The Inventor’s Guide to Technology Transfer at the University of Missouri outlines the essential elements of tech transfer at MU. It was created to provide helpful information about intellectual property for inventions and copyrightable works coming out of our vibrant community.

The Inventor’s Guide is organized to provide convenient and clear answers to common questions from MU’s research community, as well as a broad overview of the technology transfer processes and related services now available.

This guide is not a substitute for the University of Missouri Collected Rules and Regulations (CRR) Section 100.020 (Patent and Plant Variety Regulations) and 100.030 (Copyright Regulations). The CRRs always supersede any interpretations provided in this guide.

For more information, call the Office of Technology Management and Industry Relations (OTMIR) at 573.882.6013, or visit http://tmir.missouri.edu.

This booklet is adopted from the University of Michigan’s “Inventor’s Guide to Technology Transfer,” with adaptations for MU. OTMIR is grateful to Ken Nisbet and the staff of the University of Michigan Office of Technology Transfer for permission to use their excellent material and to the University of Michigan for permission to use its copyright.

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Technology Management & Industry Relations
University of Missouri

The Office of Technology Management and Industry Relations (OTMIR) performs the technology transfer function on the MU campus under the direction of the Office of Research, Graduate Studies and Economic Development.

OTMIR’s MISSION
Our mission is to identify commercializable technology resulting from research performed at MU. OTMIR legally protects intellectual property, while seeking income for MU and its inventors, as well as enhancing industrial relations and supporting regional economic development benefiting the public.

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INTTELLECTUAL PROPERTY LICENSING UNITS (IPLU)

Intellectual Property Licensing Units (IPLUs) are strategically embedded within the colleges and research centers that generate the majority of invention disclosures at MU. They are staffed by scientific, business and legal experts who work with MU researchers to analyze inventions for novelty, attainability of intellectual property protection and marketability.

Agriculture & Life Sciences
440 Christopher S. Bond Life Sciences Center
573.882.5016

Engineering & Physical Sciences
W1038 Lafferre Hall
573.884.3302

Health Sciences
NW 503 Health Sciences Center
573.882.0470

Software and Copyright
W1039 Lafferre Hall
573.882.1046
TECH TRANSFER DEFINED

Technology transfer (often called “tech transfer”) is a key component in the economic development mission of the University of Missouri (MU). Tech transfer complements the research mission of MU by providing researchers with a path to move innovative discoveries to commercial companies to further develop the technology and make it useful for humankind.

Who is responsible for tech transfer at MU?

The MU campus office that facilitates technology transfer is the Office of Technology Management and Industry Relations (OTMIR). Part of the MU Office of Research, Graduate Studies and Economic Development, OTMIR is an MU service unit composed of specialists in licensing, business development and legal matters with experience in transferring technologies to the marketplace. OTMIR serves as a facilitator of technology transfer and entrepreneurship in support of MU’s economic development mission.

Why would a researcher want to participate in the tech transfer process?

The reasons to engage in tech transfer will be unique to each researcher, but it may help you:

• Generate additional lab/departmental funding
• Earn recognition and financial rewards
• Meet the obligations of a research contract
• Create student educational/job opportunities
• Consider a startup/consulting opportunity
• Bring your research to market for maximum impact on society

How is technology transferred?

Tech transfer can take many forms. Technology is typically transferred to a commercial partner through a license agreement in which MU grants its rights in the defined technology(ies) to one or more third parties for a period of time, often limited to a particular field of use and/or geographical region. The licensee (the third party licensing the technology) may be an established company, or a new business startup.

Licenses include terms that require the licensee to meet certain performance obligations and to make financial payments to MU. Pursuant to the University of Missouri Collected Rules and Regulations (CRRs), these payments are shared with the inventors and are also distributed to the departments/units, the MU campus and the UM System to provide support for further research, education and participation in the tech transfer process.

TECH TRANSFER PROCESS

How does a researcher work with OTMIR?

Contact OTMIR early if you think you have a commercially viable invention. We’ll discuss how to best leverage the commercial potential of your research. Tech transfer staff are trained to assist inventors with questions related to marketability, funding sources, commercial partners, patenting and other protection methods, new business startup considerations, MU policies and procedures, and much more. This team approach provides you with an assigned licensing specialist supported by internal legal assistance, and, if a startup is being considered, business development resources as well.
What are the typical steps in the tech transfer process?

The process of technology transfer is summarized in the steps and diagram that follow (see Figure 1, p. 4). Note: These steps may vary in sequence and often occur simultaneously.

STEP 1 >> Research

Observations and experiments during research activities often lead to inventions. An invention is any useful process, machine, composition of matter, or any new or useful improvement of the same. Often, multiple researchers may have contributed to the invention.

STEP 2 >> Pre-Disclosure Discussion

Researchers may choose to contact OTMIR personnel to discuss their invention, as they prepare the Invention Disclosure Form (IDF). Licensing professionals in OTMIR can provide guidance with respect to such things as inventorship and the processes of assessment and protection.

STEP 3 >> Invention Disclosure

Employees must complete an Invention Disclosure Form (IDF) approved by the University’s Patent Committee under CRR 100.020. This form is essentially the written notice of invention to OTMIR that begins the formal tech transfer process. An invention disclosure is a confidential MU document and should fully describe an invention so the options for commercialization can be evaluated and pursued. In this step, OTMIR will review the development history to determine, among other things, the ownership of the invention, the existence of any contractual rights and obligations (such as from a sponsored research agreement) that may impact MU’s ability to patent/commercialize the invention and any potential deadlines/bar dates that could prevent/impede patenting.

STEP 4 >> Assessment

Virtually all inventions disclosed to OTMIR represent good science. However, not all will either be capable of obtaining meaningful patent protection, or address a large enough market to justify the expense of seeking patent protection. After receiving the IDF, OTMIR will conduct a search of the patent and scientific literature to identify prior art that could impact the scope of protection available in a potential patent application. In addition, OTMIR will analyze the market and competitive technologies to determine the invention’s commercialization potential. This assessment process, which may lead to a broadening or refinement of the invention, will guide OTMIR’s strategy for protecting and marketing the invention.

STEP 5 >> Intellectual Property Protection

**Patent protection** is a common legal method for protecting inventions. The patent process begins with the filing of a patent application with the U.S. Patent & Trademark Office (USPTO) and, when appropriate, foreign patent offices. Once a patent application has been filed, it typically will require several years and tens of thousands of dollars to obtain issued U.S. and foreign patents. Some inventions (or work product) may involve other types of intellectual property (IP) protection methods, such as copyright, trademark, trade secrets and contractual use restrictions (e.g., for databases and materials). OTMIR must justify an investment in a particular invention protection method by the potential revenue that might result from commercializing that invention.

STEP 6 >> Marketing

With the active involvement of inventors, OTMIR will seek to identify companies that have the expertise, resources and business networks to bring an invention to market. Candidate companies typically range from local startups all the way to multi-national companies. Studies have shown that most licensing deals done by universities are with companies known to the inventors. Thus, inventor participation in the marketing process is crucial to successfully commercializing an invention.

STEP 7A >> Startup Business

On some occasions, the creation of a new business startup is chosen as the optimal commercialization path. In these cases, either MU inventors, or seasoned entrepreneurs can be the driving force behind the startup. In either case, there are resources available to help a startup company, and OTMIR staff will help make connections to those resources that will assist in planning, forming and funding the startup.

STEP 7B >> Existing Business

If an appropriate and interested existing company, or companies, are selected as a potential licensee(s), OTMIR licensing specialists work with those potential licensees to develop the financial and diligence terms to fully commercialize the technology.

