



{ Part TWO of a TWO-PART series }

Start-up Ville, Part II

ON THE MEDICAL CAMPUS, ELEVEN BIOMEDICAL COMPANIES ARE BRINGING THE FUTURE CLOSER

BY ART JAHNKE

DRIVE DOWN ALBANY Street in Boston's South End and the cluster of buildings fanning out from the Medical Campus may seem firmly rooted in the present. But enter any one of the eleven young biotechnology companies that make up the BioSquare Discovery and Innovation Center, and you begin to suspect that you're not in 2010 anymore. Inside Allegro Diagnostics, at 650 Albany Street, for example, researchers are refining a technology that promises to find 90 percent of lung cancers much sooner, much cheaper, and much more painlessly than current diagnostic tools can. Allegro's advance could translate to thousands of lives saved in the United States and close to a million lives saved worldwide.

Down the street, the team at Vaccine Technologies is testing vaccines they hope will rid the world of the scourges of HIV and hepatitis B. Also in the neighborhood is Acetylon Pharmaceuticals, which has its eye on a cure for multiple myeloma, and Genus Oncology, where researchers are designing tumor-attacking molecules that target cancer of the breast, prostate, and pancreas.

The list goes on: Pharyx, Inc., is developing technologies that will speed manufacturing processes used in biotechnology, and Advanced Proteome Therapeutics is toiling to make existing protein-based therapies more effective. At Medicine in Need (MEND), an inhalable vaccine for tuberculosis is well within reach.

For twenty years now, the Bio-Square Center, supported by Boston University and Boston Medical Center, has been combining radical ideas about medical technology with first-round

investments, adding a few amenities, and turning out full-fledged, cutting-edge companies.

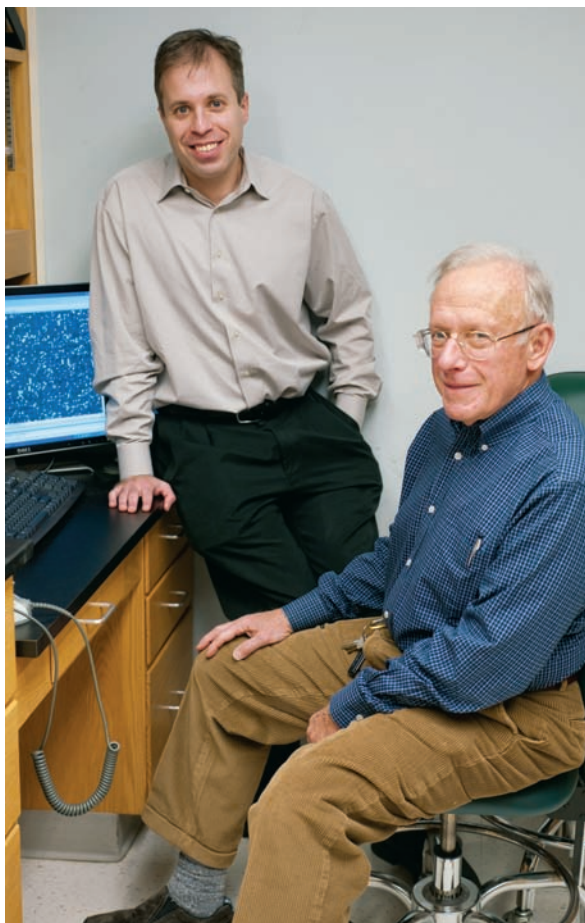
Resolvix Pharmaceuticals, for one, left the neighborhood three years ago for Bedford, Massachusetts, where it employs thirty-five people and is breaking ground in the treatment of inflammatory diseases such as rheumatoid arthritis and inflammatory bowel disease. Infinity Pharmaceuticals, whose products target proteins believed to play important roles in certain cancers, is now in Cambridge, Massachusetts, with a staff of more than 100. And CombinatoRx, which develops drugs that when used together enhance one another's therapeutic effects, is also thriving on the other side of the river.

In Allegro's case, setting up shop in a BU-run community of biotech start-ups was one of the company's easier decisions. The technology at the heart of its diagnostics was born in the labs of two BU School of Medicine researchers, Jerome Brody, a professor of medicine, and Avrum Spira (ENG'02), an

associate professor of medicine, pathology, and laboratory medicine.

The company's cancer-finding technique marks a quantum leap in diagnostics, says Daniel Rippey, Allegro's CEO. Today, most lung cancers are discovered when doctors perform a bronchoscopy, which involves inserting a long scope, often with a camera, through the mouth and into the lungs. Once in the lungs, the tool can take pictures or clip lung tissue for biopsy. The technique works, but is usually performed only after there is evidence of pulmonary distress, too late in the game for a cure, even with aggressive treatment. Of all lung cancers found with bronchoscopies, nearly two-thirds are beyond stage one and probably fatal.

