

PATENT ASSIGNMENT COVER SHEET

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CONFIRMATORY ASSIGNMENT

This Confirmatory Assignment ("Assignment") is by The Trustees of the University of Pennsylvania ("ASSIGNEE"), having a place of business at 3600 Civic Center Boulevard, 9th Floor, Philadelphia, PA 19104.

WHEREAS, Brett R. Goldsmith ("INVENTOR") is an inventor of the inventions and discoveries disclosed and/or claimed in one or more of the following patents and/or patent applications (the "Patent Properties"):

ASSIGNEE docket no. Y6037

United States patent application no. 61/529,341;
International patent application no. PCT/US12/053085; and
United States patent no. 10,983,117.

ASSIGNEE docket no. Y6117

United States patent application no. 61/566,782;
International patent application no. PCT/US2012/066064;
European patent application no. 12855675.0;
Japan patent application no. 2014-545925; and
United States patent application no. 14/362,798.

WHEREAS, pursuant to the Patent and Tangible Research Property Policies and Procedures of the University of Pennsylvania (attached hereto as Exhibit A) in effect during INVENTOR's employment with ASSIGNEE, the entire right, title, and interest of INVENTOR to the subject matter disclosed and/or claimed in the Patent Properties vested in ASSIGNEE.

NOW, THEREFORE, ASSIGNEE confirms that for good and valuable consideration, it was assigned INVENTOR's entire right, title, and interest, by operation of law and/or agreement, in and to said inventions and discoveries disclosed and/or claimed in the Patent Properties, including the right to file other applications for Letters Patent(s) on said inventions and discoveries in any and all countries, including all divisional, renewal, substitute, continuation, continuation-in-part, international, U.S. non-provisional, and Convention applications based in whole or in part on said inventions and discoveries.

This Assignment is accepted on behalf of The Trustees of the University of Pennsylvania
by:

May 20, 2021

Date

Jennifer Langenberger

Jennifer Langenberger
Executive Director, Intellectual Property

Attachment

Exhibit A - Patent and Tangible Research Property Policies and Procedures of the
University of Pennsylvania

Exhibit A

In October of 2009, the President and the Provost established a committee of representative stakeholders to review and revise the University's Patent Policy. The revised policy was completed in the spring of 2010 and major revisions were reviewed by both the Faculty Senate Executive Committee and the Council of Deans, with each body providing guidance that was taken under advisement by the committee. The proposed revised policy was published For Comment in the *Almanac* (May 25, 2010). A limited number of comments were received and addressed prior to submission of the final draft policy. That policy was adopted by the Trustees at their June 18 meeting and made effective as of July 1, 2010.

— Vincent Price, Provost

— Steven J. Fluharty, Senior Vice Provost for Research

Patent and Tangible Research Property Policies and Procedures of the University of Pennsylvania

(Note: Words appearing in capital letters are defined in Article 5, unless they are defined in the document itself.)

Article 1. Preamble to the Policies and Procedures

1.0 The Trustees of the University of Pennsylvania affirm the following principles as the basis for governing the intellectual property created by faculty, employees, students and guest scholars of the University:

1.1 The mission of the University includes the stimulation of basic and applied research activities of faculty, employees and students of the University, and the dissemination of the results of their research for the purpose of adding to the body of knowledge and serving the public interest.

1.2 The University endeavors, where it deems appropriate, to secure intellectual property protection for the products of such research and to encourage commercial investment in and development of University intellectual property for the benefit of the public.

1.3 The community has endowed the University with certain privileges, resources and assets in the expectation that no single party will derive sole benefit or be unjustly enriched from what the community has endowed to the University.

1.4 The University as a non-profit organization endeavors to marshal its resources and exploit its assets to serve the public interest, and in so doing reinvests in the research enterprises of its faculty, employees and students. Members of the University community share in the University's responsibility to serve the public interest, and have a duty to disclose and assign their inventions.

1.5 The University is regularly the recipient of grants from the government, foundations or commercial enterprises for the support of research, and is subject to legal and contractual obligations imposed by these entities.

1.6 The University wishes to share the economic benefits of inventions or other intellectual property with the creators of such works in a way that is consistent with the research and educational mission of the University, and conforms to the University's obligations to regulatory authorities, research sponsors and licensees.

1.7 In protecting and managing its intellectual property assets, the University insists that the academic freedom of its faculty and students be preserved, and that collegiality and the open expression of ideas by and among members of the University community be encouraged.

Having established the principles governing intellectual property at the University of Pennsylvania, the Trustees hereby decree as follows:

Article 2. Policy and Procedures on Inventions and Patents

2.0 Policy Statement on Inventions and Patents. It is the policy of the University that all INVENTIONS, together with associated MATERIALS, which are conceived or reduced to practice by INVENTORS in the course of employment at the University, or result from work directly related to professional or employment responsibilities at the University, or from work carried out on University time, or at University expense, or with SUBSTANTIAL USE OF UNIVERSITY RESOURCES under grants or otherwise, are the property of the University, effective immediately as of the time such INVENTIONS are conceived or reduced to practice. INVENTORS hereby irrevocably assign to the University all right, title and interest in and to the INVENTIONS, MATERIALS and related patent applications and patents, and shall cooperate fully with the University in the preparation and prosecution of patent applications and patents. Patents, as they may be available on such INVENTIONS, may be applied for in any country by the University. The University will exercise its ownership and management of such INVENTIONS, with or without economic benefit, with due regard for the principles set forth in the Preamble of this Policy. Procedures for implementation of this Policy, including a PARTICIPATION AGREEMENT, shall be developed and promulgated by the President of the University.

2.1 Procedures for the Administration and Management of Inventions and Patents. The following procedures have been approved by the President as of the EFFECTIVE DATE:

2.1.1 Participation Agreement. All faculty, emeritus faculty, visiting faculty or other visitors using research facilities (including but not limited to individuals on sabbatical from another university or research facility), researchers, adjunct faculty, postdoctoral employees and trainees, graduate students, and undergraduate students participating in research as employees or otherwise, and all salaried employees, shall execute a PARTICIPATION AGREEMENT (Appendix A) as a condition of employment, matriculation, participation in research, or use of University resources. Notwithstanding the above, an individual acknowledges that he or she is bound by this Policy by accepting or continuing University employment or by using University resources or facilities, and acknowledges that he or she hereby irrevocably assigns all right, title and interest in and to INVENTIONS, together with associated MATERIALS, and

patent applications and patents which may issue, effective as of his or her first date of employment, matriculation, participation in research, or use of any University resources, whichever occurs first, regardless of whether he or she executes or executed a PARTICIPATION AGREEMENT. All students shall be advised of the University's intellectual property policies and procedures through publication and dissemination in the *Penn Book: Resources, Policies and Procedures Handbook*, and elsewhere.

2.1.2 Disclosure and Review. INVENTORS shall file INVENTION DISCLOSURES for all INVENTIONS covered by the PATENT POLICY promptly with the CENTER FOR TECHNOLOGY TRANSFER (CTT) at the University. CTT shall direct the review and management of the INVENTIONS under procedures and practices monitored by the EXECUTIVE COMMITTEE. CTT will undertake the review of the INVENTION DISCLOSURE within thirty (30) business days after the submission is completed, or, if requested by one or more INVENTORS, CTT will use reasonable efforts to undertake the review sooner if necessary to facilitate an upcoming publication, presentation, or other public disclosure which could adversely affect whether to pursue patent protection. CTT will convey its determination whether the University wishes to retain title to and pursue a patent application on an INVENTION as soon as practicable, in writing, after completing its review of a completed INVENTION DISCLOSURE submission, and use reasonable efforts to convey such decision to all INVENTORS within three (3) months after receiving a complete INVENTION DISCLOSURE submission.

If the University wishes to retain title to an INVENTION, upon the request of the INTELLECTUAL PROPERTY ADMINISTRATOR (IPA), an INVENTOR shall sign all documents necessary for the University to protect an INVENTION, file patent application(s), comply with applicable law in connection with such INVENTION, and confirm in writing the INVENTOR's prior assignment to the University of all right, title and interest in and to such INVENTION.

2.1.3 Inventions Outside the Policy. If a faculty member, emeritus faculty, visiting faculty, other visitor using research facilities, researcher, adjunct faculty, postdoctoral employee or trainee, graduate student, undergraduate student, or salaried employee (an "INDIVIDUAL") believes that a given INVENTION was made outside the scope of the PATENT POLICY, he or she shall provide the IPA with a written statement of the circumstances leading to the making of the INVENTION. If, after reviewing the facts, the IPA determines that the INVENTION falls outside the scope of the PATENT POLICY, the IPA shall confirm in writing within thirty (30) days after receiving such written statement that the University has no right, title and interest to the INVENTION. If the facts are equivocal, or if the IPA believes that such INVENTION falls under the PATENT POLICY, the matter of ownership will be referred by the IPA or the INDIVIDUAL to the APPEALS BOARD, and the APPEALS BOARD shall make a recommendation to the President concerning ownership. Nothing in this PATENT POLICY is intended to imply or assume that an emeritus faculty member is making or has made a SUBSTANTIAL USE OF UNIVERSITY RESOURCES, or imply or assume that his or her invention falls under or outside the scope of this PATENT POLICY.

