Senate Finance Higher Education Subcommittee
Senator Judith Zaffirini, Chair

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(Your greetings to the Chair and to the committee.)

You have asked me to discuss ways to improve research commercialization at Texas universities. As both a life-long business entrepreneur in the State of Texas and, since 1989, as the founder and head of an Austin-based venture capital firm specializing in funding and managing life sciences start-up companies, I have substantial experience with Texas university technology research and the successful commercialization of such technology.

My comments will focus primarily on the needs of Texas universities' technology commercialization in developing those technologies into early-stage life sciences companies; the challenges and barriers in accomplishing this; and

recommendations to the state on how these issues can be addressed.

Technology Commercialization: University Perspective

Let me speak first from the perspective of the university.

Traditionally, Texas universities have looked on their core mission as two-fold: the creation and dissemination of knowledge for the public good; and research aimed at discovering new knowledge. That dual mission did not, and for some academic institutions, continues not to include technology commercialization as part of the university's mission.

That traditional university mission model is changing, but in many cases only slowly. It is imperative that all Texas institutions of higher education recognize and act on the recognition that technology commercialization is about translating university research into new products and services that serve the public good and benefit the welfare of humanity.

Technology commercialization creates positive growth for Texas universities, for the universities' researchers and scientists, and for business and industry partners involved in

the technology commercialization process. This process, in turn, creates positive growth for the university's community, the State of Texas, and the nation.

Successful technology commercialization is fundamentally about collaboration.

Collaborative partnerships among Texas academic institutions, business and government are forged to increase and facilitate the flow of technology from university research environments into the marketplace. The goals and results of such synergies include:

- New entrepreneurial companies
- Expanded knowledge-based employment
- Innovative, competitive products and services
- New revenue sources for Texas universities and local and state governments
- Economic development for Texas communities
- Platforms for future collaboration

Additional benefits of technology commercialization for universities are:

- Increase in Texas university research as more and more research grants demand a commercialization component
- Meeting the university's intellectual property obligations to research sponsors
- Increase in Texas academic institutions attracting research sponsors
- Increase in top scientist recruitment to Texas universities
- Increase in top scientist retention at Texas universities
- Increase in community recognition and good will for the greater economic development
- Increase in visibility of Texas universities and the State of Texas
- Increase in more industry attracted to the State of Texas

Technology Commercialization: Industry Perspective

If you look at dealing with Texas academic institutions from the perspective of industry, U.S. and international corporations, as well as smaller but well-funded companies, they often look with skepticism on collaborative partnership with the universities for the following reasons:

- University bureaucracy and “red tape” take too long to do business deals
- Universities don’t know how to value deals and often ask for too much or too little
- Big business is risk averse to the very early stage technology in universities
- Big business does not have the time or know-how to mine technology from universities

The benefits of technology commercialization for industry are obvious, and include access to breakthrough technology that could lead to a competitive and desirable market leadership position; major market revenue potential; and the continuing flow of development of the technology. Nevertheless, Texas universities cannot reap the enormous potential and rewards

of collaborative industry partnerships unless they remove the barriers to such partnerships within their university systems.

Macro Economic Realities

To fully understand the issues relating to Texas university technology commercialization, we have to consider the macro economic realities of the current investment climate in the United States.

America is in transition from a physical asset based society to a knowledge based society. The former CEO of GE, Jack Welch has said," We probably won't make refrigerators in America anymore but we will continue to make jet engines."

This transition in our society and economy necessitates the United States developing our knowledge based assets to the fullest. The greatest resource for increasing our country's knowledge-based resources is our universities and their groundbreaking research.

Future wealth creation will depend on the commercialization of knowledge residing in universities.

Biotechnology is an Excellent Model of the Risk and Rewards of Commercialization

This year for the first time the State of Texas has been named as one of the top five biotechnology economic development regions in the world by Washington, DC-based newsletter *FierceBiotech*. *FierceBiotech* included Texas as a region “having state programs that are driving the development of new facilities that will likely have a profound impact in determining where the industry will find its most fertile soil for future growth.”

In the Special Report *FierceBiotech* said “…. state economic development groups continue to see biotech as a prime source of top jobs that will in turn spawn new, clean growth.”

Texas has shown proactive leadership in developing the biotechnology industry in the state. 50% of the recipients to the Texas Emerging Technology Fund (TETF) are life science related.

Since May 2006 the Texas Emerging Technology Fund (TETF) has invested $42.5M in 38 deals:

- Of the 18 deals funded in the TETF Research Superiority and Research Matching program, one-third (6) of them were in life sciences and biotechnology.
- Of the 38 deals receiving TETF investments, 19 were medical device, biopharmaceuticals, nanotechnology, and pharmaceuticals deals.
- In regards to regional representation across all industries, nine of the TETF investments have been in rural areas in West Texas, Trans-Pecos, and South Texas. Seven of the 17 Research Superiority and Research Matching investments were in those regions.

