



16 October 2007

To: Georgia House Bioeconomic Development Study Committee
Rep. Charlice Byrd, Chair

From: Stephen Fleming
Chief Commercialization Officer, Georgia Institute of Technology

Subject: Testimony Regarding Life Sciences Economic Development in Georgia

Thank you for the opportunity to speak with you today. My name is Stephen Fleming, and I am the Chief Commercialization Officer for Georgia Tech. I oversee all activities related to protecting Georgia Tech's intellectual property and licensing it, both to startup companies and to established industry partners. One of my groups that you may be familiar with is VentureLab, which is partially funded by the Georgia Research Alliance, and is one of the most successful university commercialization groups in the country.

Georgia Tech is one of the top universities in the world for technology transfer and a top producer of startup companies, as listed in *Mind to Market*, a study published last year by the Milken Institute. According to this study, Georgia Tech was ranked number eleven globally and number 10 in the USA for overall technology transfer—bringing technologies from the lab to market. Most of our research is supported by contracts from the Federal government and private industry. According to a study last year by the Huron Consulting Group, Georgia Tech has a \$3.9 billion economic impact within the state—a return of almost \$15 for every state dollar appropriated to Tech.

What some people in Georgia still don't realize is how much of Georgia Tech's research is now devoted to biosciences. Ten years ago, the leadership of Georgia Tech and of Emory University realized the importance of convergence—the area of overlap between the previous distinct spheres of engineering and life sciences, including medicine. We don't have a medical school, Emory doesn't have an engineering school—so we created a joint Department of Biomedical Engineering. Today, we have over forty faculty members and hundreds of graduate students working in both colleges. Bioscience-related research now accounts for over \$100 million per year at Georgia Tech, approximately one-quarter of our sponsored research total.

For example, Georgia Tech, in collaboration with other Georgia institutions, has been awarded three national centers of excellence for nanomedicine, including being designated, with Emory, as just one of seven National Centers of Cancer Nanotechnology Excellence by the National Cancer Institute. Just last month, Georgia Tech and Emory were awarded a new grant from the National Institutes of Health—\$11.5 million over five years to deliver vaccines painlessly through patches applied to the skin as an alternative to hypodermic needles.

If you haven't visited the Georgia Tech campus lately, we have recently completed a four-building Life Sciences Complex, with over 1 million square feet of laboratories, offices, and classrooms. Construction is well underway for the Marcus Nanotechnology Center, which will be the most advanced nanotech facility in the Southeast, and which is designed from the ground up to encourage industry research and collaboration. We have over 400 graduate students in biology, bioinformatics, biosciences, and biomedical engineering; that's up from approximately zero only ten years ago. Most of them are working on projects that could be of direct value to Georgia's emerging bioeconomy.

Company Formation

Universities have long had a mixed record of creating commercial value from their research. Recognizing that we must do a better job of fostering and encouraging technology-based economic development, Georgia Tech has been at the forefront of providing a "continuum of care" for technology companies—and we have launched over 75 startup companies in the last decade. Our specific programs that support each stage of growth and development of companies include:

- VentureLab
- SBIR Assistance Program
- ATDC
- Technology Enterprise Park
- Bioscience Seed Fund
- Life Sciences Facilities Fund

Most of these programs are available to any startup in the state of Georgia, not just companies with ties to Georgia Tech.

VentureLab

VentureLab provides a pathway from laboratory innovation to the commercial market. Our clients are Georgia Tech faculty, research staff, and graduate students. My staff helps transform innovations into early-stage companies by assisting in business plan development, connecting the innovators with experienced entrepreneurs, locating sources of early-stage financing, and preparing the new companies for the business world. We have graduated sixteen companies in the last five years, and they have attracted well over \$100 million in venture capital investment to the state of Georgia. Approximately one-fourth of our VentureLab opportunities are in biosciences.

SBIR Assistance Program

Georgia Tech houses the SBIR Assistance Program for the state of Georgia. Frequently a financial boost from a Federal agency can be just what a company needs to take its technology to the next level with the goal of eventually commercializing it. While eleven Federal agencies provide research and development funding through the SBIR/STTR program, identifying the best way to tap into this resource can be daunting.

Traditionally, Georgia has lagged well behind our peers in capturing these grants. Georgia is 12th in the nation in academic R&D funding, 12th in number of science and engineering Ph.D.s—and 25th in SBIR/STTR awards. The SBIR Assistance Program was established two years ago to help any startup company in the state identify and compete successfully for these Federal grants. Since early 2006, we have assisted 38 applicants for life sciences SBIR/STTR grants, and have a 43% success rate to date—three times the national average. In the last year, we helped Georgia companies receive more than \$6 million in SBIR research and development funding, and we are expanding the program this year.

ATDC

Many of you are familiar with the ATDC, or Advanced Technology Development Center, which is the oldest and most successful university-based incubator in the country. Headquartered at Georgia Tech, but with branch offices in Warner Robins and Savannah, ATDC helps Georgia entrepreneurs build great technology companies. It's been in business for 27 years now, and has graduated over 112 startup companies. Since 1999, those companies have attracted more than \$1 billion in venture capital to the state of Georgia. Although physically headquartered at Georgia Tech, fewer than a third of ATDC's member companies are based on Georgia Tech research; most come from the community at large. Approximately 20% of ATDC's startups are based on biotech or the life sciences.

