Center Success Story

During the last year, CBBM's leadership and research efforts were the basis for an innovative technology spin-out company, SyntheZyme, which has the full support of Polytechnic of NYU. SyntheZyme was formed by NYU-Poly in late 2008 to commercialize the unique technology developed by Dr. Richard A. Gross, the Herman F. Mark Professor of Polymer Science and head of the Center for Biocatalysis and Bio-processing of Macromolecules at NYU-Poly Polytechnic Institute of NYU.

SyntheZyme™ is a seed stage green chemistry company developing bioplastics, pre-polymers and other enzymatic products from renewable sources. Bio-polyols and hydroxy fatty acids are key ingredients of polyurethanes and polyesters with addressable annual markets of $2.5B and $5B, respectively. SyntheZyme biocatalysts will produce a variety of products for the plastics industry, many of which also have value in personal care products, fragrances, cleaners, bio-pesticides and lubricants. Samples have been produced of both polyurethane pre-polymers and fatty acids for PHA (a polyester) synthesis.

The company has been assigned 10 granted and 8 pending US patents by Dr. Gross and NYU-Poly in exchange for equity in the company. In addition, the company will have access to NYU-Poly facilities and services during the initial commercialization phase. DNA2.0 (a leading synthetic genomics company, headquartered in Menlo Park, CA.) will be contributing pathway engineering IP to SyntheZyme in exchange for equity as part of a formal partnership agreement. When fully capitalized, eight department personnel are slated to join the company as full time employees and will be joined by 3 outside hires.

Dr. Gross will act as the CTO, directing all development activities. Frank Shinneman is a seasoned technology start-up CEO with 3 prior early stage technology ventures, preceded by 20 years in the semiconductor industry. SyntheZyme is in the process of raising $4.5 million to fund 24 months of product development. Funding is being sought from a combination of strategic partner and venture sources. New and used capital equipment will be needed early in the first year at an estimated cost of $760,000.

WICAT Success Story: Cognitive Radio Network Research

A cognitive radio (CR) is a frequency agile wireless communication device based on software defined radio (SDR) that enables dynamic spectrum access (DSA). CR represents a significant paradigm change in spectrum regulation and usage, from exclusive use by licensed users (or, primary users) to dynamic spectrum access by secondary users. While considerable progress is made in understanding the physical layer aspects of CR and on developing effective DSA schemes, it is now imperative to study how the enhanced spectrum usage can benefit the upper layers, such as transmission control protocol (TCP) based data applications and real time video streaming.

Two WICAT sites, Auburn University and Virginia Tech, have taken a lead in this emerging technology. Research at Auburn University on cognitive radio networks is focused on expanding the realm of CR research into upper layers of the protocol stack. Auburn's contribution so far has been on developing efficient signaling and medium access control protocols, analysis of TCP and video streaming applications over CR networks.

As research leaders in the area of cognitive radio network research, Virginia Tech has recognized a unique opportunity to participate in the creation of a valuable resource for researchers worldwide. This effort will create a cognitive radio network testbed. The testbed provides wireless communication researchers at Virginia Tech and around the globe the ability to develop, test, and deploy, highly advanced wireless communication technologies on a physical testbed deployed in a practical environment, unlike any other testbed currently available for cognitive radio research.

Radio spectrum being a very expensive resource, CR will play a crucial role in future wireless networking applications in the commercial, military and disaster relief communication domains. The CR paradigm shows great promise to carry spectrum intensive traffic over the wireless internet.