

Crossing the Valley of Death: Bringing Promising Medical Countermeasures to Bioshield  
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Mr. Scott Magids

Technology Advancement Program, University of Maryland

Director

Testimony

My name is Scott Magids. I am the Director of the University of Maryland's Technology Advancement Program ("TAP"), a unique program designed to stimulate the commercialization of innovations through new venture creation. I am honored to submit written and verbal testimony to this esteemed Subcommittee. By way of background, I have worked as an entrepreneur in the technology and market research industries, and as a venture capital investor and management consultant in various high-technology markets. I also teach college courses in technology entrepreneurship. I have served as a principal architect and executor of a strategic plan to increase technology commercialization at the University of Maryland as well as in the surrounding region.

The TAP Program resides within the Maryland Technology Enterprise Institute ("MTECH"). MTECH is the vehicle for entrepreneurship and outreach for the University of Maryland's Clark School of Engineering ("Clark School"), a nationally-recognized engineering college.

TAP helps bridge the gap between technical inventor and viable early-stage company by providing extensive hands-on business support; access to seed and early-stage funding; technical expertise, namely to support product development; and low-cost infrastructure. TAP supports firms in a range of markets, including biosensors, software, homeland security, pharmaceuticals, medical devices, and information technology. TAP is a key part of a comprehensive effort within the Clark School to increase technology commercialization at the University of Maryland and in the surrounding region, and this effort also includes other initiatives described below.

TAP has enjoyed significant success since its creation in 1985. As examples of our success, TAP-supported companies have created 1,790 jobs and raised \$260 million in angel and venture capital funding, including \$15 million between 2004-present.

Rationale for the University of Maryland's  
Technology Entrepreneurship Programs

Effectively commercialized technical innovations are a key catalyst for economic growth, productivity enhancements, and advancements in healthcare, public safety, and national security. In most parts of the country, including the Washington, DC region, a significant gap exists between an individual technology creator and a viable early-stage company capable of bringing technology-based products to the marketplace. This gap exists for three principal reasons:

- Professional management talent, with expertise in fundraising, business planning, and team-building, is not readily available to most technology creators;
- An inadequate amount of seed-stage (pre-prototype) funding exists for product development and startup working capital; and
- Many technology creators are not sufficiently motivated or educated in business-related topics to comfortably commercialize their inventions.

Unfortunately, this gap stymies the advancement of potentially high-impact technologies from the laboratory to the customer marketplace.

The University of Maryland's Clark School of Engineering has closely examined these obstacles, and has attempted to develop a comprehensive plan to accelerate technology commercialization, through venture creation, at the university and in the surrounding region. This plan encompasses five components: (1) education; (2) hands-on support and funding access; (3) internal and external communications; (4) operating initiatives; and (5) entrepreneurship culture-building.

## University of Maryland's Technology Entrepreneurship Initiatives

### Education

Technology commercialization begins with education. The goals of education include helping technology creators understand the commercialization process; allaying fears regarding commercial endeavors; and encouraging technologists to pursue commercialization. MTECH, the Clark School's entrepreneurship unit, offers four types of education: (1) Seminars and symposiums for faculty and students, with topics including IP protection and marketability of research; (2) Entrepreneurship courses for technical students; (3) An annual Technology Startup Boot Camp, open to technology creators throughout the region; and (4) An annual Business Plan Competition in which technical teams, from the University of Maryland, compete for cash prizes and receive intense mentoring from successful entrepreneurs.

### Hands-On Support and Access to Funding

Hands-on support and access to seed-stage funding are critical to crossing the bridge between innovator and viable enterprise. The TAP Program selectively admits two-to-four new startups each year pursuant to a thorough analytical process similar to professional investors' due diligence. During a typical four year incubation period, TAP applies a rigorous company-building process to help create well-managed, well-planned, properly-funded commercial ventures. Acting as a coach, mentor, and marshal of resources, TAP assists its companies with (1) business planning and market analyses; (2) product development support; (3) corporate structure and IP protection; (4) team-building, namely executive recruiting; (5) and capital formation. TAP helps keep its portfolio companies on track to commercialization through weekly status meetings and consistent, hands-on participation.