STEP 8 >> Licensing

A license agreement is a contract between MU and a third party in which the University’s rights to a technology are licensed, without relinquishing ownership, for financial and other benefits. A license agreement is used with either a startup business, or with an established company. An option agreement is sometimes used to
enable a third party to evaluate the technology for a limited time prior to making a decision about licensing.

**STEP 9 >> Commercialization**

The licensee continues the advancement of the technology and makes other business investments to develop the product or service. This step may entail further development, regulatory approvals, sales and marketing support, training and other activities.

**STEP 10 >> Revenue**

Revenues received by the University from commercialization activities are distributed to MU inventors, their departments and/or units, the MU campus and the UM System, as required by the UM CRRs. The funds distributed within MU and UM System are used to support research, development and other scholarly activities, as well as to encourage further participation in the tech transfer process.

**What are the “decision points”?**

During the technology transfer process, OTMIR will periodically review all available information to determine whether to proceed with the protection/commercialization of a technology. All factors that may impact the potential to generate a return on investment in the technology will be considered. At each decision point, possible outcomes include:

- File, or continue to prosecute a patent application, or other form of protection
- Market, or continue to market, the invention to potential licensees
- Hold for additional research
- Waive/offer/release/re-assign the invention back to the inventor
- Close the file and move it to inactive status

**FREQUENTLY ASKED QUESTIONS**

**How long does the tech transfer process take?**

The process of protecting the technology and finding the right licensing partner may take months—or even years—to complete. The amount of time will depend on such things as the development stage of the technology, the market for the technology, other technologies competing in the same market, the amount of work needed to bring a new concept to market-ready status and the resources and willingness of the inventor(s).

**How can a researcher help in the tech transfer process?**

**Call OTMIR at 573.882.6013 upon discovering an invention with potential commercial value.**

**Complete and submit the Invention Disclosure Form (IDF) before submitting a manuscript for review and publication and allow time for a patent application to be filed before publicly disclosing the technology.** Filing the IDF is not the same as filing a patent application.

Include companies and contacts on the IDF that might either be interested in, or may have already inquired about the invention. Studies show that over 70 percent of all University technology licenses are executed with commercial entities known by the inventor.

To avoid adversely impacting patent rights and possibly hindering the opportunity to market an invention, contact OTMIR before publishing the results of the research or holding any discussions with people outside the University community. OTMIR won’t tell you not to publish, but if given the opportunity,
As anyone who’s had a loose filling can attest, it’s a pain in the mouth—and in the wallet. Drs. Hao Li and Qingsong Yu have developed a revolutionary new plasma brush for dentists, which would replace drilling in favor of a less invasive approach using chemical reactions to disinfect and clean cavities for filling. Not only does the brush kill bacteria, it also forms a better bond between the tooth and the filling—making the need for a future replacement less likely.

“One hundred-forty million tooth restorations cost Americans an estimated $50 billion a year, and it is estimated that replacement fillings constitute 75 percent of a dentist’s work,” says Li. “The plasma brush would help reduce those costs.”

The plasma brush is just one innovation the two scientists have developed through MU and their biomedical device firm Nanova, Inc. The firm, which was formed with the assistance of MU’s Missouri Small Business & Technology Development Centers, uses tiny strands called nanofibers—1,000 times smaller than a human hair but stronger than stainless steel—to create stronger dental filling materials and bioabsorbable bone screws. Their work has captured global notice, with international venture capitalists investing more than $7 million in Nanova to produce dental products based on the nanomaterial technology. Drs. Li and Yu are faculty of Mechanical and Aerospace Engineering in MU’s College of Engineering.

A Reason to Smile
University of Missouri scientists are putting money where your mouth is.
we can protect the patent rights to an invention without hindering your ability to publish. OTMIR can facilitate a **confidentiality agreement** between the University and external persons/companies to allow you to discuss your work while maintaining confidentiality.

**Respond to OTMIR and outside patent counsel requests.** While some aspects of the patent and licensing process may require significant inventor participation, OTMIR will strive to make efficient use of an inventor’s valuable time.

**Keep OTMIR informed** of upcoming publications or interactions with companies related to the IP.

**How are licensing revenues distributed?**

The UM System [Office of Intellectual Property Administration](http://www.umsystem.edu/ums/rules/collected_rules/business/ch100/100.020_patent_and_plant_variety_regulations) is responsible for distributing the revenues associated with technology commercialization agreements. Under the UM CRRs, one-third (33.33 percent) of income (excluding reimbursed patenting expenses and some other items) are distributed to the inventor(s). After expenses, remaining funds are divided among the inventors’ department(s), the MU campus and the UM System. To review the complete policy, visit: [http://www.umsystem.edu/ums/rules/collected_rules/business/ch100/100.020_patent_and_plant_variety_regulations](http://www.umsystem.edu/ums/rules/collected_rules/business/ch100/100.020_patent_and_plant_variety_regulations)

**What are the tax implications of revenues received by MU inventors?**

License revenues are typically taxed as Form 1099 income. Researchers who receive such revenues should consult a tax advisor for advice.

**How are inventor revenues distributed if there are multiple inventors and/or multiple inventions in a license?**

Income received by the University as a result of commercializing an invention will be shared among those University employees who are considered to be the legal inventors.

The sharing of income among MU inventors will be equal, or as otherwise agreed to in writing by the inventors.

If there are several inventions based on multiple IDFs in a single license, then all MU inventors will be asked to place a relative value on the inventions described in each IDF. If the MU inventors cannot agree on a relative value, then the inventions from each IDF will be valued equally. Once sales of a product are made, the licensee is asked to tell MU which inventions are involved in those sales, so the University can determine which inventors will share in royalty disbursements.

**How is equity from a license distributed?**

MU may obtain an equity interest in a licensee as part of a license. The University’s general preference and policy is that equity interests subject to this policy be liquidated at the first reasonable opportunity. MU’s policy is not to hold shares for speculative purposes. When MU’s equity is liquidated, the resulting funds are distributed in accordance with the University’s CRRs.

**What are the most relevant CRRs when it comes to tech transfer?**

- 100.020 Patent and Plant Variety Regulations
- 100.030 Copyright Regulations
- 330.015 Policy on Conflict of Interest
- 420.030 Conflict with the Interests of Federal Grant Agencies
- 410.020 Institutional Conflicts of Interest in Human Subjects Research
- 70.070 Entrepreneurial Activity
Organovo, a startup company whose origins began at the University of Missouri, creates three-dimensional human tissue through bioprinting to advance medical research.

Organovo uses three-dimensional bioprinting to create fully functional human tissues, giving researchers an unprecedented opportunity to test drug safety and efficacy before administering the drug to a living person. The technology also provides new models for disease research and can even create new tissues to replace damaged tissue inside the human body.

The company was originally founded by MU researcher Dr. Gabor Forgacs, a self-described “theoretical physicist turned biological physicist, turned tissue engineer, turned entrepreneur.” His pioneering observations on wing development in chicks led to a desire to model embryonic cell development—eventually morphing into the technology that puts Organovo at the forefront of tissue printing.

Organovo collaborates with pharmaceutical companies and other partners to advance medical treatments. It has garnered particular attention for its first-in-class liver tissue assay, with cells that last for over 40 days, allowing a broad range of toxicities enough time to develop.

Organovo also creates lung, skin and kidney tissues, as well as blood vessels, nerve guides and cardiac patches.

Forgacs is a professor of bioengineering in the Colleges of Engineering and Agriculture, Food and Natural Resources (CAFNR).
INTELLECTUAL PROPERTY (IP) CONCERNS IN RESEARCH AND CONSULTING

Will a researcher be able to publish results and still protect the commercial value of the associated IP?