If an INDIVIDUAL makes an INVENTION which is outside the scope of the PATENT POLICY, and the IPA (or, if appealed, the President) agrees that such INVENTION is outside the scope of the PATENT POLICY, such INDIVIDUAL may request in writing to use the services of CTT in connection with the assessment, protection, and/or commercialization of such INVENTION. CTT, in its sole discretion, may decline, or may elect to use its personnel and services with respect to such INVENTION, on the condition that: (1) the INDIVIDUAL makes ASSIGNMENT to the University in a writing deemed sufficient by CTT; and (2) the INDIVIDUAL shall be deemed to be an INVENTOR and such invention shall be deemed to be an INVENTION within the scope of this PATENT POLICY, for all purposes (including but not limited to distributions), effective as of the date of ASSIGNMENT. The use of CTT shall be deemed to be a SUBSTANTIAL USE OF UNIVERSITY RESOURCES. CTT's decision to decline shall not be reviewable by the APPEALS BOARD.

2.1.4 Student Inventions.

2.1.4.1 INVENTIONS made by undergraduate students will re-

main the property of the students except when an INVENTION is made in the course of employment at the University, or results from work directly related to employment responsibilities at the University, or from work or research performed under a grant or other sponsorship, or undertaken with another INVENTOR who has a duty to make or has made ASSIGNMENT to the University. In such instances, undergraduate students are hereby deemed to have irrevocably transferred and assigned all of their right, title and interest in and to such INVENTION, effective as of the first date conceived or reduced to practice, regardless of whether or when such student executes a PARTICIPATION AGREEMENT or other written agreement confirming assignment, and such undergraduate student shall be deemed an INVENTOR for purposes of sharing in distributions and otherwise pursuant to this Policy.

2.1.4.2 INVENTIONS made by graduate students in the course of employment at the University or research carried out in University laboratories as part of a post-baccalaureate or postdoctoral degree or non-degree program, or resulting from work directly related to the graduate student's employment, training or research responsibilities at the University, or from work or research performed under a grant or other sponsorship, or undertaken with another INVENTOR who has a duty to make or has made ASSIGNMENT to the University, shall be the property of the University and shall be subject to this PATENT POLICY. Any INVENTIONS arising from a dissertation submitted as a part of the requirements for a degree shall be subject to the PATENT POLICY. In such instances, graduate students shall be deemed to have hereby irrevocably made ASSIGNMENT to the University effective as of the first date of matriculation, and will be deemed an INVENTOR for purposes of distributions and otherwise pursuant to this PATENT POLICY, regardless of whether or when such graduate student executes or executed a PARTICIPATION AGREEMENT or other written agreement confirming assignment.

2.1.5 Return of Inventions.

2.1.5.1 Inventions Made without Outside Sponsorship. If an INVENTION is made without sponsorship of the federal government or other sponsor, and the University does not wish to pursue a patent application in the United States or other jurisdiction, or elects to abandon a pending patent application, or does not wish to own an issued patent on a given INVENTION, the IPA may, after consultation with and subject to the approval of the Vice Provost for Research, return all of the University's right, title and interest to the INVENTION, patent application or issued patent to the INVENTORS, subject to and upon the terms and conditions set forth in Section 2.1.5.3.

2.1.5.2 Inventions Made with Outside Sponsorship. If an INVENTION is made with sponsorship of the federal government or other sponsor, and the University does not wish to pursue a patent application in the United States or other jurisdiction, or elects to abandon a pending patent application, or does not wish to own an issued patent on a given INVENTION, and the United States Government or other sponsor waives ownership rights, if any, the IPA may, after consultation with and subject to the approval of the Vice Provost for Research, return all of the University's right, title and interest to the INVENTION, patent application or issued patent to the INVENTORS, subject to any other rights retained by the United States Government or other sponsors, and subject to and upon the terms and conditions set forth in Section 2.1.5.3. If the INVENTION was made with sponsorship of the federal government, the INVENTORS are responsible for obtaining written approvals from the appropriate federal government representatives allowing the University to transfer the University's right, title and interest to the INVENTION to the INVENTORS, and providing such written approvals to CTT prior to any return to the INVENTORS. If the INVENTION was made with sponsorship of the federal government, to the extent applicable under then-current law, the INVENTOR shall use reasonable efforts to arrange for development and commercialization opportunities for the INVENTION, and otherwise comply with all laws regarding the INVENTION and any additional requirements imposed by the federal government when approving the transfer to the INVENTORS.

2.1.5.3 Conditions Regarding Return of Inventions. Prior to the University transferring its right, title and interest to an INVENTION

and any related patent(s) and/or patent application(s), each INVENTOR and CTT shall enter into a written agreement including at least the following terms:

2.1.5.3.1 If the University elects to return an INVENTION made by more than one INVENTOR, the University will return an undivided interest in the whole, as defined by prevailing United States patent law, to each INVENTOR, unless directed otherwise in writing by all INVENTORS.

2.1.5.3.2 In every case in which an INVENTION is returned to an INVENTOR, the University hereby reserves a royalty free, non-exclusive, irrevocable right to practice the INVENTION for research, educational, and clinical care purposes, and to permit other academic institutions and not-for-profit research institutions to do the same.

2.1.5.3.3 The INVENTOR agrees to reimburse the University for all INVENTION ASSESSMENT COSTS. After the effective date of the return of the INVENTION, the University shall not be responsible for paying any ongoing INVENTION ASSESSMENT COSTS or other costs or expenses in connection with the returned INVENTION and any patents or patent applications for the returned INVENTION.

2.1.5.3.4 The INVENTOR (or, if there is more than one INVENTOR, the INVENTORS jointly and severally) shall pay the University fifteen percent (15%) of all GROSS COMPENSATION up to the first One Million Dollars of GROSS COMPENSATION, and ten percent (10%) of all GROSS COMPENSATION in excess of the first One Million Dollars of GROSS COMPENSATION, and report nonconfidential information at least annually to CTT regarding efforts to commercialize the returned INVENTION and GROSS COMPENSATION received.

2.1.5.3.5 Each INVENTOR shall represent and warrant that the INVENTOR has disclosed to CTT, as part of the INVENTION DISCLOSURE or otherwise: the best mode contemplated by the INVENTOR for carrying out the INVENTION; all facts and circumstances relevant to assessing the INVENTION DISCLOSURE and INVENTION; and has answered each question or inquiry from CTT about the INVENTION DISCLOSURE and INVENTION truthfully, to the best of the INVENTOR's knowledge and belief.

2.1.5.3.6 INVENTORS have the obligation to disclose to the IPA, and make ASSIGNMENT of, improvements on returned INVENTIONS at the time such improvements are conceived or reduced to practice, if such improvements are conceived or reduced to practice under circumstances subject to the PATENT POLICY.

2.1.5.3.7 Each INVENTOR shall acknowledge that the transfer of the University's interest in the INVENTION may raise issues under applicable University policies, including without limitation its conflict of interest policies and restrictions on use of University facilities and assets for private purposes, and that the return of an INVENTION does not constitute a waiver of any term in any University policy or its applicability to the INVENTOR. The INVENTOR will agree not to use University resources, personnel, time, facilities or assets to further develop, protect or commercialize the returned INVENTION, unless permitted after review by the University's Conflict of Interest Standing Committee, and approved by the Vice Provost of Research.

2.1.5.3.8 Each INVENTOR will, and will cause any licensees or third persons participating in the development and commercialization of the INVENTION, to indemnify the University from any claims arising out of or resulting from or in connection with the INVENTION and its development and commercialization. The University will transfer its right, title and interest as is, without warranties.

2.2 Conveyance of Rights to Inventions.

2.2.1 Licensing. The University may convey rights to its INVENTIONS through license agreements under the terms of which the University retains all right, title and interest in and to its INVENTIONS, while granting to a commercial entity the right to make, use, and/or sell products based on the INVENTION(S).

2.2.1.1 INVENTORS or other University faculty or employees involved in the licensing of an INVENTION to a prospective licensee shall disclose any fiduciary or financial interest in or contractual relationship with the prospective licensee to their Deans and Chairs, or their relevant administrative supervisor, in accordance with the applicable University

policy on conflicts of interest. In addition, INVENTORS or other University faculty or employees involved in the licensing of an INVENTION to a prospective licensee shall disclose any fiduciary or financial interest in that prospective licensee to the IPA, who shall refer consideration of the matter to the EXECUTIVE COMMITTEE.

2.2.1.2 CTT will notify INVENTORS of prospective licensees in an early stage of the negotiation process. The final decision on whether to license an INVENTION, to whom to license an INVENTION, the terms in the agreements, and otherwise how to proceed with the license rests with CTT, and is not appealable to the APPEALS BOARD or otherwise.

2.2.2 Exceptions to Licensing. Exceptions to the requirement that rights be conveyed through a license agreement shall be considered only in extreme or unusual circumstances and shall require approval by the President of the University.

2.3 Distributions.

(For a hypothetical illustration of the distributions set forth in Sections 2.3.1 and 2.3.2, see Appendix C. Definitions for ADJUSTED CTT REVENUES FOR AN INVENTION, NET CTT INCOME FOR AN INVENTION, and other key definitions are in Article 5.)

