

Material Transfer Agreement

This Material Transfer Agreement ("Agreement") is entered into as of the 28th day of April, 2011, between U.S. Environmental Protection Agency, with its principal office at 109 TW Alexander Dr., MD-B-205-01, Research Triangle Park, NC 27711, U.S.A. ("EPA") and Astellas Pharma Inc., with its business office at 21, Miyukigaoka, Tsukuba-shi, Ibaraki 305-8585, Japan ("ASTELLAS").

WITNESSETH

WHEREAS, EPA wishes to obtain ASTELLAS's materials, which is listed in Exhibit A, ("MATERIALS") to use in certain test assay panels; and

WHEREAS, ASTELLAS wishes to have MATERIALS evaluated on such test panels;

NOW THEREFORE, in consideration of the foregoing and the covenants and promises contained herein, the parties agree as follows:

Article 1. EPA shall use the MATERIAL solely at EPA's contractors described in Exhibit B "ToxCast™ Program" and only for the purpose of its performance of the research activities, the detail of which shall be described in Exhibit B "ToxCast™ Program".

Article 2.

- (1) EPA shall acknowledge that the MATERIAL is for laboratory use only and is not for consumption by, or treatment of, humans or non-laboratory animals.
- (2) EPA shall use (and dispose of, where applicable) the MATERIAL in compliance with any of applicable laws, regulations and ordinances of the relevant jurisdiction.
- (3) EPA shall not make the MATERIAL available to any person other than those who is subject to EPA's direct supervision, without ASTELLAS's prior written consent.
- (4) EPA shall warrant that it shall have all the persons who are involved in the ToxCast™ Program described in Exhibit B which is made part of this Agreement obey the obligations of EPA set out in this Agreement.
- (5) At the conclusion of ToxCast™ Program for each MATERIAL, EPA shall destroy any unused portion of the MATERIAL, and promptly submit to ASTELLAS a written proof of said destruction signed by the authorized representative of EPA.

Article 3. To the extent permitted by law and regulation, EPA agrees to treat as confidential, any of ASTELLAS's written information about the MATERIALS that is stamped "CONFIDENTIAL". The foregoing shall not apply to information that is or becomes publicly available or which is disclosed to EPA without a confidentiality obligation. The parties acknowledge that ASTELLAS will transfer to EPA preclinical and clinical data relating to the kinetics and toxicity of the MATERIALS. These data shall be considered non-confidential unless indicated by ASTELLAS as such per this Article 3. Any oral disclosures from ASTELLAS to EPA which ASTELLAS wishes to be treated as confidential shall be identified as being Confidential at the time of the disclosure and by written notice delivered to EPA within thirty (30) days after the date of the oral disclosure.

Article 4. EPA may publish or otherwise publicly disclose the results of the ToxCast™ Program, but if ASTELLAS has given confidential information to EPA, such public disclosure may be made only after ASTELLAS has had thirty (30) days to review and comment on the proposed disclosure to determine if it includes any confidential information, to the extent such review period is permitted by law and regulation. If ASTELLAS finds that the proposed disclosure does not contain any confidential information, EPA will be free to publish the results of the ToxCast™ Program without further review. If the proposed disclosure contains confidential information that ASTELLAS determines may disclose patentable inventions, EPA will extend the review period an additional sixty (60) days to allow for filing of patent applications

Article 5. EPA will provide to ASTELLAS in writing all data, results and conclusions of any research obtained by EPA utilizing MATERIALS in the ToxCast™ Program, and EPA will not use those data, results

and conclusions to file any patent applications that claim the manufacture, use or sale of MATERIALS.

Both parties grant to each other a non-exclusive license to use the results of the ToxCast™ Program using MATERIALS in their own research.

Both parties acknowledge that such testing results shall be made freely available to the public following the review process described in Article 4 above.

Article 6. Both the ToxCast™ Program and MATERIALS are provided as a service to the research community. They are being supplied "as is" with no representations, warranties, express or implied, of any kind, including any warranty of merchantability or fitness for a particular purpose. Neither party makes any representations that the use of the ToxCast™ Program or MATERIALS will not infringe any patent or proprietary rights of third parties.

In no event shall ASTELLAS be liable for any use of MATERIALS by EPA.

Article 7. EPA shall retain title to any patent or other intellectual property rights in inventions made by its employees in the course of the performance of the ToxCast™ Program. However, notwithstanding Article 7, if said inventions contain any portion of MATERIALS, are derived from MATERIALS, or could not have been produced but for the use of MATERIALS, EPA agrees to contact with ASTELLAS to determine what ownership interests, if any, ASTELLAS may have, and where applicable, to negotiate in good faith the terms of a commercial license. Inventorship for a patent application or a commercialized product based on said inventions shall be determined according to United States patent law. Neither this Agreement nor the performance thereof by EPA will transfer to EPA any proprietary right, title, interest or claim in or to any of MATERIALS (including any intellectual property rights subsisting therein).

