MATERIALS TRANSFER AGREEMENT

Provider:
U.S. Environmental Protection Agency (EPA)
Office of Research and Development (ORD)
National Center for Computational Toxicology (NCCT)

Recipient:
The Regents of the University of California on behalf of its Davis campus

1. Provider agrees to transfer to Recipient's Investigator named below the following Research Material:

Chemicals and Materials

- X A list identifying selected chemicals from the ToxCast library to be tested by J. David Furlow.
- X A copy of the current ToxCast chemical library consisting of chemical samples prepared as solution in dimethyl sulfoxide at a concentration of 20 millimolar. Additional chemicals may be provided in the future concurrent with expansion of the ToxCast chemical library.
- ☐ Samples of nanomaterials and characterization data on said materials

Data and Summary Information

- X In vitro assay data derived from the ToxCast Program. This data is derived from chemicals analyzed using a variety of high throughput assay techniques. Below this is referred to as the "ToxCast Data".
- X In vivo whole animal toxicology data summary data derived from the EPA Toxicology Reference Database (ToxRefDB). Below this is referred to as the "ToxRefDB Data".
- X Summary descriptions of the individual data sets.
- X Individual subsets of this data will be delivered to J. David Furlow after they have been prepared for use at EPA and cleared for release to J. David Furlow.

Recipient agrees to transfer to the EPA Investigator named below:

- X All data resulting from chemical screening performed on the ToxCast chemical library.
- X Relevant data on these chemicals from non-public sources.
- X Unique chemicals for the ToxCast chemical library and subsequent testing.

2. This Research Material may not be used in human subjects. The Research Material will be used only for research purposes by Recipient's Investigator in his/her laboratory, for the research project described below, under suitable containment conditions. This Research Material will not be used for screening, production or sale, for which a commercialization license may be required. Recipient agrees to comply with all Federal rules and regulations applicable to the Research Project and the handling of the Research Material.

3. Does the Research Material include specimens or data derived or collected from human subjects?
_____ Yes – Go to item #3(a).
__x___ No – Skip to item #4.

3(a). Does the Research Material include specimens or data derived or collected from fetuses, children, pregnant women, or nursing women?
_____ Yes
_____ No

3(b). Was the Research Material obtained under a protocol that was reviewed and approved by an Institutional Review Board (IRB) that operated in accordance with the requirements of EPA Regulation 40 CFR 26, HHS Regulation 45 CFR 46, or any other Federal Regulation for the protection of human research subjects?
_____ Yes (Please indicate the applicable Regulation here _____ and provide copies of the protocol and IRB approval documents.)
_____ No (Please provide explanation with documentary support as appropriate.)

3(c). Can the Provider of the Research Material identify the subjects directly or through identifiers (codes) linked to the subjects?
_____ Yes – The Recipient's use of the Research Material may be human subject's research subject to 40 CFR 26. Go to item #3(d).
_____ No – The Recipient's use of the Research Material is not human subjects research subject to 40 CFR 26. Skip to item #4.

3(d). Is the Provider of the Research Material prohibited by this agreement from releasing information to the Recipient that might allow the identification of any of the subjects, including but not limited to the key to any existing code?
_____ Yes – The Recipient's use of the Research Material is not human subjects research subject to 40 CFR 26. Skip to item #4.
_____ No – The Recipient's use of the Research Material may be human subjects research subject to 40 CFR 26. Go to item #3(e).

3(e). Is the Research Material publicly available?
_____ Yes – The Recipient's use of the Research Material is human subjects research that is exempt from 40 CFR 26.

_____ No – The Recipient's use of the Research Material is human subjects research that may be subject to 40 CFR 26 and must be further evaluated accordingly by the EPA Human Subjects Review Official.