2.3.1 Distribution of Adjusted CTT Revenues. ADJUSTED CTT REVENUES for the INVENTION (defined in Section 5.0.1, but generally described as the PRO RATA SHARE of GROSS CTT REVENUES [defined in Section 5.0.13] minus AGGREGATE UNREIMBURSED IP EXPENSES [defined in Section 5.0.20]), shall be distributed as follows:

2.3.1.1 The INVENTORS PERSONAL SHARE shall be thirty percent (30%) of the ADJUSTED CTT REVENUES for the INVENTION (See Sec. 2.3.4).

2.3.1.2 The INVENTORS RESEARCH ACTIVITY SHARE shall be twelve and one-half percent (12.5%) of the ADJUSTED CTT REVENUES for the INVENTION (See Sec. 2.3.5).

2.3.2 Distribution of Net CTT Income. NET CTT INCOME for the INVENTION (defined in Section 5.0.22, but generally described as the amount remaining after distributions in Section 2.3.1, minus the PRO RATA SHARE of AGGREGATE CTT OPERATING COSTS [defined in Section 5.0.3]) shall be distributed as follows:

2.3.2.1 The DEPARTMENTS OF INVENTORS SHARE shall be twenty percent (20%) of the NET CTT INCOME for the INVENTION (See Sec. 2.3.6).

2.3.2.2 The SCHOOLS OF INVENTORS SHARE shall be forty percent (40%) of the NET CTT INCOME for the INVENTION (See Sec. 2.3.7).

2.3.2.3 The UNIVERSITY RESEARCH SHARE shall be forty percent (40%) of the NET CTT INCOME for the INVENTION (See Sec. 2.3.8).

2.3.3 Allocation of the EQUITY POOL. (Procedures governing licensing transactions for EQUITY are set forth in Appendix B). Under license agreements for which the University has negotiated an EQUITY POOL, where, in accordance with Appendix B.4, EQUITY will be issued directly to the INVENTOR(S), the INVENTORS shall receive thirty percent (30%) of the EQUITY POOL, unless one or more INVENTOR receives EQUITY from the licensee outside of the EQUITY POOL. An INVENTOR who receives EQUITY from the licensee outside of the EQUITY POOL shall not receive EQUITY from the EQUITY POOL except with approval of the University. The IPA shall make a recommendation in this regard to the Vice Provost for Research, who shall make a determination in consultation with the relevant Deans. Furthermore, if one or more INVENTOR receives EQUITY outside of the EQUITY POOL, the portion of the EQUITY POOL to be received by the other INVENTORS shall be reduced in proportion to the contribution to the licensed INVENTIONS, as determined by CTT, made by the INVENTORS who receive EQUITY outside of the EQUITY POOL.

2.3.3.1 INVENTORS receiving EQUITY from the EQUITY POOL or outside the EQUITY POOL may also receive INVENTORS PERSONAL SHARE of ADJUSTED CTT REVENUES FOR THE INVENTION. An exception to this may arise in certain circumstances, such as when INVENTORS receive founders EQUITY, EQUITY for consult-

ing services or other consideration from the licensee. In such cases, the University may determine that such INVENTORS shall not receive some or any of the INVENTORS PERSONAL SHARE OF ADJUSTED CTT REVENUES for the INVENTION. The IPA shall make a recommendation in this regard to the Vice Provost for Research, who shall make a determination in consultation with the relevant Deans.

2.3.3.2 Non-cash Component of License. Any tangible, non-cash considerations (except EQUITY) in licenses will be distributed by CTT on a case by case basis, in consultation with the INVENTOR(S), Vice Provost for Research, and the relevant Dean(s).

2.3.4 Rules Governing the Inventors Personal Share. The INVENTORS PERSONAL SHARE OF ADJUSTED CTT REVENUES for the INVENTION, under Section 2.3.1.1, shall be distributed among all INVENTORS (if more than one), as the INVENTORS unanimously designate in writing to the IPA. If the INVENTORS fail to make such unanimous written designation before the license agreement is executed, the INVENTORS PERSONAL SHARE OF ADJUSTED CTT REVENUES shall be distributed among all INVENTORS as CTT, in its sole discretion, shall designate. The INVENTORS share of the EQUITY POOL under Section 2.3.3 shall be distributed among all INVENTORS entitled to share in the EQUITY POOL (if more than one), as such INVENTORS unanimously designate in writing to the IPA. If the INVENTORS fail to make such unanimous written designation before the license agreement is executed, the INVENTORS share of the EQUITY POOL shall be distributed among INVENTORS entitled to share in the EQUITY POOL as CTT, in its sole discretion, shall designate.

2.3.4.1 If an INVENTOR ceases employment at and association with the University, his or her designated portion of the INVENTORS PERSONAL SHARE OF ADJUSTED CTT REVENUES under Section 2.3.1.1 and of the INVENTORS share of the EQUITY POOL under Section 2.3.3 shall remain payable to such INVENTOR. If an INVENTOR dies, his or her designated portion of the INVENTORS PERSONAL SHARE shall remain payable to his or her estate.

2.3.5 Rules Governing the Inventors Research Activity Share. The INVENTORS RESEARCH ACTIVITY SHARE, when the INVENTORS are faculty, shall be used only for research purposes approved by the Department Chair(s) of the relevant Department(s).

2.3.5.1 The INVENTORS RESEARCH ACTIVITY SHARE shall be divided among the INVENTORS (if more than one) in the same proportion as the INVENTORS PERSONAL SHARE is divided among the INVENTORS (the "DESIGNATED PROPORTION"), unless the INVENTORS unanimously request in writing, and the Dean(s) of the relevant School(s) and Vice Provost for Research approve, some other distribution.

2.3.5.2 If a sole faculty INVENTOR is no longer employed by or associated with the University, the INVENTORS RESEARCH ACTIVITY SHARE shall be distributed to the INVENTOR'S School at the University to support research in the School. If there is more than one faculty INVENTOR, and one of those INVENTORS is no longer employed by or associated with the University, that share shall be distributed evenly to support the research activity of the INVENTORS who remain. If no faculty INVENTORS remain employed by or associated with the University, the INVENTORS RESEARCH ACTIVITY SHARE will be distributed to the INVENTORS School(s) to support research in the School(s).

2.3.5.3 When an INVENTOR is an undergraduate student, the INVENTORS RESEARCH ACTIVITY SHARE shall be distributed to the University's Center for Undergraduate Research and Fellowships (CURF) or its successor organization, or if no successor organization, to the Provost's Office to be used to further and support research by undergraduate students, through a budget approved by the Provost. When INVENTORS are graduate students or postdoctoral employees or trainees, the corresponding INVENTORS RESEARCH ACTIVITY SHARE shall be distributed to the laboratory to which they are primarily assigned or in which they primarily conducted the research leading to the INVENTION. If such INVENTORS do not have a primary laboratory affiliation, their corresponding INVENTORS RESEARCH ACTIVITY SHARE shall be distributed to their Department. Amounts so distributed shall be used to

further the education and research activity of the INVENTOR while at the University and/or for other research purposes through a budget approved by the Department Chair(s) of the relevant Department(s).

2.3.5.4 When an INVENTOR is an emeritus faculty member at the time of the INVENTION, the INVENTORS RESEARCH ACTIVITY SHARE shall be distributed equally between the INVENTOR'S last SCHOOL and the INVENTOR'S last Department before assuming emeritus status, unless that emeritus faculty INVENTOR, and his/her Dean and Department Chair, agree in writing upon a different distribution, after a meeting with participation by the IPA and a representative from the Vice Provost for Research's Office. Such different distribution may include, without limitation, payment of all or a portion of such INVENTORS RESEARCH ACTIVITY SHARE to the emeritus faculty as part of his or her INVENTORS PERSONAL SHARE. Any such proposed different distribution of an INVENTORS RESEARCH ACTIVITY SHARE for an emeritus faculty INVENTOR is subject to review and approval by the Vice Provost for Research. The emeritus faculty INVENTOR may appeal the inability to reach an agreement upon a different distribution, or any disapproval by the Vice Provost for Research, to the Appeals Board. Amounts received by the School and/or the Department shall be used for research purposes only through a budget approved by the Dean(s) of the relevant School(s).

2.3.6 Rules Governing the Departments of Inventors Share.

The DEPARTMENTS OF INVENTORS SHARE shall be used only for research purposes through a budget approved by the Dean(s) of the relevant School(s).

2.3.6.1 If an INVENTION is made by INVENTORS within a Division, Research Center, or Institute, the Department(s) of the INVENTORS may make an equitable distribution of income to that Division, Research Center, or Institute from the DEPARTMENTS OF INVENTORS SHARE.

2.3.6.2 If an INVENTION is made by INVENTORS from different Departments, the DEPARTMENTS OF INVENTORS SHARE shall be divided among the Departments in the DESIGNATED PROPORTION. A Department shall retain its portion of the DEPARTMENTS OF INVENTORS SHARE if an INVENTOR from that Department is no longer employed by or associated with the Department or the University.