Working at MED's Pulmonary Center, Brody and Spira found a better way. They identified several genetic abnormalities among lung cancer patients. Because these genes can be found in epithelial cells, outside the lungs, tests can locate them easily, inexpensively, and painlessly.



MED'S AVRUM SPIRA (left) and Jerome Brody identified genetic abnormalities among lung cancer patients.

VERNON DOUCETTE

And the gene test will save money as well as lives. Rippey estimates that inadequacies in current testing add more than \$2.5 billion to health-care costs in the United States and \$7.5 billion globally each year. The CEO, who believes Allegro's diagnostics may prove useful in targeting chronic obstructive pulmonary disease and inflammatory bowel disease, says he hopes to "pursue a commercial path to market" this year.

Another BioSquare start-up, drug delivery corporation MEND has already gone global, with offices in Pretoria, South Africa, and in Paris, France. The nonprofit venture also has a comfortable financial cushion of \$8.3 million, awarded two years ago from the Bill & Melinda Gates Foundation. MEND is using the money to refine, among other things, an inhalable vaccine for tuberculosis. Tests indicate the new vaccine will prove to be far more effective than the widely used injected vaccine.

"For people with lung disease, asthma, or tuberculosis, it is often advantageous to inhale a drug," says CEO Andrew Schiermeier. "If it's inhaled, it does a better job of covering the surface area of the lung."

The technology behind MEND's effort was developed by company founder David A. Edwards, the Gordon McKay Professor of the Practice of Biomedical Engineering at Harvard. Edwards discovered that spraying liquid vaccine through a heated gas created a powdered vaccine that was far more durable and effective than those in use. He mastered ways to convert cells to aerosols or other states where they can "hibernate," according to Schiermeier, and can be reawakened with hydration.

Edwards's discovery holds great implications for treating global epidemics, Schiermeier says. In their hibernation state, they can go great distances and long periods of time without refrigeration. Treating disease in parts of the world that lack refrigeration is central to MEND's mission, which is why the young company has focused on what is called the three primary diseases of poverty: tuberculosis, malaria, and HIV/AIDS,

whose combined death toll tops six million a year.

For embryonic companies hoping to join the BioSquare, the bar is set high. Center manager John Cohan says no company gets into the cluster without a serious game plan for solidly researched breakthrough technologies. And even though almost all of the companies have already met the rigorous scientific and financial criteria required by investors, their plans and technologies are also vetted by experts from the Medical Campus. Most newcomers, he says, have at least \$1 million in commitments, either from venture capital firms or from so-called angel investors, and some have several million.

Most companies arrive with half a dozen researchers, he says, and many grow to a dozen employees before they take flight. Some resident companies have branch offices elsewhere. Vaccine Technologies, for example, which is developing better diagnostics and vaccines for HIV-1 and hepatitis B, has thirty-five researchers working in a lab in China, where the company is now building a manufacturing facility.

Cohan says fledgling companies seek out the 2.5-million-square-foot BioSquare community for several reasons. Most important, the center's arrangement with them allows businesses access to costly high-tech tools, such as cryo-electron microscopy and macromolecular X-ray crystallography. "Basically," he says, "they have access to all the tools on the Medical Campus."

The lower-tech amenities fit the bill as well. The center offers catering, space for on-site conferences, and hazardous and biological waste disposal. Cohan says the community's long-standing relationship with investors can also be helpful to start-ups, as can the intellectual firepower of fellow researchers.

"There is a tremendous amount of brain power here," he says. "If anyone has questions, they can find answers. They can talk to professors and other researchers."

And, he says, the area offers another enticement: "There are some very good restaurants not far away."

WHO THEY ARE AND WHAT THEY DO

- **Acetylon Pharmaceuticals**
New treatments for multiple myeloma and rheumatoid arthritis
- **Advanced Proteome Therapeutics**
Ways to enhance the therapeutic powers of proteins
- **Alapis Research Laboratories**
Tools to measure blood pressure by telemetry, as well as a drug to minimize damage to myocardial tissue after heart attack
- **Allegro Diagnostics**
New ways to diagnose lung cancer
- **Arietis Corporation**
New class of antimicrobial agents to treat bacterial diseases
- **Eutropics Pharmaceuticals, Inc.**
Using proteins to treat multiple myeloma, lymphoma, leukemia, and other cancers
- **Genus Oncology**
Anticancer agents to treat cancer of the breast, prostate, lung, colon, pancreas, and ovary
- **Matrivax Research & Development Corporation**
Polysaccharide-based vaccines for pneumococcal and meningococcal disease
- **MEND, Medicine in Need**
More effective vaccines for HIV, tuberculosis, and malaria
- **Pharyx, Inc.**
Miniature bioreactor to help biopharmaceutical manufacturers produce large numbers of genetically modified cells more quickly and inexpensively and with greater consistency than current technology
- **Vaccine Technologies, Inc.**
Vaccines and diagnostics for HIV-1 and hepatitis B