Today, both economic development and the use of commercialization are used as metrics in consideration in consideration of tenure track at some Texas universities. This was only started recently – 2006 – at Texas A&M by Robert Gates with the Governor's support.

World class technology is being developed right here in our state. To cite just a few examples:

In 2007, $2.0 billion in research funding spread

across markets:

- Austin – $476 million
- Dallas/Ft. Worth – $442 million
- Houston – $793 million
- San Antonio – $179 million

In 2004 the University of Texas system patent position was:

- Ranked #4 in 2004 for patents issued to US universities
- Ranked #1 in the World for Biotech patents in 2004

A case study in point is the development of technology from Texas Tech University:

In 2004 Emergent Technologies, Inc. (ETI) created an affinity fund to commercialize technologies out of Texas Tech University and the Texas Tech School of Pharmacy. We were highly motivated to do this for several reasons:

- The technology was breakthrough and has the potential to be market-leading.

- It was a both a unique and underserved opportunity.
- We had the full cooperation and support of both the community and Texas Tech University.

Included in the information packet we have provided the committee is the Receptor Logic/Abilene, Texas Case Study. It is an example of future wealth creation in action.

Receptor Logic is a company founded on technology discovered at Texas Tech University and is the first biotechnology company for Abilene. Receptor Logic received a $2 million investment from the Texas Emerging Technology Fund this June, making Receptor Logic the first Abilene company to receive a TETF investment; and the first company based on Texas Tech technology to receive a TETF investment.

In addition to the TETF investment milestone, earlier this year, Receptor Logic announced a licensing and research agreement with Sanofi Pasteur, the world leader in vaccine development. The announcement of a licensing agreement

with a global leader attracted considerable attention, both nationally and internationally, from the media, biotech scientists and industry partners.

These are the benefits that Receptor Logic is bringing to Abilene and the benefits that successful technology commercialization can bring to communities throughout our state.

(Recognize Texas Tech University System Vice Chancellor of Technology Commercialization, David Miller, in the gallery.)

Recommendations to Further Enable University Technology Commercialization Efforts

To fulfill both the economic development and commercial potential of Texas university research and discoveries, much work needs to be done to enable the process of bringing the technologies to the marketplace. Following are a list of recommendations to facilitate Texas university and research institutions' technology commercialization efforts:

1. Make knowledge and science in universities more visible and accessible.
    - Create better collaboration and synergies between our state's university systems
    - Identify and make visible to researchers the Centers of Excellence that currently exist in many Texas institutions
    - Identify a simple and easy to use format for researchers to access such centers

2. Develop and mentor promising researchers.

    - Make it easier for researchers to engage in technology commercialization.
    - Develop a process to identify, qualify, and select researchers and technologies that are deserving of funding.
    - Create a fund to provide such researchers funds for development of proof-of-concept data enablement and patent protection.
    - Develop specific training and mentorship programs for future researchers interested in technology commercialization.

3. Increase research funding in Texas universities.

- Increase SBIR, STTR and similar grant applications to federal granting agencies.
- Encourage intra-institutional collaboration for invention and tech transfer.
- Award federal grant winners with match funding for “indirect costs” such as patent attorney fees and expenses, facilities rent, and vital business development activities.

Technology Commercialization Brings Significant Benefits to Texas Communities

Successful technology commercialization equates to wealth and job creation, facilitates diversification, and enables greater economic development across the state of Texas, both the metro and rural areas. It also brings new business and industry into the state; new strategic partnerships with national and international market leaders; and helps the state attract and retain highly skilled, educated and sought-after top talent across multiple industries.

Emergent Technologies, Inc. is a good example of this. ETI manages 17 portfolio companies from three of the Big 12 Universities and 11 of these companies are located in Texas.

I have previously referred to the Receptor Logic/Abilene, Texas Case Study in your packet. Receptor Logic's technology is a prime example of what technology commercialization can mean. Receptor Logic's unique and innovative technology may be utilized to address cancer, may contribute to new life-giving vaccines and may lead to other products and processes that will have a positive impact on the health and well-being of people worldwide.

Texas university technology commercialization is a significant community, state and national economic asset. We encourage academic leaders to engage in technology transfer and commercialization; and for state policymakers to make a priority the support and incentives needed to address current issues, so that a greater number of Texas universities and research institutions can participate. That

way, our state and its citizens can reap the full benefits of successful technology commercialization.