33504

Diss *Desensitization of the Capsaicin-activated Current in Rat Dorsal Root Ganglion Neurons (Tachyphylaxis)* 01448091 ORDER NO: AADAA-I9538425

Diss *the Effect of Intermittent Noise Exposure on the Rate of Wound Healing in Albino Rats (Image Processing, Bioacoustics)* 927073 ORDER NO: AAD86-18596

Diss *Elemental Analysis of Bone for Ancient Diet Reconstruction* 01157970 ORDER NO: AAD91-14659

Diss *Geologic Models of Sediment-buffered Hydrothermal Vents: a Case Study of the Red Dog Zn-pb-ag Orebody, Western Brooks Range, Alaska (Red Dog Orebody, Zinc-lead-silver)* 01629666 ORDER NO: AAD98-22586

Diss *Influence of Myocardial Fiber Organization on Ventricular Function (Hypertrophic Cardiomyopathy)* 01664135 ORDER NO: AAD99-04816

Diss *Mechanics and Model Identification in the Coronary Circulation (Blood Flow, Impedance, Capacitance)* 01160086 ORDER NO: AAD91-15105

Diss *Neuroprotection Against Excitotoxic Cell Damage in Rat Striatum and Hippocampus* 01183033 ORDER NO: AADDX-93755

FL 1978. (On the use of radioisotopic methods in an hygienic experiment).| AU- Moscow, USSR GIGIENA I SANITARIYA No. 9:72-75.

Diss *Osteophilic Implant Materials: Design, Development and Applications* 902284 ORDER NO: AAD85-28677

Diss *Patch Clamp Study of a Large Conductance, Inward Rectifying, Potassium Channel in Cultured Mouse Hippocampal Neurons (Ion Channels, Neurophysiology, Electrophysiology)* 950038 ORDER NO: AAD87-08323

Mix *Product for Preventing and Combating Food Toxicoses Originated by Mycotoxins. Eur. Pat. Appl.*:11 pp.

Diss *Regulation of Duodenal Ion Transport by Uroguanylin and Cloning of Murine Intestinal Clc-2 Chloride Channel* 01698611 ORDER NO: AAD99-24893

Drug Abdulla, Fuad A. and Smith, Peter A. 1997. Nociceptin inhibits T-type Ca2+ channel current in rat sensory neurons by a G-protein-independent mechanism. *J. Neurosci*. 17(22):8721-8728 .

In Vit Abel, P. W., Trapani, A., Aprigliano, O., and Hermsmeyer, K. 1980. Trophic effect of norepinephrine on the rat portal vein in organ culture. *Circulation Research*. 47 ((5)): 770-775.

No Oral Acuna-Castillo Claudio, Morales Bernardo, and Huidobro-Toro, J. Pablo(A). 2000. Zinc and copper modulate differentially the p2x4 receptor. *Journal of Neurochemistry* 74(4):1529-1537.

Phy Aggarwal Rajesh and Boyden Penelope A(A). 1995. Diminished ca-2+ and ba-2+ currents in myocytes surviving in the epicardial border zone of the 5-day infarcted canine heart. *Circulation Research* 77(6):1180-1191.

Anat Aiba, Sumi and Creazzo, Tony L. 1993. Comparison of the number of dihydropyridine receptors with the number of functional L-type calcium channels in embryonic heart. *Circ. Res* 72(2):396-402

Phy Albillos Almudena, Garcia Antonio G(A), Olivera Baldomero, and Gandia Luis. 1996. Re-evaluation of the p/q ca-2+ channel components of ba-2+ currents in bovine chromaffin cells superfused with solutions containing low and high ba-2+ concentrations. *Pfluegers Archiv European Journal of Physiology*. 432(6):1030-1038.

Unrel Almers, W. and Mccleskey, E. W. 1984. Nonselective conductance in calcium channels of frog rana-temporaria muscle calcium selectivity in a single-file pore. *Journal of Physiology* (London). 353 (0). 585-608.

Unrel Altura, B. M., Ogunkoya, A., Gebrewold, A., and Altura, B. T. 1979. Effects of ethanol on terminal arterioles and muscular venules: direct observations on the microcirculation. *Journal of Cardiovascular Pharmacology* 1(1):97-113.

Phy Alvarez Julio L and Vassort Guy(A). 1992. Properties of the low threshold calcium current in single frog atrial cardiomyocytes: a comparison with the high threshold calcium current. *Journal of General Physiology* 100(3):519-545.

No COC Alvarez, R. J. 1976. A note on the *rate of passage of the digesta in chickens fed different levels of final molasses. Cuban Journal of Agricultural Science* 10(2):169-172.

No Dose Alvarez, R. J. and Sanz, M. The effect of rice polishings diets on the rate of passage and intestinal disaccharidase activity of broilers *Cuban Journal of Agricultural Science*. 18 (2). 1984 (Recd. 1985). 173-177.

Unrel Alzen, G., Banning, S., and Gunther, R. 1987. [Sonographic detectability of narcotic drug containers in the gastrointestinal tract. Experimental research in the dog]. <Original> Sonographische Nachweisbarkeit von Betaubungsmittelbehaltnissen im Gastrointestinaltrakt. Experimentelle Untersuchung beim Hund. RoFo. Fortschritte auf dem Gebiete der Rontgenstrahlen und der

Phy Amedee, T., Large, W. A., and Wang, Q. 1990. Characteristics of chloride currents activated by noradrenaline in rabbit ear artery cells. *Journal of Physiology* 428:501-16.

Unrel Anderson, G. I., McKeown, D. B., Partlow, G. D., and Percy, D. H. 1987. Rectal resection in the dog. A new surgical approach and the evaluation of its effect on fecal continence. *Veterinary Surgery* 16(2):119-25.

In Vit Anderson, S., Brismar, T., and Hansson, E. 1995. Effect of external K super(+), Ca super(2+), and Ba super(2+) on membrane potential and ionic conductance in rat astrocytes *Cell. Mol. Neurobiol.* vol. 15,(no. 4,):pp. 439-450.

FL Andres, S. Facultad de Veterinaria Caceres Espagne Departamento de Medicina y Sanidad Animal, Mane, M. C., Sanchez, J., Barrera, R., Zaragoza, C., and Jimenez, A. 1997. Response to barium selenate supplementation in sheep kept at pasture in the Mediterranean area. <Original> Reponse a une supplementation de selenate de baryum de moutons en elevage extensif en region mediterraneenne *Veterinary Research*. v. 28(6) :p. 539-545.

Alt Antonio, A., Rocha e Silva, M., and Yashuda, Y. 1973. Tachyphylactic effect of barium on intestinal smooth muscle *Arch. Int. Pharmacodyn. Ther*. 204(2):260-7.

Phy Aoki, Y., Albrecht, F. E., Bergman, K. R., and Jose, P. A. 1996. Stimulation of Na(+)-K(+)-2Cl-cotransport in rat medullary thick ascending limb by dopamine. *American Journal of Physiology* 271(6 Pt 2):R1561-7.

In Vit Aono Tadashi. 1996. Histopathological and ultrastructural studies on pulp response and dentin bridge formation by the treatment of exposed pulp with alpha-tricalcium phosphate solid. *Shikwa Gakuho* 96(8):811-835.

FL Appel, A., Heinrich, M., and Brettel, H. F. 1975. [Injuries of the rectum in barium contrast enema]. <Original> Rectumverletzungen bei BariumkontrasteinlaufenDer Chirurg; Zeitschrift fur alle Gebiete der operativen Medizen; 46

CP Apsite, M. Changes in the morphological composition of blood and in the levels of some trace elements in blood and bone marrow of chicks given large doses of barium, copper, and cobalt (1968) Mikroelem. Organizme Ryb Ptits 99-124. Editor(s): Bermane, S.. Publisher: Izd. "Zinatne", Riga,

CP Archer, F., Doherty, P., and Bolsover S(A). 1997. Cell adhesion molecules induce calcium influx in neurons developing in culture. *Society for Neuroscience Abstracts* 23(1-2):1969.

In Vit Aromolaran, A. S. and Large, W. A. 1999. Comparison of the effects of divalent cations on the noradrenaline-evoked cation current in rabbit portal vein smooth muscle cells *J. Physiol.* (Cambridge U. K.) 520(3):771-782

Unrel Arver, S. and Sjostrand, N. O. Functions of adrenergic and cholinergic nerves in canine effectors of seminal emission *Acta Physiologica Scandinavica*. 115 (1). 1982. 67-78.

Unrel Athar, M., Chaudhry, N. I., Shakoor, A., and Khan, M. A. 1996. Studies on end-to-end colonic anastomosis in the dog: a comparison of techniques. *Acta veterinaria Hungarica* 44(3):349-56.

Unrel Aucelio, J. G. 1988. Influence of steroid ovarian hormones and calcium on drug-induced contractions of the isolated immature uterine muscle of mouse. An analysis of histamine receptor system. *General Pharmacology* 19(3):483-7.

Unrel Badgaiyan, R. D. Intracerebroventricular chloride infusion enhances water intake in rats *Physiology & Behavior*. 41 (6). 1987. 605-608.

Unrel Badgaiyan, R. D. 1989. Third ventricular chloride infusions enhance drinking in water deprived rats. *Physiology & Behavior* 45(5):951-4.

Unrel Badgaiyan, R. D. and Bhargava, R. P. 1986. Influence of intracerebroventricularly infused anions on feedingresponse. *Physiology and Behavior* 38(6):761-764.

Unrel Baez, J. L., Hendrick, M. J., Walker, L. M., and Washabau, R. J. 1999. Radiographic, ultrasonographic, and endoscopic findings in cats with inflammatory bowel disease of the stomach and small intestine: 33 cases (1990-1997). *Journal of the American Veterinary Medical Association* 215(3): 349-54.

No Oral Baggio, G., Castelli, M., and Greggia, A. Influence of sodium 3,4,5-trimethoxybenzoyl-.epsilon.-aminocaproate (C3) on barium chloride cardiotoxicity in anesthetized rats *Riv. Farmacol. Ter*. (1971) 2(4):.

Unrel Bailer, B. 1998. Barium carbonate: case reports *Biologische Tiermedizin* 15(3): 101-102.

Alt Bailey, M., Capasso, G., Agulian, S., Giebisch, G., and Unwin, R. 1999. The relationship between distal tubular proton secretion and dietary potassium depletion: evidence for up-regulation of H+ -ATPase. *Nephrology, Dialysis, Transplantation* 14(6):1435-40.

Phy Baiocco, A., Boujon, C. E., Hafeli, W., Cherubini, Y. D., Bestetti, G. E., and Rossi, G. L. 1993. Megaoesophagus in rats: a clinical, pathological and morphometrical study. *Journal of Comparative Pathology* 108(3):269-81.

Drug Banchelli, G., Raimondi, L., Ghelardini, C., Pirisino R(A), Bertini, V., De Munno A, and Lucchesini, F. 2000. Benzylamine-related compounds stimulate rat vas deferens neurotransmission and potentiate memory in the mouse acting as potassium channel blockers. *Pharmacological Research* 41(2): 151-162.

Unrel Barlas, M., Gokcora, H., Erekul, S., Dindar, H., and Yucesan, S. 1992. Human amniotic membrane as an intestinal patch for neomucosal growth in the rabbit Model. *Journal of Pediatric Surgery* 27(5):597-601.

In Vit Barnes, D., Brown, V. T., and Colowick, S. Stimulation of sugar uptake and dna synthesis of 3t3 cells by particulates *Journal of Cell Biology*. 75 (2 Part 2). 1977 373a

FL Bartos, J. and Habrda, J. 1975. Skiabaryum-Spofa (barium sulphate) in the prevention and treatment ofdiarrhoea in new-born calves. *Veterinarni Medicina* 20(5):261-268.

FL Bastos-Ramos, W. P., Fortes, V. A., and Ramos, A. O. Antiarrhythmic and other cardiac actions of dropropizine *Revista de Ciencias Biomedicas*. 5 (0). 1984 (Recd. 1985). 27-32.

No COC Bauman, V. K., Valinietse, M. Yu, and Berzin, N. I. The effect of strontium and some other bivalent cations on the development of rachitis in chickens. *Sel'skokhozyaistvennaya Biologiya*. 8 (4). 1973 585-589.

In Vit Bayliss, D. A., Li, Yu Wen, and Talley, E. M. 1997. Effects of serotonin on caudal raphe neurons: Inhibition of N- and P/Q-type calcium channels and the afterhyperpolarization vol. 77, no. 3, pp. 1362-1374 *J. Neurophysiol.*

In Vit Bekar, L. K. and Walz, W. 1999. Evidence for chloride ions as intracellular messenger substances in Astrocytes. *Journal of Neurophysiology* 82(1):248-54.

HHE Belle, M., Hanss, M., Guillaumont, M., Leclercq, M., and Guinet, R. 1991. Des-gamma-carboxyprothrombin detection by immunoblotting after polyacrylamide gel affinoelectrophoresis in human plasmas. *Electrophoresis* 12(4):294-7.

Unrel Berman, M. R., Peterson, J. N., Yue, D. T., and Hunter, W. C. Effect of isoproterenol on force transient time course and on stiffness spectra in rabbit papillary muscle in barium contracture J . *Journal of Molecular and Cellular Cardiology*. 20 (5). 1988. 415-426.

Surv Beyer, W. N., Day, D., Morton, A., and Pachepsky, Y. 1998. Relation of lead exposure to sediment ingestion in mute swans on the Chesapeake Bay, USA *Environmental Toxicology and Chemistry* 17(11):2298-2301.

Mix Beyer, W. Nelson(A), Day Daniel, Melancon Mark J, and Sileo Louis. 2000. Toxicity of anacostia river, washington, dc, usa, sediment fed to mute swans (*Cygnus olor*). *Environmental Toxicology and Chemistry*. 19(3):731-735.

No Oral Bidon J-C(A), Souilem, O., Gogny, M., Blin, M. , Vu, A. Tuan, and Jondet, A. 1995. Effect of temperature reduction on the vas deferens hyperresponsiveness of sensitized mice. *Journal of Autonomic Pharmacology* 15(4):227-238.

FL Binet, L., Binet, P., Miocque, M., Morin, H., Pechery, C., and Roux, M. 1972. [Farnesol, psychosedative and spasmolytic drug]. <Original> Le farnesol, substance psycho-sedative et spasmolytique. *Therapie* 27(5):893-905.

Unrel Bisaillon, A. 1981. Gross anatomy of the cardiac blood vessels in the North American beaver (*Castor canadensis*). *Anatomischer Anzeiger* 150(3):248-58.

Anat Bjornhag, G. and Sjoblom, L. 1977. Demonstration of coprophagy in some rodents. *Swedish Journal of Agricultural Research* 7(2):105-113.

Phy Blaineau, S., Jacquemond, V., Allard, B., Amsellem, J., Moutin, M. J., and Rougier, O. 1993. Inward barium current and excitation-contraction coupling in frog twitch muscle fibres. *Journal of Muscle Research and Cell Motility* 14(2):158-66.

Unrel Blair, G. K., Castner, P., Taylor, G., Newman, D., and Santoso, B. 1988. Esophageal atresia--a rabbit model to study anastomotic healing and the use of tissue adhesive fibrin Sealant. *Journal of Pediatric Surgery* 23(8):740-3.

Unrel Blass, C. E., Ee, R. T. van, and Wilson, J. W. 1991. Microvascular and histological effects on cortical bone of applieddouble-loop cerclage. *Journal of the American Animal Hospital Association* 27(4):432-434.

Alt Blech, W. and Weiss, I. 1975. [Ribonuclease activity following partial hepatectomy in the liver of healthy and alloxan diabetic rats and histological findings in the islets of Langerhans (author's transl)]. <Original> Ribonucleaseaktivitat in der Leber nach partieller Hepatektomie bei gesunden und alloxan-diabetischen Ratten mit histologischer Untersuchung der Langerhansschen Inseln Experimentelle Pathologie 10(1-2):28-38.

Unrel Boccadoro, B., Leonardi, L., Calvari, A. R., and Ferrandi, B. 1972. (Normal radiographic appearance of the gastrointestinal tract ofsheep). *Clinica Veterinaria* 95(No.9):349-366.

Unrel Bohnen, J. M., Christou, N. V., Chiasson, L., DeVoe, I. W., and Meakins, J. L. 1984. Anergy secondary to sepsis in rats. Relation to outcome. *Archives of Surgery* 119(1):117-20.

Unrel Bohnen, J. M., Christou, N. V., and Meakins, J. L. 1987. Suppression of delayed cutaneous hypersensitivity and inflammatory cell delivery by sterile barium peritonitis. *Journal of Surgical Research* 43(5):430-5.

Unrel Boland, L. M., Morrill, J. A., and Bean, B. P. 1994. omega-Conotoxin block of N-type calcium channels in frog and rat sympathetic neurons. *Journal of Neuroscience* 14(8):5011-27.

Phy Bonvallet, S. T., Zamora, M. R., Hasunuma, K., Sato, K., Hanasato, N., Anderson, D., Sato, K., and Stelzner, T. J. 1994. BQ123, an ETA-receptor antagonist, attenuates hypoxic pulmonary hypertension in rats. *American Journal of Physiology* 266(4 Pt 2):H1327-31.

Phy Bouron, A. and Reber, B. F. 1994. Differential modulation of pharmacologically distinct components of Ca2+ currents by protein kinase C activators and phosphatase inhibitors in nerve-growth-factor-differentiated rat pheochromocytoma (PC12) cells. *Pflugers Archiv* 427(5-6):510-6.

In Vit Bouron, Alexandre, Becker, Charlotte, and Porzig, H. Functional expression of voltage-gated Na+ and Ca2+ channels during neuronal differentiation of PC12 cells with nerve growth factor or forskolin Naunyn-Schmiedeberg's *Arch. Pharmacol*. (1999) 359(5):370-377

HHE Bouron Alexandre, Soldatov Nikolai M, and Reuter Harald(A). 1995. The beta-1-subunit is essential for modulation by protein c of an human and a non-human l-type ca-2+ channel. *FEBS Letters* 377(2):159-162.

Unrel Bow, Craig S. and Geist, Dennis J. Geology and petrology of Floreana Island, Galapagos Archipelago, Ecuador. *J. Volcanol. Geotherm. Res*. (1992) 52(1-3):83-105.

Unrel Braaten, B., Madara, J. L., and Donowitz, M. 1988. Age-related loss of nongoblet crypt cells parallels decreased secretion in rabbit descending colon. *American Journal of Physiology* 255(1 Pt 1):G72-84.

FL Breier, A., Durisova, V., Monosikova, R., Stankovicova, T., Vrbanova, A., and Zubor, V. 1990. [The role of Na(+) pump inhibition induced by Ca2(+) ions in the development of pathologic changes during calcium overload in myocardial cells]. <Original> Uloha inhibicie Na(+)-pumpy

indukovanej Ca2(+)-ionmi pri rozvoji patologickych zmien pocas pret'azenia myokardialnych buniek vapnikom. *Bratislavske lekarske listy* 91(3):172-6.

Drug Briggs, R. W., Wu, Z., Mladinich, C. R., Stoupis, C., Gauger, J., Liebig, T., Ros, P. R., Ballinger, J. R., and Kubilis, P. 1997. In vivo animal tests of an artifact-free contrast agent for gastrointestinal MRI. *Magnetic Resonance Imaging* 15(5):559-66.

Phy Bril, A. and Man, R. Y. 1990. Effects of the potassium channel activator, BRL 34915, on the action potential characteristics of canine cardiac Purkinje fibers. *Journal of Pharmacology and Experimental Therapeutics* 253(3): 1090-6.

Unrel Bril, A. and Man, R. Y. 1989. The role of potassium and sodium-calcium exchange currents in the action potential durations of normal Purkinje fibres and Purkinje fibres surviving infarction. *Cardiovascular Research* 23(5):410-6.

Phy Bril, A. and Man, R. Y. K. Electrophysiological effects of acetylcholine in purkinje fibers surviving Infarction. *Cardiovascular Research*. 24 (4). 1990. 296-302.

Unrel Brink, C., Duncan, P. G., and Douglas, J. S. The lung parenchymal strip a reappraisal. *Journal of Pharmacology and Experimental Therapeutics*. 219 (1). 1981. 1-6.

Phy Broad Lisa M, Powis David A, and Taylor Colin W(A). 1996. Differentiation of bc-3h1 smooth muscle cells changes the bivalent cation selectivity of the capacitative ca-2+ entry pathway. *Biochemical Journal* 316(3):759-764.

In Vit Brokl, O. H., Martinez, C. L., Shuprisha, A., Abbott, D. E., and Dantzler, W. H. 1998. Regulation of intracellular pH in proximal tubules of avian long-looped mammalian-type nephrons. *American Journal of Physiology* 274(6 Pt 2):R1526-35.

No Oral Brun, E. and Overnes, G. 1986. Barium selenate as a slow-release selenium preparation to pigs. *Acta Veterinaria Scandinavica* 27(3):388-396.

Unrel Bruning-Fann, C., Kaneene, J. B., Miller, R. A., Gardner, I., Johnson, R., and Ross, F. 1994. The use of epidemiological concepts and techniques to discern factorsassociated with the nitrate concentration of well water on swine farmsin the USA. *Science of the Total Environment* 153(1/2):85-96.

Unrel Brzozowski, Z., Pomarnacka, E., Oledzka, K., and Filczewski, M. 1995. Derivatives of 2-mercaptobenzenesulphonamide. XVIII. Syntheses and cardiovascular effects of some S- and S,N-substituted 4-chloro-2-mercapto-5-methyl-N-(5-amino-1,2,4-triazol-3-yl) benzenesulphonamide derivatives. *Acta Poloniae Pharmaceutica* 52(3):223-30.

No Dose Bubrick, M. P., Lundeen, J. W., and Hitchcock, C. R. 1981. A comparative radiographic study of low anterior colon anastomoses in dogs. *Surgery* 89(4):454-9.

Unrel Buchanan, J. W. and Sammarco, C. D. 1998. Circumferential suture of the mitral annulus for correction of mitral regurgitation in dogs. *Veterinary Surgery* 27(3):182-93.

Unrel Burnham, C., Braw, R., and Karlish, S. J. 1986. A Ca-dependent K channel in "luminal" membranes from the renal outer medulla. *Journal of Membrane Biology* 93(2):177-86.

Unrel Burnham, C., Braw, R., and Karlish, S. J. D. A calcium-dependent potassium channel in "luminal" membranes from the renal outer medulla *J. Membr. Biol.* (1986) 93(2):177-86.

In Vit Burns, M. S., File, D. M., Deline, V., and Galle, P. 1986. Matrix effects in secondary ion mass spectrometric analysis of biological tissue. *Scanning Electron Microscopy* (Pt 4):1277-90.

Unrel Busch, D. S., Noxon, J. O., and Merkley, D. F. 1991. A case report: bronchoesophageal fistula in a dog. *Canine Practice* 16(2):25, 28-29.

Prim Buss, D. D., Hyde, D. M., and Steffey, E. P. 1983. Coronary collateral development in the rhesus monkey (Macaca Mulatta). *Basic Research in Cardiology* 78(5):510-7.

CP Butterfield, I. and Sandle, G. I. 1996. Characterization of apical membrane k+ channels induced in rat distal colon by dietary k+ loading. *Gastroenterology* 110(4 Suppl.):A316.

In Vit Butterfield, I., Warhurst, G., Jones, M. N., and Sandle, G. I. 1997. Characterization of apical potassium channels induced in rat distal colon during potassium Adaptation. *Journal of Physiology* 501(Pt 3):537-47.

Unrel Caffrey, J. M., Josephson, I. R., and Brown, A. M. 1986. Calcium channels of amphibian stomach and mammalian aorta smooth muscle cells. *Biophysical Journal* 49(6):1237-42.

Unrel Caldwell, C. J., Mattey, D. L., and Weller, R. O. 1990. Role of the basement membrane in the regeneration of skeletal muscle. *Neuropathology and Applied Neurobiology* 16(3):225-38.

Unrel Calissano, P. and Cozzari, C. 1974. Interaction of nerve growth factor with the mouse-brain neurotubule protein(s). *Proceedings of the National Academy of Sciences of the United States of*

Unrel Calixto, J. B. and Rae, G. A. Influence of castration of the neo natal rat on the pharmacological reactivity of the isolated vas deferens. *Biology of Reproduction*. 25 (3). 1981. 481-486.

Unrel Cameron, A. M., Surridge, J., Stablum, W., and Lewis, R. J. A crino toxin from the skin tubercle glands of a stonefish *Synanceia-trachynis Toxicon.* 19 (1). 1981. 159-170.

CP Cameron, W. E(A). 1998. Barium-sensitive conductances in developing genioglossal (gg) motoneurons of the rat. *FASEB Journal* 12(5):A783.

Unrel Canarelli, J. P., Leandri, J., and Legraverend, J. M. 1986. [Experimental realization of a continent ileocolic valve in rats]. <Original> Realisation experimentale d'une valve ileo-colique continente chez la rat. *Journal De Chirurgie* 123(1):39-44.

No Oral Cappai, A., Petruzzo, P., Ruiu, G., Congiu, T., Dessy, E., De Seta, W., Santa CruzG. , and Brotzu, G. 1995. Evaluation of new small barium alginate microcapsules. *International Journal of Artificial Organs* 18(2):96-102.

No COC Carlson, C. S., Meuten, D. J., and Richardson, D. C. Ischemic necrosis of cartilage in spontaneous and experimental lesions of osteochondrosis. *Journal of Orthopaedic Research*. 9 (3). 1991. 317-329.

Unrel Case, C. L., Ravin, R. R., Holani, R., Gillette, P. C., and Hewett, K. W. 1992. The developmental electrophysiologic effects of moricizine HCl on the canine cardiac Purkinje Fiber. *European Journal of Pharmacology* 218(2-3):213-8.

Unrel Casillas, G., Simonetti, C., Kempfer, A. C., and De Los Santos J C. The precipitation and adsorption of bovine factor-viii application to the preparation of a concentrate of bovine factor-viii. *Sangre (Barc*). 25 (4). 1980 (Recd. 1981). 454-460.

Unrel Cerovsky, J. 1981. The effect of addition of some chlorides on survival rate of boarspermatozoa in glucose solution. *Vedecke Prace Vyzkumneho Ustavu pro Chov Prasat v Kostelci nad Orlici* 5:76-87.

Unrel Chague-Goff, Catherine and Fyfe, William S. Effect of permafrost on geochemistry in a Canadian peat plateau bog *Appl. Geochem*. (1997) 12(4):467-472

Unrel Chambers, J. N., Purinton, P. T., Allen, S. W., and Moore, J. L. 1990. Identification and anatomic categorization of the vascular *patterns to the pelvic limb muscles of dogs. American Journal of Veterinary Research* 51(2):305-13.

In Vit Champigneulle, A., Siga, E., Vassent, G., and Imbert-Teboul, M. Relationship between extra- and intracellular calcium in distal segments of the renal tubule. Role of the Ca2+ receptor RaKCaR *J. Membr. Biol*. (1997) 156(2):117-129

Drug Chang, T. and Et Al. Experimental studies of baihua qianhu peucedanum-praeruptorum dunn on the prevention and treatment of arrhythmia effects on the rat arrhythmia induced by barium chloride. *Journal of China Medical University*. 20 (5). 1991. 337-339, 343.

Unrel Cheav, S. L(A), Chahine, R., Kirkiacharian, S., and Pieri, F. 1992. Spasmolytic and antinoradrenergic activities of p-hydroxybenzonitrile on the duodenum and the isolated vas deferens of the rat. *Annales Pharmaceutiques Francaises* 50(5-6):305-313.

Phy Cheng, B., McMahon, D. G., and Mattson, M. P. 1993. Modulation of calcium current, intracellular calcium levels and cell survival by glucose deprivation and growth factors in hippocampal neurons. *Brain Research* 607(1-2):275-85.

Method Cheng, Jiann-Jang and Wu, Jenn-Ming. Effect of Mn on the electrical properties of (Ba, Bi, Nb)-added TiO2 ceramics prepared by the sol-precipitation method. *Mater. Chem. Phys*. (1997) 48(2):129-135

No Oral Cheng, Y. Y., Fong, S. M., and Chang, H. M. 1990. [Protective action of Salvia miltiorrhiza aqueous extract on chemically induced acute myocardial ischemia in rats] *Chung hsi i chieh ho tsa chih* 10(10):609-11, 582.

Prim Chiao, G. Z., Larson, C. R., Yajima, Y., Ko, P., and Kahrilas, P. J. 1994. Neuronal activity in nucleus ambiguous during deglutition and vocalization in conscious monkeys. *Experimental Brain Research*. Experimentelle Hirnforschung.

Drug Chickering, D., Jacob, J., and Mathiowitz E(A). 1996. Poly(fumaric-co-sebacic) microspheres as oral drug delivery systems. *Biotechnology and Bioengineering* 52(1):96-101.

In Vit Chieng B(A) and Bekkers, J. M. 1999. Gabab, opioid and alpha2 receptor inhibition of calcium channels in acutely-dissociated locus coeruleus neurones. *British Journal of Pharmacology* 127(4):1533-1538.

