

University Technology Transfer

“Why we do what we do”

Universities have served for centuries to teach, to generate new knowledge through research, and to serve society. These three pillars of the university’s mission come together in the modern-day effort of technology transfer. Academic scientists and students – scientists in training – make basic discoveries in research programs often funded by government or non-profit organizations. The university technology transfer office facilitates partnerships with companies whose resources and commercial expertise help translate these basic discoveries into useful products. And society’s investment in research comes full circle, with basic discoveries brought forward to improve the health and prosperity of the broader community.

This is the vision that inspires those who work in the profession of technology transfer – to translate discoveries into tangible benefits that can impact society for generations to come.

In the past, universities typically had a relatively isolated role in society. Professors and students worked and studied quite apart from the bustle of daily commerce. In many fields, that remains true today, so that by far the most common means for new knowledge to be shared is through training students and publication. Often when new discoveries are made in university laboratories they can be of immediate use for the general public, and simple sharing of information can provide the value to the broader society. New information about how the solar system was formed, the most efficient way to irrigate food crops, or the effect of diet on human health – this and much more can be shared and be informative and useful right away.

Sometimes, though, university discoveries require extensive development before products and services can be made available to the public. Universities can’t do this alone. In one of the major advances of the 20th century, researchers at Stanford and UC San Francisco learned to clone genes in the early 1970s, but it wasn’t until 1982 that the first new drug based on this discovery – human insulin - was approved for human use. Turning the research discovery into a useful product required significant investment and further development by a private company partner, Genentech. Because companies invested in developing this university discovery, today literally hundreds of new health care products are in use, and a new industry – biotechnology – adds tremendous value to the world’s economy. Technology transfer is the tool that helped translate a basic research discovery into products that have improved human health, and shaped our world.

The history of modern-day technology transfer approaches can be traced back over half a century to shifts in US support for research. In the aftermath of World War II, the US government recognized that scientific advances pave the way to a

strong industrial society, and began a significant, long-term commitment to fund basic research. This led to strong growth in the research capacity in both federal laboratories and universities in the US and to a sea change of expectations about the role of universities in society.

In the 1960s and 1970s, universities began working much more actively with companies to support development of new products. A group led by the University of Wisconsin and Stanford University began to seek more streamlined ways of managing the intellectual property that came from their federally funded research to make it easier to transfer rights to companies who could develop products based on that work. This led to the passing in 1980 of the Bayh-Dole Act, which allowed universities to own patents based on discoveries funded by the federal government, and stimulated more universities to set up active programs to manage the commercialization of their discoveries.

Today, hundreds of universities and research institutions around the globe have active technology transfer programs. Their work has translated research into improvements in human health, useful new consumer products, new energy technologies, and an improved quality of life. Many of these stories are highlighted in The Better World Project launched in 2005 by the Association of University Technology Managers, an international nonprofit membership organization (<http://www.betterworldproject.net/>). Cancer tests, cochlear implants, more nutritious foods, cleaner ground water – pick an area of concern or opportunity, and university technologies from around the world have made a difference.

So how do great ideas get turned into great products? Universities are excellent at research and discovery, but they are not the best place to develop commercial products. To get something to market, companies must carry the ball by investing their product development skills and resources in further development. For this to happen, a company has to see a path to success in the marketplace, or it will invest in something else. The company needs to be able work closely with the university to get the information and materials that are important for further product development, and it needs intellectual property protection to reduce the risk of another company competing after it has made a significant investment. Providing these essential elements is what university technology transfer offices do – finding a good partner, getting them the information they need to develop a good product, and providing intellectual property protection so an expensive, risky project still makes good business sense.

The main motivation for a university to transfer technology is an extension of its basic mission – to teach, to generate and share new knowledge, and to be of service to society. And sometimes technology transfer generates significant income for the company partner and the university. With increasing success, and the occasional blockbuster product based on an academic discovery, reliance on university technology transfer efforts has grown. Internationally,

innovation is seen as key to competitiveness. “Innovation will be the single most important factor in shaping prosperity” according to the Council on Competitiveness.¹ Regionally, universities are seen as a source of innovations for local companies to create new products and local jobs. University officials see technology transfer activities as a potential source of revenue to support university programs, and an opportunity for professional development for faculty keen to see their research benefit the public. Everyone, it seems, has an idea of what technology transfer can do for them.

In this environment, the people who manage the university innovations play a crucial role and are relied upon by universities, companies, investors and economic development officials to identify and manage new discoveries in the best interest of the public. Their role includes:

- Preserving intellectual property rights
- Facilitating partnerships with companies and other partners in support of further research or product development
- Protecting the academic research enterprise – the source of future innovations

Their work is very labor intensive, requiring a high skill level and strong service orientation to understand and juggle the needs of the researcher, the university, company and community partners, and the public that supports the research and stands to benefit from its commercialization.

Few universities have independent funds to support their technology transfer programs, and many programs must be self-supporting. Even so, most of the funds generated through technology transfer go for further research and education, and are shared with researchers who often use them for additional research.

But the motivation for most people in technology transfer is not the money it can generate. The real value is about impact. According to Lee Hartwell, who heads the Fred Hutchinson Cancer Research Center:

“I think it is easiest to capture the role of TT by referring to the institution's mission. Ours is ‘to eliminate cancer and other important diseases as a cause of human suffering and death.’ ... (O)ur faculty don't choose their research projects on the dollar value but rather on the medical impact - so should our TT office.”

In the summer of 2006, specialists from a dozen leading research institutions came together to consider the role of technology transfer in today's university. Recognizing that, “...universities share certain core values that can and should be maintained to the fullest extent possible in all technology transfer agreements...,” they discussed their shared perspectives on the profession and

¹ <http://www.compete.org/about-us/initiatives/nii/>

developed “Nine Points to Consider in Licensing University Technology.”² Among the values supported are scientific freedom, broad access to research tools, conflicts of interest, and unmet societal needs.

The role of technology transfer will be critical for universities for the foreseeable future. New ideas and technology from university research helped to create the world we live in today, and will continue to shape the world of tomorrow. By maintaining the core values of the university while working with the private and public sectors to enable development of products, those of us in the technology transfer profession help change the world.

² http://autm.net/ninepoints_endorsement.cfm