FOCUS ON YALE MEDICINE

Biotechnology at Yale

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With Yale committing $1 billion to the development of science and technology there is much curiosity about how Yale will spend its money and why Yale is deciding to spend it now. Biotechnology in New Haven, in part, explains Yale’s move towards the sciences. With the decline in the New Haven economy since World War II, Yale stands to benefit greatly if the New Haven economy is revived, in part through the development of biotechnology. By investing in biotechnology, Yale hopes to derive fiscal and intellectual benefit from the growth of biotechnology, which many hail as one of the engines driving the economy of the future. With recent attention to this partnership, it is appropriate to look more in depth at the ideas that fuel the local companies joining with Yale to forge a future.

GENAISSEANCE

This company merges two disciplines — population genomics and informatics. Population genomics is the analysis of inherited differences within diverse groups of people; informatics is storing, manipulating, analyzing, and visualizing information on a computer. Genaissance applies population genomics to discover inherited differences, or genomic markers, that are predictive of which patients will respond effectively to a drug. Their technology is based on the discovery and application of haplotype markers. The Genaissance approach, dubbed the HAPT™ Technology, combines use of haplotype markers, known as HAPT™ Markers, with a software tool, the DecoGen™ informatics system and HAPtypingSM Services, for measuring which HAPT™ Markers are present in a patient. Genaissance, with their HAPT™ Technology, hopes to use genomic variation information to enhance the pharmaceutical process of developing, marketing and prescribing drugs.

ALEXION

This company focuses on using human Combinatorial Antibody Library Technology, “CoALT” for the discovery of highly specific human antibody products. Alexion’s process involves the generation of combinatorial libraries of human antibodies and the screening of these libraries against potential drug targets. Alexion

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Abbreviations: RCAT, Rolling Circle Amplification Technology; AICH, acute intracerebral hemorrhagic.
hopes to use this process to generate novel human therapeutic antibodies directed at known clinical targets. Furthermore, Alexion also hopes to use its technology for the simultaneous and efficient identification of both newly discovered genomic targets and their appropriate antibody therapeutics. By merging this broad enabling discovery platform with Alexion's current established antibody development capacity Alexion is poised to start a new wave of human antibody therapeutics.

VION PHARMACEUTICALS

Vion has three potential anticancer compounds and a unique targeting vehicle called TAPET (a genetically modified tumor-selective Salmonella strain). Vion is focusing on developing a method for delivering anticancer drugs (or pro-drug converting enzymes) directly to the site of solid tumors via their specialized vector. Recently published results present data indicating efficacy in large tumor localization of the vector and delivery of potential chemotherapeutic agents.

ACHILLION PHARMACEUTICALS

This new company is working on the “development of innovative treatments for serious infectious diseases.” In particular, Alexion is currently focusing on the treatment of Hepatitis B (HBV), Hepatitis C (HBC), and HIV/AIDS with several nucleoside analogs licensed from Yale. Subsequent product candidates, also licensed from Yale, may address other unmet medical needs, including Epstein-Barr virus (EBV) infection — the agent causing infectious mononucleosis in normal young people and life-threatening lymphoproliferative disorders in immunocompromised transplant recipients.

CELLULAR GENOMICS, INC.

CGI focuses on identifying potential targets for drug development. In particular, CGI has technologies for identifying membrane protein drug targets (Membrane 1-Hybrid Program), enzyme drug targets (Kinase Drug Discovery Program), and immunomodulatory therapeutics (Immunology [Dendritic Cell] Program). Their technology is a series of assays that are designed to assess and/or discover the affects of various drugs on the function of a given membrane protein, enzyme activity, or the immune response.

MOLECULAR STAGING, INC.

Dubbed RCATb (Rolling Circle Amplification Technology), RCAT is a highly sensitive and efficient amplification method that allows the user to detect the presence of target molecules in a wide array of testing formats. It is an amplification method that allows recognition, amplification and detection of targets directly on a solid surface, such as within a cell (in situ analysis) or on a microarray/biochip. MSI claims it to be more versatile and efficient that the polymerase chain reaction, the current technology most commonly used to detect genes and their mutations. Potential target molecules for RCAT include the DNA of a bacteria or virus, a protein produced by cancerous cells, antibodies to a particular infection, or a particular sequence of a gene mutation.

PHYTOCEUTICA

PhytoCeutica is focused on developing novel herbal medicines in the area of cancer and neurological disease. The two current drugs, PHY906 and PHY-X are being developed for use. PHY906 is a modulator for chemotherapy. It is currently being touted as a treatment for severe
diarrhea associated with chemotherapies for colorectal cancer. Current drugs (loperamide/octreotide) are limited in their treatment of late-onset diarrhea where this compound is currently being tested for use. PHY-X is being developed for treating acute intracerebral hemorrhagic (AICH) stroke and for other diseases related to neurological function impairment. Currently, there are no pharmaceutical treatments for AICH patients. Results from animal studies suggest that PHY-X can decrease intracranial pressure and can serve both as an anti-inflammatory and a neuroprotectant. Human case studies, as reported by the company, show decreased mortality rates as well as neurological function recovery if the drug is administered within 24 hours.

RECOMBINANT TECHNOLOGIES

RT functions as a producer and distributor of products generate by Yale laboratories (such as novel antibodies and recombinant proteins) as well as a provider of recombinant technology services such as protein purification, assay development or validation, and protein functional characterization.

Companies that are not described here but that have Yale connections include CuraGen, Agilix, L² Diagnostics, and RadioTracer.