No COC Chiou, C. Y. 1974. Neuromuscular blocking actions of (4,4'-biphenylene-bis-(2-oxoethylene))-bis-2-ethoxyethyl) methylammonium bromide) 'DEO'. *Pharmacology* 12(4-5):210-5.

Unrel Cho, K. J., Nishiyama, R. H., Shields, J. J., McCormick, T. L., and Forrest, M. E. 1981. Experimental renal infarcts: angiographic and histologic studies. AJR. *American Journal of Roentgenology* 136(3):493-8.

Unrel Chodera, A., Banaszkiewicz, W., and Glinka, B. 1980. Antiarrhythmic properties of Craviten (M-71) in cats and rabbits. *Polish Journal of Pharmacology and Pharmacy* 32(6):833-40.

Unrel Chumakova, I. V., <Editors> Taran, I. F., and Dyatlov, A. I. 1974. Cytological studies of female fleas treated with chemosterilants andsystemic poisons.:198-199.

Unrel Chung, O. Y., Blanck, T. J. J., and Berman, M. R. Depression of myocardial force and stiffness without change in crossbridge kinetics effects of volatile anesthetics reproduced by nifedipine. *Anesthesiology*. 71 (3). 1989. 444-448.

Unrel Chyatte, D., Rusch, N., and Sundt, T. M. Jr. 1983. Prevention of chronic experimental cerebral vasospasm with ibuprofen and high-dose methylprednisolone. *Journal of Neurosurgery* 59(6):925-32.

In Vit Clapham, D. E. and Logothetis, D. E. Delayed rectifier potassium current in embryonic chick heart ventricle. *American Journal of Physiology*. 254 (1 Part 2). 1988. H192-H197.

Unrel Clark, E. S., Morris, D. D., and Whitlock, R. H. Esophageal dysfunction in a weanling thoroughbred. *Cornell Veterinarian*. 77 (2). 1987. 151-160.

Unrel Clifford, D. H., Waddell, E. D., Patterson, D. R., Wilson, C. F., and Thompson, H. L. 1972. Management of esophageal achalasia in Miniature Schnauzers. *Journal of the American Veterinary Medical Association* 161(9)

Mix Cloete, S. W. P(A), Van Niekerk F E, Young, M., Van Der Merwe G D, and Clark, J. 1999. The application of a selenium fertiliser for the correction of marginal deficiencies in grazing sheep. *Journal of the South African Veterinary Association* 70(3):107-111.

Unrel Closset, J., Vanderhoeft, P. J., and Delcour, C. Bronchiolar morphology after systemic arterial interruption *Vascular Surgery*. 23 (5). 1989. 360-370.

In Vitro Cloues, Robin and Marrion, Neil V. Conduction properties of the M-channel in rat sympathetic neurons. *Biophys. J. (*1996) 70(2):806-12.

In Vit Cobbett, P. and Mason, W. T. Whole cell voltage clamp recordings from cultured neurons of the supraoptic area of neonatal rat hypothalamus. *Brain Research.* 409 (1). 1987. 175-180.

Unrel Coggan, J. S(A), Purnyn, S. L., Knoper, S. R., and Kureulen, D. L(A). 1994. Muscarinic inhibition of two potassium currents in guinea-pig prevertebral neurons: differentiation by extracellular cesium. *Neuroscience* 59(2):349-361.

In Vit Cognard, C., Lazdunski, M., and Romey, G. 1986. Different types of Ca2+ channels in mammalian skeletal muscle cells in culture. *Proceedings of the National Academy of Sciences of the United States of*

Herp Cohen, R. W., Campagnoni, A. T., and Hull, C. D. 1990. Postnatal development of voltage-dependent calcium channels in the mouse brain disclosed by the *Xenopus* oocyte assay. *Developmental Neuroscience* 12(2):81-8.

Bio Acc Collins, C. T. 1992. Metals in eggs of the california least tern in southern california. *Bull South Calif Acad Sci*. 91 (2). 49-54.

Unrel Collis, M. G., Demey, C., and Vanhoutte, P. M. 1980. Renal vascular reactivity in the young spontaneously hypertensive rat. *Hypertension* (Dallas). 2 (1). 45-52.

CP Colombaioni, L. 1993. Neuronal death in developing rat retina depends on a ca++ activated endonuclease. *Society for Neuroscience Abstracts* 19(1-3):668.

Unrel Comp, P. C., Jacocks, R. M., Ferrell, G. L., and Esmon, C. T. 1982. Activation of protein c in-vivo *Journal of Clinical Investigation*. 70 (1). 127-134.

Unrel Connall, T. P., Zhang, J., Vaziri, N. D., Schwartz, R. J., Kaupke, C. J., Oveisi, F., and Wilson, S. E. 1994. Radiodetoxified endotoxin-induced tolerance alters monocyte but not neutrophil CD11b and CD18 expression in response to lipopolysaccharide. *Archives of Surgery* 129 (11):1153-8.

Unrel Cooper, J. E. and Needham, J. R. Investigation of alopecia following sulfur rolling of mice. *Laboratory Animals*. 10 (3). 1976 349-351.

Unrel Coran, A. G. 1973. Pericardioesophagoplasty. A new operation for partial esophageal replacement. *American Journal of Surgery* 125(3):294-9.

In Vit Coulombe, A., Lefevre, I. A., Baro, I., and Coraboeuf, E. 1989. Barium and calcium-permeable channels open at negative membrane potentials in rat ventricular myocytes. *Journal of Membrane Biology*. 111 (1). 57-68.

Chem Meth Coutselinis, A. JR and Dimopoulos, G. JR. Organophosphorus pesticides in liver: their identification by gas-liquid chromatography (glc). *J. Forensic Med*. 18(1): 11-4 1971; (REF:30)

In Vitro Cox, D. H., Cui, J., and Aldrich, R. W. 1997. Separation of gating properties from permeation and block in mslo large conductance Ca-activated K+ channels. *Journal of General Physiology* 109(5): 633-46.

Not Avail Crawford, AC. 1908. Barium, acause of the loco-weed disease U.S. Dept. Agric. Bur. Plant Ind. Bull. 129

Unrel Cremer, Michel, Weber, Olivier, and Jouanneau, Jean-Marie. 1999. Sedimentology of box cores from the Cap- Ferret Canyon area (Bay of Biscay) *Deep-Sea Res.* Part II 46(10):2221-2247

Method Creson, T. K., Monaco, P. J., Rasch, E. M., Hagardorn, A. H., and Ferslew, K. E. 1998. Capillary ion analysis of lithium concentrations in biological fluids and tissues of Poecilia (teleost). *Electrophoresis* 19(16-17):3018-21.

Anat Crock, H. V. and Goldwasser, M. 1984. Anatomic studies of the circulation in the region of the vertebral end-plate in adult Greyhound dogs. *Spine* 9(7):702-6.

In Vit Cuevas, J., Harper, A. A., Trequattrini, C., and Adams, D. J. 1997. Passive and active membrane properties of isolated rat intracardiac neurons: regulation by H- and M-currents. *Journal of Neurophysiology* 78(4):1890-902.

Herp Cui, J., Mandel, G., Difranesco, D., Kline, R. P., Pennefather, P., Datyner, N. B., Haspel, H. C., and Cohen, I. S(A). 1992. Expression and characterization of a canine hippocampal inwardly rectifying potassium current in xenopus oocytes. *Journal of Physiology* (Cambridge) 457(0):229-246.

No COC Culver, K. B. 1982. Canadian Experience with Uranium Tailings Disposal. INIS-MF-9589; CONF-8206271-12

Unrel Cunnane, T. C. and Stjarne, L. Frequency dependent intermittency and ionic basis of impulse conduction in postganglionic sympathetic fibers of guinea-pig vas deferens. *Neuroscience.* 11 (1). 1984. 211-230.

Unrel Curran, T. and Morgan, J. I. 1986. Barium modulates c-fos expression and post-translational modification. *Proceedings of the National Academy of Sciences of the United States of*

In Vit Currie Kevin P M(A), Swann Karl, Galione Antony, and Scott Roderick H. 1992. Activation of calcium-dependent currents in cultured rat dorsal root ganglion neurons by a sperm factor and cyclic adp-ribose. *Molecular Biology of the Cell* 3(12):1415-1425.

Unrel Cuttino, J. T. Jr, Clark, R. L., Fried, F. A., and Stevens, P. S. Micro radiographic demonstration of pyelo lymphatic backflow in the porcine Kidney Ajr (*Am J Roentgenol*). 131 (3). 1978 501-505

Unrel Cuttino, J. T. Jr., Jennette, J. C., Clark, R. L., and Kwock, L. 1985. Renal medullary lymphatics: microradiographic, light and electronmicroscopic studies in pigs. *Lymphology* 18(1):24-30.

Unrel Dagher, F. J., Mamoun, S., Khuri, S., and Zuidema, G. D. 1970. A gastric buttress for the management of acute perforation of the lower esophagus in dogs. *European Surgical Research* 2(3):233-40.

In Vit Dahmer, M. K., Hart, P. M., and Perlman, R. L. Studies on the effect of insulin-like growth factor-i on catecholamine secretion from chromaffin cells. *Journal of Neurochemistry*. 54 (3). 1990. 931-936.

Unrel Daly, R. C., McCarthy, P. M., Orszulak, T. A., Schaff, H. V., and Edwards, W. D. 1988. Histologic comparison of experimental coronary artery bypass grafts. Similarity of in situ and free internal mammary artery Grafts. *Journal of Thoracic and Cardiovascular Surgery* 96(1):19-29.

Unrel Davidson, R. M., Shajenko, L., and Donta, T. S. 1994. Amyloid beta-peptide (A beta P) potentiates a nimodipine-sensitive L-type barium conductance in N1E-115 neuroblastoma cells vol. 643, no. 1-2, pp. 324-327 Brain Res.

Drug Davis, M. A., Mei, H., and Ritsema, G. H. 1994. Optimization of a negative oral contrast agent for magnetic resonance imaging. *Investigative radiology* 29 Suppl 2:S120-2.

FL De Barros, L. F. and Gutierrez, P. S. 1991. [Ligation of the right coronary artery in dogs. Hemodynamic and pathological effects]. <Original> Ligadura da arteria coronaria direita do cao. Efeitos hemodinamicos e patologicos. *Arquivos brasileiros de cardiologia* 57(5):375-9.

CP De Jeu M T G, Geurtsen, A. M. S., Buijs, R. M., and Pennartz, C. M. A. 1996. Circadian variation in a barium-sensitive conductance in neurons of the rat suprachiasmatic nucleus. *Society for Neuroscience Abstracts* 22(1-3):2055.

Unrel De Mey J G and Vanhoutte, P. M. Sodium ion potassium ion exchanges in canine arterial and venous smooth muscle. *American Journal of Physiology*. 243 (4). 1982. H551-H559.

Plant Debnath, Rina and Mukherji, S. Barium effects on Phaseolus aureus, Cephalandra indica, Canna indica, Beta vulgaris, Triticum aestivum, and Lactuca sativa *Biol. Plant*. (1982) 24(6):423-9.

No Dose Degernes Laurel A. 1994. Abdominal mass due to chronic salpingitis in an African grey parrot (*Psittacus erithacus)*. *Veterinary Radiology & Ultrasound* 35(1):24-28.

Unrel Del Basso P, Keller, E. A., Salica, C., and Orsingher, O. A. Vascular reactivity in peri natally under nourished rats. *European Journal of Pharmacology.* 87 (1). 1983. 107-112.

In Vit del Negro, C. A., Hsiao, C. F., and Chandler, S. H. 1999. Outward currents influencing bursting dynamics in guinea pig trigeminal Motoneurons. *Journal of Neurophysiology* 81(4):1478-85.

Unrel Dellsperger, K. C., Clothier, J. L., Hartnett, J. A., Haun, L. M., and Marcus, M. L. 1988. Acceleration of the wavefront of myocardial necrosis by chronic hypertension and left ventricular hypertrophy in dogs. *Circulation Research* 63(1):87-96.

Phy Dellsperger, K. C., Clothier, J. L., Koyanagi, S., Inou, T., and Marcus, M. L. 1991. Effects of coronary artery occlusion in animals with hypertension and left ventricular hypertrophy. *Journal of Cardiovascular Pharmacology* 17 Suppl 2:S40-5.

Phy Dellsperger, K. C., Martins, J. B., Clothier, J. L., and Marcus, M. L. 1990. Incidence of sudden cardiac death associated with coronary artery occlusion in dogs with hypertension and left ventricular hypertrophy is reduced by chronic beta-adrenergic blockade. *Circulation* 82(3):941-50.

Unrel deMello, D. E., Sawyer, D., Galvin, N., and Reid, L. M. 1997. Early fetal development of lung vasculature. *American Journal of Respiratory Cell and Molecular Biology* 16(5)

No Dose Demetriades, C., Botsios, D., Tsalis, K., Manafis, K., Zisiadis, A., and Dadoukis, J. 1998. Management of large rectal wall defects with open pedicle grafts of small intestine. *An Experimental Study. Digestive Surgery* 15(6):693-6.

In Vit Demontis, G. C., Longoni, B., Barcaro, U., and Cervetto, L. 1999. Properties and functional roles of hyperpolarization-gated currents in guinea-pig retinal rods. *Journal of Physiology* 515(Pt 3):813-28.

No COC Depczyk, D., Domanski, T., and Liniecki, J. 1966. High-strontium diet and radiostrontium retention in rats. Radiobiologia, radiotherapia 7(2):185-98.

Unrel Desaga, J. F. 1989. Visualization of the mucosal villi on double-contrast barium studies of the small intestine by using a high molecular fraction of guaran. *Gastrointestinal Radiology* 14(1):25-30.

In Vit Desmadryl, G., Hilaire, C., Vigues, S., Diochot, S., and Valmier, J. 1998. Developmental regulation of T-, N- and L-type calcium currents in mouse embryonic sensory neurones. *European Journal of Neuroscience* 10(2):545-52.

Unrel Devine, J. and Morganti, P. 1987. Biological evaluation of endodontic materials. *Connecticut Dental Student Journal* 7:13-7.

Unrel Deysine, M., Isenberg, H. D., and Steiner, G. 1983. Chronic haematogenous osteomyelitis; studies on an experimental model. *International Orthopaedics* 7(2):69-78.

Unrel Difrancesco, D. A new interpretation of the pacemaker current in calf purkinje fibers. *Journal of Physiology (London*). 314 (0). 1981. 359-376.

Unrel Difrancesco, D., Ferroni, A., and Visentin, S. Barium-induced blockade of the inward rectifier in calf purkinje fibers. *Pfluegers Archiv European Journal of Physiology*. 402 (4). 1984 (Recd. 1985). 446-453.

Plant Dillon, C. R., Maurice, D. V., and Jones, J. E. Composition of Egeria densa *J. Aquat. Plant Manage*. (1988) :26, 44-5.

No Oral Dobriakova, G. V. 1969. [Characteristics of barium 140 and promethium 147 behavior in the organism after intratracheal administration]. <Original> Osobennosti povedeniia v organizme bariia-140 i prometiia-147 posle vnutritrakheal'nogo vvedeniia. *Radiobiologiia* 9(1):101-2.

Unrel Dobrin, P. B., McGurrin, J. F., and McNulty, J. A. 1992. Chronic histologic changes after vascular clamping are not associated with altered vascular mechanics. *Annals of Vascular Surgery* 6(2):153-9.

No Oral Dobryakova, G. V. Characteristics of the behavior of barium-140 and prometium-147 in the organism after intra tracheal administration rat *Radiobiologiya.* 9 (1). 1969 101-102.

Unrel Dodds, W. J., Stewart, E. T., Hodges, D., and Zboralske, F. F. 1973. Movement of the feline esophagus associated with respiration and peristalsis. An evaluation using tantalum markers. *Journal of Clinical Investigation* 52(1):1-13.

Unrel Doering Frank, Degtiar Vadim E, Grabner Manfred, Striessnig Joerg, Hering Steffen(A), and Glossmann Hartmut. 1996. Transfer of l-type calcium channel ivs6 segment increases phenylalkylamine sensitivity of alpha-1a. *Journal of Biological Chemistry* 271(20):11745-11749.

Unrel Domanski, T., Witkowska, D., and Garlicka, I. 1980. Influence of age on the discrimination of barium in comparison with strontium during their incorporation into compact bone. *Acta Physiologica Polonica* 31(3):289-96.

No Oral Domanski, T. M., Depczyk, D., and Liniecki, J. 1966. A test of th theory of alkaline earth metabolism by the behaviour of 133Ba in rats. *Physics in Medicine and Biology* 11(3):461-70.

Aquatic Dos Santos, Luiz. Barium carbonate as a planorbicid Rev. Inst. Adolfo Lutz (1964) :24, 33-7.

Unrel Dostal, J. and Mueller, W. An Archean oceanic felsic dike swarm in a nascent arc: the Hunter Mine Group, Abitibi Greenstone Belt, *Canada J. Volcanol. Geotherm. Res*. (1996) 72(1-2):37-57.

Prim Doyle, L. L., Clew, T. H., and Chandler, G. C. 1975. Hormone-releasing silastic intrauterine devices: effect or provera-releasing intrauterine devices on two species of Primates. *Fertility and Sterility* 26(7):649-54.

In Vit Draper, Alison J. and Hammock, Bruce D. 1999. Inhibition of soluble and microsomal epoxide hydrolase by zinc and other metals (1999) *Toxicol. Sci*. 52(1):26-32..

Bact du Moulin, G. C., Paterson, D., Hedley-Whyte, J., and Broitman, S. A. 1985. E. coli peritonitis and bacteremia cause increased blood-brain barrier permeability. *Brain research* 340(2):261-8.

Bact Du Moulin G C, Paterson, D., Hedley-Whyte, J., and Broitman, S. A. Escherichia-coli peritonitis and bacteremia cause increased blood-brain barrier permeability *Brain Research*. 340 (2). 1985. 261-268.

Unrel Dube, Benoit, Dunning, Greg, and Lauziere, Kathleen. Geology of the Hope Brook mine, Newfoundland, Canada: a preserved Late Proterozoic high-sulfidation epithermal gold deposit and its implications for exploration *Econ. Geol.* (1998) 93(4):405-436.

No COC Dubrovina, E. V. and Pogodin, R. I. 1968. [Dependence of the accumulation of radioactive barium and yttrium in the animal skeleton on the level of calcium in the diet]. <Original> Zavisimost' otlozheniia v skelete zhivotnykh radiobariia i radioittriia ot urovnia kal'tsiia v ratsione. *Radiobiologiia* 8(6):927-9.

Unrel Dubrovina, Z. V. and Pogodin, R. I. Effect of the calcium radio protect level in the diet on the deposit of radio barium and radio yttrium in the animal skeleton wistar rats. *Radiobiologiya.* 8 (6). 927-929. 1968.

Phy Dubrow, T., Schwartz, R. J., McKissock, J., and Wilson, S. E. 1991. Effect of aerosolized fibrin solution on intraperitoneal contamination. *Archives of Surgery* 126(1):80-3.

Phy Duff, H. J., Brown, C. E., Cragoe, E. J., and Rahmberg, M. 1991. Antiarrhythmic activity of amiloride: Mechanisms. *Journal of Cardiovascular Pharmacology* 17(6):879-88.

Unrel Duncan, P. G. and Douglas, J. S. Sensitivity and responsiveness of tracheal and bronchial tissues from young and old guinea-pigs effect of calcium antagonists *Journal of Pharmacology and Experimental Therapeutics.* 228 (3). 1984. 612-619.

Unrel Eales, H. V. The Birds River Intrusion - a quantitative model for Karoo Central Province basalt fractionation *S. Afr. J. Geol*. (1990) 93(5-6):717-28

In Vit Easaw, J. C., Jassar, B. S., Harris, K. H., and Jhamandas, J. H. Zinc modulation of ionic currents in the horizontal limb of the diagonal band of Broca *Neuroscience* (Oxford) (1999) 94(3):785-795.

Alt Ebeigbe, A. B. and Aloamaka, C. P. 1985. Barium and strontium as calcium substitutes for contractile responses in the rat tail artery *Comparative Biochemistry And Physiology C-Comparative Pharmacology And Toxicology* 82(1):213-216.

Unrel Echigo, S., Matsuda, T., Kamiya, T., Kuroe, K., Fuse, S., Ozasa, H., and Yoda, R. Development of a device made of a shape memory polymer for closure of ductus arteriosus transvenous occlusion in dogs with experimental aorto-pulmonary shunt. *Japanese Journal of Artificial Organs*. 21 (1). 1992. 181-185.

No Oral Edel, J., Bahbouth, E., Barassi, V., Di Nucci, A., Gregotti, C., Manzo, L., and Sabbioni, E. 1991. Metabolic behavior of barium in laboratory animals Trace Elem. Man Anim. 7: Monogr. Proc., Round Tables Discuss. Int. Symp., 7th :Meeting Date 1990, 30-9-30/10. Editor(s): Momcilovic, Berislav. Publisher: Inst. Med. Res. Occup. Health Univ. Zagreb, Zagreb, Yugoslavia.

Unrel Edgerton, David. Reconstruction of the Red Dog Zn - Pb - Ba orebody, Alaska: implications for the vent environment during the mineralizing event Can. *J. Earth Sci*. (1997) 34(12):1581-1602.

In Vit Ehara, Tsuguhisa and Inazawa, Minoru. Calcium-dependent slow action potentials in potassium-depolarized guinea pig ventricular myocardium enhanced by barium ions *Naunyn-Schmiedeberg's Arch. Pharmacol*. (1980) 315(1):47-54.

Unrel Ehlert, F. J., Roeske, W. R., Itoga, E., and Yamamura, H. I. The binding of tritium labeled nitrendipine to receptors for calcium channel antagonists in the heart cerebral cortex and ileum of rats *Life Sciences*. 30 (25). 1982. 2191-2202.

Abstract Eikenburg, D. C., Ekas, R. D. Jr, and Lokhandwala, M. F. Presynaptic action of angiotensin ii and vascular reactivity during development of 2 kidney goldblatt hypertension 65th Annual Meeting of the Federation of American Societies for Experimental Biology, Atlanta, Ga., Usa, April 12-17, 1981. *Fed Proc*. 40 (3 Part 1). 1981. 533.

Alt Eisner, D. A. and Lederer, W. J. 1979. Inotropic and arrhythmogenic effects of potassium depleted solutions on mammalian cardiac muscle J PHYSIOL (LOND).. *Journal of Physiology (London*) 294 (0). . 255-278.

Prim Eliskova, M., Eliska, O., Miller, A. J., Palmer, A., DeBoer, A., and Usman, Z. 1992. The efferent cardiac lymphatic pathways in the macaque monkey. *Lymphology* 25(2):69-74.

Unrel Ellison, D. H., Velazquez, H., and Wright, F. S. Mechanisms of sodium potassium and chloride transport by the renal distal tubule. *Mineral and Electrolyte Metabolism*. 13 (6). 1987. 422-432.

Drug Ema, M., Gebrewold, A., Altura, B. T., and Altura, B. M. 1992. Magnesium sulfate prevents alcohol-induced spasms of cerebral blood vessels: an in situ study on the brain microcirculation from male versus female rats. *Magnesium and Trace Elements* 10(2-4):269-80.

Drug Ema, M., Gebrewold, A., Altura, B. T., Zhang, A., and Altura, B. M. 1998. Alcohol-induced vascular damage of brain is ameliorated by administration of magnesium. *Alcohol* 15(2):95-103.

In Vit Enkvist, M. O. Kristian, Holopainen, Irma, and Akerman, Karl E. O. The effect of potassium and glutamate receptor agonists on the membrane potential of suspensions of primary cultures of rat astrocytes as measured with a cyanine dye, DiS-C2-(5) *Brain Res*. (1988) 462(1):67-75.

FL Esser, A. 1935. Clinical, anatomical and spectrographic investigation of the central nervous system in accute metal poisoning with particular consideration of the importance for forensic medicine and tissue pathology. I. Strontium, barium, magnesium, aluminium, thorium (radioactive material), thallium, zinc, cadmium, mercury. *Dtsch. Z. Ger. Med*. 25:239.

No COC Estape, E. S., Rodriguez-Sargent, C., Cangiano, J. L., and Candia, O. A. 1995. Increased dietary NaCl intake influences lens transport properties in Sprague-Dawley rats. *Current Eye Research* 14(2):159-62.

Phy Faivre J-F, Deroubaix, E., Coulombe, A., Legrand A-M, and Coraboeuf, E. Effect of maitotoxin on calcium current and background inward current in isolated ventricular rat myocytes. *Toxicon*. 28 (8). 1990. 925-938.

CP Feldman, D. H(A), Ito, K., Harvey, W. R., and Stevens, B. R. 1997. Novel brain-specific member of cationic amino acid transporter family induces a slow hyperpolarization-activated current in *Xenopus* oocytes. *Society for Neuroscience Abstracts* 23(1-2):2291.

Mix Fendick, E. A., Stevens, G. L., Brown, R. J., and Jordan, W. P. Element content in tissues of four rodent species sampled in the Geysers geothermal steamfield *Environ. Pollut*. (1989) 58(2-3):155-78.

Nut Fernandes, J. I. M., Lima, F. R(A), Mendonca, C. X. Jr, Mabe, I., Albuquerque, R., and Leal, P. M. 1999. Relative bioavailability of phosphorus in feed and agricultural phosphates for poultry. *Poultry Science* 78(12):1729-1736.

Unrel Fernandez-Pol, J. A. Transition metal ions induced cell growth in new born rat kidney cells synchronized in g-1 by picolinic-acid. *Biochemical and Biophysical Research Communications*. 76 (2). 1977 413-419.

Unrel Ferreira, H. I. 1974. Obstructive fibrosis of the teats in cows. Clinical, radiologicaloperative technique, and histopathological studies. (Summary ofthesis.). Arquivos da Escola de Veterinaria, Universidade Federal de Minas Gerais 26(3):389-390.

HHE Ferslew, K. E., Hagardorn, A. N., Harrison, M. T., and McCormick, W. F. 1998. Capillary ion analysis of potassium concentrations in human vitreous humor. *Electrophoresis* 19(1):6-10.

No COC Ffrench-Mullen, J. M. H(A) and Rogawski, M. A. 1992. Phencyclidine block of calcium current in isolated guinea pig hippocampal neurones. *Journal of Physiology* (Cambridge) 456(0):85-105.

Unrel Finlay, M., Barer, G. R., and Suggett, A. J. 1986. Quantitative changes in the rat pulmonary vasculature in chronic Hypoxia--relation to Haemodynamic Changes. *Quarterly Journal of Experimental Physiology* 71(2):151-63.

In Vit Fitzgerald, E. M. and Dolphin, A. C. 1997. Regulation of rat neuronal voltage-dependent calcium channels by endogenous p21-ras. *European Journal of Neuroscience* 9(6):1252-61.

No COC Foerster, W., Mest, H. J., and Mentz, P. Influence of PGF2.alpha. on experimental arrhythmias. *Prostaglandins* (1973) 3(6):895-904.

No Oral Forbes, D. C. 1989. Barium retention in the lungs of a cat. *Canadian Veterinary Journal* 30(6):509-510.

Unrel Fox, D. A. and Bass, P. 1986. Pharmacological characterization of rat jejunal contractility after chronic ablation of the myenteric Plexus. *Journal of Pharmacology and Experimental Therapeutics* 238(1):372-7.

Unrel Franch, J., Garcia, F., Fuente, J. de la, Pena, T., Prandi, D., Camon, J., San Roman, F., and Manzanares, M. C. 1998. Microangiographic pattern of bone healing in canine tibial osteotomiestreated with type II external fixators. *Veterinary and Comparative Orthopaedics and Traumatology* 11(3):118-124.

Unrel Freeman, K., Ludington, J. R. Jr, Svec, T. A., Pinero, G. J., and Hoover, J. 1994. Continuously infused calcium hydroxide: its influence on hard tissue repair. *Journal of Endodontics* 20(6):272-5.

Unrel Fridman, Ya. D., Alikeeva, S. V., Dolgashova, N. V., Nanaeva, M. T., Sabirova, T. S., and Atarskaya, L. I. Effects of complexation on antioxidant and antihypoxic activities of ascorbic acid Khim.-Farm. Zh. (1988) 22(4):425-8

Unrel Frierson, M., Ibrahim, K., Boles, M., Bote, H., and Ganey, T. 1994. Distraction osteogenesis. A comparison of corticotomy Techniques. *Clinical Orthopaedics and Related Research* (301):19-24.

FL Frik, W. and Persch, W. F. 1969. [The effect of contrast media type on the vascular caliber in experimental angiography]. <Original> Der Einfluss des Kontrastmitteltyps auf das Arterienkaliber in der experimebtellen Angiographie. Fortschritte auf dem Gebiete der Rontgenstrahlen und der Nuklearmedizin

Unrel Fujii, M., Horie, R., Setogawa, T., and Yamori, Y. Comparison of sparkling substances of retinal cerebral and mesenteric arteries in stroke-prone spontaneously hypertensive rats shrsp fed on a high-fat-cholesterol diet. *Acta Societatis Ophthalmologicae Japonicae*. 92 (3). 1988. 557-564.