TAP has developed a number of initiatives to overcome the funding gap its seed-stage companies encounter: (1) TAP has designed an investment process and built close relationships with angel investors and venture capital investors; (2) TAP closely supports the angel and venture fundraising process for its companies, including preparation, structure development, and terms negotiation; (3) TAP closely coaches its companies in applying for Federal and regional grants, namely for technology development; and (4) TAP acts as a liaison to other State of Maryland and MTECH funding programs, including the State of Maryland Venture Fund and the highly successful Maryland Industrial Partnerships (MIPS) Program, an R&D funding program also run by MTECH. The MIPS Program provides grants to Maryland startups, up to \$150,000, to support technology and product development at a University of Maryland campus.

In addition to helping its companies aggregate capital, TAP also provides its firms valuable money-saving resources, including low-cost physical infrastructure; special lab facilities; access to bio equipment; and access to technical expertise through the university.

### Communications

Communications play two important roles in increasing the level of technology commercialization: (1) Communications encourage the business community and other technical institutions to support technology commercialization; and (2) Communications, depicting the success of inventors who commercialize their technologies, motivate other technology creators to consider commercial endeavors. MTECH and TAP proactively build relationships with service providers, senior personnel at other technical institutions, and investors. These persons play valuable roles as mentors, guest educators, sponsors, seed-stage capital providers, and/or referrals of technology creators seeking commercialization help. Furthermore, these persons help disseminate a key message in the regional technology and business communities: Technology commercialization is extremely important, beneficial, and feasible. As an example of the benefit of communications, several TAP companies have been started by NIH scientists.

### Operating Initiatives

MTECH and TAP have implemented operating initiatives designed to support technology commercialization. First, MTECH has recruited persons with significant venture capital and company operating experience to manage TAP and other MTECH programs. Likewise, TAP receives equity interests, deferred revenues, and current revenues from its portfolio companies, and this compensation approach helps to align the interests of all parties involved in technology commercialization. Generally, TAP receives 1%-4% of the fully-diluted equity interests of its firms per year of participation in TAP, and most startups remain in TAP an average of three years. Likewise, deferred revenues generally accrue at a rate of \$1,000-\$3,000 per month and are payable at the earlier of (1) a qualifying event such as material revenues, a significant equity financing, or a sale of the company; or (2) two years following completion of the TAP Program. MTECH reinvests

these proceeds into TAP and its other entrepreneurship initiatives. Finally, MTECH and TAP have become sensitive to the competing goals of many technology creators seeking commercialization – continue to advance within their technical fields and pursue commercial ventures. Approaches have been designed to help navigate these issues.

### Entrepreneurship Culture

The final component requisite for technology commercialization is an entrepreneurial culture. At the Clark School, several factors have contributed to the development of an entrepreneurial culture in which technologists are motivated to pursue commercialization: (1) Senior leadership within the Clark School encourage entrepreneurial activity and positively recognize such effort; (2) Communications efforts led by MTECH widely promote success stories (e.g. of TAP companies) internally and to other members of the technology community, as “success breeds success;” and (3) Most importantly, consistently exposing technologists to experienced businesspersons; commercialization education; and company-building processes inspires inventors to pursue commercialization.

### Results

The TAP Program has enjoyed significant success during the past 20 years: (1) 1,790 jobs have been created; (2) \$260 million in angel and venture funding has flowed into TAP firms; (3) Approximately 70% of TAP firms “graduating” from the Program continue material operations five years post-graduation; (4) TAP firms have received over \$70 million in Federal grants; and (5) Two TAP biotech firms have gone public on the NASDAQ, and these firms have a combined current market capitalization of \$1.6 billion. TAP has been well received at the University of Maryland and in the regional marketplace, as 396 firms have sought admission into TAP, and 68 firms have been accepted into the program. In addition, the level of entrepreneurship activity within the Clark School has increased significantly, as approximately one new faculty or student firm is formed each quarter, and a number of successful technology firms have been formed by faculty in recent years. TAP and other MTECH entrepreneurship initiatives have received local and national recognition, and numerous universities and research institutions have solicited MTECH’s assistance in creating similar programs.