4. This Research Material will be used by Recipient's investigator solely in connection with the following research project ("Research Project") described with specificity as follows ***(insert description here or use an attachment page if necessary)***:

The research material and data provided to the Recipient will be used in conjunction with the Recipient's EPA Cooperative Research and Development agreement for the STAR grant entitled "In Vitro to In Vivo Screening of Thyroid Hormone Receptor Disrupting Chemicals ". From the abstract: Thyroid hormones (TH) are critical regulators of vertebrate development and metabolism. Thus, exposure to environmental agents that affect TH synthesis, transport, metabolism, and/or receptor activity has profound consequences for the organism. The development of sensitive and reliable screening methods for TH disrupting chemicals should be an important component of a larger endocrine disruptor screening program. We recently developed a stable reporter cell line suitable for screening compounds that alter the transcriptional activity of the TH receptor (TR) *in vitro* (GH3.TRE-LUC). TH responsiveness of the cell line is highly sensitive, reliable, and rapid, and has been used in pilot high throughput screening assays at the NIH National Chemical Genomics Center. *Our hypothesis is that chemicals that alter transcriptional control of the TRE luciferase reporter gene in GH3.TRE-LUC cells will also affect endogenous TH target gene expression and impact TH action* in vivo, *specifically* Xenopus laevis *metamorphosis.* To test this hypothesis, we will validate chemicals acting as agonists or antagonists in the GH3.TRE-LUC cell line against endogenous TH target genes in GH_3 cells, and determine the TR isotype dependence of the observed effects. Next, we will screen potential TR disrupting chemicals in wild-type *Xenopus laevis* tadpoles undergoing induced and spontaneous metamorphosis, and compare those findings to effects on reporter gene activity in newly developed TRE-Luciferase transgenic *Xenopus laevis* lines. Upon completion of these studies, we will have established the predictive value of the GH3.TRE-LUC cell line to detect chemicals that can impact TH regulated gene expression and TH regulated developmental events *in vivo*. These studies have excellent potential to discover new chemicals that warrant further testing for significance to human development and overall health. These studies also lay the groundwork for future investigation in rodent models, the underlying molecular mechanisms of action, and screening larger chemical libraries and more complex mixtures for TR disrupting activity.

5. In all oral presentations or written publications concerning the Research Project, Recipient will acknowledge Provider's contribution of this Research Material unless requested otherwise. To the extent permitted by law, Recipient agrees to treat as confidential, any of Provider's written information about this Research Material that is stamped "CONFIDENTIAL" for a period of three (3) years from the date of its disclosure to Recipient. The foregoing shall not apply to information that is or becomes publicly available, that is independently developed by Recipient

without using the Confidential information, that is otherwise required to be disclosed by the Recipient due to law or judicial action, or which is disclosed to Recipient without a confidentiality obligation. Any oral disclosures from Provider to Recipient which Provider wishes to be treated as confidential shall be identified as being Confidential at the time of the disclosure and by written notice delivered to Recipient within thirty (30) days after the date of the oral disclosure. Recipient may publish or otherwise publicly disclose the results of the Research Project, but if Provider has given Confidential information to Recipient, such public disclosure may be made only after Provider has had thirty (30) days to review the proposed disclosure to determine if it includes any Confidential information, to the extent such review period is permitted by law.

6. This Research Material represents a significant investment on the part of Provider and is considered proprietary to Provider. Recipient's Investigator therefore shall retain control over this Research Material and shall not transfer the Research Material to other people not under his/her direct supervision without advance written approval of Provider. Provider reserves the right to distribute the Research Material to others and to use it for its own purposes. When the Research Project is completed, the Research Material will be returned to the Provider or disposed, if directed by Provider.

7. This Research Material is provided as a service to the research community. It is being supplied to Recipient with no warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose. Provider makes no representations that the use of the Research Material will not infringe any patent or proprietary rights of third parties.

8. Recipient shall retain title to any patent or other intellectual property rights in inventions made by its employees in the performance of the Research Project. However, if said inventions necessarily use or necessarily contain any portion of the Research Material, , Recipient agrees to contact the Provider to determine what ownership interests, if any, the Provider 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.