Yes, but because patent rights are affected by these activities, OTMIR recommends submitting an Invention Disclosure Form (IDF) well before a researcher communicates/discloses an invention to people outside the University. There are some differences between the U.S. and other countries as to how early publication affects a potential patent. The public disclosure of an invention, prior to the filing of a patent application, may adversely impact the potential for patent protection. The laws are complex. As such, a researcher should inform OTMIR of any imminent or prior presentation, lecture, poster, abstract, website description, research proposal submission, dissertation/master's thesis, publication or other public presentation involving an invention.

What about using research materials from outside collaborators?

When an MU researcher wishes to use or obtain materials from outside collaborators, the University will negotiate and execute a Material Transfer Agreement (MTA) with the collaborator. The researcher should contact either the relevant OTMIR licensing unit, or the main OTMIR office for more information on incoming MTAs. The researcher should carefully document the date and conditions of use of the material, so OTMIR can determine if the use might influence the ownership and license rights of subsequent research results.

What about sharing materials/research tools with outsiders?

If an MU researcher wishes to send materials to an outside collaborator, the University will negotiate and execute an outgoing MTA for this purpose. An NDA may also be necessary to protect the research results, or intellectual property. OTMIR can assist researchers in completing outgoing MTAs or NDAs.

What rights does a research sponsor have to any inventions associated with MU research?

The Sponsored Research Agreement (SRA), or contract, should specify the intellectual property (IP) rights of the sponsor. MU generally retains ownership of the patent rights and other IP resulting from sponsored research; however, the sponsor may have rights to obtain a license to the defined and expected outcomes of the research.

Often, SRAs, or contracts, allow the sponsor a limited time to negotiate a license for any patent, or IP rights, developed as the result of the research. Even so, the sponsor generally will not have contractual rights to inventions that are clearly outside of the scope of the research. Therefore, it is important to define the scope and boundaries of work within the sponsored research agreement or contract.

What if my project is industry-sponsored?

University policy, in accordance with BPM-203, requires facilities and administration (F&A) costs to be charged at the applicable negotiated rate plus five (5) percent when a commercial or industrial firm requires rights in data to the exclusion of the University, and/or claims ownership rights to IP developed by the University under a project. Exceptions to this policy must be approved by the Senior Vice Chancellor for Research, Graduate Studies and Economic Development.

When should I use an Industry-Sponsored Project Agreement IP Waiver?

MU does not insist on retaining ownership of IP resulting from certain industry-sponsored activities; the decision to retain IP rights is made in conjunction with the investigator(s) conducting the project. For projects where the investigator(s) and University have agreed to waive IP rights:

- The corporate sponsor may elect to take ownership of any resulting inventions. Investigator(s) must disclose inventions to the OTMIR by completing an IDF. OTMIR will forward the IDF to the corporate sponsor and assist with transfer of ownership, if needed.
- MU retains the right to practice the IP for non-commercial research and educational purposes. Investigator(s) are not restricted in publicly disclosing research results through publications and presentations.
If investigator(s) wish to have the University protect any potential IP that may emerge from a project, they should NOT sign and submit this form. MU will, to the best of its ability, negotiate contract language for full ownership. Investigator(s) should be aware that such negotiations could be prolonged, and/or the corporate sponsor could elect to not fund the project.

The MU Office of Sponsored Programs Administration (OSPA) works closely with OTMIR on IP terms and conditions of sponsored research agreements or contracts. If you’re not sure how to proceed, have questions or need more information on issues such as background IP, contact your unit’s research office, OTMIR, or the OSPA (573.882.7560).

**What about consulting?**

University employees who engage in consulting activities may or may not be acting outside the scope of their employment. Researchers who personally enter into consulting agreements should familiarize themselves with relevant MU policies. The researcher is expected to ensure that the terms of the consulting arrangement are consistent with MU policies, including those related to IP ownership, employment responsibilities, and the use of University facilities and IP. For more information regarding MU policy on consulting, visit: [http://www.umsystem.edu/ums/rules/hrm/hr500/hr512](http://www.umsystem.edu/ums/rules/hrm/hr500/hr512)

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**THE BAYH-DOLE ACT OF 1980**

The U.S. Bayh-Dole Act of 1980 allows universities to own the rights to inventions resulting from federally funded research, provided certain obligations are met.

These obligations include making efforts to protect (when appropriate) and commercialize the inventions, submitting progress reports to the funding agency, giving preference to small businesses that demonstrate sufficient capability and sharing any resulting revenues with the inventors.

The Bayh-Dole Act is credited with stimulating interest in technology transfer activities and generating increased research, commercialization, educational opportunities and economic development in the United States.
INVENTIONS

What is an invention?

U.S. Patent Law defines an invention as a new, useful process, machine, improvement, etc., that did not previously exist and is recognized as the product of some unique intuition or genius, as distinguished from ordinary mechanical skill, or craftsmanship.

What are the elements of an invention?

The elements of invention under U.S. patent law include:

Conception of the Idea. This concept involves complete performance of the mental part of the inventive act. All that remains is to convert the idea into reality by reducing it to practice. Knowledge of what is to be accomplished and how it is to be accomplished are necessary. Knowledge of a desirable result alone is not enough, and neither is a means for an unknown result.

Reduction to Practice. This involves creating either actual or constructive proof that the idea actually works, can exist, or the like. Actual reduction to practice is creating a physical embodiment of the idea—although complete perfection is not required. Constructive reduction to practice results when a patent application covering the completed concept is filed in the patent office. Among other things, constructive reduction to practice requires sufficient enabled disclosure in the application that one with ordinary skill in the art would be able to practice the invention without undue experimentation.

Note: Not all discoveries are inventions under U.S. patent law, and the case law is still evolving. For example, the identification of a gene sequence may not be patentable, whereas a therapy based on the gene sequence, or a new way to assay for that gene sequence, may be patentable.

INVENTION DISCLOSURES

What is an Invention Disclosure Form?

An Invention Disclosure Form (IDF) is a written description of the invention that is provided to OTMIR. The IDF should list all collaborating sources of support and include all of the information necessary to fully evaluate the invention and make patent and commercialization decisions. It can also include presentations, posters, drafts of papers or a thesis—more information about the invention is always better. Invention disclosures are treated as confidential information but do not provide any intellectual property protection.

Why submit an IDF?

Disclosure of inventions made by MU researchers is required under the University’s CRRs. When a researcher discloses an invention to OTMIR, it starts a process that could lead to commercialization of the technology. The process may involve seeking legal protection of the IP and working to identify outside development partners. If government funds were used for the research, a prompt disclosure is required by law, which will be reported to the sponsoring agency. Similar disclosure requirements may exist for sponsored projects.

When is a discovery (or observation) an “invention”?

Researchers are encouraged to submit an IDF for all inventions and developments that may solve a significant problem and/or have significant commercial value. Observations/ideas are not patentable under U.S. patent law. Researchers in doubt should contact OTMIR at tmir@missouri.edu.

When should a researcher complete an IDF?

A researcher should complete an IDF whenever there is an invention of something unique with possible commercial value. The IDF should be submitted well before disclosing or presenting the invention through publications, poster sessions, conferences, press releases or other communication. Such public disclosures may adversely impact patent protection both in the U.S. and abroad.

An inventor should inform OTMIR of any imminent or prior presentation, lecture, poster, abstract, website description, research proposal, dissertation/master’s theses, publication or other public disclosures that include the invention. Submission of the IDF itself does not protect future patent rights, should a public disclosure occur.

Should a researcher submit an Invention Disclosure Form for research tools?

An Invention Disclosure Form should be submitted if new research tools would benefit other researchers, and the MU researcher wants to provide them to collaborators, or other third parties. Research tools are materials such as antibodies, vectors, plasmids, cell lines, mice and other materials used as “tools” in the research process.