Unrel Fujita S(A), Ikezono, K., Umezato, M., Hosoki, E., Toba, Y., Ishikawa, M., Kusunoki, A., and Shintani, S. 1992. General pharmacological properties of the main metabolite of flosequinan. *Arzneimittel-Forschung* 42(10): 1212-1222.

Unrel Fujiwara, H. 1980. Radiography of the whole arterial system of laboratory animals. *Comptes Rendus des Seances de la Societe de Biologie* 174(1):96-103.

Bact Galdiero, Francesco, Tufano, Maria Antonietta, Rossi, Francesco, Filippelli, Walter, De Santis, Dante, Matera, Concetta, Berrino, Libero, and Marmo, Emilio. 1986. Effect of Salmonella typhimurium porins on the cardiovascular and renal apparatus *J. Med*. (Westbury NY) 17(5-6): 285-97

In Vit Galdzicki, Z., Puia, G., Sciancalepore, M., and Moran, O. Voltage-dependent calcium currents in trigeminal chick neurons. *Biochemical and Biophysical Research Communications*. 167 (3). 1990. 1015-1021.

FL Galenko-Iaroshevskii, P. A. and Tikhonov, A. V. 1985. [Comparative characteristics of the activity of lithium preparations and anti-arrhythmia agents in strophanthin, calcium chloride and barium chloride arrhythmias in an experiment]. <Original> Sravnitel'naia kharakteristika aktivnosti preparatov litiia i antiaritmicheskikh sredstv pri strofantinovoi, khloridkal'tsievoi i khloridbarievoi aritmiiakh v eksperimente. Farmakologiia i toksikologiia 48(2):64-8.

Unrel Galizzi J-P, Fosset, M., and Lazdunski, M. Characterization of the calcium coordination site regulating binding of calcium channel inhibitors deuterated diltiazem racemic bepridil and levo demethoxyverapamil to their receptor site in skeletal muscle transverse tubule membranes. *Biochemical and Biophysical Research Communications*. 132 (1). 1985. 49-55.

In Vit Gandia Luis, Lara Baldomero, Imperial Julita S, Villarroya Mercedes, Albillos Almundena, Maroto Rosario, Garcia Antonio G(A), and Olivera Baldomero M. 1997. Analogies and differences between omega-conotoxins mviic and mviid: binding sites and functions in bovine chromaffin cells. *Pfluegers Archiv European Journal of Physiology* 435(1):55-64.

In Vit Gandia Luis(A), Albillos Almudena, and Garcia Antonio G. 1993. Bovine chromaffin cells possess ftx-sensitive calcium channels. *Biochemical and Biophysical Research Communications* 194(2):671-676.

Unrel Geggel, R. L., Aronovitz, M. J., and Reid, L. M. 1986. Effects of chronic in utero hypoxemia on rat neonatal pulmonary arterial structure. *Journal of Pediatrics* 108(5 Pt 1):756-9.

Unrel German, R. Z., Crompton, A. W., Levitch, L. C., and Thexton, A. J. 1992. The mechanism of suckling in two species of infant mammal: miniature pigs and long-tailed Macaques. *Journal of Experimental Zoology* 261(3):322-30.

FL Geyer, G. 1969. [Studies on the alkaline hydrolysis of nucleic acids in tissue sections. 3. Influence on the fluorochrome and diachrome staining of the cell nucleus and on the Feulgen reaction]. <Original> Untersuchungen uber die alkalische Hydrolyse von Nukleinsauren im Gewebeschnitt. 3. Einfluss auf die Fluoro- und Diachromierung der Zellkerne sowie auf die Feulgen-Reaktion. Zeitschrift fur mikroskopisch-anatomische Forschung 80(4):575-81.

No Dose Ghomashchi, Farideh, Schuettel, Stefan, Jain, Mahendra Kumar, and Gelb, Michael H. Kinetic analysis of a high molecular weight phospholipase A2 from rat kidney: divalent metal-dependent trapping of enzyme on product-containing vesicles *Biochemistry* (1992) 31(15):3814-24.

Unrel Ghory, M. J., Pekcan, M., Hebiguchi, T., Hamilton, S. R., and Dudgeon, D. L. 1985. A muscle ablation sphincter to prevent diarrhea after total colectomy in puppies: a preliminary report. *Journal of Pediatric Surgery* 20(4):302-6.

Unrel Gilmore Shirley Ann(A) and Sims Terry J. 1993. Patterns of schwann cell myelination of axons within the spinal cord. *Journal of Chemical Neuroanatomy* 6(4):191-199.

Unrel Ginai, A. Z., ten Kate, F. J., ten Berg, R. G., and Hoornstra, K. 1984. Experimental evaluation of various available contrast agents for use in the upper gastrointestinal tract in case of suspected leakage. Effects on lungs. *British Journal of Radiology* 57(682):895-901.

Unrel Goggin, J. M., Hoskinson, J. J., Kirk, C. A., Jewell, D., and Butine, M. D. 1999. Comparison of gastric emptying times in healthy cats simultaneously evaluated with radiopaque markers and nuclear scintigraphy. *Veterinary Radiology & Ultrasound* 40(1):89-95.

No Oral Gogte, S. T. Ethylenediaminetetraacetic acid tetracycline and toxicity of barium chloride and sodium fluoride *Indian J. Physiol. Pharmacol*. (1970) 14(1): 61-2

Unrel Goldberg, H. I., Gould, R., Rosenquist, J., Royal, S., Owen, R. L., and Silverman, S. 1982. In vivo demonstration of small intestinal villi in dogs and monkeys using radiographic magnification. *Radiology* 142(1):53-8.

Rev Golden, Robert J., Schupak, Lenore H., and Karch, Nathan J. Differences between animals and humans in the gastrointestinal absorption of barium *Int. J. Environ. Stud*. (1989) 34(3):217-25.

Nut def Gonzalez-Reimers, E., Rodriguez-Moreno, F., Martinez-Riera, A., Mas-Pascual, A., Delgado-Ureta, E., Galindo-Martin, L., Arnay-De la Rosa, M., and Santolaria-Fernandez, F. Relative and combined effects of ethanol and protein deficiency on strontium and barium bone content and fecal and urinary excretion *Biol. Trace Elem. Res*. (1999) 68(1):41-49.

In Vit Gopala Reddy A(A) and Ravi Prakash V. 1999. A study on the characteristics of ca2+ channels in vas deferens isolated from cyclophosphamide treated rats. *Indian Journal of Pharmacology* 31(2):116-119.

Unrel Goto, S. and Grosfeld, J. L. 1987. Is preserving the entire aganglionic colon reasonable in the surgical treatment of total colonic aganglionosis? *Journal of Pediatric Surgery* 22(7):623-7.

FL Govorunova, N. N. and Grin, N. v. Experimental data on the embryotoxic effects of barium ferrite *Gig Sanit* (4):72-74,1984

Unrel Grant, D. R., LeBlanc, B. E., Perkins, D. G., and Duff, J. H. 1985. Experimental low colorectal anastomosis. *Canadian Journal of Surgery*. 28(1)

Unrel Greet, T. R. C. 1982. Observations on the potential role of oesophageal radiography in the horse. *Equine Veterinary Journal* 14(1):73-79.

In Vit Grubb, B. R. and Boucher, R. C. 1997. Enhanced colonic Na+ absorption in cystic fibrosis mice versus normal mice. *American Journal of Physiology* 272(2 Pt 1): G393-400.

Unrel Guilford, W. G., Lawoko, C. R. O., and Allan, F. J. 1997. Accuracy of localizing radiopaque markers by abdominal radiography andc orrelation between their gastric emptying rate and that of a canned food in dogs. *American Journal of Veterinary Research* 58(12):1359-1363.

Unrel Gupta, R. C., Gupta, S. C., and Gupta, K. K. Experimental study on osseous phlebography and fracture healing. *Indian Journal of Medical Research*. 72 (Aug.). 1980 (Recd. 1981). 293-299.

Abstract Hai C-M and Murphy, R. A. 1986. Barium induces stress development in swine carotid artery by mobilizing intracellular calcium 30th Annual Meeting of the Biophysical Society, San Francisco, Calif., Usa, Feb. 9-13, 1986. *Biophys J.* 49 (2 Part 2). 461a.

Unrel Hallback, M., Lundgren, Y., and Weiss, L. 1974. The distensibility of the resistance vessels in spontaneously hypertensive rats (SHR) as compared with normotensive control rats (NCR). *Acta Physiologica Scandinavica* 90(1):57-68.

Unrel Han, S. L., Nagao, T., Kita, J., and Uchida, H. 1995. Esophageal transection using a biofragmentable anastomosis ring in Dogs. *Surgery Today* 25(9):802-5.

Unrel Hanisch E(A), Herrmann, G., Lemperle, S., Jakobi, R., Weber, T., and Wagner, M. 1992. Correction of ba 95060046. Proliferation kinetics after orthotopic liver transplantation in the rat: influence of rearterialization. Addition of author name. Erratum published in langenbecks arch chir vol. 378. Iss. 1. 1993. P. 63. *Langenbecks Archiv fuer Chirurgie* 377 (6):360-367.

Unrel Hansson, L., Alwmark, A., Christensen, P., Jeppsson, B., Holst, E., and Bengmark, S. 1985. Standardized intraabdominal abscess formation with generalized sepsis: pathophysiology in the rat. *European Surgical Research* 17(3):155-9.

Unrel Hanzlik, P. J. 1915. The effects of chelidonin on smooth muscle. *J Pharmacol Exp Therapeut* 7: 99-119.

Unrel Harauchi, T., Takano, K., Matsuura, M., and Yoshizaki, T. 1986. Liver and plasma levels of descarboxyprothrombin (PIVKA II) in vitamin K deficiency in rats. *Japanese Journal of Pharmacology* 40(4):491-9.

In Vit Harder, David R. and Sperelakis, Nick. Action potential generation in reaggregates of rat aortic smooth muscle cells in primary culture *Blood Vessels* (1979) 16(4):186-201.

Unrel Hart, J. L. 1984. Effects of pregnancy on spontaneous contraction and barium responsiveness of the rat portal vein. *Biological Research in Pregnancy and Perinatology* 5(2):78-83.

Unrel Hartzband, L. E. 1988. What is your diagnosis? *Journal of the American Veterinary Medical Association* 193(3):369-370.

Unrel Hasse, C., Schrezenmeir, J., Stinner, B., Schark, C., Wagner, P. K., Neumann, K., and Rothmund, M. 1994. Successful allotransplantation of microencapsulated parathyroids in rats. *World Journal of Surgery* 18(4):630-4.

No COC Hayano Chieko(A), Nakanishi Takahiro(A), Katayama Hideki, Tani Tadato= (A), and Hirotsu Ichiro(A). 1997. General pharmacology of calcium 4-(5-ethyl-4-(3-(2-hexyl-octylamino)-benzoyl)-1-methyl-1h-pyrrol-2-yl)- butyrate (hql-1069), a novel 5-alpha-reductase inhibitor. *Oyo Yakuri* 53(3):187-195.

Mix Heffron, C. L., Reid, J. T., Furr, A. K. , Parkinson, T. F., King, J., Bache, C. A., St. John, L. E. Jr., Gutenmann, W. H., and Lisk, D. J. 1977. Lead and other elements in sheep fed colored magazines and newsprint. *Journal of Agricultural and Food Chemistry* 25(3):657-660.

Prim Hein, P. R., van Groeninghen, J. C., and Puts, J. J. 1985. A case of acardiac anomaly in the cynomolgus monkey (Macaca fascicularis): a complication of monozygotic monochorial Twinning. *Journal of Medical Primatology* 14(3):133-42.

Phy Heinamaki, J. 1934. Behavior of enteric-coated granules administered in controlled-release matrices to the stomach of a fed dog Acta Pharm. Fenn. 100 ISS 1 1991

In Vit Heinz, M., Krattenmacher, R., Hoffmann, B., and Clauss, W. Different modes of electrogenic sodium absorption in the coprodeum of the chicken embryo role of extracellular calcium *Journal of Comparative Physiology B Biochemical Systemic and Environmental Physiology*. 161 (4). 1991. 363-370.

Drug Hemmati, A. A(A) and Hicks, R. 1999. Increased myofibroblast contractile sensitivity in paraquat pretreated rat lung tissue. *Life Sciences* 65(22):2325-2332.

Unrel Herendeen Patrick S(A), Crepet William L, and Nixon Kevin C. 1993 . Chloranthus-like stamens from the upper cretaceous of new jersey. *American Journal of Botany* 80(8):865-871.

Unrel Herman, J. R. and Bass, P. Temporal changes in mechanical properties of rat jejunal smooth muscle after myenteric plexus ablation *American Journal of Physiology*. 253 (6 Part 1). 1987. G745-G750.

Unrel Hermsmeyer, K., Sturek, M., Marvin, W., Mason, R., and Puga, A. 1989. Vascular muscle calcium channel modulation in hypertension. *Journal of Cardiovascular Pharmacology* 14 Suppl 6:S45-8.

FL Hernandez Bermejo, J. P. 1995. [Clinical response of different colonic segments to chemical denervation: an experimental study]. <Original> Respuesta clinica de distintos segmentos del colon a la denervacion quimica. Estudio experimental en ratas. *Cirugia pediatrica* 8(3):113-7.

FL Hernandez Bermejo, J. P. 1994. [Efficacy of extramucosal myotomy in an experimental model of intramural colonic obstruction. An experimental study in rats]. <Original> Eficacia de la miotomia extramucosa en un modelo experimental de obstruccion colica intramural. Estudio experimental en ratas. *Cirugia pediatrica* 7(4):188-91.

No Dose Hibino, Hiroshi, Horio, Yoshiyuki, Inanobe, Atsushi, Doi, Katsumi, Ito, Minoru, Yamada, Mitsuhiko, Gotow, Takahiro, Uchiyama, Yasuo, Kawamura, Masaru, Kubo, Takeshi, and Kurachi, Yoshihisa. An ATP-dependent inwardly rectifying potassium channel, KAB-2 (Kir4.1), in cochlear stria vascularis of inner ear: its specific subcellular localization and correlation with the formation of endocochlear potential *J. Neurosci*. (1997) 17(12):4711-4721.

HHE Hidaka Toshinori, Aisaka Kazuo, Furuya Mayumi, Masuda Yutaka, Uramoto Hiroshi, Tani Yoshihiro, Nakamura Shizuo, Inoue Teruyoshi, Saitoh Kyoshi, and Et Al. 1992. General pharmacology of carperitide, an alpha-human atrial natriuretic peptide (carperitide, sun-4936). *Pharmacometrics* 44(5):605-624.

Unrel Hidalgo, A., Casas-Tineo, M., Garcia de Boto, M. J., and Andres-Trelles, F. 1984. [Different behavior of the rat vas deferens of castrated animals and those treated with cyproterone acetate]. <Original> Diferente comportamiento del conducto deferente de rata de animales castrados y tratados con acetato de ciproterona. Revista espanola de fisiologia 40(2):159-63.

In Vit Hilaire, C., Diochot, S., Desmadryl, G., Baldy-Moulinier, M., Richard, S., and Valmier, J. Opposite developmental regulation of P- and Q-type calcium currents during ontogenesis of large diameter mouse sensory neurons *Neuroscience* (Oxford) (1996) 75(4):1219-1229

In Vit Hilaire, C., Diochot, S., Desmadryl, G., Richard, S., and Valmier, j. Toxin-resistant calcium currents in embryonic mouse sensory neurons. *Neuroscience*; 80 (1). 1997. 267-276.

In Vit Hirano, Y. and Hiraoka, M. Barium-induced automatic activity in isolated ventricular myocytes from guinea-pig hearts *Journal of Physiology* (London). 395 (0). 1988. 455-472.

CP Hivert, B. and Pietrobon, D. 1995. Calcium channels of embryonic rat spinal motoneurons. *Society for Neuroscience Abstracts* 21(1-3):1578.

Unrel Hoffer, R. E., Valdes-Dapena, A., and Baue, A. E. 1967. A comparative study of naturally occurring canine achalasia. *Archives of Surgery* 95(1):83-8.

Unrel Holland, R., Pinheiro, C. E., de Mello, W., Nery, M. J., and de Souza, V. 1982. Histochemical analysis of the dogs' dental pulp after pulp capping with calcium, barium, and strontium hydroxides. *Journal of Endodontics* 8(10):444-7.

Unrel Hopsu-Havu, V. K., Arstila, A. U., Helminen, H. J., and Kalimo, H. O. 1967. Improvements in the method for the electron microscopic localization of arylsulphatase activity. *Histochemie* 8(1):54-64.

Unrel Horie, R. and Yamori, Y. 1980. Neural factors and genetic disposition in cerebrovascular atherogenesis in rats. *Clinical and Experimental Hypertension* 2(6):1097-115.

In Vit Hoth, Markus. Calcium and barium permeation through calcium release-activated calcium (CRAC) channels. *Pfluegers Arch*. (1995) 430(3):315-22.

Bio Acc Hothem, Roger L., Roster, Douglas L., King, Kirke A., Keldsen, Timothy J., Marois, Katherine C., and Wainwright, Susan E. Spatial and temporal trends of contaminants in eggs of wading birds from San Francisco Bay, California *Environ. Toxicol. Chem*. (1995) 14(8):1319-31.

CP Hotta, K., Oba, T., and Yamamoto, Y. Ionic mechanisms affecting the movement of cellularly associated calcium leading to the mechanical activation of skeletal and smooth muscle Meeting of the Research Group on Muscle Physiology, Tokyo, Japan, March 1984. *Jikeikai Med J.* 30 (Suppl. 1). 1984. 23-30.

Alt Hu, K. G. and Marmor, M. F. 1984. Selective actions of barium on the c-wave and slow negative potential of the rabbit eye. *Vision Research* 24(10):1153-6.

In Vit Huang, S. J. and Robinson, D. W. 1998. Activation and inactivation properties of voltage-gated calcium currents in developing cat retinal ganglion cells. *Neuroscience* 85(1):239-47.

Unrel Huang Yu. 1995. Bacl-2- and 4-aminopyridine-evoked phasic contractions in the rat vas deferens. *British Journal of Pharmacology* 115(5):845-851.

No Dose Hui, Clifford A. University of California Davis and Beyer, W. Nelson USGS Laurel MD. Sediment Ingestion of Two Sympatric Shorebird Species *Sci Total Environ.* v224, n1-3, p227(7)

Unrel Hulse, E. V. and Mizon, L. G. 1967. Radiation-conditioned aversion in rats after part-body x-irradiation and its relationship to gastric emptying. *International Journal of Radiation Biology and Related Studies in*

Unrel Hume, I. D., Carlisle, C. H., Reynolds, K., and Pass, M. A. 1988. Effects of fasting and sedation on gastrointestinal tract function intwo potoroine marsupials. *Australian Journal of Zoology* 36(4):411-420.

Unrel Huss, B. T., Payne, J. T., Johnson, G. C., and Wagner-Mann, C. C. 1994. Comparison of a biofragmentable intestinal anastomosis ring with appositional suturing for subtotal colectomy in normal cats. *Veterinary Surgery* 23(6):466-74.

Prim Hutcheson, D. P., Gray, D. H., Venugopal, B., and Luckey, T. D. 1975. Safety of heavy metals as nutritional markers. *Environmental Quality and Safety. Supplement* 1:74-80, 114-5.

Mix Hutcheson, D. P., Gray, D. H., Venugopal, B., and Luckey, T. D. 1975. Studies of nutritional safety of some heavy metals in mice *.J. Nutr.* 105(6):670-675.

Bio Acc Ikebe, Katsuhiko, Nishimune, Takahiro, and Sueki, Kenji. Behavior of several elements in foods. VII. Contents of 17 metal elements in food determined by inductively coupled plasma atomic emission spectrometry. Meat and meat products *Shokuhin Eiseigaku Zasshi* (1994) 35(3):323-7.

Unrel Ikezono K(A), Fujita, S., Umezato, M., Hosoki, E., Toba, Y., Kusunoki, A., and Shintani, S. 1992. General pharmacological properties of the new vasodilator flosequinan. *Arzneimittel-Forschung* 42(10):1200-1211.

Unrel Imoto, Y., Ehara, T., and Matsuura, H. 1987. Voltage- and time-dependent block of iK1 underlying Ba2+-induced ventricular automaticity. *American Journal of Physiology* 252(2 Pt 2):H325-33.

Alt Inazawa, M. Characteristics of divalent cation dependent slow action potentials in potassium de polarized guinea-pig ventricular muscle *Fukuoka Acta Medica*. 73 (13). 1982 (Recd. 1983). 711-726.

Alt Inazawa, Minoru, Ehara, Tsuguhisa, and Ito, Takao. 1984. Barium-calcium antagonism in the electrical and mechanical activity in guinea - pig ventricular muscle. *Biomed. Res*. 5(5):393-400.

In Vit Inomata Hachiro(A), Mimata Tomofumi, and Wakui Makoto. 1998 . Isoprenaline enhances both voltage-dependent ba2+ and k+ currents in guinea-pig vas deferens. *Tohoku Journal of Experimental Medicine* 184(4):317-320.

Phy Inoue Yoshihito, Shimamura Keiichi, and Sperelakis Nicholas(A). 1992. Oxytocin actions on voltage-dependent ionic channels in pregnant rat uterine smooth muscle cells. *Canadian Journal of Physiology and Pharmacology* 70(12):1597-1603.

Unrel Isotalo T(A), Alarakkola, E., Talja, M., Tammela, T. L. J., Valimaa, T., and Tormala, P. 1999. Biocompatibility testing of a new bioabsorbable x-ray positive sr-pla 96/4 urethral stent. *Journal of Urology* 162(5):1764-1767.

Unrel Ito, T., Itoshima, T., Kiyotoshi, S., Kawaguchi, K., Ogawa, H., Hattori, S., Kitadai, M., Maruyama, T., and Nagashima, H. 1982. Peritoneoscopic study on rat liver cell necrosis induced by carbon tetrachloride and allyl formate. *Gastroenterologia Japonica* 17(1):31-5.

Unrel Jackson, S. and Duke, G. E. 1995. Intestine fullness influences feeding behaviour and crop filling in the domestic turkey. *Physiology & Behavior* 58(5):1027-34.

CP Jacobson, K. B., Turner, J. E., Christie, N. T., and Owenby, R. K. 1981. *Toxic and Biochemical Effects of Divalent Metal Ions in Drosophila: Correlation to Effects in Mice and to Chemical Softness Parameters*. CONF-811035-3

Unrel James, A. E. Jr, Montali, R. J., Chaffee, V., Strecker, E. P., and Vessal, K. 1975. Barium or gastrografin: which contrast media for diagnosis of esophageal tears? *Gastroenterology* 68(5 Pt 1):1103-13.

Unrel James, S. W. and Eason, R. W. 1992. Extraordinary Polarised Light does not always yield the Highest Reflectivity from Self-Pumped BaTio sub 3

Unrel James, S. W. and Eason, R. W. 1992. Intensity Dependent Thresholding and Switching in the Photorefractive 'Bridge' Mutually Pumped Phase Conjugator

Unrel Janse, M. J. and Wilms-Schopman, F. 1982. Effect of changes in perfusion pressure on the position of the electrophysiologic border zone in acute regional ischemia in isolated perfused dog and pig hearts. *American Journal of Cardiology* 50(1):74-82.

Aquatic Jeffree, Ross A. Patterns of accumulation of alkaline-earth metals in the tissue of the freshwater mussel Velesunio angasi (Sowerby) *Arch. Hydrobiol*. (1988) 112(1):67-90.

Nut Jensen, L. S., Casey, J. M., Savage, S. I., and Britton, W. M. An association of hardness of water with incidence of fatty liver syndrome in laying hens. *Poult. Sci*. (1976) 55(2):719-24.

Unrel Jiang, H. X., Chen, P. C., Sobin, S. S., and Giannotta, S. L. 1992. Age related alterations in the response of the pial arterioles to adenosine in the rat. *Mechanisms of Ageing and Development* 65(2-3):257-76.

Unrel Jianqing, F., Huipin, Y., and Xingdong, Z. 1997. Promotion of osteogenesis by a piezoelectric biological ceramic. *Biomaterials* 18(23):1531-4.

Phy Johnson Barry D and Byerly Lou(A). 1994. Ca-2+ channel ca-2+-dependent inactivation in a mammalian central neuron involves the cytoskeleton. Pfluegers *Archiv European Journal of Physiology* 429(1):14-21.

Unrel Johnson, J. E., Ward, G. M., Ennis, M. E. Jr., and Boamah, K. N. 1988. Transfer coefficients of selected radionuclides to animal products. I.Comparison of milk and meat from dairy cows and goats. *Health Physics* 54(2): 161-166.

Unrel Johnson Joyce E(A), Perkett Elizabeth A, and Meyrick Barbara. 1997. Pulmonary veins and bronchial vessels undergo remodeling in sustained pulmonary hypertension induced by continuous air embolization into sheep. *Experimental Lung Research* 23(5):459-473.

Unrel Jones, R. L. Relationship of pheasant occurrence to barium in illinois soils. *Environ Geochem Health*. 14 (1). 1992. 27-30.

No Oral Judson, G. J., Ellis, N. J. S., Kempe, B. R., and Shallow, M. Long-acting selenium treatments for sheep. *Australian Veterinary Journal*. 68 (8). 1991. 263-265.

Unrel Jurkiewicz, N. H., Jurkiewicz, A., Gomes, C. B., and Aucelio, J. G. Pharmacodynamic analysis of the rat isolated vas deferens after transplantation to intestinal wall. *Journal of Pharmacology and Experimental Therapeutics*. 203 (1). 1977 112-119.

Unrel Kaderly, R. E., Anderson, B. G., and Anderson, W. D. 1983. Intracapsular and intraosseous vascular supply to the mature dog's coxofemoral joint. *American Journal of Veterinary Research* 44(10):1805-12.

FL Kadic, M. 1975. Effect of phosphates, sulphates and alginates on absorption ofradioactive strontium from the digestive tract. *Veterinaria, Yugoslavia* 24(2):219-234.

FL Kaiser, A., Frick, T., Scharen, S., Freiburghaus, A., and Largiader, F. 1993. [Acute pancreatitis after local infusion of divalent cations]. <Original> Akute Pankreatitis nach lokaler Infusion divalenter Kationen. *Helvetica chirurgica acta* 59(5-6):897-960.

Phy Kamimura, N., Suga, S., Wada, J., Mio, Y., Suzuki, T., and Wakui M(A). 1996. Excitatory and inhibitory actions of norepinephrine on the ba-2+ current through l-type ca-2+ channels of smooth muscle cells of guinea-pig vas deferens. *Journal of Cellular Physiology* 169(2):373-379.

Unrel Kamo, S. L., Wasteneys, H., Gower, C. F., and Krogh, T. E. U-Pb geochronology of Labradorian and later events in the Grenville Province, eastern Labrador *Precambrian Res.* (1996) 80(3-4):239-260

Unrel Kang, H. S., Lee, Y., Park, J. H., Kim, C. W., Han, M. C., and Kim, Y. I. 1989. Microcholangiography. Normal microbiliary system and its alteration after extrahepatic bile duct obstruction. *Investigative Radiology* 24(6):451-5.

In Vit Kano, M. 1975. Development of excitability in embryonic chick skeletal muscle cells. *Journal of Cellular Physiology* 86(3 Pt 1):503-10.

In Vit Kano, M., Wakuta, K., and Satoh, R. Calcium channel components of action potential in chick skeletal muscle cells developing in culture. *Developmental Brain Research*. 32 (2). 1987. 233-240.

In Vit Kano, M., Wakuta, K., and Satoh, R. Two components of calcium channel current in embryonic chick skeletal muscle cells developing in culture. *Developmental Brain Research.* 47 (1). 1989. 101-112.

Bact Karaki, Hideaki, Ikeda, Miyoshi, and Urakawa, Norimoto. Effects of external calcium and some metabolic inhibitors on barium-induced tension changes in guinea pig *Taenia coli* *Jpn. J. Pharmacol.* (1967) 17(4): 603-12.

Bact Karaki, Hideaki, Ikeda, Miyoshi, and Urakawa, Norimoto. Movements of calcium during tension development induced by barium and high potassium in guinea pig *Taenia coli*. *Jap. J. Pharmacol*. (1969) 19(2): 291-9.

Mix Karunski, A. I., Kryuchkova, E. F., and Niki'burskii, N. I. 1993. Wastes from sugarbeet production in the feeding of pigs and chickens. *Zootekhniya* (9):15-18.

FL Kasamaki, Yuji, Guo, An Chi, Shuba, Lesya M., Ogura, Toshitsugu, and McDonald, Terence F. Sodium-pump potentials and currents in guinea - pig ventricular muscles and myocytes *Can. J. Physiol. Pharmacol*. (1999) 77(5):339-349.