2.3.7 Rules Governing the Schools of Inventors Share. The SCHOOLS OF INVENTORS SHARE may be used for any research purpose designated by the Dean(s) of the School(s). At the discretion of the Dean(s), any portion of the SCHOOLS OF INVENTORS SHARE may be distributed to Department(s) of the INVENTORS or used to support the research activity of the INVENTORS.

2.3.7.1 If an INVENTION is made by INVENTORS from different Schools, the SCHOOLS OF INVENTORS SHARE shall be divided among the Schools in the DESIGNATED PROPORTION. A School will retain its portion of SCHOOLS OF INVENTORS SHARE if an INVENTOR from that School is no longer employed by or associated with the School or the University.

2.3.8 Rules Governing the University Research Share. The UNIVERSITY RESEARCH SHARE shall be used for the general support of research at the University as determined by the Provost. The Provost will release periodic reports describing the use of these funds.

2.3.9 Periodic Reports of Use of Funds to Support Research. The Deans of each School that receives funds during the Fiscal Year as SCHOOLS OF INVENTORS SHARES or DEPARTMENTS OF INVENTORS SHARES shall release a report to the Vice Provost for Research at least once during the subsequent Fiscal Year describing the use of these funds for research purposes and the support of research.

2.3.10 Invention Revenue Distribution for Non-Academic Inventors. When an INVENTOR is other than a faculty member, emeritus faculty, employee of an academic laboratory, student or postdoctoral employee or trainee, the distribution of ADJUSTED CTT REVENUES FOR THE INVENTION (other than the INVENTORS PERSONAL SHARE) and NET CTT INCOME for the INVENTION shall be determined by the President on a case-by-case basis with a recommendation from the IPA together with the Executive Vice President, the Vice Provost

for Research, the Chief Executive Officer of the Medical Center (where applicable), relevant Deans, and/or other involved administrative heads.

2.3.11 INVENTORS with Joint Appointments. If an INVENTOR has joint appointments in two or more Schools or Departments and there is no primary appointment (for example only, a Penn Integrates Knowledge professor), the Deans shall determine an equitable apportionment of that INVENTOR's portion of the INVENTORS RESEARCH ACTIVITY SHARE, DEPARTMENTS OF INVENTORS SHARE, and SCHOOLS OF INVENTORS SHARE, unless the Deans of such Schools had previously agreed on an allocation for such INVENTOR.

2.4 Implementation of Procedures for Distributions.

2.4.1 inventions Disclosed and Licensed After the Effective Date. Distributions from all INVENTIONS disclosed and licensed on or after the EFFECTIVE DATE shall be governed by the procedures in Section 2.3.

2.4.2 inventions Disclosed Before the Effective Date, but Licensed After the Effective Date. Distribution of income from all INVENTIONS disclosed before the EFFECTIVE DATE, but not yet subject to a license agreement as of the EFFECTIVE DATE, shall be governed by the procedures in Section 2.3.

2.4.3 inventions Disclosed and Licensed Before the Effective Date. All distributions during and after the fiscal year that the revised policy becomes effective, including distributions for an INVENTION whose disclosure or licensing was completed prior to the EFFECTIVE DATE of the revised policy, will be made according to the revised policy, and shall thus be governed by the procedures in Section 2.3.

2.5 Administration of Distributions and Reporting. Distributions, with a report outlining how the amounts were calculated, shall be made to each recipient within forty-five (45) days after the end of the FISCAL YEAR. The University will not pay interest on amounts received and held by the University pending distribution.

2.6 Use of Outside Facilities. Faculty members, employees or students who use research facilities at another institution or a corporation (including, without limitation, when on sabbatical from the University or as visiting faculty or visiting researchers) shall contact the IPA prior to commencing such use, for assistance in evaluating the policies of the host institution or corporation as appropriate. Graduate students who are conducting research in commercial research facilities should obtain a written assurance of their right to publish the results of their research. Faculty members, employees or students who engage in outside employment or consulting agreements are referred to Article 3.

Article 3. Policy and Procedures Relating to Consulting and Outside Activities

3.1 Consulting Policy. As stated in the University policy entitled "Conflict of Interest Policy for Faculty Members" (Section II.E.10 of the *Handbook for Faculty and Academic Administrators*), the University recognizes the value to the institution and to its faculty of permitting the faculty to engage in extramural consulting activities. These activities offer the potential of strengthening the competence and expertise of the faculty as scholars, as well as the potential of developing the intellectual property owned by the University. In all circumstances where consulting activities may result in the creation of an INVENTION, the following procedures and principles apply:

3.1.1 To ensure that the consulting activities are consistent with faculty members' professional obligations to the University, responsibilities with respect to the avoidance of conflicts of interest, and to their commitments for teaching and research, faculty members should comply with the provisions of Section II.E.10 of the *Handbook* which include both the prospective disclosure of the potential consulting activities to their Department Chairs and School Deans, as well as written reports on such activities as set forth in the *Handbook*, or other related procedures established by their School or Department.

3.1.2 In any case where the faculty member, Department Chair, or Dean believes that there is a potential conflict of interest or conflict of commitment, the matter shall be referred to the University Conflict of

Interest Standing Committee. The Committee shall review the matter and make recommendations to the Provost, or his/her designee, who has the authority to approve, modify, or disapprove any consulting arrangement that raises a potential conflict. In determining whether review by the Conflict of Interest Standing Committee is appropriate, the faculty member, Department Chair, or Dean may consult with the General Counsel.

3.1.3 In all consulting relationships, faculty members have the duty to protect any intellectual property owned by the University and the ability of the University to fulfill its obligations to government funding agencies and commercial and non-commercial sponsors of research.

3.2 Consulting Agreements. Except to the extent set forth in Section 3.4 below, faculty members contemplating entering into a consulting agreement shall ensure that his/her obligations under the PATENT POLICY are not compromised and the University's rights are protected. Specifically, faculty members have the responsibility to ensure that the following terms are not part of any consulting agreement: (1) confidentiality provisions that prevent the individual from publishing research or from reporting results of University research to research sponsors; (2) confidentiality provisions that prevent the individual from providing TANGIBLE RESEARCH PROPERTY or other deliverables to a University research sponsor or other entity as required by federal law, federal regulation, or by sponsor agreement; (3) intellectual property provisions that preclude the consultant from assigning any inventions that arise out of the consulting relationship to the University; and (4) any provisions that are designed to circumvent University policies and procedures for the disclosure, review and approval of sponsored research projects or other University policies concerning intellectual property. Moreover, in the context of academic research, it may be difficult to avoid commingling of research activity or resources with services provided under the consulting agreement. It is the obligation of the faculty member in negotiating the consulting agreement to ensure that any consulting relationship entered into protects against any such commingling of research or resources.

3.2.1 Faculty members may seek the assistance of the IPA in determining whether a proposed agreement conforms to these guidelines. Such assistance should not be construed to be advice or counsel as to the faculty member's personal interests in the consulting agreement.

3.3 Consulting Activity with a Company Providing Sponsored Research. In addition to the procedures set forth above, if a faculty member contemplates a consulting relationship with a company that sponsors research for that individual at the University, the proposed consulting agreement shall be disclosed to the IPA, along with an explanation of the nature and scope of the individual's anticipated activities. The IPA shall refer the matter to the University Conflict of Interest Standing Committee, with copies of all applicable documentation to relevant Deans, Department Chairs and the General Counsel, or his/her designee, for review. The Committee shall make recommendations to the Provost, or his/her designee, who shall have the authority to approve, modify or disapprove any such proposed agreements.

3.4 Exception to the General Consulting Policy. Notwithstanding the policies articulated in Article 2.0 above, and in the general consulting policy set forth above, the University recognizes that faculty members may seek to undertake consulting engagements, at the direction of a firm or entity other than the University, that may require that any resulting INVENTIONS be assigned to the sponsor of the engagement. While not providing the University with ownership of the INVENTION, these consulting engagements may nevertheless provide significant benefits to faculty members and to the University. For this reason, it is the policy of the University to authorize a Dean, in his or her discretion, to permit these consulting engagements, without claiming any ownership interest in the INVENTION for the University, under the following conditions.

3.4.1 Conditions for Consulting Engagements. In order for a faculty member and his or her particular proposed consulting engagement to be eligible for consideration under this exception to the consulting policy: (1) The engagement must be consistent with the policy on "Conflict of Interest Policy for Faculty Members" (*Handbook for Faculty and Academic Administrators*, II.E.10); (2) no undergraduate or graduate students may be involved in the engagement; (3) the faculty member

must be compensated in cash, and the compensation must be fixed and not variable, must reflect the fair market value of the consulting to be performed, and must not vary according to the perceived value of INVENTIONS assigned. (The faculty member may not be compensated with EQUITY or any form of contingent or variable compensation, including but not limited to options, warrants, royalties, or a payment that varies based upon the sales, revenues or other perceived success of an INVENTION or product or service based upon such INVENTION); (4) the faculty member may not have a SIGNIFICANT EQUITY INTEREST in the sponsoring entity or an affiliate of that entity; (5) performance of the engagement may not involve the use of any University facilities, personnel, equipment or assets, except for *de minimus* amounts or uses; and (6) the terms of the engagement must not conflict with any existing commitments under sponsored research or otherwise for ownership of resulting inventions, and shall not make assignment of ownership of any future INVENTION not conceived and reduced to practice during the term of, and as a direct and sole result of performing, the consulting engagement.