Most research tools do not necessarily need to be protected by patents in order to be licensed to commercial third parties and/or to generate revenue for a researcher’s laboratory. If the research tools may be valuable, or the researcher desires to provide them to others (including research collaborators), OTMIR will work to develop the appropriate protection, licensing and distribution strategy.
How does a researcher submit an IDF?
For questions, IDF forms or more information, visit the OTMIR’s website: http://tmir.missouri.edu or call 573.882.6013.

INVENTION DISCLOSURE ASSESSMENT

How does OTMIR assess invention disclosures?
OTMIR licensing professionals examine each IDF to assess its potential for meaningful patent protection and its prospects for commercial success. Some of the factors considered may include:

- The existence of related IP
- The novelty of the invention
- Pre-existing rights associated with the IP
- Whether the invention is reduced to practice
- The marketability of potential products/services
- Size and growth potential of the relevant market
- Amount of time/money required for development
- Whether the IP can be the basis for a startup
- Potential competition from other products/technologies

How does OTMIR decide whether to commercialize with a traditional or an “open source” license for software?
Generally, OTMIR supports MU software developers who choose to essentially “give their programs away” through open source mechanisms, provided that (1) the University retains the right to distribute the program freely, (2) open sourcing is consistent with obligations to sponsors and (3) each developer’s unit supports the decision.

Is an invention ever “assigned” to an inventor?
If OTMIR decides not to pursue patent protection and/or chooses not to actively market the invention, MU may transfer ownership to the inventor(s). This action is sometimes referred to as “waiving,” “releasing,” or “reassigning” the invention. Reassignment of inventions funded from U.S. government sources requires the government’s prior approval, and the inventor becomes responsible for further compliance.

PATENTS

What is a patent?
A patent is a government-granted right to exclude others from making, using, selling or offering for sale, the invention claimed in the patent. In return for that right, the patent must completely disclose the claimed invention sufficiently to allow “one skilled in the art” (i.e., an individual with knowledge in the field) to practice the invention. The scope of coverage of a patent is defined by the claims in the patent, as supported by the specification (written description) and drawings. Patent claims (drafted by patent attorneys with input from the inventor(s)) provide the legal definition of an inventor’s protectable invention.

A patent doesn’t necessarily provide the holder any affirmative right to practice a technology, because it may fall under a broader patent owned by others. Instead, as noted above, the patent provides the right to exclude others from practicing the invention.

What is the United States Patent and Trademark Office (USPTO)?
The USPTO is the federal agency, organized under the Department of Commerce, responsible for administering patents on behalf of the U.S. government. The USPTO employs patent examiners who are skilled in various technical fields to examine patent applications and issue patents when all legal requirements are met. To obtain foreign patent protection, the patent application must be filed in separate foreign patent offices for each jurisdiction where foreign patent protection is desired.

What are the general standards for obtaining a patent?
Filing an application for a patent does not guarantee that a patent will issue from that application. To receive a patent, an invention must be useful, novel (that is, it has never been done before), and non-obvious (that is, it would not have been obvious to either modify or combine what is already known to arrive at the invention). The USPTO searches and reviews the so-called “prior art” to assess the novelty and non-obviousness of the claimed invention.

What is “prior art”?
The definition of prior art varies by country, but it may generally be thought of as anything in the field previously made or disclosed. Prior art may include printed publications, conference handouts, abstracts, books, newspaper articles, etc. It may also include oral presentations, disclosures to competitors and colleagues and other public statements.

An inventor may create his/her own prior art by publicly disclosing an invention prior to the filing of a patent application (thereby jeopardizing patent rights). Thus, if a researcher has publicly disclosed the invention to others prior to filing a U.S. patent...
Acid reflux is on the rise in the U.S., with as many as one in five Americans experiencing the discomfort of heartburn every week. Many sufferers find relief from Zegerid, a medicine made possible by MU researcher Dr. Jeffrey Phillips and biopharmaceutical company Santarus, Inc.

Zegerid combines the strongest known type of acid blocker, called a proton-pump inhibitor (PPI), with an antacid. The medicine treats heartburn, stomach ulcers, gastroesophageal reflux disease and damage to the esophagus. It also helps prevent stomach bleeding in patients who have a serious illness.

Thanks to innovations developed by Phillips—and unlike other PPI-based medications—the drug does not require an acid-resistant coating, meaning that it is available in liquid form for those with swallowing difficulties.

MU licensed Phillips’ technology to Santarus, Inc. in 2001, and since that time, sales of Zegerid have totaled over $1 billion. In 2013, Santarus was sold to Salix Pharmaceuticals, Ltd., for more than $2.5 billion.
application directed to the invention, the researcher may be barred from obtaining a patent on the invention or the disclosure may limit the scope of ultimate patent protection. Many foreign countries do not allow any such activity prior to filing an application; thus, a researcher may be barred from obtaining patent protection in foreign countries if the invention was publicly disclosed prior to filing a patent application (i.e., a first-to-file patent system with no grace period).

What types of patents are available in the United States?

A **non-provisional/utility patent** may be directed to useful processes, machines, compositions of matter, articles, computer programs and methods (including methods of making compositions, methods of making articles, and even methods of doing business). A **plant patent** covers asexually reproduced varieties of new plants (other than a tuber propagated plant, or a plant found in an uncultivated state). A **design patent** covers the visual ornamental characteristics embodied in an article of manufacture.

What is a provisional patent application?

A **provisional patent** application for an invention is a patent application that may be filed through the USPTO without some of the formalities required of a non-provisional patent application (see non-provisional patent application). A provisional patent application is **not** examined by the USPTO, and a patent cannot issue directly from a provisional application. A provisional patent application can be used as part of an overall strategy for invention protection.

What is a non-provisional/utility patent application?

A **non-provisional patent** application is sometimes called a “utility,” “regular,” or “full” patent application. The **patent application** is a written document that must describe the invention in such a way that would allow someone skilled in the same technical field to duplicate the invention. Preparing the patent application requires the inventors’ technical expertise, as well as the patent attorney’s knowledge of the technical area, and patent law.

A non-provisional U.S. application and related foreign applications must be filed within one year of the provisional filing in order to receive the provisional filing date as the earliest **priority date** for the invention. However, an applicant only receives the benefit of the earlier filing date for material that is adequately described and enabled in the provisional application. As a result, the patent attorney needs the assistance of the inventor(s) to ensure scientific details are accurate when the first-filed application is provisional.

The **formal requirements** of a non-provisional/utility patent application include, among other things:

- A detailed (and enabling) description of the invention
- A description of the background of the invention
- A brief description of the drawings (if any)
- A brief description of the invention
- Drawings (when needed), and
- Claims.

The claims are numbered sentences at the end of the patent application that define the invention in words. The claims are thus important in at least two respects. First, the claim should recite an element/step that is the point of novelty such that the claim is different from (and non-obvious) in view of the prior art.

Claims should be drafted broadly enough so infringers cannot make minor changes and “design around” the patent claims to generate an equally effective invention without infringing on the researcher’s claimed invention. More than one claim can be presented, provided each claim is different.

Who should be listed as the inventors on a patent, and who determines this?

Under U.S. law, an inventor is a person who takes part in the conception of the ideas in the claims of a patent. Thus, an employer or person who only furnishes money to build (or practice) an invention is not an inventor. Likewise, persons included as authors on a publication may not meet the definition of inventorship on a patent. **Inventorship** is a legal issue and may require an intricate legal determination by the patent attorney prosecuting the application. Importantly, inventorship of a patent application may change as the patent claims are amended during prosecution of the application.

What (and how) records should be kept to help with the patenting process?