FL Kashihara, Toshio, Yoshioka, Toshio, Matsui, Masakazu, and Kitamori, Nobuyuki. Dissolution behavior of pH-response antacid granules in the dog gastrointestinal tract Yakuzaigaku (1988) 48(3):215-21.

Phy Kasner, S. E. and Ganz, M. B. 1992. Regulation of intracellular potassium in mesangial cells: a fluorescence analysis using the dye, PBFI. *American Journal of Physiology* 262(3 Pt 2):F462-7.

Unrel Kato, Katsumasa, Terai, Takeshi, and Ono, Masahiko. Development of ornaments for gifts *Aichi-ken Tokoname Yogyo Gijutsu Senta Hokoku* (1998) :25, 38-40.

In Vit Kato, M. 1995. Withdrawal of somatostatin augments L-type Ca2+ current in primary cultured rat somatotrophs. *Journal of Neuroendocrinology* 7(11):855-9.

Alt Kato Seika(A), Ishida Hitoshi, Tsuura Yoshiyuki, Okamoto Yoshimasa, Tsuji Kazuo, Horie Minoru, Okada Yasunobu, and Seino Yutaka. 1994. Increased calcium-channel currents of pancreatic beta cells in neonatally streptozocin-induced diabetic rats. *Metabolism Clinical and Experimental* 43(11):1395-1400.

Unrel Kawase, S. and Ishikura, H. 1995. Female-predominant occurrence of spontaneous gastric adenocarcinoma in cotton Rats. *Laboratory Animal Science* 45(3):244-8.

FL KE, Y. and ET, A. L. 474. Cement: an animal experimental Study. *Zhonghua Guke Zazh.;* 9 (6). 1989. 435-437

Unrel Keane, F. B., Moore, D. J., Byrne, P. J., and Hennessy, T. P. 1982. A comparison of circular stapling devices for rectal anastomoses. A study in dogs. *Diseases of the Colon and Rectum* 25(4):285-8.

Unrel Kharaka, Yousif K., Mariner, Robert H., Ambats, Gil, Evans, William C., White, Lloyd D., Bullen, Thomas D., and Kennedy, B. Mack. Origins of water and solutes in and north of the Norris-Mammoth Corridor, Yellowstone National Park Trans. - Geotherm. Resour. Counc. (1990) 14(Pt. 1, Int. Symp. Geotherm. Energy, 1990):705-14.

Unrel Kholoussy, A. M., Yang, Y., Bonacquisti, K., Witkowski, T., Takenaka, K., and Matsumoto, T. 1986. The competence and bacteriologic effect of the telescoped intestinal valve after small bowel resection. *American Surgeon* 52(10):555-9.

Method Kiernan John A(A), Macpherson Cheryl M, Price April, and Sun Tina. 1998. A histochemical examination of the staining of kainate-induced neuronal degeneration by anionic dyes. *Biotechnic & Histochemistry* 73(5):244-254.

Phy Kilborn, M. J. and Fedida, D. A study of the developmental changes in outward currents of rat ventricular Myocytes *J Physiol (Camb).* 430 (0). 1990. 37-60.

Unrel Killingsworth, C. R., Slocombe, R. F., and Wilsman, N. J. 1987. Immotile cilia syndrome in an aged dog. *Journal of the American Veterinary Medical Association* 190(12)

Unrel Kim, N. N., Kim, J. J., Hypolite, J., Garcia-Diaz, J. F., Broderick, G. A., Tornheim, K., Daley, J. T., Levin, R., and Saenz de Tejada, I. 1996. Altered contractility of rabbit penile corpus cavernosum smooth muscle by hypoxia. *Journal of Urology* 155(2):772-8.

Unrel Kim, Sang-Tae and O'Neil, James R. Equilibrium and nonequilibrium oxygen isotope effects in synthetic carbonates *Geochim. Cosmochim. Acta* (1997) 61(16):3461-3475.

In Vit King, B. F. and Szurszewski, J. H. Effects of potassium channel-blocking agents on neurons in the inferior mesenteric ganglion in guinea pig. *J. Auton. Nerv. Syst*. (1988) 23(3):241-52.

Unrel Kinnamon, S. C., Betz, W. J., and Caldwell, J. H. 1985. Development of a steady electric current in neonatal rat lumbrical muscle. *Developmental Biology* 112(1):241-7.

Unrel Kischer, C. W., Sheridan, D., and Pindur, J. 1989. Use of nude (athymic) mice for the study of hypertrophic scars and keloids: vascular continuity between mouse and implants. *Anatomical Record* 225 (3):189-96.

Method Kiyomatsu, Y. 1992. [A scanning electron microscopic study on experimental ischemic lesions in dogs] *Nippon Geka Gakkai zasshi* 93(3):257-65.

Chem Meth Klingenberg, Andreas and Seubert, Andreas. Comparison of silica-based and polymer-based cation exchangers for the ion chromatographic separation of transition metals *J. Chromatogr. (*1993) 640(1-2):167-78.

No Oral Knudsen, T. 1995. The Na+/K(+)-pump in rat peritoneal mast cells: some aspects of regulation of activity and cellular function. *Danish Medical Bulletin* 42(5):441-54.

Unrel Kobayashi, Y., Tabuse, K., Tabuse, Y., Aoyama, O., Egawa, H., Nagai, Y., Mori, K., Yamaue, H., Azuma, Y., and Et Al. Microwave surgery for splenic preservation an experimental study. *Archiv fuer Japanische Chirurgie*. 54 (2). 1985. 91-99.

Drug Koch, Heinrich P., Hofeneder, Maria, and Bohne, Bernd. The yeast test: an alternative method for the testing of acute toxicity of **Drug** substances and environmental chemicals Methods Find. *Exp. Clin. Pharmacol*. (1993) 15(3):141-52

Unrel Kodirov, M. K., Myslivits, S. A., Rustamov, Kh. Sh., and Slabko, V. V. Interference of nonlinear processes during parametric generation of UV and VUV radiation in metal vapors *Opt. Spektrosk*. (1992) 72(6):1451-6.

Unrel Kojima, I., Matsunaga, H., Kurokawa, K., Ogata, E., and Nishimoto, I. 1988. Calcium influx: an intracellular message of the mitogenic action of insulin-like growth factor-I. *Journal of Biological Chemistry* 263(32): 16561-7.

Alt Kojima, M. and Sperelakis, N. Properties of oscillatory after potentials in young embryonic chick hearts. *Circulation Research*. 55 (4). 1984. 497-503.

Unrel Kondo, S. 1996. Microinfusion method using barium sulfate for visualization of embryonic blood vessels with light and scanning electron microscopy. *Journal of Electron Microscopy* 45(2):163-7.

Unrel Kondo, S. 1998. Microinjection methods for visualization of the vascular architecture of the mouse embryo for light and scanning electron microscopy. *Journal of Electron Microscopy* 47(2):101-13.

Phy Konishi, T. 1994. Activity-dependent regulation of inwardly rectifying potassium currents in non-myelinating Schwann cells in mice. *Journal of Physiology* 474(2):193-202.

Phy Konishi, T. 1996. Developmental and activity-dependent changes in K+ currents in satellite glial cells in mouse superior cervical Ganglion. *Brain Research* 708(1-2):7-15.

No COC Konishi, T. Voltage-gated potassium currents in myelinating schwann cells in the mouse *J Physiol (Camb*). 431 (0). 1990. 123-140.

Unrel Kormano, M. 1970. Combination of microangiography and histochemistry. *Histochemie* 22(1):79-81.

Unrel Kormano, M. 1970. Histologic staining of contrast-filled blood vessels in microangiographed tissues. *Acta Radiologica: Diagnosis* 10(2): 138-44.

Method Koutselinis, A. C. JR, Dimopoulos, G. D. JR, and Smirnakis, Z. I. JR. Separation and identification of some organophosphorus pesticides from liver by two-dimensional tlc. *Med. Sci. Law*. 10(3): 178-9 1970; (REF:21)

Unrel Kozlov, M. P., Savel'ev, V. N., Chumakova, I. V., <Editors> Taran, I. F., and Dyatlov, A. I. 1974. The outlook for the development of biological methods of control for fleas of rodents.:150-152.

FL Krasovskii, G. N., Butenko, P. G., Vasyukovich, L. Ya., Bonashevskaya, T. I., and Belyaeva, N. N. Hygienic basis of the maximum allowable concentration of barium in water. *Gig. Sanit*. (1980) (6):86-7.

No Oral Krasovskii, G. N., Yurasova, O. I., Charyev, O. G., and et, a. l. 1977. (Prediction of gonadotoxic action of heavy metals from the primary effect of material Accumulations).*Gigiena I Sanitariya* 7:11-16.

Method Kraus, B. B., Rappaport, D. C., Ros, P. R., and Torres, G. M. 1994. Evaluation of oral contrast agents for abdominal magnetic resonance imaging. *Magnetic Resonance Imaging* 12(6):847-58.

Unrel Kraus, B. L. H., Kirker-Head, C. A., Kraus, K. H., Jakowski, R. M., and Steckel, R. R. 1995. Vascular supply of the tendon of the equine deep digital flexor musclewithin the digital sheath. *Veterinary Surgery* 24(2):102-111.

Alt Kreye, V. A. W., Rueegg, J. C., and Hofmann, F. 1985. Effect of calcium-antagonists and barium ions on calmodulin-dependent contractions of chemically skinned renal arteries of the rabbit. *Inst. Natl. Sante Rech. Med.* [Colloq.] 124:(Regul. Calciques Muscles Lisses), 455-62.

No COC Kubli-Garfias, C., Hoyo-Vadillo, C., and Ponce-Monter, H. Relaxant effect of testosterone and 5.alpha.-reduced androgens on the smooth muscle of the male rat reproductive system. *Proc. West. Pharmacol. Soc.* (1983) :26, 31-4

Unrel Kuboyama, Y., Mori, K., Suzuki, K., Ishii, A., and Shuto, K. 1996. Changes in nasal cavity volume and target area of exposure to nasal drops with age in rats. *Experimental Animals* 45(1):15-22.

Unrel Kumar Naveen, Pal Amar, and Pawde, A. M. 1995. Megaoesophagus in a buffalo: a case report. *Indian Veterinary Journal* 72(4):382-384.

Unrel Kundrotas, L. W., Young, G. S., Lang, K. A., and Woods, J. A. 1995. Felinization of the esophagus. *Gastrointestinal Endoscopy* 42(1):37-40.

FL Kuroda, H. 1984. [An experimental histo-pathological study of a hard setting type paste (Fr, Hydron) used for combined root canal filling]. *Shika gakuho* 84(3):393-425.

Unrel Labib, R. S., Awad, E. R., and Farag, N. W. Proteases of cerastes-cerastes egyptian sand viper and cerastes-vipera sahara sand viper snake venoms. *Toxicon.* 19 (1). 1981. 73-84.

Alt Labrid, Claude, Dureng, Georges, Bert, Helene, and Duchene-Marullaz, Pierre. (1977). Non-specific antispasmodics and barium induced contraction. *J. Pharmacol.* 8(2):169-84.

Surv LaDelfe, C. M. 1981. Detailed Geochemical Survey Data Release for the San Andres-Oscura Mountains Special Study Area, New Mexico. GJBX-215-81; LA-8016-MS

Unrel Laermann, Barbara, O'Brien, Paul, and Bartram, Clive. Optimizing of the physicochemical properties of a novel barium sulphate preparation for the x-ray examination of the intestine Mater. Res. Soc. Symp. Proc. (1999) 550(Biomedical Materials--Drug Delivery, Implants and Tissue Engineering):59-64.

Unrel Lais, L. T. and Brody, M. J. 1975. Mechanism of vascular hyperresponsiveness in the spontaneously hypertensive rat. *Circulation Research* 36(6 Suppl 1):216-22.

Unrel Lais, L. T. and Brody, M. J. Vaso constrictor hyper responsiveness an early pathogenic mechanism in the spontaneously hypertensive rat. *European Journal of Pharmacology*. 47 (2). 1978 177-190.

In Vit Lalevee Nathalie, Pluciennik Frederique, and Joffre Michel(A). 1997. Voltage-dependent calcium current with properties of t-type current in sertoli cells from immature rat testis in primary cultures. *Biology of Reproduction* 56(3):680-687.

Drug Lally, K. P. and Nichols, R. L. 1981. Various intraperitoneal irrigation solutions in treating experimental fecal peritonitis. *Southern Medical Journal* 74(7):789-91, 798.

Unrel Lally, K. P., Shorr, L. D., and Nichols, R. L. 1985. Aminoglycoside peritoneal lavage: lack of efficacy in experimental fecal peritonitis. *Journal of Pediatric Surgery* 20(5):541-2.

Unrel Lamb, F. S. and Webb, R. C. 1989. Potassium conductance and oscillatory contractions in tail arteries from genetically hypertensive rats. *Journal of Hypertension* 7(6):457-63.

Unrel Lang, F., Woll, E., Waldegger, S., Friedrich, F., Ritter, M., Pinggera, G., Kloiber, K., Bichler, I., Heitzenberger, H., Maly, K., and et, a. l. 1992. Cell membrane potential oscillations induced by kinins in fibroblasts expressing the Ha-ras oncogene. *Agents and Actions* 38(Pt 2):73-80.

Nut def Larkin, H. A. and Hannan, J. 1983. Gastric structure and function in iron-deficient piglets. *Research in Veterinary Science* 34(1):11-15.

Unrel Larson, J. E. and Herring, S. W. 1996. Movement of the epiglottis in mammals. *American Journal of Physical Anthropology* 100(1):71-82.

Unrel Lauweryns, J. M. 1971. The blood and lymphatic microcirculation of the lung. *Pathology Annual* 6:365-415.

Unrel Leaper, D. J. A method for the study of the vasculature of the abdominal wall and gastro intestinal tract in experimental animals. *Microcirculation.* 2 (1). 1982. 35-44.

In Vit Legendre, P., Brigant, J. L., and Vincent, J. D. 1987. [Development of electrical activity of hypothalamic cells in culture]. <Original> Developpement de l'activite electrique des cellules hypothalamiques en culture. *Annales D'endocrinologie* 48(5):356-62.

Unrel Legendre, P. and Poulain, D. A. 1992. Intrinsic mechanisms involved in the electrophysiological properties of the vasopressin-releasing neurons of the hypothalamus. *Progress in Neurobiology* 38(1):1-17 .

Unrel Lehur, P. A. and Khosrovaninejad, C. 1989. [Colonic vascularization does not change by circular stapling: an angiographic study in dogs]. <Original> La vascularisation colique n'est pas alteree par l'agrafage circulaire: etude angiographique chez le chien. Annales de chirurgie 43(4):315-9.

Unrel Leonardo, M. R., Almeida, W. A., da Silva, L. A., and Utrilla, L. S. 1998. Histological evaluation of the response of apical tissues to glass ionomer and zinc oxide-eugenol based sealers in dog teeth after root canal treatment. *Endodontics & Dental Traumatology* 14(6):257-61.

Unrel Leonardo, M. R., da Silva, L. A., Almeida, W. A., and Utrilla, L. S. 1999. Tissue response to an epoxy resin-based root canal sealer. *Endodontics & Dental Traumatology* 15(1):28-32.

Unrel Leonards, Kenneth S. Changes in the surface charge properties of isolated cardiac sarcolemmal vesicles measured by light scattering. I. Characteristics of rat and canine preparations *Biochim. Biophys. Acta* (1988) 938(2):293-309

In Vit Leonards, Kenneth S. Roles of proteins in cation/membrane interactions of isolated rat cardiac sarcolemmal vesicles *Mol. Cell. Biochem*. (1990) 95(1):31-42

Unrel Lepkovsky, S., Dimick, M. K., Furuta, F., Feldman, S. E., and Park, R. 1975. Stomach and upper intestine of the rat in the regulation of food intake. *Journal of Nutrition* 105(12):1491-9.

Ecol Levey, D. J. and Duke, G. E. 1992. How do frugivores process fruit? Gastrointestinal transit and glucose absorption in cedar waxwings (Bombycilla cedrorum). vol. 109, no. 4, pp. 722-730 *Auk.*

Alt Levine, J. P., Bradley, J., Turk, A. E., Ricci, J. L., Benedict, J. J., Steiner, G., Longaker, M. T., and McCarthy, J. G. 1997. Bone morphogenetic protein promotes vascularization and osteoinduction in preformed hydroxyapatite in the rabbit. *Annals of Plastic Surgery* 39(2):158-68.

Phy Lewis, D. L., De Aizpurua, H. J., and Rausch, D. M. 1993. Enhanced expression of Ca2+ channels by nerve growth factor and the v-src oncogene in rat phaeochromocytoma cells. *Journal of Physiology* 465:325-42.

In Vit Lewis, Deborah L., Goodman, Miriam B., St. John, Paul A., and Barker, Jeffery L. Calcium currents and fura-2 signals in fluorescence-activated cell sorted lactotrophs and somatotrophs of rat anterior pituitary. *Endocrinology* (Baltimore) (1988) 123(1):611-21

Mix Li, Cai, Wang, Fan, and Wang, Lijuan. Effects of hyperthyroidism on barium chloride-induced myocardial necrosis *Baichiuen Yike Daxue Xuebao* (1984) 10(3):246-50 .

Phy Li, Y. W. and Guyenet, P. G. 1996. Angiotensin II decreases a resting K+ conductance in rat bulbospinal neurons of the C1 area. *Circulation research* 78(2):274-82.

Unrel Lichtman, S. N., Wang, J., and Clark, R. L. 1995. A microcholangiographic study of liver disease models in rats. *Academic radiology* 2(6):515-21.

Unrel Lin, D. H. and Yin, F. C. 1998. A multiaxial constitutive law for mammalian left ventricular myocardium in steady-state barium contracture or tetanus. *Journal of Biomechanical Engineering* 120(4):504-17.

Unrel Lindeman, R. C. 1975. Diverting the paralyzed larynx: a reversible procedure for intractable aspiration. *Laryngoscope* 85(1):157-80.

In Vit Linz, K. W. and Meyer, R. 1998. The late component of L-type calcium current during guinea-pig cardiac action potentials and its contribution to contraction. *Pflugers Archiv* 436(5):679-88.

No Dose Little, A. G., Correnti, F. S., Calleja, I. J., Montag, A. G., Chow, Y. C., Ferguson, M. K., and Skinner, D. B. 1986. Effect of incomplete obstruction on feline esophageal function with a clinical correlation. *Surgery* 100(2):430-6.

Unrel Liu G-Q, Sun J-N, He Z-Z, and Jiang, Y. Spasmolytic actions of active principles of volatile oil of acorus-gramineus *Acta Pharmacologica Sinica.* 4 (2). 1983. 95-97.

Unrel Liu, M. S. and Long, D. M. 1977. Perfluoroctylbromide as a diagnostic contrast medium in gastroenterography. *Radiology* 122(1):71-6.

In Vit Liu, Y. J., Grapengiesser, E., Gylfe, E., and Hellman, B. 1995. Glucose induces oscillations of cytoplasmic Ca2+, Sr2+ and Ba2+ in pancreatic beta-cells without participation of the thapsigargin-sensitive store. *Cell calcium* 18(2):165-73.

FL Lizasoain Urcola, J., Gonzalez Sanz-Agero, P., De Castro Carpeno, J., Rey Sanz R, Hernandez Galan, R., Celdran Uriarte, A., and Molina Perez, E. 1995. [Melanoma of the small intestine and adenocarcinoma of the colon]. <Original> Melanoma de intestino delgado y adenocarcinoma de colon. *Gastroenterologia y hepatologia* 18(6):323-5.

Nut Logan, E. F., Rice, D. A., Smyth, J. A., and Ellis, W. A. 1990. Weak calf syndrome and parenteral selenium supplementation. *Veterinary Record* 126(7):163-164.

Mix London, J. E. 1988. Preliminary Toxicological Study of Yttrium Barium Copper Oxide. LA-11437-MS

In Vit Long, K. J. and Walsh, K. B. 1994. A calcium-activated potassium channel in growth plate chondrocytes: regulation by protein kinase A. Biochemical and biophysical research communications 201(2):776-81.

Unrel Lopez-Merino, V., Lledo, S., Chulia, V., Lledo, M., and Esplugues, J. 1980. [New experimental method for analysis of bronchopulmonary airway resistance to airflow (author's transl)]. <Original> Nuevo modelo experimental para el analisis de las resistencias de las vias broncopulmonares al flujo aereo. Revista espanola de fisiologia 36(4):363-9.

Unrel Lorenzon, N. M. and Foehring, R. C. 1995. Characterization of pharmacologically identified voltage-gated calcium channel currents in acutely isolated rat neocortical neurons. II. Postnatal development. *Journal of neurophysiology* 73(4):1443-51.

In Vit Lorenzon, N. M., Lutz, C. M., Frankel, W. N., and Beam, K. G. 1998. Altered calcium channel currents in Purkinje cells of the neurological mutant mouse leaner. Journal of neuroscience 18(12):4482-9.

No Oral Low, Willie C. A. and Prathap, K. Reaction of fetal tissues to intrauterine subcutaneous injection of barium sulfate. *J. Pathol*. (1977) 121(3):159-62

In Vit Lu, Ming, Giebisch, Gerhard, and Wang, Wenhui. Nitric oxide-induced hyperpolarization stimulates low-conductance Na+ channel of rat *CCD Am. J. Physiol*. (1997) 272(4, Pt. 2):F498-F504.

Unrel Ludders, J. W., Wilson, J. W., and Ribble, G. A. 1985. Microangiography and correlated histology: a research technique for examining renal microcirculation. *American Journal of Veterinary Research* 46(12):2536-8.

In Vit Lukacs, G. L. and Fonyo, A. 1985. Ba2+ ions inhibit the release of Ca2+ ions from rat liver mitochondria. *Biochimica et Biophysica Acta* 809(2):160-6.

In Vit Lukacs, G. L. and Fonyo, A. Barium ions inhibit the release of calcium ions from rat liver mitochondria. *Biochimica et Biophysica Acta*. 809 (2). 1985. 160-166.

In Vit Lukacs, Gergely L. and Fonyo, Attila. Barium(2+) ions inhibit the release of calcium ions from rat liver mitochondria *Biochim. Biophys. Acta* (1985) 809(2):160-6.

Unrel Lundgren, Y. 1974. Adaptive changes of cardiovascular design in spontaneous and renal hypertension. Hemodynamic studies in rats. *Acta physiologica Scandinavica. Supplementum* 408:1-62.

In Vit MacDonald, J. F. and Schneiderman, J. H. Frequency-dependent decay of calcium spikes in cultured spinal cord neurons *Neuroscience* (Oxford) (1986) 19(4):1335-47.

Unrel Maglinte, D. D., Strong, R. C., Strate, R. W., Caudill, L. D., Dyer, P. A., Chernish, S. M., and Graffis, R. F. 1982. Barium enema after colorectal biopsies: experimental data. Ajr. *American Journal of Roentgenology* 139(4):693-7.

Unrel Maj, J., Kulig, D., Mysliwiec, D., Bugielska, Z., Tomsa, E., and Zaczynska-Kostrakiewicz, M. Pharmacological properties of craviten m-71. *Polish Journal of Pharmacology and Pharmacy*. 32 (6). 1980 (Recd. 1981). 855-876.

Acute Malhi, C. S., Parshad, V. R., and Ahmad, N. (1994). Determination of potential of barium carbonate for the control of house rat (*Rattus rattus*). *Z. Angew. Zool*. 80(1):43-9.

No COC Malhotra, O. P. Isolation and some properties of 11-gla and prothrombin and 9-gla prothrombin from normal plasma. *Biochemistry and Cell Biology*. 69 (5-6). 1991. 404-408.

FL Mandache, F., Ghergut, A., Stratulat, L., Popescu, G., Ciocilteu, P., Giuroiu, V., Pahomeanu, M., Calescu, M., Frumuz, F., and Tarta, D. 1976. [Experimental basis for a new surgical-therapeutic method for duodenal ulcer: gastric mucoslerosis]. <Original> Baze experimentale pentru o noua metoda terapeutica chirurgicala a ulcerului duodenal: mucoscleroza gastrica Revista de chirurgie, oncologie, radiologie, o.r.l., oftalmologie,

No Dose Maney, J. W., Katz, A. R., Li, L. K., Pace, W. G., and Hardy, T. G. 1988 . Biofragmentable bowel anastomosis ring: comparative efficacy studies in dogs. *Surgery* 103(1):56-62.

Unrel Mansour Atef, Dawoud Ibrahim, and Gad-El-Hak Nabil(A). 1998. The potential site of disordered gallbladder contractility during the early stage of cholesterol gallstone formation. *Hepato-Gastroenterology* 45(23):1404-1409.

In Vit Marcotti Walter, Geleoc Gwenaelle Sg, Lennan George Wt, and Kros Corne J(A). 1999. Transient expression of an inwardly rectifying potassium conductance in developing inner and outer hair cells along the mouse cochlea. *Pfluegers Archiv European Journal of Physiology* 439(1-2):113-122.

In Vit Markwardt, F. and Nilius, B. Changes of calcium channel inactivation during run-down. *Gen. Physiol. Biophys.* (1990) 9(3):209-18.

Unrel Marretta, S. M., Golab, G., Anthony, J. M., Cloran, J., and Klippert, L. 1992. Development of a teaching model for coronal access to the canine dentition. *Journal of Veterinary Dentistry* 9(4):11-7.

In Vit Martini, Lucienne C., Garcez-Do-Carmo, Lucia, and Jurkiewicz, Aron. Functional classification of non-competitive antagonism in vas deferens *Ann. N. Y. Acad. Sci*. (1997) 812(Receptor Classification):196-199.

Alt Mascher, D. .1973. Electrical and mechanical responses in ventricular muscle fibers during barium perfusion. *Pfluegers Arch* 342(4):325-46 .

Phy Masuda Hiroshi, Sumii Kotaro, and Sperelakis Nicholas(A). 1996. Developmental changes in beta-adrenergic and muscarinic modulations of ca-2+ currents in fetal and neonatal ventricular cardiomyocytes of the rat. *Reproduction Fertility and Development* 8(1):129-135.

Unrel Masuda, M. O. and Carvalho, A. P. D. Rate and rhythm dependency of propagation from normal myo cardium to a barium potassium induced slow response zone in rabbit left atrium. *Circulation Research*. 50 (3). 1982. 419-427.

Unrel Matlow, A. G., Bohnen, J. M., Nohr, C., Christou, N., and Meakins, J. 1989. Pathogenicity of enterococci in a rat model of fecal peritonitis. *Journal of Infectious Diseases* 160(1):142-5.

Unrel Matsui, O., Kawamura, I., and Takashima, T. 1986. Occurrence of an intrahepatic porto-arterial shunt after hepatic artery embolization with Gelfoam powder in rats and rabbits. *Acta Radiologica: Diagnosis* 27(1):119-22.

Unrel Matsunaga, H., Nishimoto, I., Kojima, I., Yamashita, N., Kurokawa, K., and Ogata, E. 1988. Activation of a calcium-permeable cation channel by insulin-like growth factor II in BALB/c 3T3 Cells. *American Journal of Physiology* 255(4 Pt 1):C442-6.

Alt Matsuoka, T., Tsukui, M., Nagashima, S., and Murata, Y. Effect of contractile Drugs on the isolated quail coturnix-coturnix-japonica rectum. *Journal of the Takeda Research Laboratories*. 38 (3-4). 1979 (Recd. 1980). 187-192.

In Vit Mayer, M. L. 1985. A calcium-activated chloride current generates the after-depolarization of rat sensory neurones in culture. *Journal of Physiology* 364:217-39.

Unrel McAlister, W. H. and Askin, F. B. 1983. The effect of some contrast agents in the lung: an experimental study in the rat and dog. AJR. *American Journal of Roentgenology* 140(2):245-51.

Bio Acc McCauley, P. T. and Washington, I. S. Barium bioavailability as the chloride, sulfate, or carbonate salt in the rat drug. *Chem. Toxicol*. (1983) 6(2):209-17

In Vit McCullough, L. A., Egan, T. M., and Westfall, T. C. 1998. Neuropeptide Y inhibition of calcium channels in PC-12 pheochromocytoma cells. *American Journal of Physiology* 274(5 Pt 1):C1290-7.

In Vit McCullough, L. A., Egan, T. M., and Westfall, T. C. 1998. Neuropeptide Y receptors involved in calcium channel regulation in PC12 cells. *Regulatory Peptides* 75-76:101-7.

In Vit McKhann, G. M. II, D'Ambrosio, R., and Janigro, D. 1997. Heterogeneity of astrocyte resting membrane potentials and intercellular coupling revealed by whole-cell and gramicidin-perforated patch recordings from cultured neocortical and hippocampal slice astrocytes vol. 17, no. 18, pp. 6850-6863 *J. Neurosci.*

Unrel Mclaughlin, M. K., Quinn, P. M., and Farnham, J. S. Differential sensitivity to angiotensin ii in pregnant rabbits. *American Journal of Obstetrics and Gynecology*. 146 (6). 1983. 633-638.