3.4.2 Procedures for Disclosing Consulting Engagements. To qualify for consideration under Section 3.4 and allow for meaningful advance review, the specific terms of the proposed agreement must be disclosed to the Department Chair and the Dean at a reasonable time prior to the commencement of the engagement and, in all circumstances, prior to the faculty member entering into any legally binding agreement to engage in the engagement. The engagement and its terms must be reported to the Department Chair and the Dean, in writing, on an annual basis. If the Dean determines, after consultation with the Department Chair and the IPA that criteria set forth in Section 3.4.1 have been met, the Dean may approve the engagement, in his or her discretion, but is not required to approve the engagement. If the Dean determines that the criteria set forth in Section 3.4.1 have not been met, or otherwise declines to approve the engagement, the Dean should so notify the faculty member, who may then seek review of the decision by the Provost (the Dean's determination, and any determination by the Provost, shall not be appealable to the APPEALS BOARD or otherwise). The Dean should notify the faculty member of his or her decision promptly, and if possible, within thirty (30) days of receipt of the disclosure.

3.4.3 Procedures for Waiver of Conditions. Should a faculty member seek to undertake a consulting engagement that is neither within the general consulting policy, nor satisfies the criteria of Section 3.4.1, the faculty member may request a waiver from the Dean to permit the faculty member to enter into the consulting arrangement. After consulting with the General Counsel, the Provost or his/her designee and the IPA, the Dean may grant the waiver. If the Dean determines that, under the facts and circumstances of the particular case, the waiver would undermine the principles underlying the PATENT POLICY, violate any legal or regulatory requirement, present an unmanageable conflict of interest or otherwise violate University policy, the Dean should deny the waiver and notify the faculty member. The decision should be made and communicated to the faculty member as promptly as possible, generally within fifteen (15) days of receipt of the waiver request. Should the waiver be denied, the faculty member may appeal the decision to the Provost, whose decision shall be final and not appealable to the APPEALS BOARD or otherwise.

3.4.4 Liability when Consulting. Faculty members entering into consulting engagements should understand that they are undertaking personal responsibilities and may be assuming certain personal risks of liability. For that reason, all faculty members may wish to seek personal legal counsel, at their own expense, for the purpose of reviewing proposed consulting agreements so as to protect their personal interests. To the extent, however, that faculty members are availing themselves of this exception to the PATENT POLICY, they are doing so entirely at their own risk and are not, in any way, protected by the University. For this reason, faculty members are well advised to seek personal legal advice before entering into such a consulting relationship.

3.5 Application of the Consulting Policy and Procedures to Administrators and Staff. The University recognizes the value to the institution and of permitting administrators and staff, as well as faculty, to engage in extramural consulting activities, under certain circumstances.

Except as specifically set forth below, the above policy applies to administrators and staff who seek to enter into consulting engagements.

3.5.1 Staff and administrators who contemplate entering into consulting engagements are subject to the "Guidelines for Extramural Activities, Associations, and Interest for Staff" (*Human Resources Policy Manual*, Policy No. 006, effective 2/1/1990) and should follow the procedures for disclosure and clearance of potential conflict of interest issues set forth in those guidelines.

3.5.2 Section 3.4 does not apply to administrators or staff.

3.6 Sections 3.1 through 3.5, inclusive, set forth how decisions and other actions may be appealed, and, therefore, the APPEALS BOARD shall not have any jurisdiction regarding a decision or action arising under or out of this Article 3.

Article 4. Policy and Procedures Relating to Tangible Research Property

4.0 Policy Statement on Tangible Research Property. TANGIBLE RESEARCH PROPERTY made by INVESTIGATORS in the course of employment at the University, or work or research directly related to professional, educational or employment responsibilities, or work or research carried out on University time, or at University expense or with SUBSTANTIAL USE OF UNIVERSITY RESOURCES under grants or otherwise, is the property of the University. INVESTIGATORS hereby irrevocably assign to the University all right, title and interest in and to the TANGIBLE RESEARCH PROPERTY and shall cooperate fully with the University in the preparation and prosecution of patents or other intellectual property protection, if available and applicable. The University and INVESTIGATORS will endeavor to make such property available to the research community on a reasonable basis, consistent with other University policies, procedures and legal obligations, and pursuant to a written agreement in a form approved by the Office of the General Counsel, including but not limited to a materials transfer agreement, license agreement, deposit to a research or data bank repository, or other form of agreement.

4.1 Disclosure to CTT. INVESTIGATORS shall disclose new TANGIBLE RESEARCH PROPERTY promptly to CTT.

4.2 Revenues from Transfer of Tangible Research Property. Unless prohibited by law or the terms of a grant, award or contract under which TANGIBLE RESEARCH PROPERTY is developed:

4.2.1 If the TANGIBLE RESEARCH PROPERTY is protected by one or more patent(s) anywhere in the world, or CTT has filed one or more patent application(s) anywhere in the world claiming patent protection for an aspect of such TANGIBLE RESEARCH PROPERTY, then such TANGIBLE RESEARCH PROPERTY shall be treated as much as possible as an INVENTION for purposes of this PATENT POLICY, and all GROSS CTT REVENUES from such TANGIBLE RESEARCH PROPERTY shall be distributed pursuant to Section 2.3 above as if such TANGIBLE RESEARCH PROPERTY were an INVENTION, including but not limited to a deduction from GROSS CTT REVENUES of AGGREGATE UNREIMBURSED IP EXPENSES prior to distribution of the ADJUSTED CTT REVENUES for such TANGIBLE RESEARCH PROPERTY.

4.2.2 In any case not governed by Section 4.2.1 above (for example, where CTT did not file any patent application anywhere in the world claiming patent protection for an aspect of the TANGIBLE RESEARCH PROPERTY), CTT shall determine the GROSS CTT REVENUES for the TANGIBLE RESEARCH PROPERTY. Then, CTT shall determine, in conjunction with the INVESTIGATORS and the appropriate University staff, the applicable TANGIBLE RESEARCH PROPERTY DIRECT GENERATION COSTS. The TANGIBLE RESEARCH PROPERTY DIRECT GENERATION COSTS shall be reimbursed to the University account(s) of the INVESTIGATOR(S) and/or such other School, Department or other accounts from which portions of the TANGIBLE RESEARCH PROPERTY DIRECT GENERATION COSTS were paid. The amount remaining, if any, after deducting the TANGIBLE RESEARCH PROPERTY DIRECT GENERATION COSTS from the GROSS CTT REVENUES for the TANGIBLE RESEARCH PROPERTY, shall be

defined as the ADJUSTED CTT REVENUES for such TANGIBLE RESEARCH PROPERTY. The ADJUSTED CTT REVENUES for the TANGIBLE RESEARCH PROPERTY or NET CTT INCOME for the TANGIBLE RESEARCH PROPERTY (as the case may be) shall be distributed in accordance with Section 2.3 above (substituting the INVESTIGATOR(S) for the INVENTOR(S) and the TANGIBLE RESEARCH PROPERTY for the INVENTION, where applicable in applying this PATENT POLICY):

4.2.2.1 Thirty percent (30%) of ADJUSTED CTT REVENUES for the TANGIBLE RESEARCH PROPERTY as the INVESTIGATORS PERSONAL SHARE (see Sec. 2.3.4)

4.2.2.2 Twelve and one-half percent (12.5%) of ADJUSTED CTT REVENUES for the TANGIBLE RESEARCH PROPERTY as the INVESTIGATORS RESEARCH ACTIVITY SHARE (see Sec. 2.3.5)

4.2.2.3 Twenty percent (20%) of NET CTT INCOME for the TANGIBLE RESEARCH PROPERTY as the DEPARTMENTS OF INVESTIGATORS SHARE (see Sec. 2.3.6)

4.2.2.4 Forty percent (40%) of NET CTT INCOME for the TANGIBLE RESEARCH PROPERTY as the SCHOOLS OF INVENTORS SHARE (see Sec. 2.3.7)

4.2.2.5 Forty percent (40%) of NET CTT INCOME for the TANGIBLE RESEARCH PROPERTY as the UNIVERSITY RESEARCH SHARE (see Sec. 2.3.8).

4.3. Program Income and Sponsored Awards. INVESTIGATORS and CTT shall report any GROSS CTT REVENUES from TANGIBLE RESEARCH PROPERTY to the Office of Research Services for a determination whether such revenues must be reported to a funding agency or sponsor as program income. In those circumstances in which GROSS CTT REVENUES from the TANGIBLE RESEARCH PROPERTY may be considered program income under federal law, or grant, award or contract terms, or where the distribution formula set forth in Sections 4.2.1 and 4.2.2 above would cause the University to violate law or grant, award or contract terms, the UNIVERSITY will comply with applicable law and the sponsor's terms in the use and/or distribution of any GROSS CTT REVENUES as program income or otherwise, and otherwise equitably share any ADJUSTED CTT REVENUES for such TANGIBLE RESEARCH PROPERTY, if any.