Accurate laboratory notebooks are essential for the documentation of an invention and establishing inventorship. They may also help overcome some types of prior art. To maintain good **laboratory notebooks**, be sure to:

- Avoid erasures
- Use permanent ink
- Identify subject matter
- Avoid loose pages/inserts
- Provide proper and safe storage
- Have entries witnessed daily/weekly
- Identify and attach photos, drawings, etc.
- Include and explain sketches, diagrams, etc.
- Use consecutive pages and date the entries
- Make new entries; do not alter existing entries
- Clearly identify the project to which all data relate
Collagen research at MU results in a better product for wound care and youthful skin.

Collagen is responsible for skin’s strength, texture and elasticity. When used in a medical setting, added collagen can aid in youthful looking skin, the healing of soft tissue and the restoration of lost volume.

Over time, collagen breaks down. Doctors had addressed this degradation, but the process used to alter the collagen yielded a product that was problematic for the body. In 2009 MU researchers Rebecca Rone and Dr. Sheila Grant discovered a new way to inhibit collagen degradation using nanotechnology. The collagen treated by their method is more stable and remains biocompatible—a promising factor for wound/burn care, osteoarthritis treatment and even a potential innovation for soldiers to minimize blood loss.

Using their technology, Rone and Grant along with Jonathan Thompson, Anthony Harris and David Grant founded a biotechnology firm called EternoGen. The firm was the first startup company to receive competitive funding from the University’s Enterprise Investment Program. Since its inception, it has been housed in MU’s Life Science Business Incubator and opened offices in St. Louis, Mo. and Stockholm, Sweden. Eternogen has attracted more than $2 million in investments and is now in the commercialization phase.

Dr. Sheila Grant is a professor of bioengineering at MU. She also serves as chief technology officer for EternoGen. Rebecca Rone, formerly director of MU’s Coulter Translational Partnership Program, now serves exclusively as EternoGen’s director of clinical and regulatory affairs.
Mizzou researchers are on their way to producing edible meat and usable leather with minimal environmental impact and without slaughtering animals.

One third of all available land globally is used for livestock production, and livestock contributes to 18 percent of greenhouse gas emissions. It takes more than 75 square feet of land to make one hamburger. University of Missouri professor, Gabor Forgacs, and his team are well aware of these statistics and their consequences. In 2011, they founded Modern Meadow, a company focused on leveraging advances in tissue engineering to solve global resource challenges created when raising livestock for the production of meat and leather.

The technology behind Modern Meadow was initially developed for medical applications. The emerging medical field of “tissue engineering” weaves together several disciplines of science and engineering to make tissues and organs that can mimic, restore, maintain or improve body function.

Members of Modern Meadow’s scientific team were some of the pioneers behind medical tissue engineering.

The Modern Meadow team is translating that research into creating leather and meat in the lab. Forgacs hopes that cultured meat and hides will help reduce negative effects of typical animal farming and provide additional options for both chefs and eco-friendly fashion designers.

Modern Meadow started with a group of dedicated scientists and researchers at MU. The company has since attracted a world-class team, with advisors and investors pledging more than $10 million in capital—all of whom share the common goal of solving the global food and resource crisis.
Upon filing the application, the patent applicant is aware of that could impact the patentability of the invention. This submission is called an Information Disclosure Statement (IDS) or a patent application before it is filed and will also ask questions about inventorship.

At the time an application is filed, OTMIR will ask the inventors to sign an Inventor’s Declaration and a confirmatory Assignment of Rights to MU for filing with the application at the USPTO.

**What occurs during the patent application drafting and prosecution processes?**

**Patent Application Drafting.** Patent applications are generally drafted by either a patent attorney, or a patent agent (a non-attorney with a science education licensed by the USPTO). The patent attorney/agent will ask all inventors to review an application before it is filed and will also ask questions about inventorship.

Failure to fulfill one’s duty to disclose material information to the patent office can sometimes rise to the level of defrauding the USPTO and can lead to either invalidation, or dismissal of a patent/patent application.

**Patent Prosecution.** Upon filing the application, the application is granted a filing date and a serial number. Once filed, the University (and the inventors) are allowed to use the designation “patent pending” with respect to products incorporating the invention and associated advertising, packaging, etc. However, there are no enforceable rights unless and until a patent application is deemed allowable by a patent examiner and the issue fees are paid. Thus, while filing an application begins the process, the University cannot prevent others from making, using, selling or offering for sale the invention unless and until a patent actually issues.

Primarily because of the backlog of applications at the USPTO, it will typically be at least 18 months (and up to five years or more for software/Internet patent applications) before the application is reviewed by a patent examiner (Examiner).

**What is an Information Disclosure Statement (IDS)?**

In the U.S., a patent applicant has a continuing duty to disclose to the USPTO all information that the patent applicant is aware of that could impact the patentability of the invention. This submission is called an Information Disclosure Statement (IDS) and typically includes copies of prior art (e.g., prior patents or journal articles).

The patent prosecution process is adversarial in nature. Relatively few applications are allowed as filed. Multiple Office Actions may be received as the patent prosecution process continues.

The patent attorney, inventors and OTMIR will collectively work on a response to each Office Action to address the Examiner’s reasons for rejection. The claims may be amended in the response, but new matter cannot be added.

If the Examiner is persuaded, the claims of the patent application are eventually allowed by the Examiner, and an issued patent is obtained. The time frame for the entire process of filing and prosecuting a patent application to issuance varies but is typically two to five years.

**What is a “final” Office Action?**

When an Examiner rejects the patent application for a second time for the same reasons as in the prior Office Action, the Examiner calls the Office Action a “final” Office Action. This wording is somewhat of a misnomer, because the patent applicant may still seek 1) to amend the claims again, 2) an interview to persuade the examiner in person, 3) to file a request for continued examination (along with an additional fee), or 4) to appeal. A 2010 study from Stanford University found that more than half of those applications that received a final rejection ultimately resulted in patents, and another 20 percent were still pending after more than five years.

**What is a University inventor’s role in responding to the Office Action?**

If the decision has been made to respond to the Office Action, the patent attorney will be directed to obtain any necessary assistance to prepare an appropriate response.

• Avoid fragmentary diagrams/sketches, or diagrams/sketches without explanatory notes
• Avoid splitting entries between two or more laboratory books (one book should be complete in itself, especially when two or more investigators are working on the same project)
• Make notations of the progress and completion of compounds, assemblies or models being prepared for testing
• Note the successful testing of a compound or particular set-up/piece of equipment, because the “reduction to practice” and the date of such accomplishment may be important
• Never tear or cut out pages from a lab notebook

What is an Office Action?

In nearly all instances, the patent prosecution process involves the issuance of one or more Office Actions by the Examiner. After reviewing the patent application, the Examiner will search the USPTO’s prior art databases (e.g., issued patents, published applications, technical articles, etc.) to attempt to locate any relevant prior art references. In the Office Action, the Examiner explains why each of the pending claims is allowable or rejected for either a lack of novelty, or for being obvious in view of the prior art. The Examiner may also believe that the claims are not sufficiently clear, or that the claims are too broad, given the actual invention.
Unless the objections or rejections are purely procedural in nature, it is likely that the inventors will be contacted for their input and review of draft responses prepared by our patent attorney.

What is a Notice of Allowance (NOA)?

When the Examiner believes the claims are sufficiently clear, not overly broad, novel and non-obvious, he/she will issue a Notice of Allowance (NOA), essentially saying that the patent application is ready to issue into an enforceable patent.

How is patent protection in foreign countries achieved?