Article 8. Either party shall have the right to terminate this Agreement at any time. Upon termination, the performance of the ToxCast™ Program using MATERIALS shall end, and EPA shall destroy any unused portion of the MATERIAL, and promptly submit to ASTELLAS a written proof of said destruction signed by the authorized representative of EPA.

Article 9. All notices pertaining to or required by this Agreement shall be in writing and shall be signed by an authorized representative and shall be delivered by hand (including private courier mail service) or sent by certified mail, return receipt requested, with postage prepaid, addressed as follows:

EPA's Official and Mailing Address:

Rovert J. Kavlock
Director
US EPA/ORD/NCCT
109 TW Alexander Dr., MD-B-205-01
Research Triangle Park, NC 27711

ASTELLAS's Officials and Mailing Addresses:

Jiro Seki, Ph.D.
Senior Research Fellow
Drug Safety Research Labs.
Astellas Pharma Inc.
2-1-6, Kashima, Yodogawa-ku,
Osaka 532-8514, Japan

James Keirns, PhD
Vice President
Global Expert Regulations
Clinical Pharmacology & Exploratory Development
Astellas Pharma Global Development, Inc.
3 Parkway North
Deerfield, IL 60015

Article 10. Articles 3, 4, 5, 6 and 7 shall survive termination.

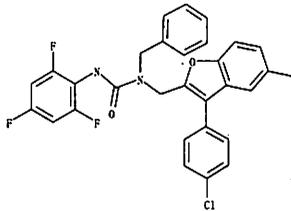
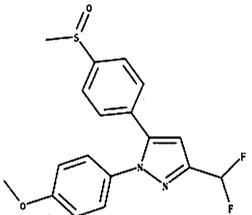
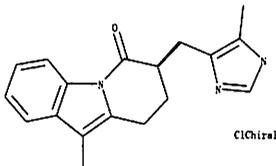
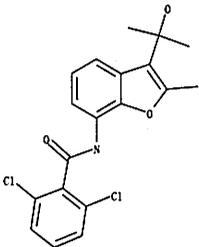
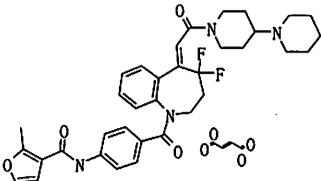
Article 11. This Agreement shall be construed in accordance with law as applied by the Federal courts in the District of Columbia.

Article 12. Neither party is obligated to negotiate or enter into any other agreement, and any evaluation or discussions may be terminated at the sole discretion of either party at any time and for any reason. Unless and until a definitive agreement is executed by the parties, neither party is under any legal obligation of any kind with respect to any transaction, except for the matters specifically agreed to in this Agreement.

Article 13. A waiver by either party of any term or condition of this Agreement must be in writing signed by the waving party. A waiver in one instance of a term or condition shall not be deemed a waiver of such term or conditions in any other instance.

Article 14. This Agreement sets forth the parties' entire understanding about its subject matter and supersedes any other agreement or understanding between the parties about its subject matter. Neither party can assign, amend, or terminate any part of this Agreement except in writing signed by both parties. Notwithstanding the foregoing, (A) ASTELLAS may assign this Agreement and/or its rights and obligations hereunder without the consent of EPA to (i) any affiliate; (ii) an assignee or successor in interest (by merger, operation of law or otherwise); or (iii) a purchaser of all or substantially all of its business to which this Agreement relates and (B) the rights and obligations of ASTELLAS under this Agreement may be exercised or performed by one or more of its affiliates.

Exhibit A
Materials: Astellas Compounds for Tox21

Code Name	Compound Name	Chemical Name	Chemical Structure	MW	Amount of Supply	Reason for Termination
AST1	FR145237	1-benzyl-1-([3-(4-chlorophenyl)-5-methyl-1-benzofuran-2-yl]methyl)-3-(2,4,6-trifluorophenyl) urea		534.96	200mg	Preclinical Tox Adrenal tox in dogs, rabbits
AST2	FR140423	3-(difluoromethyl)-1-(4-methoxyphenyl)-5-[4-(methylsulfinyl)phenyl]phenyl]-1H-pyrazole		362.39	200mg	Preclinical Tox Mammary grand hyperplasia in 13W-tox in rats
AST3	FR121052	(7R)-10-methyl-7-[(5-methyl-1H-imidazol-4-yl)methyl]-8,9-dihydropyrido[1,2-a]indol-6(7H)-one hydrochloride (1:1)		293.36	200mg	Preclinical Tox Hepato-carcinogenesis in rats and mice
AST4	FR167356	2,6-dichloro-N-[3-(2-hydroxypropan-2-yl)-2-methyl-1-benzofuran-7-yl]benzamide		378.25	200mg	Preclinical Tox Chol and ALP↑ in 13W-tox in dogs
AST5	YM218 hemi fumarate	N-[4-(((5Z)-5-[2-(1,4'-bipiperidin-1'-yl)-2-oxoethylidene]-4,4-difluoro-2,3,4,5-tetrahydro-1H-1-benzazepin-1-yl]carbonyl)phenyl]-2-methyl-3-furamide (2E)-but-2-enedioate (1:1)		732.77	200mg	Preclinical Tox Liver tox in dogs, hypertrophy of bile duct epithelial cells in monkeys