Unrel McMorn, S. O., Harrison, S. M., Zang, W. J., and Boyett, M. R. Comparison of ultra-slow, voltage-dependent inactivation of the cardiac L-type Ca2+ channel with Ca2+ or Ba2+ as the charge carrier in ferret ventricular myocytes *Exp. Physiol*. (1996) 81(4):565-575.

Unrel Mcmurphy, D. S. and Ljung, B. Neuro effector maturity of portal veins from new born rats rabbits cats and guinea-pigs. *Acta Physiologica Scandinavica*. 102 (2). 1978 218-223.

Nut Mee, J. F., O'Farrell, K., Rogers, P. A. M., <Editors> Anke, M., Meissner, D., and Mills, C. F. 1993. Effects of parenteral iodine and selenium supplementation on calvingperformance in trace element deficient herds.:321-322.

CP Mee, J. F., O'Farrell, K. J., Rogers, P. A. M., and <Editors> Trenti, F. 1994. Effects of parenteral iodine and selenium supplementation on calvingperformance in trace element-deficient herds.

<Document Title>Proceedings 18th World Buiatrics Congress: 26thCongress of the Italian Association of Buiatrics, Bologna, Italy,August 29-September 2, 1994. Volume 1.:649-652.

Unrel Meliksetyan, S. G. and Arutyunyan, G. G. 1986. The use of magnetic trap made of barium ferrite to control feeding trauma in dairy cattle. <Original> Primenenie magnitnoj lovushki iz ferrita bariya protiv kormovogo travmatizma molochnogo skota. Work of the scientists of Yerevan zootechnical veterinary institute for livestock production development. <Original> Uchenye Erevanskogo zootekhnino-veterinarnogo instituta -proizvodstvu p. 29-30

In Vit Mergler, S., Steinhausen, K., Wiederholt, M., and Strauss, O. 1998. Altered regulation of L-type channels by protein kinase C and protein tyrosine kinases as a pathophysiologic effect in retinal degeneration. *FASEB journal* 12(12):1125-34.

Mix Meshkov, N. V. and Gadzhieva, Z. M. 1949-1954. Pathomorphological changes in the peroral action of the arsenic - containing pesticies, zinc fluoroarsenate and barium fluoroarsenate. *Vopr. Pitaniya;* 28(4)

Bact Meyrick, B. and Brigham, K. L. Repeated escherichia-coli endotoxin-induced pulmonary inflammation causes chronic pulmonary hypertension in sheep structural and functional changes. *Laboratory Investigation*. 55 (2). 1986. 164-176.

Unrel Meyrick, B., Niedermeyer, M. E., Ogletree, M. L., and Brigham, K. L. Pulmonary hypertension and increased vasoreactivity caused by repeated indomethacin in sheep. *Journal of Applied Physiology*. 59 (2). 1985. 443-452.

Unrel Meyrick, B. O. and Perkett, E. A. 1989. The sequence of cellular and hemodynamic changes of chronic pulmonary hypertension induced by hypoxia and other stimuli. *American Review of Respiratory Disease* 140(5):1486-9.

In Vit Middleton, J. F. S. and Hunt, S. 1988. Cation movement in rat articular and non-articular cartilage and in isolated chondrocytes: calcium influx and efflux *Comp. Biochem. Physiol. A: Comp. Physiol*. 91A(4): 837-47

Unrel Mihranian, M. H. and Miller, D. R. 1981. Continent ileostomy in dogs. An experimental study of ileal pouches using a simple prosthetic valve. *Journal of Surgical Research* 31(1):69-76.

CP Millar Julie A, Barratt Lynne, Southan Andrew P, Page Karen M, Fyffe Robert E W, Robertson Brian, and Mathie Alistair(A). 2000. A functional role for the two-pore domain potassium channel task-1 in cerebellar granule neurons. Proceedings of the National Academy of Sciences of the United States of America 97(7):3614-3618.

Unrel Miller, A. J., DeBoer, A., Pick, R., Van Pelt, L., Palmer, A. S., and Huber, M. P. 1988. The lymphatic drainage of the pericardial space in the dog. *Lymphology* 21(4):227-33.

No Dose Mitchell, Rory and Anderson, Richard. Selective secretagogue action of barium(2+) ions at lactotrophs but not gonadotrophs . *Biochem. Soc. Trans.* (1985) 13(6):1186.

FL Mitina, L. S. 1974. [Experimental study on the comparative toxicity of organic barium compounds]. <Original> Eksperimental'noe issledovanie sravnitel'noi toksichnosti organicheskikh soedinenii bariia *Gigiena i sanitariia* (11):91-2.

In Vit Mogami, Hideo, Kanzaki, Makoto, Nobusawa, Romi, Zhang, You-Qing, Rurukawa, Megumi, and Kojima, Itaru. Modulation of adenosine triphosphate-sensitive potassium channel and

voltage-dependent calcium channel by activin A in HIT-T15 cells. *Endocrinology* (1995) 136(7):2960-6.

Phy Mohammed, T., Stulc, J., Glazier, J. D., Boyd, R. D. H., and Sibley, C. P(A). 1993. Mechanisms of potassium transfer across the dually perfused rat placenta. *American Journal of Physiology* 265(2 PART 2):R341-R347.

Unrel Mohanan, P. V. and Rathinam, K. 1991. Teratogenicity testing of barium methacrylate (monomer). *International Journal of Toxicology*

HHE Moore, J. G., Dubois, A., Christian, P. E., Elgin, D., and Alazraki, N. 1986. Evidence for a midgastric transverse band in humans. *Gastroenterology* 91(3):540-5.

Unrel Mori Masahiko, Sakyo Katsufumi, Hamada Hiroyuki, Yokoyama Hiroyuki, Shikata Yoshiyuki, Ito Mami, Murai Etsuko, Hikida Muneo, Shiba Toshiharu, and Kishi Ikuo. 1996. General pharmacological studies of methotrexate and 7-hydroxymethotrexate. *Oyo Yakuri* 52(6):459-470.

Unrel Moustoukas, N., Browder, W., Gleason, C., Di Luzio, N., and Nichols, R. L. 1985. Adverse effect of splenectomy in experimental peritonitis. *Journal of Surgical Research* 38(6):574-81.

Unrel Moutsouris, C., Barouchas, G., Karayannacos, P., Dontas, I., Salakos, C., and Skalkeas, G. 1987. Tubular musculopleural pedicle grafting of esophageal long gaps in dogs. *Journal of Pediatric Surgery* 22(2):117-9.

CP Muhlhauser, R., Martin, D., Donnelly, J., and Jennings, R. 1992. Development and evaluation of rectal suspension formulations containing barium sulfate, sucralfate and a new class of antiinflammatory agents: leumedins. *Pharmaceutical Research* (New York) 9(10 SUPPL.):S140.

Unrel Munakata, A., Iwane, S., Todate, M., Nakaji, S., and Sugawara, K. 1995. Effects of dietary fiber on gastrointestinal transit time, fecal properties and fat absorption in rats. *Tohoku Journal of Experimental Medicine* 176(4):227-38.

Phy Murchison, D. and Griffith, W. H. 1996. High-voltage-activated calcium currents in basal forebrain neurons during aging. *Journal of Neurophysiology* 76(1):158-74.

Alt Murciano, Jose, Agut, Amalia, Sanchez-Valverde, Miguel A., Laredo, Francisco G., and Tovar, Maria C. Local and systemic effects of water-soluble contrast media and barium in rats with chronic small bowel obstruction. *Invest. Radiol.* (1995) 30(11):683-9.

CP Nagano Norihiro, Imaizumi Yuji, and Watanabe Minoru. 1993. Effects of arachidonic acid on voltage-gated calcium channel current in single smooth muscle cells isolated from guinea pig vas deferens. *Japanese Journal of Pharmacology* 61(SUPPL. 1):315P.

Unrel Naheed, G. and Khan, J. A. 1989. "Poison-shyness" and "bait-shyness" developed by wild rats (Rattusrattus L.). I. Methods for eliminating "shyness" caused by bariumcarbonate poisoning. *Applied Animal Behaviour Science* 24(2):89-99.

Unrel Nakada, Setsuya, Bacon, Charles R., and Gartner, Anne E. Origin of phenocrysts and compositional diversity in pre-Mazama rhyodacite lavas, Crater Lake, *Oregon J. Petrol*. (1994) 35(1):127-62.

Drug Nakanishi Takahiro(A), Hayano Chieko(A), Moriya Hiroki(A), Takagi Yoko= (A), Katayama Hideki, Tani Tadato(A), and Hirotsu Ichiro(A). 1997. General pharmacology of

4-benzhydryloxy-1-(3-(1h-tetrazol-5-yl)-propyl)piperidine (hql-79), a novel antiallergic drug. *Oyo Yakuri* 53(2):157-173.

Unrel Nakazato, Y., Ito, S., and Ohga, A. 1989. Effects of tetrodotoxin and monensin on the noradrenaline output induced by ouabain from the guinea-pig vas deferens in the presence of various divalent cations. *Quarterly Journal of Experimental Physiology* 74(4):443-50.

No COC Namasivayam, K. M., Subramanian, T., and Shanmagusundaram, E. R. B. 1978. Radioactive 32P incorporation in liver of mice fed with Aspergillusterreus contaminated feed. *Journal of Radioanalytical Chemistry* 46(1):155-158.

Rev NAS. 1980. *Mineral Tolerance of Domestic Animals*. Subcommittee on Mineral Toxicity Committee on Animal Nutrition. 1980.:588.

Unrel Nassar-Gentina, V., Pollard, H. B., and Rojas, E. 1988. Electrical activity in chromaffin cells of intact mouse adrenal gland. *American Journal of Physiology* 254(5 Pt 1):C675-83.

FL Nechaeva, E. N., Berliner, E. G., Dubeikovskaia, L. S., Kuz'minskaia, G. N., and Frolova, A. D. 1982. [Toxicologico-hygienic evaluation of radioceramic barium-base materials]. <Original> Toksikologo-gigienicheskaia kharakteristika radiokeramicheskikh materialov na osnove bariia. Gigiena truda i professional'nye zabolevaniia (9):10-4.

No Oral Neizvestnova, E. M., Davydova, V. I., Malysheva, L. G., and Konovalova, N. E. Acute and subacute toxicity of four high-temperature superconducting materials containing copper, barium, bismuth, strontium, yttrium, thallium, lanthanum and cobalt. *Curr. Toxicol.* (1993) 1(1):39-45.

In Vit Neveu, Dorine, Nargeot, Joel, and Richard, Sylvain. Two high-voltage-activated, dihydropyridine-sensitive calcium channel currents with distinct electrophysiological and pharmacological properties in cultured rat aortic myocytes *Pfluegers Arch*. (1993) 424(1):45-53.

Unrel Nishino Mikio. 1993. Experimental study on stenosis after instrumental anastomosis in canine colon. *Medical Journal of Kinki University* 18(1):19-31.

Unrel Nishio, A., Gebrewold, A., Altura, B. T., and Altura, B. M. 1988. Comparative effects of magnesium salts on reactivity of arterioles and venules to constrictor agents: an in situ study on Microcirculation. *Journal of Pharmacology and Experimental Therapeutics* 246(3):859-65.

Unrel Nobel, W. 1969. Observations on the microcirculation of peripheral nerves. *Bibliotheca anatomica* 10:316-20.

Unrel Noguera, M. A(A), Chulia, S., Elorriaga, M., Ivorra, M. D., and D'ocon, P. 1996. Effect of divalent cations on the contractile response of rat aorta to depolarization before and after nifedipine treatment. *Pharmacology* (Basel) 53(2):98-108.

Unrel Nordstrom, C. and Dahlqvist, A. 1971. Rat enterokinase: the effect of ions and the localization in the intestine. *Biochimica et Biophysica Acta* 242(1):209-25.

In Vit Norenberg, W., Von Kugelgen, I., Meyer, A., Illes, P., and Starke, K. M-type K+ currents in rat cultured thoracolumbar sympathetic neurones and their role in uracil nucleotide-evoked noradrenaline releas. *Br. J. Pharmacol*. (2000) 129(4):709-723.

Unrel Northway, M. G., Eastwood, G. L., Libshitz, H. I., Feldman, M. S., Mamel, J. J., and Szwarc, I. A. 1982. Antiinflammatory agents protect opossum esophagus during radiotherapy. *Digestive Diseases and Sciences* 27(10):923-8.

Unrel Northway, M. G., Libshitz, H. I., Osborne, B. M., Feldman, M. S., Mamel, J. J., West, J. H., and Szwarc, I. A. 1980. Radiation esophagitis in the opossum: radioprotection with indomethacin. *Gastroenterology* 78(5 Pt 1):883-92.

Unrel Northway, M. G., Libshitz, H. I., and Szwarc, I. A. A technique for barium esophagram in the opossum *Didelphis-marsupialis. Laboratory Animal Science*. 29 (4). 1979. 534-537.

Phy O'brodovich Hugh(A) and Rafii Bijan. 1993. Effect of k channel blockers on basal and beta-agonist stimulated ion transport by fetal distal lung epithelium. *Canadian Journal of Physiology and Pharmacology* 71(1):54-57.

Unrel O'callaghan, M. W., Pascoe, J. R., Tyler, W. S., and Mason, D. K. Exercise-induced pulmonary hemorrhage in the horse results of a detailed clinical post mortem and imaging study iv. Changes in the bronchial circulation demonstrated by ct scanning and microradiography. *Equine Veterinary Journal*. 19 (5). 1987. 405-410.

No Oral O'Callaghan, M. W. and Sanderson, G. N. 1982. Clinical bronchography in the horse: development of a method usingbarium sulphate powder. *Equine Veterinary Journal* 14(4):282-289.

Unrel Odagiri Norio(A), Kobayashi Hirofumi(A), Hokamura Kazuya(A), Zhao Xue-Hui(A), Qu Xiao-Fei(A), Imai Reiko(A), Ishibashi Yoshinori(A), Agatsuma Kaori(A), Yoshii Toshio(A), Ozawa Yukiko, and Ida Hisashi. 1994. General pharmacology of finasteride (mk-906). *Pharmacometrics* 47(5):479-487.

Unrel Oesch, I., Helikson, M. A., Shermeta, D. W., Hutchins, G. M., and Haller, J. A. Jr. 1980. Esophageal reconstruction with free jejunal grafts: an experimental study. *Journal of Pediatric Surgery* 15(4):433-6.

In Vit Ogata, R., Kitamura, K., Ito, Y., and Nakano, H. 1997. Inhibitory effects of genistein on ATP-sensitive K+ channels in rabbit portal vein smooth muscle. *British Journal of Pharmacology* 122(7):1395-404.

Unrel Ogura, A., Nishida, T., and Mochizuki, K. The arterial supply of the female reproductive system in the hamster. *Anatomia Histologia Embryologia*. 14 (4). 1985. 289-303.

In Vit Ohmori, H., Yoshida, S., and Hagiwara, S. 1981. Single K+ channel currents of anomalous rectification in cultured rat myotubes. Proceedings of the National Academy of Sciences of the United States of

In Vit Ohmori, H., Yoshida, S., and Hagiwara, S. Single potassium(1+) channel currents of anomalous rectification in cultured rat myotubes. *Proc. Natl. Acad.* Sci. U. S. A. (1981) 78(8):4960-4.

Drug Ohoki, Hiroshi. Experimental studies on cerebral blood flow in acute carbon monoxide poisoning. *Nippon Hoigaku Zasshi (*1972) 26(4):253-61.

Phy Ohzato, H., Gotoh, M., Monden, M., Dono, K., Kanai, T., and Mori, T. 1991. Improvement in islet yield from a cold-preserved pancreas by pancreatic ductal collagenase distention at the time of harvesting. *Transplantation* 51(3):566-70.

Alt Ojewole, J. A. O. Autonomic pharmacology of echitamine an alkaloid from alstonia-boonei *Fitoterapia*. 54 (3). 1983. 99-114.

Unrel Oka, H., Harrison, R. C., and Burhenne, H. J. 1982. Effect of a biologic glue on the leakage rate of experimental rectal anastomoses. *American Journal of Surgery* 143(5): 561-4.

Unrel Oldendorf, W. H. 1989. Trophic changes in the arteries at the base of the rat brain in response to bilateral common carotid ligation. *Journal of Neuropathology and Experimental Neurology* 48(5): 534-47.

Unrel Omon, M. and Shiga, Y. 1986. Sialographic investigations on the anatomy of mouse parotid glands. *Anatomical Record* 214(2):165-7.

Anat Oni, O. O. 1999. The microvascular anatomy of the physis as revealed by osteomedullography and correlated histology. *Orthopedics* 22(2):239-41.

Unrel Oni, O. O., Stafford, H., and Gregg, P. J. 1988. An investigation of the routes of venous escape from the diaphyseal marrow of the canine and rabbit long bones. *International Journal of Microcirculation, Clinical and Experimental*; 7

Phy Ono Katsushige and Fozzard Harry A. 1993. Two phosphatase sites on the ca-2+ channel affecting different kinetic functions. *Journal of Physiology* (Cambridge) 470(0):73-84.

Unrel Onuaguluchi, G. and Igbo, I. N. 1987. Comparative local anaesthetic and antiarrhythmic actions of levamisole hydrochloride and lignocaine hydrochloride. Archives internationales de pharmacodynamie et de therapie 289(2)

Unrel Orime, Y. Experimental study in intraaortic balloon pumping and left ventricular assist device for left ventricular failure individual and in combination influence on coronary sinus flow and renal artery flow. *Journal of the Japanese Association for Thoracic Surgery*. 34 (6). 1986. 829-838.

In Vit Orlando RoyC, M. D. National Technical Information Service (NTIS). Smoke-induced inhibition of active sodium transport in stratified squamous epithelium: mechanisms and effects on cell ph, volume, and survival FEDRIP Database

FL Orlova AkinchevaMYa, N. V. 1967. Hygienic characterizations of certain arsenic-containing pesticides *Vop. Pitaniya*; 26(1): 63-9

Alt Ortiz Antonio, Killian, J. Antoinette, Verkleij Arie J, and Wilschut Jan(A). 1999. Membrane fusion and the lamellar-to-inverted-hexagonal phase transition in cardiolipin vesicle systems induced by divalent cations. *Biophysical Journal* 77(4):2003-2014.

FL Osada, Eisaburo, Uematsu, Toshio, Saito, Gosaku, and Kagiwada, Kazuo. Pharmacological study of proglumide. 2. Pharmacological effects of proglumide (KXM) *Oyo Yakuri* (1971) 5(2):193-202.

Phy Osaka, T. and Joyner, R. W. Developmental changes in calcium currents of rabbit ventricular cells. *Circulation Research*. 68 (3). 1991. 788-796.

No COC Osborn, Russell G., Osweiler, G. D., and Foley, C. W. Effects of zearalenone on various components of rabbit uterine tubal fluid. *Am. J. Vet. Res*. (1988) 49(8):1382-6.

Abstract Ozaki, H. and Urakawa, N. Sodium calcium exchange and tension development in the guinea-pig aorta the 52nd General Meeting of the Japanese Pharmacological Society, Tokyo, Japan, March 26-29, 1979. *Jpn J Pharmacol*. 29 (Suppl.). 1979 (Recd. 1980). 119p.

Unrel Pacha, J., Popp, M., and Capek, K. 1988. Corticosteroid regulation of Na+ and K+ transport in the rat distal colon during postnatal development. *Journal of Developmental Physiology* 10(6):531-40.

Unrel Pacha, J., Popp, M., and Capek, K. 1987. Potassium secretion by neonatal rat distal colon. *Pflugers Archiv* 410(4-5):362-8.

Unrel Palavinskas, R., Kriesten, K., and Schulten H-R. Concentrations of electrolytes and trace metals in amniotic fluid and body tissues of rabbits during the last 2 weeks of gestation. *Comparative Biochemistry and Physiology A Comparative Physiology*. 76 (1). 1983. 63-70.

No Oral Papp, Gyula, Szekeres, Laszlo, and Szmolenszky, Tamas. Effects of quinidine, ajmaline, papaverine, and adrenergic beta-receptor inhibitors in experimental barium chloride arrhythmia developed for the quantitative assay of antiarrhythmic Drugs. *Acta Physiol. Acad. Sci. Hung*. (1967) 32(4):365-75.

In Vit Pappano, Achilles J. Action potentials in chick atria. Ontogenetic changes in the dependence of tetrodotoxin-resistant action potentials on calcium, strontium, and barium. *Circ. Res*. (1976) 39(1):99-105.

Unrel Park, J. B., Kelly, B. J., Kenner, G. H., von Recum, A. F., Grether, M. F., and Coffeen, W. W. 1981. Piezoelectric ceramic implants: in vivo results. *Journal of Biomedical Materials Research* 15(1):103-10.

Unrel Park, J. B., von Recum, A. F., Kenner, G. H., Kelly, B. J., Coffeen, W. W., and Grether, M. F. 1980. Piezoelectric ceramic implants: a feasibility Study. *Journal of Biomedical Materials Research* 14(3):269-77.

Unrel Park, J. T. Experimental surgical treatment of cholangitis with clonorchiasis. *Journal of Busan Medical College*. 18 (2 Suppl.). 1978 (Recd. 1979). 43-54.

In Vit Paulais, Marc, Baudouin-Legros, Maryvonne, and Teulon, Jacques. Functional evidence for a Ca2+/polyvalent cation sensor in the mouse thick ascending limb *Am. J. Physiol. (*1996) 271(5, Pt. 2):F1052-F1060.

Unrel Pearson, H., Darke, P. G. G., Gibbs, C., Kelly, D. F., and Orr, C. M. CS UK. 1978. Reflux oesophagitis and stricture formation after anaesthesia: aof seven cases in dogs and cats. *Journal of Small Animal Practice* 19(9):507-519.

Not Avail Pellegrini, N., Pierotti, P., Buggiani, S. S., Iardella, R., and Pozzo. Poisoning with soluble barium salts in rabbits. Gross, histological toxicological findings.

Unrel Pereira, J. S., Dhume, V. G., D'souza, R. S. D., and Abhraham, G. J. S. Vascular desensitization possible role of prostaglandins. *Indian Journal of Physiology and Pharmacology*. 31 (1). 1987. 42-50.

Unrel Pereira, O. C. 1987. Some effects of cimetidine on the reproductive organs of rats. *General Pharmacology* 18(2):197-9.

Unrel Perissat, J., Masson, B., Gouffrant, J. M., and Tamarelle, C. 1974. [Massive resection of the small intestine. A transit-retarding technic of experimental study in dogs]. <Original> Restion massive de l'intestin grele. Une technique d'analtomose freinatrice du transit. Etude experimentale chez le chien. *Journal de chirurgie* 108(1-2):179-86.

Unrel Perkett, E. A., Brigham, K. L., and Meyrick, B. Continuous air embolization into sheep causes sustained pulmonary hypertension and increased pulmonary vasoreactivity. *American Journal of Pathology*. 132 (3). 1988. 444-454.

Unrel Perkett, E. A., Brigham, K. L., and Meyrick, B. Increased vasoreactivity and chronic pulmonary hypertension following thoracic irradiation in sheep. *Journal of Applied Physiology*. 61 (5). 1986. 1875-1881.

Abstract Perry, H. M Jr, Erlanger, M. W., and Perry, E. f. 1983. Hypertension following chronic barium ingestion 67th Annual Meeting of the Federation of American Societies for Experimental Biology

Unrel Perry, R. L., Carrig, C. B., Williams, J. F., Johnson, C. A., and Kaneene, J. B. 1993. Anatomic features and radiographic observations of gastric emptying and small intestinal motility in the rat. *Laboratory Animal Science* 43(6):586-93.

BioX Perry, R. L., Williams, J. F., Carrig, C. B., Kaneene, J. B., and Schillhorn Van Veen, T. W. 1994. Radiologic evaluation of the liver and gastrointestinal tract in rats *infected with Taenia taeniaeformis*. *American* Journal Of Veterinary Research. 55(8):1120-1126.

Unrel Petkov, V., Georgiev, V., Roussinov, K., Grigorov, I., Slokoska, L., Angelova, M., Lazarova, M., Getova, D., Todorov, S., and Et Al. Pharmacology of the ergot alkaloid elymoclavine. *Biomedica Biochimica Acta*. 43 (11). 1984 (Recd. 1985). 1305-1316.

Unrel Petkov, V., Todorov, S., Donev, N., and Belokonski, I. Comparative studies of colon reactivity of healthy and ionization radiated guinea-pigs to some spasmogens and their antagonists. *Acta Physiologica et Pharmacologica Bulgarica*. 4 (1). 1978 (Recd. 1979). 26-37.

CP Petruzzo, P., Cappai, A., Ruiu, G., Dessy, E., and Brotzu, G. 1996. Development of biocompatible barium alginate microcapsules. *Cell Transplantation* 5(5 Suppl. 2):52.

Unrel Piasecki, C. 1975. Observations on the submucous plexus and mucosal arteries of the dog's stomach and first part of the duodenum. *Journal of Anatomy* 119(1):133-48.

Unrel Plimpton, R. F., Motycka, R. R., Ockerman, H. W., and Parker, C. F. Carcass skeletal form of the camel back lamb. *Journal of Animal Science*. 37 (1). 1973 269

Phy Plummer, M. R. and Hess, P. 1991. Reversible uncoupling of inactivation in N-type calcium channels. *Nature* 351(6328):657-9 .

Unrel Poeggel, G. and Bernstein, H. G. 1981. Towards a specific histochemical localization of adenylate cyclase in the rat hippocampus. I. Methodical aspects. *Acta Histochemica* 69(2):171-5.

Anat Pomerri, F., Gasparini, G., Martin, A., Fries, W., Pagiaro, E., and Merigliano, S. 1995. Microradiographic anatomy of the explanted rat colon. *Acta Radiologica* 36(2):210-4.

In Vit Poole-Wilson, P. A., Bourdillon, P. D., and Harding, D. P. 1979. Influence of contractile state on the size of the extracellular space in isolated ventricular myocardium. *Basic Research in Cardiology* 74(6):604-10.

FL Popova, O. Y. and Peretolchina, N. M. Embryotropic action of barium fluoride. *Gig Sanit* (2):109-111,1976

FL Popova, O. YA. Experimental materials for substantiation of the maximum permissible concentration of barium fluoride in the air of work area *Gig Tr Prof Zabol*. (5). 1978 34-37

Phy Prins Gail S(A), Woodham Carl, Lepinske Mark, and Birch Lynn. 1993. Effects of neonatal estrogen exposure on prostatic secretory genes and their correlation with androgen receptor expression in the separate prostate lobes of the adult rat. *Endocrinology* 132(6):2387-2398.

CP Przywara Dennis A, Chowdhury Pertha S, Bhave Sanjiv V, Wakade Taruna D, and Wakade Arun R. 1993. Barium-induced exocytosis is due to internal calcium release and block of calcium efflux. Proceedings of the National Academy of Sciences of the United States of America 90(2):557-561.

No Oral Pucci, C., Poma, S., Quarti Trevano, G., Ferro, C., Pizzocaro, M., and Ferri, O. 1983. [Barium peritonitis: experimental study using barium sulfate and radioactive barium]. <Original> Le peritoniti da bario: studio sperimentale con solfato di bario e con bario radioattivo. *La Radiologia medica* 69(1-2):7-10.

Unrel Puri, P., Blake, N., Carrol, R., and Nixon, H. H. 1980. Relationship between functional and histologic appearances of developing ganglion cells in the guinea pig rectum. *Journal of Pediatric Surgery* 15(1):42-7.

In Vit Qi, H., Zhong, G. G., Chen, L., Jiang, Y., and Wei, J. J. 1993. [Sodium channel blocking effect of scorpion venom on cultured mouse myocardiocytes] *Chung-kuo yao li hsueh pao* 14(4):361-4.

Unrel Quastel, D. M. J. and Saint, D. A. Transmitter release at mouse motor nerve terminals mediated by temporary accumulation of intracellular barium. *Journal of Physiology (London).* 406 (0). 1988. 55-74.

Phy Quignard Jean-Francois, Grazzini Eric, Guillon Gilles, Harricane Marie-Cecile, Nargeot Joel, and Richard Sylvain(A). 1996. Absence of calcium channels in neonatal rat aortic myocytes. *Pfluegers Archiv European Journal of Physiology* 431(5):791-793.

Alt Radomirov, R. 1976. Pharmacological effect on the average rates of development of the contractile and relaxation phases of the acetyl choline contractile effect in the smooth muscles of guinea-pig cecum ACTA PHYSIOL PHARMACOL BULG. *Acta Physiologica et Pharmacologica Bulgarica.* 2 (2).:63-67.

No Control Raj, G. Govinda and Srihari, K. Toxicity of barium carbonate to field rodents, a laboratory and field evaluation Mysore *J. Agric. Sci.* (1984) 18(2):131-4

Unrel Rakhmanov, A. I. Problems of rat extermination at railway transport objects *Gigiena I Sanitariya*; 0 (5). 1995. 51-53.

No Oral Ram, L., Schonewille, J. T., Klooster, A. T. van't, and Beynen, A. C. 1999. Lethal effect of intraruminal barium chloride administration in goats. *New Zealand Veterinary Journal* 47(4):150.