Each country has its own patent laws, and a patent must be filed in each country where patent protection is desired. However, under the Patent Cooperation Treaty (PCT), an inventor can file a single international patent application in one language with one patent office in order to preserve the right to seek patent protection for an invention in 100+ countries throughout the world. Although the PCT system does not grant an international patent, the University may file a PCT application because it:

• Delays the expenses associated with applying for patent protection in individual countries;
• Allows OTMIR more time to assess the commercial viability of the invention; and
• Provides preliminary examination as to the patentability of the claims.

How are the patent laws in foreign countries different from the U.S.?

Foreign patent protection is subject to the laws of each individual country, although in a general sense the process works much the same as it does in the U.S.

Importantly, in most foreign countries, an inventor will lose any patent rights if the inventor publicly discloses the invention prior to filing the patent application. In contrast, the U.S. has a very limited one-year grace period to file a patent application, but the scope of this grace period is legally complex. If the invention has been disclosed publicly for less than one year, this grace period may apply. Contact OTMIR as soon as possible to assess the patentability of an invention.

How long is a utility patent enforceable?

Once a utility patent is issued in the U.S., it is enforceable for 20 years from the initial filing of the application that resulted in the patent. The USPTO requires payment of maintenance fees at four, eight and 12 years from patent issuance.

How much does it cost to file for and obtain a patent?

Filing a regular U.S. patent application typically costs $10,000 or more. To obtain an issued patent typically costs at least an additional $10,000 to $15,000 in patent prosecution fees.

Filing and obtaining issued patents in other countries may cost $20,000, or more, per country. Also, throughout the life of a pending patent application/issued patent in most foreign countries and once a patent is issued in the U.S., certain government maintenance fees are required to keep the patent application viable, or the issued patent enforceable. These fees range from hundreds to thousands of dollars.

What happens when inventions are created through a collaboration with another institution/company?

After the inventor submits an IDF, OTMIR will review the circumstances under which the invention was developed. If the invention resulted under a contract between MU and another entity, OTMIR, in conjunction with the Office of the General Counsel, will review the contract to determine ownership and other rights associated with the contract and to determine the appropriate next steps. If the technology is jointly owned with a company, OTMIR will work with the company to determine the appropriate patenting and licensing strategy, which may involve a first/preferential option for the company to license the technology before a license can be offered to another party.

Should the technology be jointly owned with another academic institution, the licensing specialist will usually (1) negotiate an inter-institutional agreement (IIA) that provides for one of the institutions to take the lead in patent management and licensing activities for the invention, (2) bear the expenses associated with the patenting process (or work out a cost-sharing arrangement between the parties) and (3) allocate any licensing revenues.

Where can a researcher find patent and patent application examples?


For copies of international patents, visit http://patentscope.wipo.int/search/en/search.jsf.
COPYRIGHTS, TRADEMARKS, TRADE SECRETS, AND RESEARCH TOOLS & MATERIALS

What is a copyright, and how is it useful?

Copyright is a form of protection provided by the laws of the United States to the authors of “original works of authorship.” This includes literary, dramatic, musical, artistic and certain other intellectual works, as well as computer software, including mobile applications. This protection is available to both published and unpublished works.

The Copyright Act generally gives the owner of the copyright the exclusive right to conduct and authorize various activities, including reproduction, public performance and making derivative works. Copyright protection is automatically secured when a work is fixed into a tangible medium such as a book, software code, video, etc. In some instances, the University registers copyrights but generally not until a commercial product is ready for manufacture/licensure.

What is a derivative work?

In relation to copyrights, a derivative work is based upon one or more preexisting works, such as a translation, musical arrangement, dramatization, fictionalization, motion picture version, sound recording, art reproduction, abridgment, condensation, or any other form in which a work may be recast, transformed or adapted. A work consisting of editorial revisions, annotations, elaborations, or other modifications, which, as a whole, represent an original work of authorship, is a derivative work. The owner of a copyright generally has the exclusive right to create derivative works.

How should copyrightable works be marked?

Although copyrightable works do not require a copyright notice, it is recommended. For works owned by the University, the following template should be used: © [Year] by The Curators of the University of Missouri, a public corporation.

How is a copyright on a work obtained?

Copyright protection, unlike patent protection, is automatic. As soon as the work is fixed in a tangible form, it is protected under copyright law. An author does not have to place a copyright notice on a work for it to be protected, but this is a good idea, because it tells others to whom the work belongs.

What is a registered copyright?

Although copyright is obtained once a work is fixed in a tangible medium, the copyright must be registered with the Library of Congress to be able to sue if someone infringes the copyright. The registration process is relatively inexpensive. If registration is filed within three months of publication, or at any time prior to an infringement, the registration allows the copyright owner to recover statutory damages and attorney’s fees. The statutory recovery provision may be of help because copyright owners often find it difficult to calculate and prove exactly how an infringement has hurt/damaged them.

What is the public domain?

Works that are not copyrighted are considered to be in the public domain and anyone may freely use such works for any purpose. In reality, very few works created after 1978 are in the public domain. Just because a work is publicly available (e.g., on the Internet), does not mean the work is in the public domain. To use copyrighted works, you must obtain permission from the copyright owner. Many works are distributed with certain permissions expressly granted, and if so, the user may use the work only for the purposes stated. If the user wants to use the work for any other purpose, the user must obtain prior permission from the copyright owner.

How can a researcher learn more about MU copyright policies?

MU’s copyright policies are found in CRR 100.030: Copyright Regulations, which are available online at: http://www.umsystem.edu/ums/rules/collected_rules/business/ch100/100.030_copyright_regulations

Contact OTMIR with any questions about a potentially copyrightable work.

What is a trademark and how is it useful?

A trademark is a brand name. A trademark is any word, name, symbol, device or combination thereof, used in commerce to identify and distinguish the goods of one manufacturer/seller from those manufactured or sold by others.

What is a federal trademark registration and how is it obtained?

A federal trademark registration is a procedure in which the USPTO extends certain rights to trademark applicants if the trademark application meets certain legal criteria based upon legitimate use of the mark in commerce. However, it is not necessary to register a trademark to prevent infringement. Trademarks for products and services generally become protected as soon as they are used in commerce, even before registration, in the geographical area of use.
COLLABORATIVE SUCCESS STORIES

University of Missouri scientists have created the first soy product with the texture of chicken.

Meat substitutes provide essential protein without antibiotics, hormones, GMOs, trans fats and cholesterol. But many consumers are reluctant to eat substitutes, because the texture is different from meat.

A soy product that tastes like chicken is nothing new, but mimicking the feel has eluded food scientists — until now. MU researchers Fu-Hung Hsieh and Harold Huff have found the recipe for success. Food Network critic Alton Brown gave their product a thumbs up: “I actually feel the product breaking down meatily in my mouth…I think these guys may be on to something.”

Entrepreneur Ethan Brown of Beyond Meat quickly saw the discovery’s potential and partnered with Hsieh, Huff and MU to begin commercial production under the brand name “Beyond Meat.” With support from additional investors, including Bill Gates, the chicken-free strips are now available nationwide in Whole Foods and other familiar stores.

Dr. Fu-Hung Hsieh is a Professor of Bioengineering and Harold Huff is a Senior Research Specialist in Bioengineering. Both scientists are housed in the University of Missouri’s College of Engineering and the College of Agriculture, Food and Natural Resources (CAFNR).

Chews Like Chicken

*Image courtesy of The Columbia Daily Tribune.
With a federal trademark registration, the registrant is presumed to be entitled to use the trademark throughout the U.S. for the goods or services for which the trademark is registered.

What is a trade secret?

A trade secret is a formula, practice, process, design, instrument, pattern or compilation of information which is not generally known or reasonably ascertainable, by which a business can obtain an economic advantage over competitors or customers.