Article 5. Definitions and Miscellaneous

5.0.1 TOTAL ADJUSTED CTT REVENUES means GROSS CTT REVENUES minus AGGREGATE UNREIMBURSED IP EXPENSES. **ADJUSTED CTT REVENUES FOR AN INVENTION** means the PRO RATA SHARE of the TOTAL ADJUSTED CTT REVENUES.

5.0.2 ADJUSTED PROCEEDS FOR AN INVENTION means ADJUSTED CTT REVENUES FOR AN INVENTION, minus the INVENTORS PERSONAL SHARE and minus the INVENTORS RESEARCH ACTIVITY SHARE.

5.0.3 AGGREGATE CTT OPERATING COSTS means all of CTT's internal or out-of-pocket expenses to operate CTT, as allocated to and determined by the University, during a Fiscal Year, including, without limitation: salaries, benefits and other personnel costs; expenses related to licensing and distribution, and attempts to license and/or distribute, INVENTIONS, TANGIBLE RESEARCH PROPERTY, copyrightable works, and trademarks; fees and expenses paid to third persons (excluding any amounts included within IP EXPENSES); overhead expense; finder's fees or commissions; EQUITY or other consideration paid or due to patent management organizations; expenses in connection with the sale, investment or management of EQUITY or the EQUITY POOL; litigation or dispute resolution costs and expenses (not otherwise included within IP EXPENSES); and consideration paid or due third persons as a result of settlement of or judgment in a dispute; applicable taxes (if any), and other operating expenses the University allocates to CTT. Notwithstanding the foregoing sentence, AGGREGATE CTT OPERATING COSTS excludes UNREIMBURSED IP EXPENSES and REIMBURSED IP EXPENSES.

5.0.4 APPEALS BOARD means a group of nine (9) voting members (seven [7] standing members and two [2] ad hoc members). The seven standing members shall be comprised of: one (1) voting Chair, appointed by the Faculty Senate and who shall be a Standing Faculty member; four (4) administrators (each appointed by the Vice Provost for Research); and

two (2) term faculty appointed by the Faculty Senate. The two (2) ad hoc members shall be faculty selected for expertise by the Dean(s) of the relevant School(s) or the Chair(s) of the relevant Departments(s), except that if one or more of the individuals involved in the appeal is an emeritus faculty, the two ad hoc voting members selected by the Dean(s) or Department Chair(s) shall be emeritus faculty, and if one or more of the individuals involved in the appeal is a graduate student, the two ad hoc voting members selected by the Dean(s) or Department Chair(s) shall be graduate students. In addition, the APPEALS BOARD shall include one nonvoting member *ex officio*, who shall be an attorney from the Office of the General Counsel and appointed by the General Counsel. The APPEALS BOARD shall be staffed by the Office of the Vice Provost for Research.

5.0.5 ASSIGNMENT means the execution of a written agreement by an INVENTOR assigning all of the INVENTOR'S right, title and interest in and to an INVENTION or TANGIBLE RESEARCH PROPERTY. INVENTIONS are deemed automatically and irrevocably assigned, effective as of the time they are conceived or reduced to practice, regardless of whether or when such individual executes a PARTICIPATION AGREEMENT or other written agreement confirming assignment.

5.0.6 CENTER FOR TECHNOLOGY TRANSFER (CTT) means the administrative unit, under the direction of the INTELLECTUAL PROPERTY ADMINISTRATOR, which is responsible for the receipt, review, management and administration of intellectual property matters of the University.

5.0.7 EFFECTIVE DATE means the earlier of July 1, 2010 or the date this version of this PATENT POLICY was adopted by the Trustees of the University.

5.0.8 EQUITY means ownership interests or securities, including but not limited to shares of stock or securities; stock options; warrants or any other rights to purchase stock or securities; debt instruments; partnership interests in a general or limited partnership; or membership interests in a limited liability company or partnership.

5.0.9 EQUITY POOL means the total allotment of EQUITY negotiated by the University as consideration for a license of the University's interests in an INVENTION or TANGIBLE RESEARCH PROPERTY.

5.0.10 EXECUTIVE COMMITTEE is appointed by the Provost in consultation with the Vice Provost for Research, and chaired by the Vice Provost for Research. The EXECUTIVE COMMITTEE is comprised of the INTELLECTUAL PROPERTY ADMINISTRATOR, *ex officio*; the Vice Provost for Research; the Dean of the School of Medicine or his/her designee; one faculty from each of the School of Arts and Sciences and the School of Engineering and Applied Science; one at-large faculty; and an attorney from the Office of the General Counsel selected by the General Counsel, who shall be non-voting and *ex officio*. The Executive Committee's charge is to provide oversight and steering of the technology transfer process. Together with the Vice Provost for Research, the Executive Committee will assist the Provost in setting the operating budget for CTT.

5.0.11 FISCAL YEAR means the period from July 1 through June 30 (or, should the University adjust its fiscal year, the same period as the University's then-current fiscal year for federal tax purposes.)

5.0.12 GROSS COMPENSATION means all cash or other compensation received or to which someone is entitled due to or arising out of or related to or in connection with the licensing, sale, development, commercialization, or other exploitation of the INVENTION, including without limitation royalties, sales receipts, upfront payments, option fees, milestone payments, equity proceeds, other securities or investments, infringement or settlement proceeds, or other forms of monetization or compensation.

5.0.13 GROSS CTT REVENUES means all gross revenues actually received by CTT during the previous Fiscal Year from all agreements arising out of or related to or in connection with the licensing, development, commercialization, or other exploitation of an INVENTION or TANGIBLE RESEARCH PROPERTY, or intellectual property related to an INVENTION or TANGIBLE RESEARCH PROPERTY, whether involving patents, know-how, trademarks, copyrights, and/or other forms of intellectual property, but excluding: (1) payments made to the Univer-

sity under sponsored research agreements or research awards, grants and contracts; (2) revenues payable to a third party sponsor or funder pursuant to a funding agreement, where performance of the sponsored or funded research directly gave rise to the INVENTION or TANGIBLE RESEARCH PROPERTY; (3) revenues related to the licensing of a University or Penn Medicine trademark (e.g., trademark royalties in connection with Penn-branded apparel, etc.) and unrelated to the licensing, development or other exploitation of an INVENTION or TANGIBLE RESEARCH PROPERTY; and (4) consideration payable to a university or other third party related to co-inventor(s) or contributors to INVENTIONS or TANGIBLE RESEARCH PROPERTY having a duty to assign to such university or other third party (for example only, revenues payable to another institution due to joint inventorship or inter-institutional arrangements.) GROSS CTT REVENUES includes, without limitation: license fees; license maintenance fees; minimum royalties; sublicense payments; milestone payments; option fees; royalties on sales of products and services; proceeds realized from the sale or other disposition of EQUITY from an EQUITY POOL; dividends and other monetary distributions related to EQUITY from an EQUITY POOL; and settlements of lawsuits or intellectual property disputes with third parties related to an INVENTION DISCLOSURE, INVENTION or TANGIBLE RESEARCH PROPERTY. GROSS CTT REVENUES does not include REIMBURSED IP EXPENSES.

5.0.14 INTELLECTUAL PROPERTY ADMINISTRATOR (IPA) means the Executive Director of CTT (or his or her successor, as designated by the Vice Provost for Research).

5.0.15 INVENTION means and includes technical information, trade secrets, developments, discoveries, inventions, know-how, methods, techniques, formulae, data, processes and other proprietary ideas or matter.

5.0.16 INVENTION DISCLOSURE means the written submission to the IPA, on standard invention disclosure forms available from CTT, of a written description of any INVENTION that an INVENTOR believes he or she has made.

5.0.17 INVENTORS means University faculty, emeritus faculty, visiting faculty or researchers, adjunct faculty, postdoctoral employees or trainees, or other employees, or students, or others who individually or jointly make an INVENTION subject to the PATENT POLICY and who meet the criteria for inventorship under United States patent laws and regulations.

5.0.18 INVENTION ASSESSMENT COSTS means all historic out-of-pocket costs and expenses related to the review, assessment and protection of the INVENTION DISCLOSURE and the INVENTION, including without limitation patent and copyright application costs and expenses, legal fees, filing fees, search fees, fees for legal opinions, patent maintenance fees, IP EXPENSES, and any other out-of-pocket transactional costs attributable to the INVENTION DISCLOSURE and the INVENTION.

5.0.19 INVESTIGATOR means any University faculty member, emeritus faculty, visiting faculty or researcher, adjunct faculty, postdoctoral employee or trainee, or other employee, or an undergraduate or graduate student engaged in sponsored or unsponsored research.