Chem Meth Rao, D. Muralidhar, Reddy, G. Nivedita, Ramaiah, E. Kodanda, and Ram, Kashi. 1995. Complex formation of some bivalent metal ions with p- tolylhydrazonopropanoic acid in ethanol-water medium. *Acta Cienc. Indica Chem*. 21(3):111-114.

In Vit Rappay, G., Komolov, I. S., Fazekas, I., Bacsy, E., Gudoshnikov, V. I., and Fedotov, V. P. 1981. Ba2+ affects growth hormone and prolactin secretion as well as cell morphology in rat anterior pituitary cultures. *Acta biologica* 32(2):137-46.

In Vit Rappay, Gyorgy, Komolov, I. S., Fazekas, Ilona, Bacsy, Erno, Gudoshinikov, V. I., and Fedotov, V. P. Barium(2+) affects growth hormone and prolactin secretion as well as cell morphology in rat anterior pituitary cultures *Acta Biol. Acad. Sci. Hung*. (1981) 32(2):137-46.

FL Ravo, B., Ferris, V. J., Cortesi, F., and Bagnato, J. 1992. [Aseptic resection of the intraluminal colon in laparoscopy]. <Original> Resezione di colon intraluminale asettica in laparoscopia. Il Giornale di chirurgia 13(4):208-11.

Unrel Rayl, J. E., Balison, J. R., Thomas, H. F., and Woodward, E. R. 1972. Combined radiographic, manometric, and histologic localization of the canine lower esophageal sphincter. *Journal of Surgical Research* 13(6):307-14.

Unrel Rayner, V., Wenham, G., White, F., Rhind, S. M., Bruce, J. B., and <Editors> Christensen, J. 1980. Digesta transit by X-ray screening, glucose absorption, insulinsecretion, and the migrating myoelectric complex in the pig. <Document Title>Gastrointestinal motility:253-260.

Unrel Rayssiguier, Y. and Larvor, P. 1974. Daily variations of magnesium in blood of rats: effect of starvationand filling of the stomach. *Annales de Biologie Animale, Biochimie, Biophysique* 14(4B):821-827 .

Unrel Reddy, V. Mohan, Meyrick Barbara, Wong Jackson, Khoor Andras, Liddicoat John R, Hanley Frank L, and Fineman Jeffrey R(A). 1995. In utero placement of aortopulmonary shunts: a model of postnatal pulmonary hypertension with increased pulmonary blood flow in lambs. *Circulation* 92(3):606-613.

FL Regodon, S., Robina, A., Franco, A., Vivo, J. M., and Lignereux, Y. 1991. [Radiological and statistical determination of the morphological type of the canine skull: dolichocephaly, mesocephaly and brachycephaly]. <Original> Determination radiologique et statistique des types morphologiques craniens chez le Chien: dolichocephalie, mesocephalie et brachycephalie. *Anatomia, histologia, embryologia* 20(2):129-38.

Unrel Reid, I. S. 1975. The significance of the ileocecal valve in massive resection of the gut in puppies. *Journal of Pediatric Surgery* 10(4):507-10.

Method Reidenberg, J. S. and Laitman, J. T. 1990. A new method for radiographically locating upper respiratory and upper digestive tract structures in rats. *Laboratory Animal Science* 40(1):72-6.

Unrel Ren Lei-Ming, Hoyle Charles H V, and Burnstock Geoffrey(A). 1996. Developmental changes in sympathetic contraction of the circular muscle layer in the guinea-pig vas deferens. *European Journal of Pharmacology* 318(2-3):411-417.

Unrel Reznick, R. K., Craddock, G. N., Langer, B., Gilas, T., and Cullen, J. B. 1982. Structure and function of small bowel allografts in the dog: immunosuppression with cyclosporin A. *Canadian Journal of Surgery*. Journal canadien de chirurgie 25(1)

In Vit Riccardi D(A), Gadbut, A. P., Wu, I., Galper, J. B., and Hebert, S. C. 1996. Specificity of the coupling of muscarinic receptor (machr) isoforms to a novel chick brain inward-rectifying k+ channel. *FASEB Journal* 10(3):A139.

Unrel Ridgway, R. L. and Suter, P. F. 1979. Clinical and radiographic signs in primary and metastatic esophagealneoplasms of the dog. *Journal of the American Veterinary Medical Association* 174(7):700-704.

Phy Rittenhouse Ann R(A) and Hess Peter. 1994. Microscopic heterogeneity in unitary n-type calcium currents in rat sympathetic neurons. *Journal of Physiology* (Cambridge) 474(1):87-99.

Unrel Roberts, R. J., Weesner, K. M., and Bucher, J. R. 1983. Oxygen-induced alterations in lung vascular development in the newborn rat. *Pediatric Research* 17(5):368-75.

Unrel Rockar, R. A., Sandanaga, K. K., Burkett, D. E., Mitroka, J. G., Bonner, R. A., and Weinstein, M. J. 1995. Cerebrospinal fluid retrieval in the conscious dog: a methods development study. *Journal of Investigative Surgery* 8(1):85-94.

Unrel Rodriguez-Sargent, C., Estape, E. S., Fernandez, N., Irizarry, J. E., Cangiano, J. L., and Candia, O. A. 1996. Altered lens short-circuit current in adult cataract-prone Dahl hypertensive rats. *Hypertension* 28(3):440-3.

Method Ronkko, S. 1992. Purification and characterization of phospholipase a-2 from bovine prostate. *International Journal of Andrology* 15(5):394-406.

Aquatic Roper, J. M., Cherry, D. S., Simmers, J. W., and Tatem, H. E. Bioaccumulation of toxicants in the zebra mussel, Dreissena polymorpha, at the Times Beach Confined Disposal Facility, Buffalo, New York. *Environ. Pollut*. (1997) Volume Date 1996, 94(2):117-129.

Aquatic Roper, J. M(A), Cherry, D. S., Simmers, J. W., and Tatem, H. E. 1996. Bioaccumulation of toxicants in the zebra mussel, dreissena polymorpha, at the times beach confined disposal facility, buffalo, new york. *Environmental Pollution* 94(2):117-129.

Unrel Rosowsky, A. and Forsch, R. 1982. Methotrexate analogues. 16. Importance of the side-chain amide carbonyl group as a structural determinant of biological Activity. *Journal of Medicinal Chemistry* 25(12):1454-9.

Unrel Rossmanith, G. H., Hoh, J. F. Y., Kirman, A., and Kwan, L. J. Influence of v-1 and v-3 isomyosins on the mechanical behavior of rat papillary muscle as studied by pseudo-random binary noise modulated length perturbations. *Journal of Muscle Research and Cell Motility*. 7 (4). 1986. 307-319.

Unrel Roush, J. K., Howard, P. E., and Wilson, J. W. 1989. Normal blood supply to the canine mandible and mandibular Teeth. *American Journal of Veterinary Research* 50(6):904-7.

Unrel Rovira, C. and Ben Ari, Y. 1994. Benzodiazepines modulate calcium spikes in young and adult hippocampal cells vol. 5, no. 16, pp. 2125-2129 *Neuroreport*

FL Ruberte, J., Sautet, J. Y., Gine, J. M., Lopez, C., Ordonez, G., and Rodriguez, A. 1991. [Lymphaticovenous communication in the mammary gland of the female dog]. <Original> Communications lymphatico-veineuses dans la glande mammaire de la chienne. *Anatomischer Anzeiger* 172(5):331-9.

Drug Rubin, D. L., Muller, H. H., and Young, S. W. 1992. Formulation of radiographically detectable gastrointestinal contrast agents for magnetic resonance imaging: effects of a barium sulfate additive on MR contrast agent effectiveness. *Magnetic Resonance in Medicine* 23(1):154-65.

Method Rubin, D. L., Muller, H. H., and Young, S. W. 1991. Methods for the systematic investigation of gastrointestinal contrast media for MRI: evaluation of intestinal distribution by radiographic monitoring. *Magnetic Resonance Imaging* 9(3):285-93.

In Vit Rubin, H. Specificity of the requirements for magnesium and calcium in the growth and metabolism of chick embryo fibroblasts. *Journal of Cellular Physiology*. 91 (3). 1977 449-458.

Unrel Rudigier, J., Draenert, K., Gruenert, A., and Ritter, G. Effects of adding x-ray contrast materials to bone cements. *Aktuelle Traumatologie*. 7 (1). 1977 35-48.

Drug Rudigier, J., Draenert, K., Gruenert, A. , Ritter, G., and Krieg, H. Biological effect of barium sulfate as contrast material in bone cement an animal study on rabbit femora. *Archiv fuer Orthopaedische und Unfall-Chirurgie*. 86 (3). 1976 279-290

Unrel Rudland Philip S(A), Platt-Higgins Angela M, Wilkinson Mark C, and Fernig David G. 1993. Immunocytochemical identification of basic fibroblast growth factor in the developing rat mammary gland: structure and differentiation. *Journal of Histochemistry and Cytochemistry* 41(6):887-898.

Unrel Rusak, A. V., Polenok, R. A., and Moldaver, B. L. 1993. Determination of acycloguanosine in tissues and fluid of the eye using high-performance liquid chromatography. *Khimiko-Farmatsevticheskii Zhurnal* 27(2):67-69.

Unrel Saad, A. H., Zhou, L. Y., Lambe, E. K., and Hahn, G. M. 1994. Mutagenesis in mammalian cells can be modulated by radiation-induced voltage-dependent potassium channels. *Mutation Research* 324(4):171-6.

CP Saeki, Y. and Kato, C. Isometric tension development and tension transients in barium-activated glycerinated heart muscle L983 Annual Meeting on Muscle Physiology, Okazaki, Japan, Nov. 24-26, 1983. *J Muscle Res Cell Motil*. 5 (4). 1984. 470-471.

Unrel Saeki, Y., Sagawa, K., and Suga, H. Transient tension responses of heart muscle in barium contracture to step length changes. *American Journal of Physiology*. 238 (3). 1980. H340-H347.

FL Saito, S., Ishikawa, K., Kubo, T., Wakabayashi, K., Kunimatu, H., Miyakubo, H., Hoshino, M., Kotake, K., Yamamoto, T., and Et Al. The general pharmacological effects of sodium tyropanoate bilopaque. *Nichidai Igaku Zasshi*. 35 (10). 1976 (Recd 1977) 1019-1050.

Bact Saito, Yukio, Sakai, Yutaka, and Urakawa, Norimoto. Effect of cholinergic Drug and barium on oxygen consumption in guinea pig *Taenia coli* *Jap. J. Pharmacol*. (1972) 22(5):653-61

Phy Sakamoto, K., Nosaka, K., Shimegi, S., Ohmori, H., and Katsuta, S. 1996. Creatine kinase release from regenerated muscles after eccentric contractions in rats. *European Journal of Applied Physiology and Occupational Physiology;* 73

CP Sakamoto, K., Nosaka, K., Shimegi, S., Ohmori, H., and Katsuta, S. 1995. Muscle fibers recovered from chemically-induced damage do not show attenuated ck release after subsequent eccentric exercise 42nd Annual Meeting of the American College of Sports Medicine

Unrel Sakoff, J. A. and Murdoch, R. N. 1996. The role of calcium in the artificially induced decidual cell reaction in pseudopregnant mice. *Biochemical and Molecular Medicine* 57(2):81-90.

Nut Sakurai, F., Hamamatsu, M., Takahashi, R., Tsushima, N., Ohta, Y., and Ishibashi, T. 1998. Endogenous amino acids in budgerigars (*Melopsittacus undulatus*). *Experimental Animals* 47(3):189-94.

FL Salahi, A. 1982. Fast Transport Facility for Activation Analysis with High-Energy Neutrons. <NOTE> Thesis (Dr. techn.). INIS-MF-8945

Herp Sands Steven B(A), Costa Alberto C S, and Patrick James W. 1993. Barium permeability of neuronal nicotinic receptor alpha-7 expressed in xenopus oocytes. *Biophysical Journal* 65(6):2614-2621.

Alt Sato, K., Webb, S., Tucker, A., Rabinovitch, M., O'Brien, R. F., McMurtry, I. F., and Stelzner, T. J. 1992. Factors influencing the idiopathic development of pulmonary hypertension in the fawn hooded rat. *American Review of Respiratory* disease 145(4 Pt 1):793-7.

Gene Sawata Sinya, Shimayama Takashi, Komiyama Makoto, Kumar Penmetcha K R, Nishikawa Satoshi, and Taira Kazunari(A). 1993. Enhancement of the cleavage rates of dna-armed hammerhead ribozymes by various divalent metal ions. *Nucleic Acids Research* 21(24):5656-5660.

No Oral Sawyer, R. G., Spengler, M. D., Adams, R. B., and Pruett, T. L. The peritoneal environment during infection the effect of monomicrobial and polymicrobial bacteria on oxygen partial pressure and ph. *Annals of Surgery*. 213 (3). 1991. 253-260.

In Vit Scamps, F., Valentin, S., Dayanithi, G., and Valmier, J. 1998. Calcium channel subtypes responsible for voltage-gated intracellular calcium elevations in embryonic rat motoneurons. *Neuroscience* 87(3):719-30.

Drug Schieken, R. M. The effect of diazepam upon the development of hypertension in the spontaneously hypertensive rat. *Pediatric Research*. 13 (9). 1979. 992-996.

FL Schmidt, D., Huller, H., Amon, I., and Peters, R. 1973. [On the pharmacology of a series of diphenylaminopropane derivatives]. <Original> Zur Pharmakologie einer Serie von Diphenylaminopropanderivaten. Die Pharmazie 28(10):677-80.

FL Schmidt, P., Burck, D., and Gohlke, R. 1975. [Animal experiments on barium stearate toxicity]. <Original> Tierexperimentelle Untersuchungen zur Toxizitat des Bariumstearats Zeitschrift fur die gesamte Hygiene und ihre Grenzgebiete 21(8)

Unrel Schnermann, J. 1995. Effects of barium ions on tubuloglomerular feedback. *American Journal of Physiology* 268(5 Pt 2):F960-6.

FL Schofiel.jg. 1974. Inhibition of barium stimulated release of rat growth-hormone by linear somatostatin. *Experientia* 30:708-709.

HHE Schott, G. D. and McArdle, B. 1974. Barium-induced skeletal muscle paralysis in the rat , and its relation to human familial periodic paralysis *J. Neurol. Neurosurg. Psychiat.* 37(1):32-9.

Phys Schulert, A. R., Glasser, S. R., Stant, E. G. Jr, Brill, A. B., Koshakji, R. P., and Mansour, M. M. 1969. Development of placental discrimination among homologous elements *Aec Symp Ser* 17:145-152.

Unrel Schultheiss, P. C. and Dolginow, S. Z. 1994. Granulomatous enteritis caused by Mycobacterium avium in a ferret. *Journal of the American Veterinary Medical Association* 204(8):1217-8.

Unrel Schwartz, R. J., Dubrow, T. J., Rival, R. A., Wilson, S. E., and Williams, R. A. 1992. The effect of fibrin glue on intraperitoneal contamination in rats treated with systemic antibiotics. *Journal of Surgical Research* 52(2):123-6.

Not Avail Schwartze, EW. 1920. *Toxicity of barium carbonate to rats.* U.S. Dept. Agric. Bull. 915

Drug Seekri, I. K., Rescorla, F. J., Canal, D. F., Zollinger, T. W., Saywell, R. Jr, and Grosfeld, J. L. 1991. Lesser curvature gastrostomy reduces the incidence of postoperative gastroesophageal reflux. *Journal of Pediatric Surgery* 26(8):982-4; discussion 984-5.

No Oral Segreti, Anthony, Vocci, Frank J. Jr., and Dewey, William L. Antagonism of barium chloride lethality by atropine and naloxone: analysis by a multivariate logistic model *Toxicol. Appl. Pharmacol*. (1979) 50(1):25-30.

Unrel Seife, B., Shils, M. E., and Amster, G. 1969. The estimation of fat absorption in man with the use of double isotopes 131BaSO4 and 131-iodine triolein. *Journal of Laboratory and Clinical Medicine* 74(1):119-28.

HHE Semeraro, N. and Vermylen, J. Evidence that washed human platelets possess factor-x activator activity. *British Journal of Haematology*. 36 (1). 1977 107-115.

Phy Seutin, V., Scuvee-Moreau, J., Massotte, L., and Dresse, A. 1995. Hydrogen peroxide hyperpolarizes rat CA1 pyramidal neurons by inducing an increase in potassium conductance. *Brain Research* 683(2):275-8.

In Vit Seward, Elizabeth P., Chernevskaya, Natalya I., and Nowycky, Martha C. Ba2+ ions evoke two kinetically distinct patterns of exocytosis in chromaffin cells, but not in neurohypophysial nerve terminals *J. Neurosci*. (1996) 16(4):1370-9.

Unrel Shah, D. V. and Suttie, J. W. 1971. Mechanism of action of vitamin K: evidence for the conversion of a precursor protein to prothrombin in the rat. *Proceedings of the National Academy of Sciences*

Surv Shahin, Usama, Yi, Seung-Muk, Paode, Rajendra D., and Holsen, Thomas M. Long-Term Elemental Dry Deposition Fluxes Measured around Lake Michigan with an Automated Dry Deposition Sampler. *Environ. Sci. Technol*. (2000) 34(10):1887-1892.

Unrel Sheterline, P., Schofield, J. G., and Mira-Moser, F. The effect of secretagogues and 2 methyl pentan-2 4-diol on the micro tubule tubulin equilibrium and the release of growth hormone from bovine anterior pituitary slices. *Experimental Cell Research*. 104 (1). 1977 127-134.

Phy Shibata, S. 1990. [Dissolution and radio-opacity of apatite cement] *Gifu Shika Gakkai zasshi* 17(1):74-93.

Alt Shibata, S., Kuchii, M., and Kurahashi, K. 1972. Supersensitivity of isolated rabbit atria and aortic strips produced by 6-hydroxydopamine *Eur. J. Pharmacol*. 18(2):271-80 .

Phy Shibata, T., Berman, M. R., Hunter, W. C., and Jacobus, W. E. Metabolic and functional consequences of barium-induced contracture in rabbit myocardium *American Journal of Physiology.* 259 (5 Part 2). 1990. H1566-H1574.

Unrel Shibata, T., Hunter, W. C., and Sagawa, K. Dynamic stiffness of barium-contractured cardiac muscles with different speeds of contraction. *Circulation Research*. 60 (5). 1987. 770-779.

Unrel Shibata, T., Hunter, W. C., Yang, A., and Sagawa, K. Dynamic stiffness measured in central segment of excised rabbit papillary muscles during barium contracture *Circulation Research*. 60 (5). 1987. 756-769.

Unrel Shirazi, S. S. 1980. Long-term effect of Nissen fundoplication in young puppies. *Journal of Pediatric Surgery* 15(6):869-71.

FL Shubochkin, L. N., Gerasimova, I. L., and Rozinskii, B. F. Hygienic standards for barium tri carbonate aerosols in the air of work areas *Gig Tr Prof Zabol*; 0 (6). 1980. 55.

FL Shutova, N., Tazina, E., and Stepanova, I. 1988. Bischofite in the diet for chickens. *Ptitsevodstvo* (4):19-20.

Prim Sidhu, G. S., Narasimharao, K. L., Usha Rani, V., Sarkar, A. K., and Mitra, S. K. 1985. Absorption studies after massive small bowel resection and antiperistaltic colon interposition in rhesus monkeys. *Digestive Diseases and Sciences* 30(5):483-8.

FL Silaev, A. A. and Tarasenko, N. I. u. 1976. [Effect of barium on the generative function and its hygienic significance]. <Original> Vliianie bariia na generativnyiu funktsiiu i ego gigienicheskoe znachenie Gigiena truda i professional'nye zabolevaniia (7):33-7.

FL Silaev, A. A. and Tarasenko, N. Yu. Effect of barium on the reproductive function and its hygienic significance *Gig. Tr. Prof. Zabol*. (1976) (7):33-7

No COC Silva, A. J., Fleshman, D. G., and Shore, B. 1973. The effects of penicillamine on the body burdens of several heavy metals. *Health Physics* 24(5):535-9.

Unrel Simoes, C. M. O., Schenkel, E. P., Bauer, L., and Langeloh, A. Pharmacological investigations on achyrocline-satureioides lam. Dc. Compositae. *Journal of Ethnopharmacology*. 22 (3). 1988. 281-294.

Unrel Sindelar, W. F., Hoekstra, H. J., Kinsella, T. J., Barnes, M., DeLuca, A. M., Tochner, Z., Pass, H. I., Kranda, K. C., and Terrill, R. E. 1988. Response of canine esophagus to intraoperative electron beam radiotherapy. *International Journal of Radiation Oncology, Biology, Physics* 15(3)

Unrel Singaram, C., Sweet, M. A., Gaumnitz, E. A., Bass, P., and Snipes, R. L. 1996. Evaluation of early events in the creation of amyenteric opossum model of achalasia. *Neurogastroenterology and Motility* 8(4):351-61.

In Vit Sinnegger, M. J., Wang, Z., Grabner, M., Hering, S., Striessnig, J., Glossmann, H., and Mitterdorfer, J. 1997. Nine L-type amino acid residues confer full 1,4-dihydropyridine sensitivity to the neuronal calcium channel alpha1A subunit. Role of L-type Met1188. *Journal of Biological Chemistry* 272(44):27686-93.

Unrel Sisel, R. J., Donovan, A. J., and Yellin, A. E. 1972. Experimental fecal peritonitis. Influence of barium sulfate or water-soluble radiographic contrast material on Survival. *Archives of Surgery* 104(6):765-8.

Unrel Slegers, J. F. G., Forster, M. T. G., and Moons, W. M. Inhibition of calcium release by diazoxide studied in the isolated rat kidney. *Archives Internationales de Pharmacodynamie et de Therapie.* 250 (1). 1981. 147-163.

Nut Slesarev, I. K., Golushko, V. M., and Pilyuk, N. V. 1991. Phosphogypsum and the solution of the sulphur problem in animalhusbandry. *Zootekhniya* (9):33-36.

CP Slesinger, P. A., Stoffel, M., Jan, Y. N., and Jan, L. Y. 1997. Defective gamma-aminobutyric acid type B receptor-activated inwardly rectifying K+ currents in cerebellar granule cells isolated from weaver and Girk2 null mutant mice. *Proceedings of the National Academy of Sciences*

No COC Soliman, F. A., Saleh, M., Seifelnasr, E., and Hassan, H. 1976. Radiological studies on the effect of vitamin A on the rate of foodpassage in Fayoumi chicken. *Assiut Veterinary Medical Journal* 4(7):35-41.

No Oral Souilem, O., Bidon J-C(A), Gogny, M., Blin, M. , Vu, A. T., and Jondet, A. 1995. Effect of moderate cooling on contractile responses in mouse vas deferens and its relation to calcium. *Naunyn-Schmiedeberg's Archives of Pharmacology* 352(3):337-345.

Abstract Spaeh, F. 1985. The role of endogenous catecholamines in the generation of barium-induced ventricular automaticity 3rd International Brain Heart Conference, Trier, West Germany, Sept. 7-9. *J Neurol*. 232 (3).: 191.

Phy Speisky, H., Squella, J. A., and Nunez-Vergara, L. J. Activity of boldine on rat ileum. *Planta Medica*. 57 (6). 1991. 519-522.

No COC Srivastava, U. 1968. The effect of age on the variation of the phosphorus content in the muscle, liver adn brain of rats. *Archives Internationales De Physiologie et De Biochimie* 76(4):707-20.

Unrel Stanley, E. F. 1993. Single calcium channels and acetylcholine release at a presynaptic nerve terminal. *Neuron* 11(6):1007-11.

CP Stea, A., Tomlinson, W. J., Dubel, S. J., and Snutch, T. P. 1993. Electrophysiological and pharmacological characterization of cloned neuronal n and l-type calcium channels. *Biophysical Journal* 64(2 PART 2):A6.

Unrel Stehbens, W. E. 1974. Changes in the cross-sectional area of the arterial fork. *Angiology* 25(9):561-75.

Unrel Stojilkovic, S. S., Izumi, S., and Catt, K. J. 1988. Participation of voltage-sensitive calcium channels in pituitary hormone Release. *Journal of Biological Chemistry* 263(26):13054-61.

Unrel Stordahl, A., Haider, T., and Laerum, F. 1989. Acute lethality after enteral administration of contrast media in anaesthetized rats with intestinal ischaemia. *Acta Radiologica* 30(2):213-6.

FL Stratmann, K. Comparison of embryotoxic effects of inorganic fluorides *Dtsch Zahnaerztl z* 34:484-486,1979

No COC Stratmann, K. and Eifinger, F. F. Toxicological threshold values of various fluoride compounds *Kariesprophylaxe* 3:15-17,1981

Phy Streit, J. and Lux, H. D. Calcium current inactivation during nerve-growth-factor-induced differentiation of pc12 cells. *Pfluegers Archiv European Journal of Physiology*. 416 (4). 1990. 368-374.

Unrel Streit, J. and Lux, H. D. Distribution of calcium currents in sprouting pc12 cells. *Journal of Neuroscience*. 9 (12). 1989. 4190-4199.

FL Stromberg, T. and Ternryd, C. O. 1973. Some aspects on the analysis of pulpal vasculature using perfusion with Mixobar and photogrammetric evaluation. An experimental study in dogs. Svensk tandlakare tidskrift. *Swedish Dental Journal* 66(2):157-62.

Unrel Sugahara, Y., Catalfamo, J., Brooks, M., Hitomi, E., Bajaj, S. P., and Kurachi, K. 1996. Isolation and characterization of canine factor IX. *Thrombosis and Haemostasis* 75(3):450-5.

No Org Sun, Ye-Ming, Favre, Isabelle, Schild, Laurent, and Moczydlowski, Edward. On the structural basis for size-selective permeation of organic cations through the voltage-gated sodium channel: Effect of alanine mutations at the DEKA locus on selectivity, inhibition by Ca2+ and H+, and molecular sieving. *J. Gen. Physiol*. (1997) 110(6):693-715.

No COC Sutton, A., Humphreys, E. R., Shepherd, H., and Howells, G. R. 1972. Reduction in the retention of radioactive barium in rats following theaddition of sodium alginate derivatives to the diet. *International Journal of Radiation Biology* 22(3):297-300.

No Dose Suzuki, S., Ogawa, Y., Kisi, Y. , and Chiba, M. The effect of orally administered rare earth metals on the essential metals of the rat femur. *Biomed. Res. Trace Elem*. (1991) 2(2):223-4..

CP Sweezey, N., Ghibu, F., Lambessis, P., Hamilton, R., and Macleod, J. Developmental changes in ion transport in fetal rat alveolar epithelial type ii cells Meeting of the American Pediatric Society and the Society for Pediatric Research, Baltimore, Maryland, Usa, May 4-7, 1992. *Pediatr Res*. 31 (4 Part 2). 1992. 54a.

Unrel Sykova Eva(A) and Chvatal Alexandr. 1993. Extracellular ionic and volume changes: the role in glia-neuron interaction. *Journal of Chemical Neuroanatomy* 6(4):247-260.

In Vit Szabo, Ildiko, Bernardi, Paolo, and Zoratti, Mario. Modulation of the mitochondrial megachannel by divalent cations and protons *J. Biol. Chem*. (1992) 267(5):2940-6.

Unrel Szafranski, M. A. Anti peristaltic bowel segment in colectomized rats. *Roczniki Pomorska Akademia Medyczna Im Generala Karola Swierczewskiego w Szczecinie*. 27 (0). 1981 (Recd. 1982). 391-402.

BioX Tabata, T. and Sugimoto, H. 1997. [Development of an experimental rat model of intraabdominal abscess by Escherichia coli alone. I. Materials for abscess formation] *Kansenshogaku zasshi* 71(8):697-702.

Unrel Taglialatela, M., Canzoniero, L. M. T., Amoroso, S., Fatatis, A., Direnzo, G. F., and Annunziato, L. 1989. Cobalt-sensitive and dihydropyridine-insensitive stimulation of dopamine release from tuberoinfundibular neurons by high extracellular concentrations of barium ions *Brain Research* 488(1-2):114-120.

Alt Takahashi, Nobuyuki. 1976. Influence of the removal of external potassium on tonus and Drug-induced contractions of the isolated rat ileum, particularly in relation to calcium *Kobe J. Med. Sci*. 22(4):273-82 .

Phy Takanaka, C. and Singh, B. N. 1990. Barium-induced nondriven action potentials as a model of triggered potentials from early afterdepolarizations: significance of slow channel activity and differing effects of quinidine and amiodarone. *Journal of the American College of Cardiology* 15(1):213-21.

Unrel Takeda, S., Abe, T., and Otsuka, M. 1981. [A device for the **Drug**-capsule administration into the rat stomach and its pharmacological application (author's transl)] *Nippon yakurigaku zasshi* 78(5):393-401.