MU does not generally attempt to protect trade secrets; however, many of MU’s corporate partners place a high value on protection of their trade secrets. For this reason, extreme care must be taken if confidential information shared with MU by a corporate partner under a non-disclosure agreement (NDA) is included in a publication or public presentation. For more information, contact OTMIR at 573.882.6013, tmir@missouri.edu, or visit http://tmir.missouri.edu.

OWNERSHIP OF INVENTIONS AND COPYRIGHTABLE WORKS

Who owns inventions and copyrightable works created at MU?

As a general rule, the University owns inventions made by its employees:

1) Whenever the employee’s duties include research or investigation, and the invention or plant variety arose in the course of such research or investigation and is relevant to the general field of an inquiry to which the employee was assigned; or

2) Whenever the invention or plant variety was in a substantial degree made or developed through the use of MU facilities or financing, or on University time, or through the aid of MU information not available to the public.

MU will own the copyright in copyrightable works that are:

1) Commissioned for its use by the University;
2) Created by employees if the production of the works is a specific responsibility of the position for which the employee is hired;
3) Sponsored works, which are works resulting from internal grants (work created as a result of an agreement between MU and the creator(s) of the work) and external grants (work created as a result of an agreement between an external sponsor and MU); or
4) Created with the use of substantial University resources which are specifically provided to support the production of the copyrightable works.

The University policy governing patents and plant variety ownership is found in UM CRR 100.020, and the University policy governing copyrightable works is found in UM CRR 100.030. In some cases, the terms of a Sponsored Research Agreement or Materials Transfer Agreement may impact ownership. When in doubt, it is best to contact OTMIR for advice.

Who owns rights to inventions made while consulting?

MU employees are expected to ensure that the terms of any consulting arrangement are consistent with University policies, including those related to conflicts of interest, IP ownership, employment responsibilities and the use of MU facilities/IP.

Can a student contribute to an invention?

Yes, many students contribute to inventions at MU under a wide variety of circumstances. MU promotes student entrepreneurship, and students can be named as inventors under U.S. patent law. Typically, students will own the rights to an invention unless they created it in their capacity as an MU employee, or if they used more than incidental MU resources. Review UM CRR 100.020 for details.

Clearly define the scope of work within consulting contracts to minimize any issues with ownership of inventions created from MU research/resources. OTMIR is available for questions and advice.

Who owns rights to inventions made while on sabbatical?

Generally, if faculty members on sabbatical leave are paid by the University, then the University retains rights to any inventions connected to the faculty member’s scope of employment. Contact OTMIR before a sabbatical leave to ensure that ownership considerations are documented.

Should visiting scientists or scientists at other institutions be listed on an IDF?

All potential inventors should be mentioned in an IDF—even if they are not MU employees. OTMIR, along with legal counsel, will determine the rights of such persons and institutions. It is prudent to discuss with OTMIR all working relationships (preferably before they begin) to understand the implications for any subsequent inventions.

Can a student contribute to an invention?

Yes, many students contribute to inventions at MU under a wide variety of circumstances. MU promotes student entrepreneurship, and students can be named as inventors under U.S. patent law. Typically, students will own the rights to an invention unless they created it in their capacity as an MU employee, or if they used more than incidental MU resources. Review UM CRR 100.020 for details.
What is a license agreement?

A license is a legal agreement by which the owner or controller of intellectual property (IP) grants rights to another party. License agreements describe the rights and responsibilities related to the use and exploitation of IP developed at the University. MU license agreements usually stipulate that the licensee should diligently seek to bring the IP into commercial use for the public good and provide a reasonable financial return to the University.

How are most licensees identified?

OTMIR uses many sources and strategies to identify potential licensees and market University inventions. Sometimes existing relationships of the inventors, OTMIR staff and other researchers are useful in marketing an invention. Market research can also assist in identifying prospective licensees. OTMIR examines other complementary technologies and agreements to assist their efforts. In its efforts to identify potential licensees, OTMIR attends conferences and industry events, makes direct contacts with potential licensees and uses its website to post inventions. Faculty publications and presentations are often excellent marketing tools as well, but their timing must be coordinated with OTMIR to avoid compromising patent rights. It is rare for MU to have multiple potential licensees seeking an exclusive license for an invention.

How long does it take to find a potential licensee?

It can take months and sometimes years to locate a licensee depending on the attractiveness of the invention, its stage of development, competing technologies and the size and intensity of the market. Most University inventions tend to be in the early stage of the development cycle and thus require substantial commercialization investment, making it difficult to attract a licensee.

How can a researcher assist in marketing his/her invention?

A researcher’s active involvement can dramatically improve the chances of matching an invention to an outside company. Research and consulting relationships are often helpful in both identifying potential licensees and technology champions within companies. Once interested companies are identified, the inventor is the best person to describe the details of the invention and its technical advantages.

The most successful tech transfer results are obtained when the inventor and the licensing professional work together as a team to market and attract investment in the technology.

How does OTMIR choose a licensee?

A prospective licensee is asked by OTMIR to prepare a business plan showing how they plan to commercialize a given technology. Sometimes an established company with experience in similar technologies and markets, or a track record of success in other areas is the best choice. In other cases, the focus and intensity of a startup company is a better option.

Can there be more than one licensee for a single invention?

Yes, an invention can be licensed to multiple licensees, either non-exclusively to several companies, or exclusively to several companies, each for a unique field-of-use (application) or geography.

What can an inventor expect if their invention is licensed?

Per University policy, a share of any financial return from a license (with some exclusions) is provided to the inventor(s). For more information, see Section H of the University’s patent policy found at: http://www.umsystem.edu/ums/rules/collected_rules/business/ch100/100.020_patent_and_plant_variety_regulations.

Most inventors enjoy the satisfaction of knowing their inventions are being commercialized for the benefit of the general public. New and enhanced relationships with businesses are another possible outcome that can augment one’s teaching, research and consulting. In some cases, additional sponsored research may result from the licensee.

What is the relationship between an inventor and a licensee, and how much of the inventor’s time will it require?

Many licensees require the active assistance of the inventor to facilitate their commercialization efforts, at least at the early stages of development. This can range from infrequent, informal contacts to a more formal consulting relationship, or a separate sponsored research agreement for further research and development of a licensed technology.

Working with a business startup can require substantially more time, depending on the inventor’s role in/with the company and his/her continuing role within the University.
An inventor’s participation with a startup is governed by University conflict of interest policies and the approval of the inventor’s supervisor.

**What other types of agreements are involved with licensing?**

**Non-Disclosure Agreements** (NDA) are used to protect the confidentiality of an invention during evaluation by potential licensees. NDAs also protect proprietary information of third parties that University researchers need to review to conduct research, or to evaluate research opportunities. NDAs are facilitated by OTMIR and can only be executed by someone with University signature authority.

**Material Transfer Agreements** (MTA), used for incoming and out-going materials at the University, are also administered by OTMIR. These agreements describe the terms under which both MU and outside researchers may share materials, typically for research or evaluation purposes. Intellectual property rights can be endangered if materials are used without a proper MTA. MTAs are facilitated by OTMIR and can only be executed by someone with University signature authority.

**Inter-Institutional Agreements** (IIA) describe the terms under which two or more institutions (generally two universities) will collaborate to assess, protect, market, license and share in the revenues received from licensing jointly owned IP. A single co-owner usually takes the lead on patent management and licensing activities for the consolidated rights, and OTMIR negotiates and executes the IIAs on behalf MU. IIAs can only be executed by someone with University signature authority.

**Option Agreements**, or option clauses within research agreements, describe the terms and conditions under which the University grants the exclusive opportunity for a third party to negotiate a license for IP, typically for a limited time.