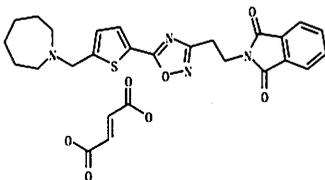
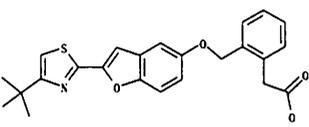
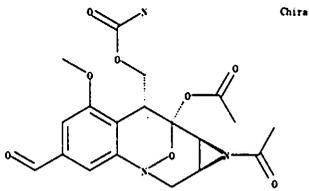
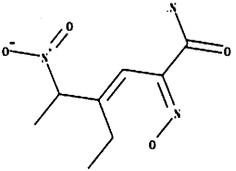
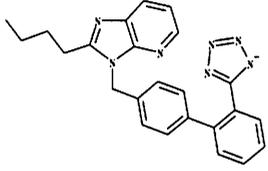
AST6	YM742 mono fumarate	2-(2-{5-[5-(azepan-1-ylmethyl)-2-thienyl]-1,2,4-oxadiazol-3-yl}ethyl)-1H-indole-1,3(2H)-dione (2E)-but-2-enedioate (1:1)		552.60	200mg	Preclinical Tox Hypoglycemia, death in monkeys
AST7	FR150011	[2-({[2-(4-tert-butyl-1,3-thiazol-2-yl)-1-benzofuran-5-yl]oxy}methyl)phenyl]acetic acid		421.51	200mg	Clinical Tox Skin rash in P1
AST8	FR073317	(1aS,8R,9S,9aS)-1-acetyl-8-[(carbamoyloxy)methyl]-5-formyl-7-methoxy-1,1a,2,9a-tetrahydro-3,9-epoxyazireno[2,3-c][1]benzazocin-9(8H)-yl acetate	 Chiral	419.39	200mg	Clinical Tox Fibroid lung in cancer patients (P1)
AST9	FR900409	(2E,3E)-4-ethyl-2-(hydroxyimino)-5-nitrohex-3-enamide		215.21	200mg	Clinical Tox Anemia in P2a
AST10	FR130739 (=sodium salt)	sodium 5-{4'-[(2-butyl-3H-imidazo[4,5-b]pyridin-3-yl)methyl]biphenyl-2-yl}tetrazol-1-ide	 Na ⁺	431.47	200mg	Clinical Tox Elevation of liver enzyme in P2a

Exhibit B**ToxCast Research Description**

EPA launched the ToxCast research project in 2007 to develop ways to predict potential toxicity and to develop a cost-effective approach for prioritizing the thousands of chemicals that need toxicity testing. ToxCast uses advanced science tools to help understand how human biological processes are impacted by exposures to chemicals and helps determine which exposures are most likely to lead to adverse health effects. It includes over 500 high-throughput assays that are screening 1,000 environmental chemicals for potential toxicity. Phase I, "Proof of Concept", was completed in 2009 and it profiled over 300 well studied chemicals (primarily pesticides). Phase II is currently screening 1,000 chemicals (including screening Phase I again) from a broad range of sources including industrial and consumer products, food additives and drugs from pharmaceutical companies that never made it to the market to evaluate the predictive toxicity signatures developed in Phase I. The compounds and associated pre-clinical and clinical data provided by Astellas will be added to chemical library that ToxCast is screening. Results from the ToxCast high-throughput screening will be compared to the pre-clinical and clinical data to assess how well a combination of ToxCast assays can predict potential toxicity that is relevant to humans. ToxCast will screen Astellas compounds in the assays provided by EPA contractors. Examples of EPA assay contractors are listed below.

Examples of EPA assay contractors

ACEA: Real-time Cell Electronic Sensing

Appredica

Attagene: Transcription factor assays

BioSeek: Cell-based protein level assays

Cellumen: Cell imaging assays

CellzDirect: Transcription assays

Gentronix: GreenScreen GeneTox assay

NCGC: Nuclear receptor assays

Novascreen/ Caliper : Receptor binding and enzyme inhibition assays

Odyssey Thera: High-content assays based on contextual Protein-fragment

Complementation Assay (PCA) technology, and a supporting platform captures and analyzes microscopic images

Solidus: P450 vs. cytotoxicity assays