FL Talaeva, I. u. G., Chugunikhina, N. V., Takhirov, M. T., and Khasanova, M. I. 1991. [The elaboration of a complex of indices for the intensiveness of an experimental infectious process to be used in hygienic research]. <Original> Razrabotka kompleksa pokazatelei intensivnosti eksperimental'nogo infektsionnogo protsessa pri ispol'zovanii ego v gigienicheskikh issledovaniiakh. *Gigiena i sanitariia* (11):53-6.

FL Talalaenko, A. N. and Degonskii, A. I. Characteristics of the effect of barium titanates on the body. *Gig Sanit*; (6). 1974 102-103

Unrel Tallon, J. L., Loram, J. W., Williams, G. V. M., Cooper, J. R., Fisher, I. R., Johnson, J. D., Staines, M. P., and Bernhard, C. Critical doping in overdoped high-Tc superconductors. A quantum critical point? *Phys. Status Solidi B* (1999) 215(1):531-540.

Unrel Tangner, C. H. 1984. Cholecystoduodenostomy in the dog. Comparison of two techniques. *Veterinary Surgery* 13(3):126-134.

FL Taucins, E, Svilane, A, Valdmanis, A, Buike, A, Zarina, R, and Fedorova, E Ya. 1969. Barium, strontium, and copper salts in chick nutrition. *Fiziol. Akt. Komponenty Pitan. Zhivotn*. 199

Unrel Tawfic Sherif, Goueli Said A, Olson Mark O J, and Ahmed Khalil(A). 1993. Androgenic regulation of the expression and phosphorylation of prostatic nucleolar protein b23. *Cellular & Molecular Biology Research* 39(1):43-51.

In Vit Taylor, Mark S. and Benoit, Joseph N. Effect of milrinone on small mesenteric artery vasoconstriction: role of K+ channels *Am. J. Physiol*. (1999) 277(1, Pt. 1):G69-G78

Unrel Tenbrinck, R., Gaillard, J. L., Tibboel, D., Kluth, D., Lachmann, B., and Molenaar, J. C. 1992. Pulmonary vascular abnormalities in experimentally induced congenital diaphragmatic hernia in rats. *Journal of Pediatric Surgery* 27(7):862-5.

In Vit Teramoto Noriyoshi(A) and Brading Alison F. 1998. The effects of nifedipine and other calcium antagonists on the glibenclamide-sensitive k!+ Currents in smooth muscle cells from pig urethra. *British Journal of Pharmacology* 123(8):1601-1608.

Phy Thayer, S. A. and Wang, G. J. 1995. Glutamate-induced calcium loads: effects on energy metabolism and neuronal viability. *Clinical and Experimental Pharmacology & Physiology* 22(4):303-4.

Unrel Thexton, A. J. and McGarrick, J. D. 1988. Tongue movement of the cat during lapping. *Archives of Oral Biology* 33(5):331-339.

HHE Thompson, A. R., Forrey, A. W., Gentry, P. A., Smith, K. J., and Harker, L. A. 1980. Human factor IX in animals: kinetics from isolated, radiolabelled protein and platelet destruction following crude concentrate infusions. *British Journal of Haematology* 45(2):329-42.

Alt Thompson, I. M., Whittlesey, G. C., Slovis, T. L., Chang, C. H., Cullen, M. L., Philippart, A. I., Stockmann, P. S., Adkins, E. S., and Klein, M. D. 1997. Evaluation of contrast media for bronchography. *Pediatric Radiology* 27(7):598-605.

No Dose Thompson, J. S., Harty, R. J., Saigh, J. A., and Giger, D. K. 1988. Morphologic and nutritional responses to intestinal patching following intestinal resection. *Surgery* 103(1):79-86.

Phy Thompson, S. M. and Wong, R. K. 1991. Development of calcium current subtypes in isolated rat hippocampal pyramidal cells. *Journal of Physiology* 439:671-89.

Unrel Thomsen, H. S., Dorph, S., and Olsen, S. 1981. Pyelorenal backflow in normal and ischemic rabbit kidneys. *Investigative radiology* 16(3): 206-14.

Unrel Thomsen, H. S. and Larsen, S. Intra renal back flow during retrograde pyelography with graded intra pelvic pressure a patho anatomic study. *Acta Pathologica Microbiologica et Immunologica Scandinavica Section A Pathology*. 91 (4). 1983. 245-252.

Unrel Thorp, B. H. and Duff, S. R. I. 1988. Effect of unilateral weight-bearing on pelvic limb development inbroiler fowls: vascular studies. Research in Veterinary Science 44(2):164-174.

No Dose Thorp, B. H., Lynch, M., and Duff, S. R. 1986. Embedding of skeletal tissue in plastic for vascular and histological study to demonstrate delayed endochondral ossification in Leghorn type fowl. Research in veterinary science 40(2):236-40.

Unrel Threadgold, L. T. and Arme, C. 1974. Hymenolepis diminuta: an electron microscope study of ion absorption. *Experimental Parasitology* 35(3):475-91.

Phy Tiaho Francois and Nerbonne Jeanne M(A). 1996. Vip and secretin augment cardiac l-type calcium channel currents in isolated adult rat ventricular myocytes. *Pfluegers Archiv European Journal of Physiology* 432(5):821-830.

Unrel Tibbits, G. F. and Philipson, K. D. 1985. Na+-dependent alkaline earth metal uptake in cardiac sarcolemmal vesicles. *Biochimica et biophysica acta* 817(2):327-32.

Phy Tinker Andrew and Williams Alan J(A) . 1992. Divalent cation conduction in the ryanodine receptor channel of sheep cardiac muscle sarcoplasmic reticulum. *Journal of General Physiology* 100(3):479-493.

CP Tiwari-Woodruff, S., Cox, T. C., and Peterson, R. N. 1993. A bay-k sensitive, barium permeable cation channel in boar sperm plasma membranes. *FASEB Journal* 7(3-4):A590.

Method Tjon, A. Tham Richenel T O(A), Korte Jan H, Bom Ernst P, Van Kints= Marjolijn J, and Zwinderman Aeilko H. 1993. Preparation of the colon for single- and double-contrast barium enema examination: a simplified method. *Radiology* 188(2):578-580.

Unrel Todd, L., Mullen, M., Olley, P. M., and Rabinovitch, M. 1985. Pulmonary toxicity of monocrotaline differs at critical periods of lung development. *Pediatric Research* 19(7):731-7.

In Vit Toepert Christoph, Doering Frank, Wischmeyer Erhard, Karschin Christine, Brockhaus Johannes, Ballanyi Klaus, Derst Christian, and Karschin Andreas= (A). 1998. Kir2.4: A novel k!+ Inward rectifier channel associated with motoneurons of cranial nerve nuclei. *Journal of Neuroscience* 18(11):4096-4105.

Unrel Tokita, N. and Raju, M. R. 1988. Biological dosimetry at the tissue-barium sulphate interface: a jejunal crypt survival assay. *British Journal of Radiology* 61(722):169-70.

In Vit Tokita, N., Van der Kogel, I., Chmielewski, J. J., and Raju, M. R. Physical and biological dosimetry at the barium sulfate-culture medium interface *Br. J. Radiol*. (1986) 59(707): 1131-3.

FL Tomizawa, Setsuo, Suguro, Nobuo, Kurebe, Masaru, Kawamura, Kenji, and Yoshinari, Masachika. Toxicological studies on mydocalm (1-piperidino-2-methyl-3-(p-tolyl)propan- 3-one). I. Toxicity and pharmacological properties of mydocalm *Oyo Yakuri* (1971) 5(3):421-33

Unrel Tone, H., Kiyosaki, T., Nishimori, T., Kobayashi, F., Nishimura, K., Morino, H., and Tsuchiyama, M. 1986. [General pharmacology of (2"R)-4'-O-tetrahydropyranyladriamycin, a new antitumor antibiotic] *Japanese Journal of Antibiotics* 39(2):526-46.

In Vit Tritthart, H. A., Windisch, H., and Heuberger, S. Effects of the brady cardia producing compound alinidine on action potentials and tension development in cardiac fibers. *Naunyn-Schmiedeberg'S Archives of Pharmacology*. 316 (2). 1981. 172-177.

Unrel Tsukamoto, Y. and Koh, K. 1994. [Adaptation and effects of ileal reservoir on ileo-proctostomy following total colectomy in dogs] *Journal of Smooth Muscle Research* 30(1):35-50.

Acute Tsurumi, K., Hyano, S., Hasegawa, J., and Funjimura, H. 1979. Cathartic activity of spasmogens in mice rats and guinea-pigs. *Folia Pharmacologica Japonica*. 75 (4).: 309-314.

Phy Turnage, R. H., Coran, A. G., and Drongowski, R. A. 1990. The value of intestinal myotomy and myectomy in improving the reservoir capacity of the endorectal pull-through. *Annals of surgery* 211(4):463-9.

Unrel Ufkes, J. G. R., Ottenhof, M., Labruyere, W. T., Boers, W., Van Vugt H, and Van Gool J. The effects of alpha-m fetoprotein an acute phase protein and barium sulfate-induced injury on immunoglobulin e-mediated systemic anaphylaxis in the rat. *British Journal of Experimental Pathology*. 67 (3). 1986. 321-328.

No Dose Uriu-Hare, Janet Y., Swan, Shanna H., Bui, Linh M., Neutra, Raymond R., and Keen, Carl L. Drinking water source and reproductive outcomes in Sprague-Dawley rats *Reprod. Toxicol*. (1995) 9(6):549-61.

Unrel Valentim Vassallo D and Geraldo Mill J. Mechanical behavior of rest contractions in cardiac muscle. *Acta Physiologica et Pharmacologica Latinoamericana*. 38 (1). 1988. 87-97.

Method van der Geest, R. J., Morris, K. G., Cusma, J. T., and Reiber, J. H. 1994. Postmortem validation of the automated coronary analysis (ACA) software Package. *International Journal of Cardiac Imaging* 10(2):95-102.

Unrel Van Driessche, W. and Zeiske, W. 1985. Ionic channels in epithelial cell membranes. *Physiological Reviews* 65(4):833-903.

Unrel Van Niekerk F E(A), Cloete, S. W. P., Van Der Merwe G D, Heine, E. W. P., and Scholtz Anna J. 1995. Parenteral copper and selenium supplementation of sheep on legume-grass pastures: biochemical and production responses in lambs to maternal treatment. *Journal of the South African Veterinary Association* 66(1):11-17.

No Oral Van Ryssen, J. B. J. a, Bradfield, G. D., Van Malsen, S., and De Villers, J. F. 1992. Response to selenium supplementation of sheep grazing cultivated pastures in the natal midlands. *Journal of the South African Veterinary Association* 63(4):148-155.

Unrel Van Ryssen J B J(A), Bradfield Gail D, Van Malsen Sue, and De Villers J F. 1992. Response to selenium supplementation of sheep grazing cultivated pastures in the natal midlands. *Journal of the South African Veterinary Association* 63(4):148-155.

Unrel van Vugt, H., van Gool, J., and D.E. Ridder, L. 1986. Alpha 2 macroglobulin of the rat, an acute phase protein, mitigates the early course of endotoxin shock. *British Journal of Experimental Pathology* 67(3):313-9.

In Vitro Vandeputte, D. F., Jacob, W. A., and Van Grieken R.E. Influence of fixation procedures on the microanalysis of lead-induced intranuclear inclusions in rat Kidney. *J Histochem Cytochem*; 38 (3). 1990. 331-338.

In Vit Vanheel, B. and De Hemptinne, A. Influence of potassium-ATP channel modulation on net potassium efflux from ischemic mammalian cardiac tissue *Cardiovasc. Res*. (1992) 26(11):1030-9.

Unrel Vargas F(A), Moreno, M. R. R., and Osuna, A. 1996. Renal vascular reactivity to atp in ageing rats. *Medical Science Research* 24(4):263-265.

In Vit Varnai, P., Osipenko, O. N., Vizi, E. S., and Spat, A. 1995. Activation of calcium current in voltage-clamped rat glomerulosa cells by potassium ions. *Journal of Physiology* 483(Pt 1):67-78.

Unrel Vassalle, M., Kotake, H., and Lin C-I. Pacemaker current membrane resistance and potassium in sheep cardiac purkinje fibres *Cardiovascular Research*. 26 (4). 1992. 383-391.

Phy Vassalle Mario, Yu Hangang, and Cohen Ira S(A). 1995. The pacemaker current in cardiac purkinje myocytes. *Journal of General Physiology* 106(3):559-578.

Unrel Vazquez, B., Ginebra, M. P., Gil, F. J., Planell, J. A., Lopez Bravo A, and San Roman= J(A). 1999. Radiopaque acrylic cements prepared with a new acrylic derivative of iodo-quinoline. *Biomaterials* 20(21):2047-2053.

Unrel Verdes, N., Pop, T., Bancescu, T., Vior, E., and Brezuleanu, I. An episode of hyposelenosis in the pig in the industrial rearing system. *Lucrarile Institutului de Cercetari Veterinare si Biopreparate Pasteur*. 17 (0). 1985 (1986) (Recd. 1987). 25-36.

In Vit Vergara, C., Alvarez, O., and Latorre, R. 1999. Localization of the K+ lock-In and the Ba2+ binding sites in a voltage-gated calcium-modulated channel. Implications for survival of K+ Permeability. *Journal of General Physiology* 114(3):365-76.

In Vit Vickroy, Thomas W. and Schneider, Cynthia J. Characterization of divalent cation-induced [3H]acetylcholine release from EGTA-treated rat hippocampal synaptosomes *Neurochem. Res*. (1991) 16(10):1175-85.

Unrel Villar R(A), Laguna, M. R., Cadavid, I., and Calleja, J. M. 1994. Effects of aqueous extracts of six marine microalgae on smooth muscle contraction in rat duodenum and vas deferens. *Planta Medica* 60(6):521-526.

Unrel Villarroya Mercedes, Gandia Luis, Lara Baldomero, Albillos Almudena, Lopez Manuela G, and Garcia Antonio G(A). 1995. Dotarizine versus flunarizine as calcium antagonists in chromaffin cells. *British Journal of Pharmacology 114(2):369-376.*

Unrel Vlahos, L., Karatzas, G., Papaharalambous, N., and Pontifex, G. R. 1980. Percutaneous arterial embolization in the kidneys of dogs: a comparative study of eight different materials. *British Journal of Radiology* 53(628):289-98.

Phy Vogalis, F., Publicover, N. G., and Sanders, K. M. Regulation of calcium current by voltage and cytoplasmic calcium in canine gastric smooth muscle AM J PHYSIOL. American Journal of Physiology. 262 (3 Part 1). 1992. C691-C700.

Method Volpi Nicola. 1993. "Fast moving" and "slow moving" heparins, dermatan sulfate, and chondroitin sulfate: qualitative and quantitative analysis by agarose-gel electrophoresis. *Carbohydrate Research* 247(0):263-278.

FL Votyakov, A. V. and Krasovskii, G. N. Activity of .beta.-galactosidase in seminal fluid and gonad tissue as a biochemical criterion of gonadotoxic effects of chemical substances *Gig. Sanit.* (1989) (3):62-3.

In Vit Wagner, E. J., Ronnekleiv, O. K., Grandy, D. K., and Kelly, M. J. 1998. The peptide orphanin FQ inhibits beta-endorphin neurons and neurosecretory cells in the hypothalamic arcuate nucleus by activating an inwardly-rectifying K+ conductance. *Neuroendocrinology* 67(2):73-82.

No COC Wagner, J. C., Berry, G., and Timbrell, V. 1973. Mesotheliomata in rats after inoculation with asbestos and other materials. *British Journal of Cancer* 28(2):173-85.

Unrel Waheed, A. and Van Etten R L. A spectrophotometric determination of sulfate ion and its application in studies of substrate purity and of aryl sulfatase a kinetics. *Analytical Biochemistry*. 89 (2). 1978 550-560.

Phy Waldegger, S., Beisse, F., Apfel, H., Breit, S., Kolb H-A, Haeussinger, D., and Lang F(A). 1995. Electrophysiological effects of progesterone on hepatocytes. *Biochimica et Biophysica Acta* 1266(2):186-190.

Unrel Waldron, R. L. 2d. 1968. Reflux pancreatography. An evalauation of contrast agents for studying the pancreas. *American Journal of Roentgenology, Radium Therapy, and Nuclear Medicine*

In Vit Walz, W. and Kimelberg, H. K. 1985. Differences in cation transport properties of primary astrocyte cultures from mouse and rat brain. *Brain Research* 340(2):333-40.

CP Wang, L. and Duff, H. J. 1995. Comparison of the effects of different k+ channel blockers on action potential duration in fetal mouse ventricular tissue. *Clinical and Investigative Medicine* 18(4 SUPPL.):B17.

In Vit Wang, Wenhui, Schwab, Albrecht, and Giebisch, Gerhard. Regulation of small-conductance potassium channel in apical membrane of rat cortical collecting tubule *Am. J. Physiol*. (1990) 259(3, Pt. 2):F494-F502.

Unrel Ward, R. J., Florence, A. L., Baldwin, D., Abiaka, C., Roland, F., Ramsey, M. H., Dickson, D. P. E., Peters, T. J., and Crichton, R. R. 1991. Biochemical and biophysical investigations of the ferrocene-iron-loadedrat: an animal model of primary haemochromatosis. *European Journal of Biochemistry* 202(2):405-410.

Unrel Warden, D. H., Hayashi, M., Schuster, V. L., and Stokes, J. B. 1989. K+ and Rb+ transport by the rabbit CCD: Rb+ reduces K+ conductance and Na+ transport. *American Journal of Physiology* 257(1 Pt 2):F43-52.

In Vit Warden, David H., Hayashi, Matsuhiko, Schuster, Victor L., and Stokes, John B. Potassium and rubidium transport by the rabbit CCD: rubidium reduces potassium conductance and sodium transport. *Am. J. Physiol*. (1989) 257(1, Pt. 2):F43-F52.

Alt Washizu, Yoshiaki. 1968. Strontium and barium ions and guinea pig ureterComp. *Biochem. Physiol*. 25(1):367-71 .

Method Wasserman, R. H., Corradino, R. A., and Taylor, A. N. Vitamin D-dependent calcium-binding protein. Purification and some properties *J. Biol. Chem*. (1968) 243(14):3978-86.

Unrel Watson, A. D. 1980. Giardiosis and colitis in a dog. *Australian Veterinary Journal* 56(9):444-7.

Unrel Watson, A. D. J. Systemic availability of chloramphenicol from tablets and capsules in cats *J Vet Pharm Ther*. 3 (1). 1980. 45-52.

Unrel Weichselbaum, R. C., Feeney, D. A., and Hayden, D. W. 1994. Comparison of upper gastrointestinal radiographic findings tohistopathologic observations: a retrospective study of 41 dogs and catswith suspected small bowel infiltrative disease (1985 to 1990). *Veterinary Radiology & Ultrasound* 35(6): 418-426.

Method Weinstein, R. E., Rickles, F. R., and Walker, F. J. 1990. Purification and preliminary characterization of rabbit vitamin K-dependent coagulation proteins. *Thrombosis Research* 59(4):759-72.

Unrel Weinstein, W. M., Onderdonk, A. B., Bartlett, J. G., and Gorbach, S. L. 1974. Experimental intra-abdominal abscesses in rats: development of an experimental Model. *Infection and Immunity* 10(6):1250-5.

Unrel Welch, S. P., Vocci, F. J. Jr, and Dewey, W. L. Anti nociceptive and lethal effects of intra ventricularly administered barium and strontium antagonism by atropine sulfate or naloxone hydro chloride. *Life Sciences*. 33 (4). 1983. 359-364.

No Oral Welch, Sandra P., Vocci, Frank J. Jr., and Dewey, William L. Antinociceptive and lethal effects of intraventricularly administered barium and strontium: antagonism by atropine sulfate or naloxone hydrochlorine *Life Sci.* (1983) 33(4):359-64.

Unrel Welling, P. A. and Linshaw, M. A. 1988. Importance of anion in hypotonic volume regulation of rabbit proximal straight tubule. *American Journal of Physiology* 255(5 Pt 2):F853-60.

No Oral West, P. G., Rowland, G. R., Budsberg, S. C., and Aron, D. N. 1996. Histomorphometric and angiographic analysis of the humerus in pigeons. *American Journal of Veterinary Research* 57(7):982-6.

Method Weston, Andrea, Brown, Phyllis R., Heckenberg, Allan L., Jandik, Petr, and Jones, William R. Effect of electrolyte composition on the separation of inorganic metal cations by capillary ion electrophoresis. *J. Chromatogr*. (1992) 602(1-2):249-56.

In Vit Westphale H-J, Wojnowski, L., Schwab, A., and Oberleithner, H. Spontaneous membrane potential oscillations in madin-darby canine kidney cells transformed by alkaline stress. *Pfluegers Archiv European Journal of Physiology*. 421 (2-3). 1992. 218-223.

Surv Whelan, B. R. 1993. Effect of barium selenate fertilizer on the concentration of barium in pasture and sheep tissues. *J Agric Food Chem* 41(5):768-770.

Abstract Wiener, S. L., Shahoda, P., and Venton, D. 1984. Inhibition of an inflammatory fluid and cell growth inhibitor and cytocidal factor by zinc-ii or cadmium-ii or mixtures of metals 24th Annual Meeting of the American Society for Cell Biology, Kansas City, Mo., Usa, Nov. 12-16, 1984. *J Cell Biol*. 99 (4 Part 2).: 390a.

Unrel Wild, L. M., Nickerson, P. A., and Morin, F. C. Iii. Ligating the ductus arteriosus before birth remodels the pulmonary vasculature of the lam. *Pediatric Research.* 25 (3). 1989. 251-257.

Unrel Wilkinson, L. and Rodning, C. B. 1986. Valva ileocaecalis: preservation during ileocolonic surgery employing a rodent experimental model. *American surgeon* 52(5):269-72.

Unrel Wilson, W. L., Mullen, M., Olley, P. M., and Rabinovitch, M. 1985. Hyperoxia-induced pulmonary vascular and lung abnormalities in young rats and potential for recovery. *Pediatric research* 19(10):1059-67.

Alt Wisniewski, K., Piekarska, T., and Danysz, A. 1972. [Reaction of the small intestine of guinea pigs to barium chloride in irradiation sickness]. <Original> Badania nad odczynowoscia jelita cienkiego swinki morskiej na chlorek baru w chorobie popromiennej. *Acta physiologica Polonica* 23(1):159-66.

Mix Wolf, B. W., Berger, L. L., and Fahey, G. C. Jr. 1996. Effects of feeding a return chewing gum/packaging material mixture onperformance and carcass characteristics of feedlot cattle. *Journal of Animal Science* 74(11):2559-2565.

Unrel Wood, A. K. W. and Kidder, D. E. 1982. Radiologic observations of gastric mixing and emptying of food ingrowing pigs. *American Journal of Veterinary Research* 43(8):1401-1408.

Unrel Wooldridge, C. B. 1969. Environmental Status of the Hanford Reservation for July--December 1968

Drug Wu, Guanzhong, Hang, Bingqian, and Lu, Wei. Anti-injurious effect of the polysaccharides of Coriolus versicolor. *Zhongguo Yaoke Daxue Xuebao* (1991) 22(5):301-4.

Unrel Wu Mei-Hwan, Su Ming-Jai(A), and Lue Hung-Chi. 1993. Postnatal maturation of inwardly rectifying potassium current in isolated ventricular myocytes. *Journal of the Formosan Medical Association* 92(1):15-19.

Surv Wu, T. Y. and Weng, P. S. 1977. Determination of radium-226 in bone of the native Taiwan buffalo and in environmental samples of North Taiwan power reactor Site. *Health Physics* 32(6):565-567.

In Vit Yaari, Y., Hamon, B., and Lux, H. D. 1987. Development of two types of calcium channels in cultured mammalian hippocampal neurons *Science* (Wash D C). 235 (4789). 680-682.

Phy Yamamoto, K., Takeshita, A., Ashihara, T., Imaizumi, T., and Nakamura, M. 1990. Alteration in the sarcolemmal Na(+)-K+ pump of hindquarters resistance arteries in DOCA-salt rats. *Clinical and experimental hypertension. Part A, Theory and practice;*

Unrel Yamazaki, J., Urushidani, T., and Nagao, T. 1996. Barium activates rat cerebellar nitric oxide synthase. *Japanese journal of pharmacology* 70(4):351-4.

Unrel Yanagihara, K. and Irisawa, H. Potassium current during the pacemaker de polarization in rabbit sino atrial node cell. *Pfluegers Archiv European Journal of Physiology*. 388 (3). 1980 (Recd. 1981). 255-260.

No Org Yang, Seng-Lu and Wu, Jenn-Ming. Effects of Nb2O5 in (Ba,Bi,Nb)-added TiO2 ceramic varistors. *J. Mater. Res*. (1995) 10(2):345-52.

FL Yang Y-H, Zuo J-B, and Zhou Y-F. The reproductive toxicity of barium chloride in male mice. *Zhongguo Yaolixue Yu Dulixue Zazhi*. 5 (2). 1991. 121.

CP Yeung, C. H(A), Sonnebert-Riethmacher, E., and Cooper, T. G(A). 1999. Defects in sperm volume regulation as a cause of infertility in the c-ros tyrosine kinase knockout mouse. *Journal of Andrology (SUPPL):*35.

Unrel Yoo, S. J. and Lee, Y. K. The effects of artificial sphincter in massive small bowel resection in dog. *Journal of Catholic Medical College*. 37 (4). 1984. 991-1002.

Acute Yoshikawa, Hiroshi. Preventive effect of pretreatment with low dose of metals on the acute toxicity of metals in mice. *Ind. Health* (1970) 8(4):184-91.

Unrel Yoshimoto, S., Otsuki, S., Ohnishi, R., Nishimura, S., and Kawai, K. 1980. Impression method of the colon using sodium alginate--an experimental evaluation in dog. *Gastroenterologia Japonica* 15(6):616-9.

Unrel Yoshino, M. and Yabu, H. Single calcium channel currents in mammalian visceral smooth muscle cells. *Pfluegers Archiv European Journal of Physiology*. 404 (3). 1985. 285-286.

Mix Young, R. W., Furr, A. K., Stoewsand, G. S., Bache, C. A., and Lisk, D. J. 1978. Lead and other elements in tissues of guinea pigs fed crown vetch grown adjacent to a highway. *Cornell veterinarian* 68(4):521-9.

In Vit Ypey, D. L. and Clapham, D. E. 1984. Development of a delayed outward-rectifying K+ conductance in cultured mouse peritoneal macrophages. Proceedings of the National Academy of Sciences

Unrel Yu Jian-Lin, Wang Li-Qing, Andersson Roland, Persson Bo G, and Bengmark Stig. 1993. New model of reversible obstructive jaundice in rats. *European Journal of Surgery* 159(3):163-166.

In Vit Yue, David T. and Marban, Eduardo. 1990. Permeation in the dihydropyridine-sensitive calcium channel. Multi-ion occupancy but no anomalous mole-fraction effect between barium and calcium. *J. Gen. Physiol*. (1990) 95(5):911-39.

Abstract Zabik, J. E., Fitsch, B. R., and Maickel, R. P. Pharmacological and toxicological effects of alkali and alkaline earth metal ions as measured by deprivation induced fluid consumption. *Toxicology and Applied Pharmacology*. 33 (1). 1975 128

Bio Acc Zatta, P., Cervellin, D., Favarato, M., Gerotto, M., and Mattiello, G. Microelemental concentration in the ontogenesis of rat brain. *Trace Elem. Electrolytes* (1994) 11(3):143-7.

In Vit Zaza, A., Rocchetti, M., Brioschi, A., Cantadori, A., and Ferroni, A. 1998. Dynamic Ca2+-induced inward *rectification of K+ current during the ventricular action potential. Circulation research* 82(9):947-56.

Unrel Zdanowicz, J. A., Mundorff, S. A., Featherstone, J. D., and Proskin, H. M. 1989. Inhibitory effect of barium on caries formation in rats. *Caries research* 23(2):65-9.

Method Zekorn T(A), Horcher, A., Siebers, U., Schnettler, R., Kloeck, G., Hering, B., Zimmermann, U., Bretzel, R. G., and Federlin, K. 1992. Barium-cross-linked alginate beads: a simple, one-step method for successful immunoisolated transplantation of islets of langerhans. *Acta Diabetologica* 29(2):99-106.

Mix Zekorn, T. D., Horcher, A., Siebers, U., Federlin, K., and Bretzel, R. G. 1999. Synergistic effect of microencapsulation and immunoalteration on islet allograft survival in bioartificial pancreas. *Journal of molecular medicine* 77(1):193-8.

Unrel Zhang Feng, Sowers James R, Ram Jeffrey L, Standley Paul R, and Peuler Jacob D. 1994. Effects of pioglitazone on calcium channels in vascular smooth muscle. *Hypertension (Dallas)* 24(2):170-175.

Drug Zheng, R. X., Fang, S. M., Li, Z. M., and Zhang, X. M. 1993. [Prevention of arrhythmia in rats by puhuang] *Chung-kuo chung yao tsa chih* 18(2):108-10, 127.