5.0.20 IP EXPENSES means all out-of-pocket expenses incurred or accrued during the previous Fiscal Year by CTT arising out of or related to or in connection with the review, assessment, protection, licensing, defense, enforcement, or audit of intellectual property rights related to INVENTION DISCLOSURES, INVENTIONS, TANGIBLE RESEARCH PROPERTY, and copyrightable works, or the defense, enforcement or audit of licenses or other agreements related to INVENTION DISCLOSURES, INVENTIONS, TANGIBLE RESEARCH PROPERTY, or copyrightable works, including but not limited to: outside legal and patent agent fees and expenses; search fees and expenses; application fees; fees for legal opinions; government filing and maintenance fees; legal fees to defend or enforce intellectual property, license agreements, option agreements, confidentiality agreements, or other agreements related to the INVENTION DISCLOSURE, INVENTION, TANGIBLE RESEARCH PROPERTY or copyrightable work; fees and expenses to audit licensees and related agreements; and other out-of-pocket transactional costs relat-

ed to patent, copyright, trademark and other intellectual property protection or licensing anywhere in the world. **REIMBURSED IP EXPENSES** means IP EXPENSES for which CTT received or accrued payment or reimbursement from a licensee, INVENTOR or third person before the end of the Fiscal Year. **AGGREGATE UNREIMBURSED IP EXPENSES** means all of the IP EXPENSES which remain unpaid and unreimbursed from a licensee, INVENTOR or third person at the end of the Fiscal Year, as shown in the accounting records of CTT (excluding accrued payments or reimbursements.)

5.0.21 MATERIALS means lab notebooks, records, drawings, sketches, photographs, radiographs or other images, models, biological specimens, chemical samples, or other materials needed to support the preparation, submission, prosecution, defense or enforcement of a patent in the United States or other applicable jurisdictions.

5.0.22 NET CTT INCOME FOR AN INVENTION means the ADJUSTED PROCEEDS FOR AN INVENTION, minus the PRO RATA SHARE of the AGGREGATE CTT OPERATING COSTS. If zero or a negative number, then there is no NET CTT INCOME FOR AN INVENTION. (As an example, if the ADJUSTED PROCEEDS FOR AN INVENTION equals \$273,125, the PRO RATA SHARE is five percent (5%), and the AGGREGATE CTT OPERATING COSTS equals \$4,500,000, the NET CTT INCOME FOR AN INVENTION equals [\$273,125 minus (0.05 x \$4,500,000)], or \$48,125.)

5.0.23 PATENT POLICY means this Patent and Tangible Research Property Policies and Procedures of the University of Pennsylvania, with any amendments to such procedures, if any, approved by the President from time to time.

5.0.24 PARTICIPATION AGREEMENT means a written agreement substantially in the form of Appendix A to the PATENT POLICY, setting out rights and responsibilities of University faculty, emeritus faculty, visiting faculty and researchers, adjunct faculty, postdoctoral employees and/or other salaried employees, students, and others under the University's policies and procedures, and confirming the automatic assignment of ownership of INVENTIONS covered under the PATENT POLICY, to the University.

5.0.25 PRO RATA SHARE means the ratio (expressed as a percentage) of the GROSS CTT REVENUES directly generated by and attributable to an INVENTION and/or TANGIBLE RESEARCH PROPERTY, as determined by CTT, compared to the entire GROSS CTT REVENUES, during a Fiscal Year. (As an example, if the GROSS CTT REVENUES directly generated by and attributable to an INVENTION total \$600,000 in a Fiscal Year, and the GROSS CTT REVENUES total \$12,000,000 in a Fiscal Year, the PRO RATA SHARE is five percent (5%).)

5.0.26 SIGNIFICANT EQUITY INTEREST means any EQUITY or other financial interest that when aggregated for the individual and the individual's spouse and dependent children exceeds \$25,000 in value, as determined through reference to public prices or other reasonable measures of fair market value, and does not represent more than five percent (5%) ownership interest in any single entity.

5.0.27 STAKEHOLDERS means shareholders, owners, members, general partners, limited partners, or other owners or investors in an entity.

5.0.28 SUBSTANTIAL USE OF UNIVERSITY RESOURCES means the use of University funds, facilities, equipment, or other resources significantly in excess of the norm for educational and research purposes in the Department or School in which the faculty member(s) holds his or her (their) primary appointment(s) or in which a staff member or student is enrolled or employed. Academic year salary, office, usual library resources, usual secretarial and administrative staff resources or usual computer equipment, among other things, are not regarded as constituting "substantial use of University resources." Any question about what constitutes substantial use of University resources should be referred to the Vice Provost for Research.

5.0.29 TANGIBLE RESEARCH PROPERTY means unique research products or tools, such as biological materials or chemical moieties, whether or not patentable or otherwise protectable using intellectual

property laws. Categories of biological material include organisms, cells, viruses, cell products, cloned DNA, as well as DNA sequences, mapping information and crystallographic coordinates. Some specific examples of biological materials include specialized and/or genetically defined cells, including normal and diseased human cells; monoclonal cell lines; hybridoma cell lines; microbial cells and products; viruses and viral products; recombinant nucleic acid molecules; DNA probes; nucleic acid and protein sequences; and transgenic mice or other animals. Categories of chemical moieties or engineered products include sample compounds, reagents, intermediates, models, sensors, devices, equipment, computer hardware or firmware, diagrams, or computer media.

5.0.30 TANGIBLE RESEARCH PROPERTY DIRECT GENERATION COSTS means all of the documented and verifiable direct costs and expenses attributable or allocated to the generation of the quantities of TANGIBLE RESEARCH PROPERTY distributed which led to the receipt of GROSS CTT REVENUES from such TANGIBLE RESEARCH PROPERTY. As an example only, the costs of raw materials, supplies, reagents, specialized equipment, and other direct costs and expenses necessary to generate the quantity of TANGIBLE RESEARCH PROPERTY constitutes TANGIBLE RESEARCH PROPERTY DIRECT GENERATION COSTS. Salaries, overhead, and equipment which is otherwise used for teaching or numerous research purposes is not part of TANGIBLE RESEARCH PROPERTY DIRECT GENERATION COSTS. (Any disagreement among the INVESTIGATORS and CTT regarding the calculation of TANGIBLE RESEARCH PROPERTY DIRECT GENERATION COSTS may be appealed to the APPEALS BOARD.)

5.1 Review of Policies and Procedures. The EXECUTIVE COMMITTEE together with the Vice Provost for Research shall review the PATENT POLICY (including Appendix B), from time to time to determine whether it is accomplishing its intended purposes and is in confor-

mity with applicable laws and regulations, including intellectual property laws. The EXECUTIVE COMMITTEE shall make recommendations for amendments or other changes to the Provost and the Faculty Senate, who shall confer with the President.

5.2 Disputes Under Policies and Procedures. Except as expressly set forth otherwise in this PATENT POLICY, disputes arising from the interpretation or administration of the PATENT POLICY (excluding disputes arising from Article 3) may be referred by any interested party to the Chair of the APPEALS BOARD and the Office of the Vice Provost for Research, who will promptly notify the IPA. The APPEALS BOARD shall first determine whether it has jurisdiction to hear any such dispute before proceeding. The APPEALS BOARD shall provide an equitable mechanism for the review and resolution of disputes brought before it, and shall have the authority to make a judgment with respect to such disputes. The APPEALS BOARD shall use reasonable efforts to make a judgment with respect to any dispute within thirty (30) days after having any such dispute referred to it. Any judgment of the APPEALS BOARD may be appealed by any interested party to the Vice Provost for Research. The Vice Provost for Research shall consider the matter *de novo*, and shall use reasonable efforts to review any such appeal and make a judgment with respect to any appeal, within thirty (30) days after having any such dispute referred to him or her. Any judgment of the Vice Provost for Research may be appealed to the President, who will make a final decision for the University.

5.3 No Change to Relationships. Nothing in this PATENT POLICY or the actions taken in connection with INVENTIONS, TANGIBLE RESEARCH PROPERTY, or EQUITY, is intended to or shall be interpreted or deemed to create a fiduciary, trust, or agency relationship between the University or any of its units or personnel, and any faculty, staff, student or INVENTOR.

See Appendices on following pages

Appendix A. Participation Agreement

In order that the University may fulfill legal and contractual obligations to sponsors of research, including but not limited to the federal government, and in consideration of my employment by the University, or my participation in sponsored research, or my use of funds, facilities, or other resources provided by the University, I hereby agree as follows:

1. I have read, and I understand and agree that I am bound by, the terms of the Patent and Tangible Research Property Policies and Procedures of the University of Pennsylvania, as well as by the terms of any revisions or amendments adopted by the President and/or the Trustees of the University of Pennsylvania (collectively, the "Patent Policy"), effective retroactively to the first date of my employment, appointment or matriculation, and/or participation in sponsored research, and/or SUBSTANTIAL USE OF UNIVERSITY RESOURCES ("Start Date"). I understand that words appearing as all capitalized letters in this Agreement are used as defined in the Patent Policy.

2. I agree to report to the INTELLECTUAL PROPERTY ADMINISTRATOR ("IPA") any INVENTION which is conceived or reduced to practice in the course of my employment at the University, or from work directly related to professional or employment responsibilities at the University, or from work carried out on University time, or at University expense, or with SUBSTANTIAL USE OF UNIVERSITY RESOURCES under grants or otherwise. I hereby irrevocably assign to The Trustees of the University of Pennsylvania all right, title and interest in and to any and all such INVENTIONS, effective retroactively to my Start Date.

3. I acknowledge that any TANGIBLE RESEARCH PROPERTY, whether or not patentable, which is made in the course of employment at the University or from work directly related to professional or employment responsibilities at the University, or from work carried out on University time, or at University expense, or with SUBSTANTIAL USE OF UNIVERSITY RESOURCES under grants or otherwise is the property of the University. I hereby irrevocably assign to The Trustees of the University of Pennsylvania all right, title and interest in and to any and all such TANGIBLE RESEARCH PROPERTY, effective retroactively to my Start Date.