9. When Provider is the EPA: Recipient agrees not to claim, infer, or imply endorsement by the Government of the United States of America (hereinafter referred to as "Government") of the Research Project, the institution or personnel conducting the Research Project or any resulting product(s). Recipient agrees to hold the Government harmless and to indemnify the Government for all liabilities, demands, damages, expenses and losses caused by Recipient's use for any purpose of the Research Material.

10. When Recipient is the EPA: Provider will not be liable to EPA for any claims or damages arising from EPA's use of the Research Material.

11. The Provider shall have the right to terminate this Agreement at any time if Recipient breaches any of the terms of this Agreement. Upon termination, Recipient shall return to the Provider all unused portions of the Research Materials.

12. Will EPA develop any products or services from information or materials provided by the Recipient?

____ Yes – go to item A

__x__ No – skip to #13 (next clause)

Item A: The EPA has a long history of applying principles of quality assurance/quality control to all technical work conducted by or for the Agency (CIO 2106: USEPA Quality Policy). Given EPA is receiving metabolomics and screening data and will use the metabolomics and screening data for Agency purposes, the Recipient is required to provide EPA with documentation such as a quality manual, describing their organization's quality system. In lieu of such documentation, Standard Operating Protocols for compound handling and the assays performed are acceptable or documentation showing third party accreditation to a relevant standard and scope is also acceptable for documenting an organization's quality system. EPA requirements for quality management plans can be found at this URL:
http://www.epa.gov/quality/qa_docs.html

13. 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:

Provider's Administrative Contact Information:

Kevin Crofton
National Center for Computational Toxicology (NCCT)
US EPA
109 TW Alexander (MD-B-205-01)
Research Triangle Park, NC 27711
For commercial courier address use:
4930 Old Page Rd.
Durham, NC 27703
919-541-3002
crofton.kevin@epa.gov

Recipient's Contact Information:

Attn: Executive Director
UC Davis Innovation*Access*
1850 Research Park Drive, Suite 100
Davis, CA 95618-6134
Tel: 530-754-8649
Fax: 530-754-7620
MTA@ucdavis.edu

14. Paragraphs 2, 7, 9 and 10 shall survive termination.

15. The undersigned Provider and Recipient expressly certify and affirm that the contents of any statements made herein are truthful and accurate.

16. This agreement shall enter into force as of the date of the last signature of the parties and shall remain in effect for one year from said date.

SIGNATURES

FOR THE RECIPIENT:

Acknowledged and Understood by Recipient's Investigator

J. David Furlow
Professor
jdfurlow@ucdavis.edu

8/15/13
Date

Agreed to by Authorized Representative of Institution

~~Jan D. Carmikle~~David R. McGee, Ph.D.
~~Senior Intellectual Property Officer~~
Executive Director

8/22/13
Date

CERTIFICATION OF NO CONFLICT OF INTEREST (EPA ONLY)

I hereby certify that neither I nor any member of my immediate family will benefit in any material way from the execution or failure to execute the attached FTTA Cooperative Agreement or Licensing Agreement except to the extent of participation in royalty sharing as authorized by section 13 of the Stevenson-Wydler Technology Innovation Act, as amended by the Federal Technology Transfer Act of 1986 (15 U.S.C. 3710a et seq.).

I further certify that I have no knowledge of any such conflict by any other person who has participated in any material way in the initiation, design or development of the attached Agreement or who will participate in carrying it out.

Signed:_____

Name: _____

Title: _____

_____

****

FOR THE PROVIDER:

Principal Investigator

_____ 29-Aug-13
Keith Houck
Houck.keith@epa.gov
Date

Authorized Representative of Institution

_____ 8.29.13
Thomas B. Knudsen
Acting Director, NCCT/ORD/EPA
Date

Any false or misleading statements made, presented, or submitted to the Government, including any material omissions, under this Agreement and during the course of negotiation of this Agreement are subject to all applicable civil and criminal statutes including 31 U.S.C. ' ' 3801-3812 (civil liability), 18 U.S.C. ' 1001 (criminal liability), and 31 U.S.C. ' ' 3729-33 (False Claims Act).