This Page Intentionally Left Blank

Literature Rejection Categories		
Rejection Criteria	**Description**	**Receptor**
ABSTRACT (Abstract)	Abstracts of journal publications or conference presentations.	Wildlife Plants and Soil Invertebrates
ACUTE STUDIES (Acu)	Single oral dose or exposure duration of three days or less.	Wildlife
AIR POLLUTION (Air P)	Studies describing the results for air pollution studies.	Wildlife Plants and Soil Invertebrates
ALTERED RECEPTOR (Alt)	Studies that describe the effects of the contaminant on surgically-altered or chemically-modified receptors (e.g., right nephrectomy, left renal artery ligature, hormone implant, etc.).	Wildlife
AQUATIC STUDIES (Aquatic)	Studies that investigate toxicity in aquatic organisms.	Wildlife Plants and Soil Invertebrates
ANATOMICAL STUDIES (Anat)	Studies of anatomy. Instance where the contaminant is used in physical studies (e.g., silver nitrate staining for histology).	Wildlife
BACTERIA (Bact)	Studies on bacteria or susceptibility to bacterial infection.	Wildlife Plants and Soil Invertebrates
BIOACCUMULATION SURVEY (Bio Acc)	Studies reporting the measurement of the concentration of the contaminant in tissues.	Wildlife Plants and Soil Invertebrates
BIOLOGICAL PRODUCT (BioP)	Studies of biological toxicants, including venoms, fungal toxins, *Bacillus thuringiensis*, other plant, animal, or microbial extracts or toxins.	Wildlife Plants and Soil Invertebrates
BIOMARKER (Biom)	Studies reporting results for a biomarker having no reported association with an adverse effect and an exposure dose (or concentration).	Wildlife
CARCINOGENICITY STUDIES (Carcin)	Studies that report data only for carcinogenic endpoints such as tumor induction. Papers that report systemic toxicity data are retained for coding of appropriate endpoints.	Wildlife Plants and Soil Invertebrates
CHEMICAL METHODS (Chem Meth)	Studies reporting methods for determination of contaminants, purification of chemicals, etc. Studies describing the preparation and analysis of the contaminant in the tissues of the receptor.	Wildlife Plants and Soil Invertebrates
CONFERENCE PROCEEDINGS (CP)	Studies reported in conference and symposium proceedings.	Wildlife Plants and Soil Invertebrates
DEAD (Dead)	Studies reporting results for dead organisms. Studies reporting field mortalities with necropsy data where it is not possible to establish the dose to the organism.	Wildlife Plants and Soil Invertebrates
DISSERTATIONS (Diss)	Dissertations are excluded. However, dissertations are flagged for possible future use.	Wildlife
DRUG (Drug)	Studies reporting results for testing of drug and therapeutic effects and side-effects. Therapeutic drugs include vitamins and minerals. Studies of some minerals may be included if there is potential for adverse effects.	Wildlife Plants and Soil Invertebrates
DUPLICATE DATA (Dup)	Studies reporting results that are duplicated in a separate publication. The publication with the earlier year is used.	Wildlife Plants and Soil Invertebrates

Literature Rejection Categories		
Rejection Criteria	**Description**	**Receptor**
ECOLOGICAL INTERACTIONS (Ecol)	Studies of ecological processes that do not investigate effects of contaminant exposure (e.g., studies of "silver" fox natural history; studies on ferrets identified in iron search).	Wildlife Plants and Soil Invertebrates
EFFLUENT (Effl)	Studies reporting effects of effluent, sewage, or polluted runoff.	Wildlife Plants and Soil Invertebrates
CONTAMINANT FATE/METABOLISM (Fate)	Studies reporting what happens to the contaminant, rather than what happens to the organism. Studies describing the intermediary metabolism of the contaminant (e.g., radioactive tracer studies) without description of adverse effects.	Wildlife Plants and Soil Invertebrates
FOREIGN LANGUAGE (FL)	Studies in languages other than English.	Wildlife Plants and Soil Invertebrates
FOOD STUDIES (Food)	Food science studies conducted to improve production of food for human consumption.	Wildlife
FUNGUS (Fungus)	Studies on fungus.	Wildlife Plants and Soil Invertebrates
GENE (Gene)	Studies of genotoxicity (chromosomal aberrations and mutagenicity).	Wildlife Plants and Soil Invertebrates
HUMAN HEALTH (HHE)	Studies with human subjects.	Wildlife Plants and Soil Invertebrates
IMMUNOLOGY (IMM)	Studies on the effects of contaminants on immunological endpoints.	Wildlife Plants and Soil Invertebrates
INVERTEBRATE (Invert)	Studies that investigate the effects of contaminants on terrestrial invertebrates are excluded.	Wildlife
IN VITRO (In Vit)	*In vitro* studies, including exposure of cell cultures, excised tissues and/or excised organs.	Wildlife Plants and Soil Invertebrates
LEAD SHOT (Lead shot)	Studies administering lead shot as the exposure form. These studies are labeled separately for possible later retrieval and review.	Wildlife
MEDIA (Media)	Authors must report that the study was conducted using natural or artificial soil. Studies conducted in pore water or any other aqueous phase (e.g., hydroponic solution), filter paper, petri dishes, manure, organic or histosoils (e.g., peat muck, humus), are not considered suitable for use in defining soil screening levels.	Plants and Soil Invertebrates
METHODS (Meth)	Studies reporting methods or methods development without usable toxicity test results for specific endpoints.	Wildlife Plants and Soil Invertebrates
MINERAL REQUIREMENTS (Mineral)	Studies examining the minerals required for better production of animals for human consumption, unless there is potential for adverse effects.	Wildlife
MIXTURE (Mix)	Studies that report data for combinations of single toxicants (e.g. cadmium and copper) are excluded. Exposure in a field setting from contaminated natural soils or waste application to soil may be coded as Field Survey.	Wildlife Plants and Soil Invertebrates
MODELING (Model)	Studies reporting the use of existing data for modeling, i.e., no new organism toxicity data are reported. Studies which extrapolate effects based on known relationships between parameters and adverse effects.	Wildlife Plants and Soil Invertebrates

Literature Rejection Categories		
Rejection Criteria	**Description**	**Receptor**
NO CONTAMINANT OF CONCERN (No COC)	Studies that do not examine the toxicity of Eco-SSL contaminants of concern.	Wildlife Plants and Soil Invertebrates
NO CONTROL (No Control)	Studies which lack a control or which have a control that is classified as invalid for derivation of TRVs.	Wildlife Plants and Soil Invertebrates
NO DATA (No Data)	Studies for which results are stated in text but no data is provided. Also refers to studies with insufficient data where results are reported for only one organism per exposure concentration or dose (wildlife).	Wildlife Plants and Soil Invertebrates
NO DOSE or CONC (No Dose)	Studies with no usable dose or concentration reported, or an insufficient number of doses/concentrations are used based on Eco-SSL SOPs. These are usually identified after examination of full paper. This includes studies which examine effects after exposure to contaminant ceases. This also includes studies where offspring are exposed in utero and/or lactation by doses to parents and then after weaning to similar concentrations as their parents. Dose cannot be determined.	Wildlife Plants and Soil Invertebrates
NO DURATION (No Dur)	Studies with no exposure duration. These are usually identified after examination of full paper.	Wildlife Plants and Soil Invertebrates
NO EFFECT (No Efct)	Studies with no relevant effect evaluated in a biological test species or data not reported for effect discussed.	Wildlife Plants and Soil Invertebrates
NO ORAL (No Oral)	Studies using non-oral routes of contaminant administration including intraperitoneal injection, other injection, inhalation, and dermal exposures.	Wildlife
NO ORGANISM (No Org) or NO SPECIES	Studies that do not examine or test a viable organism (also see in vitro rejection category).	Wildlife Plants and Soil Invertebrates
NOT AVAILABLE (Not Avail)	Papers that could not be located. Citation from electronic searches may be incorrect or the source is not readily available.	Wildlife Plants and Soil Invertebrates
NOT PRIMARY (Not Prim)	Papers that are not the original compilation and/or publication of the experimental data.	Wildlife Plants and Soil Invertebrates
NO TOXICANT (No Tox)	No toxicant used. Publications often report responses to changes in water or soil chemistry variables, e.g., pH or temperature. Such publications are not included.	Wildlife Plants and Soil Invertebrates
NO TOX DATA (No Tox Data)	Studies where toxicant used but no results reported that had a negative impact (plants and soil invertebrates).	Plants and Soil Invertebrates
NUTRIENT (Nutrient)	Nutrition studies reporting no concentration related negative impact.	Plants and Soil Invertebrates
NUTRIENT DEFICIENCY (Nut def)	Studies of the effects of nutrient deficiencies. Nutritional deficient diet is identified by the author. If reviewer is uncertain then the administrator should be consulted. Effects associated with added nutrients are coded.	Wildlife
NUTRITION (Nut)	Studies examining the best or minimum level of a chemical in the diet for improvement of health or maintenance of animals in captivity.	Wildlife
OTHER AMBIENT CONDITIONS (OAC)	Studies which examine other ambient conditions: pH, salinity, DO, UV, radiation, etc.	Wildlife Plants and Soil Invertebrates
OIL (Oil)	Studies which examine the effects of oil and petroleum products.	Wildlife Plants and Soil Invertebrates

Literature Rejection Categories		
Rejection Criteria	**Description**	**Receptor**
OM, pH (OM, pH)	Organic matter content of the test soil must be reported by the authors, but may be presented in one of the following ways; total organic carbon (TOC), particulate organic carbon (POC), organic carbon (OC), coarse particulate organic matter (CPOM), particulate organic matter (POM), ash free dry weight of soil, ash free dry mass of soil, percent organic matter, percent peat, loss on ignition (LOI), organic matter content (OMC). With the exception of studies on non-ionizing substances, the study must report the pH of the soil, and the soil pH should be within the range of ≥ 4 and ≤ 8.5. Studies that do not report pH or report pH outside this range are rejected.	Plants and Soil Invertebrates
ORGANIC METAL (Org Met)	Studies which examine the effects of organic metals. This includes tetraethyl lead, triethyl lead, chromium picolinate, phenylarsonic acid, roxarsone, 3-nitro-4-phenylarsonic acid,, zinc phosphide, monomethylarsonic acid (MMA), dimethylarsinic acid (DMA), trimethylarsine oxide (TMAO), or arsenobetaine (AsBe) and other organo metallic fungicides. Metal acetates and methionines are not rejected and are evaluated.	Wildlife
LEAD BEHAVIOR OR HIGH DOSE MODELS (Pb Behav)	There are a high number of studies in the literature that expose rats or mice to high concentrations of lead in drinking water (0.1, 1 to 2% solutions) and then observe behavior in offspring, and/or pathology changes in the brain of the exposed dam and/or the progeny. Only a representative subset of these studies were coded. Behavior studies examining complex behavior (learned tasks) were also not coded.	Wildlife
PHYSIOLOGY STUDIES (Phys)	Physiology studies where adverse effects are not associated with exposure to contaminants of concern.	Wildlife
PLANT (Plant)	Studies of terrestrial plants are excluded.	Wildlife
PRIMATE (Prim)	Primate studies are excluded.	Wildlife
PUBL AS (Publ as)	The author states that the information in this report has been published in another source. Data are recorded from only one source. The secondary citation is noted as Publ As.	Wildlife Plants and Soil Invertebrates
QSAR (QSAR)	Derivation of Quantitative Structure-Activity Relationships (QSAR) is a form of modeling. QSAR publications are rejected if raw toxicity data are not reported or if the toxicity data are published elsewhere as original data.	Wildlife Plants and Soil Invertebrates
REGULATIONS (Reg)	Regulations and related publications that are not a primary source of data.	Wildlife Plants and Soil Invertebrates
REVIEW (Rev)	Studies in which the data reported in the article are not primary data from research conducted by the author. The publication is a compilation of data published elsewhere. These publications are reviewed manually to identify other relevant literature.	Wildlife Plants and Soil Invertebrates
SEDIMENT CONC (Sed)	Studies in which the only exposure concentration/dose reported is for the level of a toxicant in sediment.	Wildlife Plants and Soil Invertebrates

Literature Rejection Categories		
Rejection Criteria	**Description**	**Receptor**
SCORE (Score)	Papers in which all studies had data evaluation scores at or lower then the acceptable cut-off ($\leq$10 of 18) for plants and soil invertebrates).	Plants and Soil Invertebrates
SEDIMENT CONC (Sed)	Studies in which the only exposure concentration/dose reported is for the level of a toxicant in sediment.	Wildlife Plants and Soil Invertebrates
SLUDGE	Studies on the effects of ingestion of soils amended with sewage sludge.	Wildlife Plants and Soil Invertebrates
SOIL CONC (Soil)	Studies in which the only exposure concentration/dose reported is for the level of a toxicant in soil.	Wildlife
SPECIES	Studies in which the species of concern was not a terrestrial invertebrate or plant or mammal or bird.	Plants and Soil Invertebrates
STRESSOR (QAC)	Studies examining the interaction of a stressor (e.g., radiation, heat, etc.) and the contaminant, where the effect of the contaminant alone cannot be isolated.	Wildlife Plants and Soil Invertebrates
SURVEY (Surv)	Studies reporting the toxicity of a contaminant in the field over a period of time. Often neither a duration nor an exposure concentration is reported.	Wildlife Plants and Soil Invertebrates
REPTILE OR AMPHIBIAN (Herp)	Studies on reptiles and amphibians. These papers flagged for possible later review.	Wildlife Plants and Soil Invertebrates
UNRELATED (Unrel)	Studies that are unrelated to contaminant exposure and response and/or the receptor groups of interest.	Wildlife
WATER QUALITY STUDY (Wqual)	Studies of water quality.	Wildlife Plants and Soil Invertebrates
YEAST (Yeast)	Studies of yeast.	Wildlife Plants and Soil Invertebrates

This Page Intentionally Left Blank

Appendix 6-1

Mammalian Toxicity Data Extracted and Reviewed for Wildlife Toxicity Reference Value (TRV) - Barium

November 2003

This page intentionally left blank

Appendix 6.1 Mammalian Toxicity Data Extracted for Wildlife Toxicity Reference Value (TRV)
Barium

Ref			Exposure																				Effects					Conversion to mg/kg bw/day				Result		Data Evaluation Score										
Result #	Ref No.		Chemical Form	MW%	Common name	Phase #	# of Conc/ Doses	Conc/ Doses	Wet Weight Reported?	Application Frequency	Conc/Dose Units	Method of Chem Analyses	Route of Exposure	Exposure Duration	Duration Units	Age	Age Units	Lifestage	Sex	Control Type	Test Location	Effect Type	Effect Measure	Response Site	Study NOAEL	Study LOAEL	Body Weight Reported?	Body Weight (kg)	Ingestion Rate Reported?	Ingestion Rate (kg or L/day)	NOAEL Dose (mg/kg/day)	LOAEL Dose (mg/kg/day)	Data Source	Dose Route	Test Concentrations	Chemical form	Dose Quantification	Endpoint	Dose Range	Statistical Power	Exposure Duration	Test Conditions	Total
Biochemical																																											
1	18734	Borzelleca et al, 1988	Barium chloride	65.95	Rat (*Rattus norvegicus*)	1	5	0/100/145/209/300	N	X per d	mg/kg bw/d	U	GV	10	d	37	d	JV	F	C	Lab	CHM	UREA	BL		100	Y	0.196	N	0.0180		66.0	10	8	10	10	10	1	4	10	10	4	77
2	18124	Perry et al, 1983	Barium chloride	100	Rat (*Rattus norvegicus*)	1	4	0/1/10/100	N	NR	mg/L	U	DR	4	mo	NR	NR	JV	F	C	Lab	CHM	ATPT	HE	10.0	100	Y	0.435	Y	0.0220	0.506	5.06	10	5	5	10	7	1	8	10	10	4	70
3	18186	Dietz et al, 1992	Barium chloride dihydrate	100	Rat (*Rattus norvegicus*)	2	6	0/4.3/17/32.9/61.1/120.7	N	ADL	mg/kg bw/d	UX	DR	92	d	43-44	d	JV	M	C	Lab	CHM	PHOS	SR	4.30	17.0	Y	0.197	N	0.0230	4.30	17.0	10	5	10	10	10	1	8	10	10	4	78
4	18750	Perry et al, 1989	Barium chloride	100	Rat (*Rattus norvegicus*)	2	2	0/100	N	ADL	mg/L	U	DR	16	mo	NR	NR	JV	F	C	Lab	ENZ	Other	HE		100	Y	0.045	Y	0.0224		49.8	10	5	5	10	7	1	4	10	10	4	66
Behavior																																											
5	18427	Tardiff et al, 1988	Barium chloride	100	Rat (*Rattus norvegicus*)	1	4	0/2.1/9.7/45.7	N	DLY	mg/kg bw/d	M	DR	13	w	4	w	JV	B	C	Lab	FDB	FCNS	WO	45.7		Y	0.497	N	0.0528	45.7		10	5	10	10	10	4	4	8	10	4	75
6	18186	Dietz et al, 1992	Barium chloride dihydrate	100	Rat (*Rattus norvegicus*)	2	6	0/4.3/17/32.9/61.1/120.7	N	ADL	mg/kg bw/d	UX	DR	92	d	43-44	d	JV	B	C	Lab	FDB	WCON	WO	61.0	121	Y	0.340	N	0.0375	61.0	121	10	5	10	10	10	4	10	10	10	4	83
7	18186	Dietz et al, 1992	Barium chloride dihydrate	100	Mouse *(Mus musculus)*	1	6	0/12.4/41.9/82.9/164.7/436.2	N	ADL	mg/kg bw/d	UX	DR	92	d	43-44	d	JV	M	C	Lab	FDB	WCON	WO	165	436	Y	0.038	N	0.0052	165	436	10	5	10	10	10	4	10	10	10	4	83
Physiology																																											
8	18124	Perry et al, 1983	Barium chloride	100	Rat (*Rattus norvegicus*)	1	4	0/1/10/100	N	NR	mg/L	U	DR	8	mo	NR	NR	JV	F	C	Lab	PHY	BLPR	WO	1.00	10.0	Y	0.348	Y	0.0210	0.060	0.60	10	5	5	10	7	4	8	10	10	4	73
9	18750	Perry et al, 1989	Barium chloride	100	Rat (*Rattus norvegicus*)	1	4	0/0.05/0.2292/2.029	N	ADL	mg/org/d	U	DR	8	mo	NR	NR	JV	F	C	Lab	PHY	BLPR	WO	0.050	0.23	Y	0.045	Y	0.0224	1.10	5.10	10	5	5	10	7	4	8	10	10	4	73
10	18115	McCauley et al, 1985	Barium chloride	100	Rat (*Rattus norvegicus*)	4	2	0/250	N	ADL	mg/L	U	DR	5	mo	NR	NR	NR	NR	C	Lab	PHY	HTRT	HE	250		N	0.600	N	0.0625	26.0		10	5	5	10	5	4	4	10	10	4	67
11	18750	Perry et al, 1989	Barium chloride	100	Rat (*Rattus norvegicus*)	2	2	0/100	N	ADL	mg/L	U	DR	16	mo	NR	NR	JV	F	C	Lab	PHY	BLPR	WO		100	Y	0.045	Y	0.0224		49.8	10	5	5	10	7	4	4	10	10	4	69
Pathology																																											
12	18427	Tardiff et al, 1988	Barium chloride	100	Rat (*Rattus norvegicus*)	1	4	0/2.1/9.7/45.7	N	DLY	mg/kg bw/d	M	DR	8	w	4	w	JV	M	C	Lab	ORW	SMIX	AR	10.0	50.0	Y	0.497	N	0.0528	2.10	9.70	10	5	10	10	10	4	8	10	10	4	81
13	18186	Dietz et al, 1992	Barium chloride dihydrate	100	Rat (*Rattus norvegicus*)	2	6	0/4.3/17/32.9/61.1/120.7	N	ADL	mg/kg bw/d	UX	DR	92	d	43-44	d	JV	M	C	Lab	ORW	ORWT	KI	17.0	32.9	Y	0.191	N	0.0223	17.0	32.9	10	5	10	10	10	4	10	10	10	4	83
14	18186	Dietz et al, 1992	Barium chloride dihydrate	100	Mouse *(Mus musculus)*	1	6	0/12.4/41.9/82.9/164.7/436.2	N	ADL	mg/kg bw/d	UX	DR	92	d	43-44	d	JV	M	C	Lab	ORW	SMIX	LI	41.9	82.9	Y	0.028	N	0.0039	41.9	82.9	10	5	10	10	10	4	10	10	10	4	83
16	1858	Schroeder and Mitchener, 1975	Barium acetate	100	Mouse *(Mus musculus)*	1	2	0/5	N	NR	mg/L	U	DR	520	d	19-20	d	JV	B	C	Lab	HIS	EDMA	WO		5.00	Y	0.027	N	0.0038		0.710	10	5	5	10	6	4	4	10	10	4	68
Reproduction																																											
16	18186	Dietz et al, 1992	Barium chloride dihydrate	100	Rat (*Rattus norvegicus*)	2	6	0/4.3/17/32.9/61.1/120.7	N	ADL	mg/kg bw/d	UX	DR	92	d	43-44	d	JV	M	C	Lab	REP	RHIS	TE	121		Y	0.307	N	0.0342	121		10	5	10	10	10	10	4	1	10	4	74
17	18734	Borzelleca et al, 1988	Barium chloride	65.95	Rat (*Rattus norvegicus*)	1	5	0/100/145/209/300	N	X per d	mg/kg bw/d	U	GV	10	d	37	d	JV	F	C	Lab	REP	RHIS	OV	209	300	Y	0.196	N	0.0180	138	198	10	8	10	10	10	4	10	10	10	4	86
18	18186	Dietz et al, 1992	Barium chloride dihydrate	100	Mouse *(Mus musculus)*	1	6	0/12.4/41.9/82.9/164.7/436.2	N	ADL	mg/kg bw/d	UX	DR	92	d	43-44	d	JV	M	C	Lab	REP	RHIS	TE	165	436	N	0.016	N	0.0024	165	436	10	5	10	10	10	10	10	10	10	4	89
Growth																																											
19	17086	Schroeder and Mitchener, 1975	Barium acetate	100	Rat (*Rattus norvegicus*)	1	2	0/5	N	DLY	mg/L	U	DR	520	d	21	d	JV	B	C	Lab	GRO	BDWT	WO	5.00		Y	0.245	N	0.0279	0.570		10	5	5	10	6	8	4	10	10	4	72
20	18053	Stoewsand et al, 1988	Barium chloride	100	Rat (*Rattus norvegicus*)	1	2	0/4.714	N	DLY	mg/org/d	U	FD	29	d	NR	NR	JV	M	C	Lab	GRO	BDWT	WO	4.70		N	0.267	N	0.0232	16.5		10	10	5	10	5	8	4	10	10	4	76
21	18186	Dietz et al, 1992	Barium chloride dihydrate	100	Rat (*Rattus norvegicus*)	2	6	0/4.3/17/32.9/61.1/120.7	N	ADL	mg/kg bw/d	UX	DR	92	d	43-44	d	JV	B	C	Lab	GRO	BDWT	WO	61.0	121	Y	0.340	N	0.0375	61.0	121	10	5	10	10	10	8	10	10	10	4	87
22	18186	Dietz et al, 1992	Barium chloride dihydrate	100	Mouse *(Mus musculus)*	1	6	0/12.4/41.9/82.9/164.7/436.2	N	ADL	mg/kg bw/d	UX	DR	92	d	43-44	d	JV	M	C	Lab	GRO	BDWT	WO	165	436	Y	0.038	N	0.0052	165	436	10	5	10	10	10	8	10	10	10	4	87
23	18734	Borzelleca et al, 1988	Barium chloride	65.95	Rat (*Rattus norvegicus*)	1	5	0/100/145/209/300	N	X per d	mg/kg bw/d	U	GV	10	d	37	d	JV	B	C	Lab	GRO	BDWT	WO	300		Y	0.253	N	0.0222	198		10	8	10	10	10	8	4	10	10	4	84
24	1858	Schroeder and Mitchener, 1975	Barium acetate	100	Mouse *(Mus musculus)*	1	2	0/5	N	NR	mg/L	U	DR	10	d	19-20	d	JV	F	C	Lab	GRO	BDWT	WO		5.00	Y	0.018	N	0.0026		0.741	10	5	5	5	6	8	4	10	10	4	67
Survival																																											
25	18186	Dietz et al, 1992	Barium chloride dihydrate	100	Rat (*Rattus norvegicus*)	2	6	0/4.3/17/32.9/61.1/120.7	N	ADL	mg/kg bw/d	UX	DR	92	d	43-44	d	JV	M	C	Lab	MOR	MORT	WO	61.0	121	Y	0.340	N	0.0748	61.0	121	10	5	10	10	10	9	10	10	10	4	88
26	18734	Borzelleca et al, 1988	Barium chloride	65.95	Rat (*Rattus norvegicus*)	1	5	0/100/145/209/300	N	X per d	mg/kg bw/d	U	GV	10	d	37	d	JV	F	C	Lab	MOR	MORT	WO	209	300	Y	0.196	N	0.0180	138	198	10	8	10	10	10	9	10	10	10	4	91
27	18186	Dietz et al, 1992	Barium chloride dihydrate	100	Mouse *(Mus musculus)*	1	6	0/12.4/41.9/82.9/164.7/436.2	N	ADL	mg/kg bw/d	UX	DR	13	d	43-44	d	JV	M	C	Lab	MOR	MORT	WO	165	436	Y	0.038	N	0.0052	165	436	10	5	10	10	10	9	8	10	10	4	86
Data Not Used to Derive Wildlife Toxicity Reference Value																																											
28	17086	Schroeder and Mitchener, 1975	Barium acetate	100	Rat (*Rattus norvegicus*)	1	2	0/5	N	DLY	mg/L	U	DR	1173	d	21	d	JV	B	C	Lab	MOR	LFSP	WO	5.0		Y	0.486	N	0.0517	0.532		10	5	5	10	6	9	4	1	10	4	64
29	17086	Schroeder and Mitchener, 1975	Barium acetate	100	Rat (*Rattus norvegicus*)	1	2	0/5	N	DLY	mg/L	U	DR	540	d	21	d	JV	B	C	Lab	ORW	ORWT	HE	5.0		Y	0.486	N	0.0517	0.532		10	5	5	10	6	4	4	1	10	4	59
30	757	Mercado and Bibby 1973	Barium chloride	100	Rat (*Rattus norvegicus*)	1	2	0/50	N	ADL	mg/L	U	DR	50	d	23	d	JV	M	C	Lab	PHY	GPHY	TH	50.0		N	0.267	N	0.0302	5.65		10	5	5	10	5	4	4	1	10	4	58
36	757	Mercado and Bibby 1973	Barium chloride	100	Rat (*Rattus norvegicus*)	1	2	0/50	N	ADL	mg/L	U	DR	50	d	23	d	JV	M	C	Lab	GRO	BDWT	WO	50.0		N	0.267	N	0.0302	5.65		10	5	5	10	5	8	4	1	10	4	62
30	18115	McCauley et al, 1985	Barium chloride	100	Rat (*Rattus norvegicus*)	1	5	0/1/10/100/250	N	ADL	mg/L	U	DR	36	w	NR	NR	NR	M	C	Lab	HIS	HYPL	AR	250		N	0.600	N	0.0625	26.0		10	5	5	10	5	4	4	1	10	4	58
31	18750	Perry et al, 1989	Barium chloride	100	Rat (*Rattus norvegicus*)	3	4	0/0.058/0.279/2.5	N	ADL	mg/org/d	U	DR	16	mo	NR	NR	JV	F	C	Lab	GRO	BDWT	WO	2.50		Y	0.045	Y	0.0224	55.6		10	5	5	10	7	8	4	1	10	4	64
32	18750	Perry et al, 1989	Barium chloride	100	Rat (*Rattus norvegicus*)	3	4	0/0.058/0.279/2.5	N	ADL	mg/org/d	U	DR	16	mo	NR	NR	JV	F	C	Lab	CHM	CALC	HE	2.50		Y	0.045	Y	0.0224	55.6		10	5	5	10	7	1	4	8	10	4	64
33	17086	Schroeder and Mitchener, 1975	Barium acetate	101	Rat (*Rattus norvegicus*)	2	3	0/5	N	DLY	mg/L	U	DR	98	d	21	d	JV	B	C	Lab	CHM	GLUC	SR		5.00	Y	0.245	N	0.0279		0.570	10	5	5	10	6	1	4	10	10	4	65
34	1858	Schroeder and Mitchener, 1975	Barium acetate	100	Mouse *(Mus musculus)*	1	2	0/5	N	NR	mg/L	U	DR	520	d	19-20	d	JV	M	C	Lab	MOR	LFSP	WO		5.00	Y	0.027	N	0.0038		0.710	10	5	5	5	6	9	4	1	10	4	59

All abbreviations and definitions are used in coding stuides are available from Attachment 4-3 of the Eco-SSL guidance (U.S. EPA 2003).