4. I understand that the University incurs binding obligations to sponsors under the terms of sponsored research agreements. When I participate in sponsored research, I understand that it is my responsibility to ascertain and abide by the terms of the sponsored research agreement as it relates to me. In particular, when engaged in outside activity, such as consulting, I recognize my duty to protect the University's obligations to its research sponsors and its rights pursuant to the PATENT POLICY.

5. I also understand that on occasion University policy or the University's obligations to research sponsors may require that I assign my interest in copyrightable materials to the University. In such cases, I hereby irrevocably assign all right, title and interest in and to such materials and the copyrights therein, if any, to The Trustees of the University of Pennsylvania, effective retroactively to my Start Date. I further understand that, in agreements with research sponsors, the University seeks to retain copyrights for its faculty.

6. I will cooperate fully with the University in the preparation, filing and prosecution of patents, in the registration of copyrights and in the preparation and execution of all documents necessary or incidental thereto, including but not limited to any additional written assignments deemed desirable by the University to further evidence my legal assignment of ownership or otherwise facilitate protection of the intellectual property.

7. I accept the provisions for the sharing of amounts and EQUITY in the PATENT POLICY and the then-current Policy Relating to Copyrights and Commitment of Effort for Faculty (the "Copyright Policy").

8. I am under no obligation to any person, organization or corporation with respect to any INVENTION(S), TANGIBLE RESEARCH PROPERTY or copyrightable materials which are, or could be reasonably be construed to be, in conflict with this Agreement, except as set forth in writing in the signed attachment to this letter (if any).

9. This Agreement and the assignments and obligations are effective as of my Start Date, and apply to any INVENTION(S), TANGIBLE RESEARCH PROPERTY, and copyrightable materials made during the time I am employed by the University, hold an appointment, continue to matriculate, participate in sponsored research, or otherwise make a SUBSTANTIAL USE OF UNIVERSITY RESOURCES.

Signature: _____

Printed Name: _____

Date: _____

Appendix B. Rules Governing EQUITY Transactions

B.1 Licenses in Consideration of EQUITY. The principal purpose of licensing by the University is to promote the development of technologies to serve the public interest. If after a diligent effort to identify prospective licensees, the IPA determines that the public interest is best served by a license in consideration of EQUITY, the IPA may negotiate such a license on behalf of the University, following consultation with the Vice Provost for Research, the INVENTORS, the General Counsel (or his/her designee), the Treasurer (or his/her designee), and the University Conflict of Interest Standing Committee. The IPA should be satisfied that the licensee can demonstrate management and technical capability, and that it has the financial resources necessary to meet its developmental objectives and its obligations to the University. The IPA may accept EQUITY in the license for the University in lieu of or in addition to license or other fees, provided that the EQUITY represents a fair valuation for the technology. The IPA shall include in each license measures of performance that must be met in order to maintain the license granted by the University.

B.2 Disclosure of EQUITY. The University will require the prospective licensee to disclose all EQUITY offered to the University (and other institutions or individuals which may co-own an INVENTION with the University) in consideration for the license agreement. In addition, the prospective licensee will be required to disclose in writing to the IPA and the Treasurer the specific terms and conditions associated with such EQUITY, and the current and *pro forma* capital structure of the venture. Furthermore, the prospective licensee and the INVENTORS must disclose to the IPA and the Treasurer in writing the EQUITY to be issued to INVENTORS for their role as founders, consultants, or otherwise.

B.3 Conflicts of Interest in License Agreements Involving EQUITY. License agreements involving EQUITY must be structured to protect the University from liability and to avoid conflicts of interest. Prior to the University executing any agreement, the INVENTOR(S) shall disclose to the IPA and the University Conflict of Interest Standing Committee, any existing or proposed consulting agreement between the INVENTOR(S) and the prospective licensee or any other consulting agreements with other entities that have potential for conflicts of interest. Upon the recommendation of the Vice Provost for Research, the University and the relevant Deans may impose limitations on the proposed license agreement, associated sponsored research agreement, consulting agreement between the INVENTOR and the licensee, or other agreements. In addition, the University, Deans or Chairpersons may create an oversight mechanism for the relevant INVENTORS.

B.3.1 Board Participation and Fiduciary Roles. In general, the University will not accept a position on the board of directors (or other comparable governing entity) of the licensee, but may accept and

exercise observer rights on such boards or comparable governing entities. Exceptions to this policy require the approval of the Executive Vice President of the University in consultation with the IPA and the General Counsel. As a matter of policy, INVENTORS may not serve on the board of directors (or other comparable governing entity) of the licensee, or in any other fiduciary capacity during the time their University research is sponsored by the licensee. In general, INVENTORS may accept a seat on scientific advisory boards providing that membership on such a board does not create a fiduciary responsibility to the licensee or any of its STAKEHOLDERS.

B.3.2 Minority Ownership. The INVENTORS (and members of their families) together may not be majority STAKEHOLDERS of the venture at the time that the license agreement is negotiated and thereafter.

B.3.3 Licensee Representation. In license negotiations with the University, the prospective licensee must be represented by a party other than an INVENTOR or a member of the INVENTOR'S family.

B.4 Direct Personal Ownership of EQUITY. The University generally requires that the EQUITY provided to INVENTORS from the EQUITY POOL must be issued directly to the INVENTORS at the time the EQUITY is issued. The INVENTORS will be responsible for retaining their own business advisors, legal counsel and tax counsel. INVENTORS are responsible for all financial, tax and legal consequences related to the EQUITY they receive. The University Conflict of Interest Standing Committee reserves the right to require that any EQUITY issued to INVENTORS by the licensee be held in a "blind trust" for a defined period of time. An INVENTOR who receives EQUITY from the EQUITY POOL or from the licensee outside of the EQUITY POOL generally will receive a reduced INVENTORS PERSONAL SHARE of ADJUSTED CTT REVENUES for the INVENTION, pursuant to Section 2.3.3.1 above, to avoid an unintended incentive to structure transactions whereby the INVENTORS retain 100% of the proceeds from their share of the EQUITY POOL, and obtain 30% of the proceeds to the University when the University liquidates EQUITY held by the University. Under rare circumstances, the University may agree to accept all shares of the EQUITY POOL including INVENTORS shares, providing that all INVENTORS and other institutions release the University in writing from any liability associated with the management, investment and ownership of the EQUITY. In such cases, the Investment Board of the University will control the EQUITY. Any income received by the University from EQUITY held on behalf of INVENTORS will be distributed among INVENTORS in accordance with Section 2.3.4 of the Patent and Tangible Research Policies and Procedures.

B.5 Management of EQUITY. Any EQUITY received by the University under a license agreement will be held by the Office of the Treasurer until such time that the University's Investment Board decides to liquidate such EQUITY.

See Appendix C on next page

Appendix C: Hypothetical Example

GROSS CTT REVENUES for FY 2010 equals \$12,000,000

GROSS CTT REVENUES for FY 2010 attributable to the XYZ INVENTION equals \$600,000.

The PRO RATA SHARE equals 5% (\$600,000 divided into \$12,000,000 equals 0.05).

AGGREGATE UNREIMBURSED IP EXPENSES for all of CTT for FY 2010 equals \$2,500,000.

The PRO RATA SHARE of AGGREGATE UNREIMBURSED IP EXPENSES attributable to the XYZ INVENTION equals \$125,000 (0.05 times \$2,500,000 equals \$125,000).

Thus, the ADJUSTED CTT REVENUES for the XYZ INVENTION equals \$475,000 (\$600,000 minus \$125,000 equals \$475,000).

The INVENTORS PERSONAL SHARE equals 30% of ADJUSTED CTT REVENUES for the XYZ INVENTION, or \$142,500 (\$475,000 times 0.3 equals \$142,500).

The INVENTORS RESEARCH ACTIVITY SHARE equals 12.5% of ADJUSTED CTT REVENUES for the XYZ INVENTION, or \$59,375. (\$475,000 times 0.125 equals \$59,375).

The ADJUSTED PROCEEDS FOR THE XYZ INVENTION equals \$273,125 (\$475,000 minus \$142,500 and minus \$59,375).

AGGREGATE CTT OPERATING COSTS for FY 2010 equals \$4,500,000

The PRO RATA SHARE of AGGREGATE CTT OPERATING COSTS attributable to the XYZ INVENTION equals \$225,000 (0.05 times \$4,500,000 equals \$225,000).

Thus, the NET CTT INCOME for the XYZ INVENTION equals \$48,125 (\$273,125 minus \$225,000).

The DEPARTMENTS OF INVENTORS SHARE equals 20% of the NET CTT INCOME for the XYZ INVENTION, or \$9,625 (\$48,125 times 0.2 equals \$9,625.)

The SCHOOLS OF INVENTORS SHARE equals 40% of the NET CTT INCOME for the XYZ INVENTION, or \$19,250 (\$48,125 times 0.4 equals \$19,250.)

The UNIVERSITY RESEARCH SHARE equals 40% of the NET CTT INCOME for the XYZ INVENTION, or \$19,250 (\$48,125 times 0.4 equals \$19,250.)