Technology Enterprise Park

Since some of you may not be familiar with the Technology Enterprise Park, let me say a few words about it now. It's an eleven-acre site on North Avenue, very near Coca-Cola's headquarters, and across the street from Georgia Tech's campus. Just this summer, we opened the first of four planned buildings that will total 600,000 square feet of laboratory space designed to support biotechnology organizations from startup through maturity. I hope each of you visits soon; it's very impressive!

This sort of multi-tenant "wet lab" space has simply not been available in Georgia before, and we are already hosting two medical device companies there. We hope that the construction and future expansion of TEP will encourage more bioscience startups to stay in the state, as well as encourage more mature bioscience companies to open offices in Georgia. TEP was constructed without any public funds.

State of Georgia Bioscience Seed Fund

We also manage the state's Bioscience Seed Fund, which is available to startup companies in Georgia. It can provide a small amount of matching funds for startups that have already attracted angel or venture capital financing. The fund is very small—only \$8 million—and although it is not well-suited to the large capital requirements of bioscience companies, it does provide critical seed funding to launch promising ventures.

Life Sciences Facilities Fund

We at Georgia Tech also act as advisors to the state Department of Community Affairs for their Life Sciences Facilities Fund, a revolving-loan fund that allows the state to assist with the expansion or relocation of emerging or development-stage life-science companies.

Existing Biosciences Companies

As alluded to above, Georgia Tech's impact is not limited to startup companies. As an institution of higher education, perhaps our greatest potential contribution to the local biosciences economy is our graduates. This is particularly true for the medical device industry, but also for the manufacture of biologics and conventional pharmaceutical drug products. Several local companies including CR Bard, CardioMEMS and Altea Therapeutics have hired Georgia Tech engineering graduates for manufacturing and operational positions.

Drug manufacturing is a specialized form of chemical engineering. In the *U.S. News and World Report* survey for 2007, Georgia Tech's chemical engineering program was again ranked in the Top Ten, and our industrial and systems engineering program was ranked #1 for the seventeenth consecutive year! Many graduates of these schools have pursued careers in the pharmaceutical industry and are making valuable contributions to companies both inside and outside Georgia. (Incidentally, as you browse through those rankings, it's interesting to note that Georgia Tech is ranked first, second, or third in engineering education for women, African Americans, and Hispanics, at both the undergraduate and graduate levels.)

So Georgia Tech—as well as Emory, UGA, and other universities—are creating the necessary brainpower to grow a significant bioeconomy in Georgia. What is holding us back? Two things: management and money.

Management Talent

One of my biggest challenges in spinning companies out of Georgia Tech is finding early-stage entrepreneurs who can take a concept from patent application through incorporation to capturing significant investment. Those individuals tend to be serial entrepreneurs—they will start many companies during their career, not just one. I can usually find talented and experienced individuals for software or telecommunications companies—but, in biosciences, those people are awfully thin on the ground in Georgia.

It is difficult to recruit successful life sciences entrepreneurs to Georgia because the smart ones look at the entire local ecosystem. They ask “I have lots of available options here in California. Even if your new company in Georgia is successful, my early-stage contribution there is likely to be only a few years. After that, then what? Should I uproot my spouse and my children *again* to move back to California?” Without a steady pipeline of early-stage opportunities, it’s hard to make the argument that relocation makes sense.

To jumpstart this process, I believe that the state should look into a very targeted recruitment program, perhaps modeled on the Georgia Research Alliance’s “Eminent Scholar” program. We could provide sufficient financial incentive to convince successful serial entrepreneurs to consider Georgia as the location for their next company.

Investment Capital

All startups need investment capital, and biosciences startups need more than most. The undersupply of venture capital in Georgia deserves a committee hearing of its own, but I’ll just point out that, for the last seven years, 90% of the venture money invested in Georgia companies comes from out of state. That’s a good-news/bad-news story. The good news is, we’re bringing someone else’s money into Georgia. The bad news is, as often as not, the financial backers eventually move the company out of Georgia and closer to home. So Georgia loses out on the jobs, the tax base, the follow-on research, and all the other positive economic impacts of a growing company. This has happened to me multiple times at Georgia Tech, and it has happened to my counterparts at Emory and UGA as well.

There is not one silver bullet to fix the lack of venture capital in Georgia, but the Legislature could do several things immediately that would help:

- Continued support of the Georgia Research Alliance’s commercialization efforts, with expanded availability of investment capital for VentureLab companies.
- Passage of the angel tax credit, which was considered as HB435 last year.
- Enabling state pension monies to be invested in alternative assets such as venture capital funds. This was considered as SB80 last year.
- Expansion of the SBIR assistance program to include financial support for awardee companies, such as is being done in Kentucky, Maryland, and North Carolina.
- Increasing the amount and the flexibility of investment available to the Georgia Biosciences Seed Fund and the Georgia Life Sciences Facilities Fund.

- Providing infrastructure support for bioscience parks throughout the state to encourage the growth and recruitment of biotech-related companies at all levels of maturity.

Conclusion

There has been a lot of talk for several years now about establishing Georgia as a major player in the biotechnology industry. While we have debated, our neighbors in North Carolina and Florida have committed over half a billion dollars each to building their biotechnology infrastructure and commercialization pipelines.

As stated in HR662, "this state cannot afford to leave the development of a bioeconomy to chance, for each year Georgia fails to act, the state falls further behind the competition and Georgia loses its substantial investment in university research programs." Addressing the challenge will not be cheap, but our next steps are straightforward. We should not waste any more time.

Thank you for the opportunity to speak with you today.

Stephen Fleming
Georgia Institute of Technology
(404) 894-1700 • fleming@gatech.edu