Option clauses are often provided in a **Sponsored Research Agreement** (SRA) with corporate research sponsors. Option Agreements are entered into with third parties wishing to evaluate a technology prior to entering into a full license agreement. Options can only be executed by someone with University signature authority.

**CONFLICT OF INTEREST**

**What is a conflict of interest?**

MU is committed to fostering an academic environment in which the University’s teaching, research, service and economic development missions are furthered. Participation in outside professional or commercial activities make important direct and indirect contributions to the strength and vitality of Mizzou. Such activities add knowledge that is relevant and useful to teaching and research, develop sources of funding, and establish relationships valuable to the University. However, the pursuit of MU’s diverse missions can lead to inherent conflicts of interest (COI). As a steward of public funds and public trust, MU is committed to identifying activities that present the potential for COIs and managing them to assure that they do not threaten the integrity of MU students, staff and faculty.

The key to identifying a COI is to evaluate the dual roles an employee plays and determine whether there is a potential for personal gain and/or improper advantage to others to the University’s detriment. Put another way, if an employee has an outside interest that could reasonably appear to affect his/her teaching, research or other University responsibilities, or could impact the interests of the external entity in which the employee has an interest, a COI may exist.

A COI may arise regardless of an employee’s intentions. Perceived COIs can be as harmful as real COIs; therefore, it is MU’s policy that all outside interests of an employee related to their institutional responsibilities must be disclosed.

**What is MU’s policy on conflict of interest (COI)?**

All MU employees are subject to the requirements within the UM CRRs. All University employees, regardless of position or length of employment, must self-disclose any outside employment or business activities and interests that could interfere with his/her regular duties, or represent a COI (UM CRR, Section 330.015.D).

All faculty and exempt staff have the additional duty to disclose any consulting activities outside the University on an annual basis (MU CRR, Section 330.015.E).


Also, for those individuals involved in research funded through federal grants/contracts, please see the concurrent COI policy related to research activities at: http://www.umsystem.edu/ums/rules/collected_rules/research/ch420/420.030_conflict_with_the_interests_of_federal_grant_agencies.

Lastly, some conflicts can also arise at the institutional level. MU has a policy addressing such conflicts at: http://www.umsystem.edu/ums/rules/collected_rules/research/ch410/410.020_institutional_conflicts_of_interest_in_human_subjects_research.
What are some COI examples?

The following are examples of possible COIs that may or may not require management but should be reported:

- A faculty member is teaching for both MU and a local community college
- A faculty member owns stock in a company that supports the member’s research
- A company is sponsoring a faculty member’s research and has asked the member to speak at the company’s annual convention
- A researcher owns equity in a small business run by the researcher, or a family member
- A researcher’s startup company wishes to enter into a contract with MU
- A faculty member authors a textbook assigned to the faculty member’s students in a course at MU
- A faculty member is a consultant for industry
- A researcher’s outside employment or business activities and interests potentially interfere with the researcher’s University-related responsibilities
- A faculty member’s outside interest overlaps with MU’s business activities (teaching, research or service)

What is a conflict of commitment?

A conflict of commitment may exist when duties, assignments or responsibilities associated with a technology license, or outside interest, either (a) impacts an ability to meet responsibilities to MU, or (b) exceeds the amount of time available for these activities to occur concurrently. MU policy states that employees must disclose the situation to their supervisors and discuss the implications on their job responsibilities with the University.

How does a researcher disclose outside interests?

To disclose outside interests, go to https://ecompliance.missouri.edu/login. You will be directed to MU’s eCompliance reporting portal.

Once logged-in, select the Conflict of Interest module from the dashboard screen; there, you can create or update an Outside Interest Disclosure Form. If additional guidance is needed, please reference the step-by-step guides at: http://research.missouri.edu/compliance/conflict_of_interest/using

If an employee has a COI, who determines how the conflict will be managed?

MU’s Conflict of Interest Committee has been charged by the Chancellor with the responsibility for management of all University COIs. The Provost coordinates Committee activities and is considered the campus’ designated official for compliance with federal regulations.

How does MU manage conflicts associated with research and tech transfer transactions?

While it is the responsibility of the employee to disclose any outside interests (as described in the COI policies) the COI Office is available to answer any questions and provide guidance to MU employees about reportable activities. The COI Committee works to assist faculty and staff to appropriately structure their various outside interests to reduce, or eliminate potential risks. No two situations are the same; therefore, the Committee works diligently to understand each scenario to customize solutions to best meet the needs of all parties.

When should a researcher seek guidance on conflict of interest?

Whenever a question or uncertainty arises, guidance is available from the COI Office by calling 573.882.3841. Information, including direct contact numbers and emails, is available online at: http://research.missouri.edu/compliance/conflict_of_interest.

Employees should seek COI guidance when a license, option or MTA is being considered with a company in which any University employee has an equity/management interest.

What happens if an MU employee ignores a possible COI situation?

MU policy requires disclosure of outside interests annually/whenever an outside interest arises or changes. Violation of this policy constitutes a breach of the employment contract and may lead to disciplinary action. In some cases, the failure to disclose and manage COI is also a violation of state and federal regulations and mandated sanctions apply.

Finally, failing to disclose a potential COI can slow grant proposals and other approval processes.
Enzymes are widely used in food processing and manufacturing, because they use little energy, are non-toxic and extremely efficient. Unfortunately, enzymes also pose challenges because they are commonly expensive to produce and typically break down extremely quickly in harsh conditions.

In 2008, MU postdoctoral investigator Brian Thompson and Dr. George Stewart, a professor in the department of Veterinary Pathobiology, were researching bacterial structures when they discovered bacteria which would produce enhanced enzymes. These enhanced enzymes were easily harvested and lasted much longer than traditionally-produced enzymes. This discovery is now the foundation of the technology for Elemental Enzymes, which produces ultra-stable enzymes at lower costs.

The proprietary and patented Elemental Enzymes technology allows enzymes to operate under higher temperatures and last longer in harsh environments or industrial processes—opening marketplaces where enzymes were previously not a viable or commercially consistent option.

Elemental Enzymes has a number of exciting technologies that can be utilized in various agriculture market segments. They maintain research labs at the MU Life Sciences Business Incubator and recently added an R&D facility in St. Louis, Mo. Recently, they announced a cross-licensing agreement with Bayer Crop Science to further its research on crop productivity.
The University of Missouri Office of Technology Management and Industry Relations (OTMIR) works to identify, assess, protect and market commercially viable intellectual property (IP) developed at MU by:

- **Filing** for IP protection with U.S. and foreign patent and trademark offices;
- **Negotiating** all IP agreements;
- **Facilitating** industry relations by negotiation and execution of Material Transfer and Non-Disclosure Agreements;
- **Assisting** with negotiation of IP provisions in industry-sponsored research contracts.

We strive to facilitate pathways for MU technology to create impact in our society, build and enhance relationships with industry and stimulate regional economic development.

In FY2015, OTMIR received 71 invention disclosures and executed 22 licenses and options. We filed 73 U.S. patent applications and had 25 U.S. patents issued. In addition, 197 Non-Disclosure Agreements and 391 Material Transfer Agreements were executed.

Our experienced central administrative staff receives invention disclosures, works with inventors to collect documentation, manages financial records and provides general support to the OTMIR team. Intellectual Property Licensing Units (IPLUs) are strategically embedded within the colleges and research centers that generate the majority of invention disclosures at MU. They are staffed by scientific, business and legal experts who work with MU researchers to analyze inventions for novelty, attainability of intellectual property protection and marketability.

Our licensing professionals have industrial and academic expertise in agronomy, biological and chemical engineering, reproductive physiology, cell and molecular biology, as well as many aspects of pharmaceutical research.

The OTMIR team provides the optimal vehicle for successful technology commercialization for MU’s diverse and productive research programs.