Patient Encounters of the WiSE and Automated Kind

By Eric Grunwald

What began as an effort to reduce costs and errors by two staff members of the Faculty Practice Plan (FPP) of the Stanford University Clinic has turned into a licensing deal that promises to boldly take health care where no doctor has gone before, replacing mounds of paper with hand-held, wireless terminals.

Stanford has granted WiSE Communications, Inc. (Los Gatos) a license to the "Automated Patient Encounter System (APES)," know-how developed over a four-year period by Ray Pedden, former Director of Business Operations, and Vic Arnold, Director of Management Information Systems.

The story began approximately four years ago when the two began looking for ways to cut costs and errors in FPP's operations, mainly by reducing the redundancy in recording the information associated with patients' visits.

As Brian Kissel, the OTL Associate who negotiated the license with WiSE explains, "The doctor writes his notes, the nurse then translates those notes onto forms containing standard codes, the form is then keyed into the computer systems, and a bill is generated. The goal was to eliminate some

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Inventions that Could Help Millions not Easily Licensed

By Amy Forrest

Parasitic diseases infect approximately six hundred million people annually worldwide, mainly in the Third World, and the rate is rising. Stanford researchers have developed a virtual arsenal of inventions to diagnose and treat several of these diseases, but getting them from the lab to the people who need them has been difficult.

One invention targets schistosomiasis, a potentially fatal disease caused by water-borne parasitic flatworms that infects approximately 220 million people worldwide.

Dr. Tag Mansour of the Department of Molecular Pharmacology has developed a DNA clone that allows expression of an enzyme that can be used to screen drugs for treating the disease; if a given drug inhibits the enzyme, it will also kill the parasite.

Another invention from Dr. John Boothroyd of the Department of Microbiology targets toxoplasmosis, a disease caused by the common protozoal parasite Toxoplasma gondii.

According to Boothroyd, "Infection can be very dangerous to two groups of individuals: pregnant women (particularly women who have contracted the infection for the first time during pregnancy), and people whose immune systems are compromised by AIDS, lymphomas, or transplant procedures."

To address the problem, Boothroyd and Dr. Roland Buelow have developed monoclonal antibodies that can be used in an assay (a diagnostic test) to detect degrees of infection in a patient's blood sample. The number of antibodies indicate whether the infection is chronic or acute.

Says Boothroyd, "The disease is most dangerous to pregnant women if it is acute because the fetus is at greater risk for severe neurological damage." And better diagnostic procedures are crucial because "about half of the women diagnosed with

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A Sampling of Licenses Granted by OTL in the Last Quarter

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Inventions that Could Help Millions Not Easily Licensed

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acute toxoplasmosis will choose to have an abortion although there is only about a 10-15% chance of transmitting the disease. The antibodies can also be used to generate methods to prevent or control the disease.

Boothroyd has also worked with Drs. Dominique Salditi and Kami Kim to develop a way to create attenuated strains of toxoplasmosis, which can be used as vaccines against toxoplasmosis, other infectious agents, and even cancer cells.

Tag Mansour has also found a group of phosphorus-containing chemicals that block the primary energy source of Toxoplasma gondii, thereby inhibiting the growth of the parasites. These "inhibitors" may have the same effect on related parasites, such as those causing amoebic dysentery, intestinal disturbance, and genital infections.

While a serious problem, though, "toxoplasmosis doesn't hold a candle to the millions of people dying of malaria," says Boothroyd. The World Health Organization (WHO) estimates between three and five hundred million clinical cases of malaria each year, resulting in between one and a half and three million deaths. Most cases (90%) occur in Africa, and about one million of the deaths are African children under five.

To combat this killer, Drs. Kasturi Haldar and Sabine Laurer of Microbiology and Immunology have developed a method of chemotherapeutics for infections caused by malaria. Haldar says their therapy is similar to current malaria therapies in that it targets the sexual development cycle of the parasite "which causes the symptoms of the disease—the cytophagous fevers—that have led to the popular notion of malaria."

But while current chemotherapeutics "target the digestive food vacuole or inhibit DNA synthesis in the parasite," she says, "we have identified a completely new target in the cell."

One major obstacle in treating malaria, however, is that the parasite consistently develops resistance to therapy. "The original resistance to the antimalarial drug, chloroquine, might have taken five to seven years to document well," Haldar explains. "But now we see drug resistance in a few years."

Patterns of resistance develop more quickly as many therapeutics are being trademarked. "And Dr. Laurer's new chemotherapy may be significant in keeping the disease at bay."

The mutation of diseases is also the subject of an invention by Drs. James McSweeney and Peter Smith of OTR. The invention involves a method that can rapidly track strains of diseases and the way they respond to therapy.

The assay alerts researchers whether patients are mutating in an infected population and allows them to follow and possibly inhibit the mutation.

The vaccine could also be used to create vaccines, evaluate the effects of anti-microbial therapies, detect the type of disease and create models for genetic diseases. Ideal targets are AIDS, cancer, and tuberculosis.

Mary Albertson, the OTR Associate currently concluding negotiations with the WHO for a royalty-free license for the technology, is excited about its potential for commercialization.

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“...It is a phenomenal opportunity to disseminate this technology in the broadest possible manner, particularly in Third World countries,” she says.

Albertson says the technology is valuable to the WHO’s Vaccine Development Unit of the Global Program on AIDS, but due to the variety of the invention’s potential applications, it could benefit multiple markets.

Licensing the invention to the WHO is a great opportunity, explains OTL Director Kathy Ku, because “unfortunately, OTL rarely has the chance to license technology to service organizations suited both to developing and to reaching the markets they will benefit most.”

Ku says licensing such technologies has historically been difficult, because the countries in which they have the greatest potential are unable to offer financial incentives to the companies or organizations with the resources to develop treatments.

“These diseases often strike hardest in Third World countries where funding for their prevention and treatment is scarce,” says Ku.

“Although Stanford may have the means, we can’t cure malaria without licensees with the resources to reach markets that are literally dying for these innovations.”

Luis Mejia, the OTL Senior Associate trying to license the other technologies described above, says the ideal licensee for inventions of this kind is a “major pharmaceutical company with the global wherewithal to broadly disseminate drugs to address these diseases.”

Unfortunately, he continues, “the profit margin is small when dealing with developing countries. And Third World governments have a hard time enforcing systems of patent protection, which also acts as a disincentive to licensing.”

Ku, however, remains optimistic about the possibility of long term success. “We look forward to finding licensees willing to join us in the commitment to commercializing these inventions,” she says.

Patient Encounters of the WISE Kind

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Wisepharma’s Robert Brekka expresses the importance of financial incentives to licensees intending to license this technology: “It was our ideas that needed protection,” says Brekka. “Brian zeroed right in on that. It took a long time, but everyone got a better deal in the long run.” Both sides eventually agreed on a royalty based on a percentage of gross sales.

“...What’s really nice,” adds Pedden, “is that...I don’t have to worry about negotiations or any of the other issues.”

Since concluding the agreement, WISE has taken Pedden and Arnold’s ideas and advanced them significantly, developing the RF (radio frequency) wireless communication technology and an advanced software interface.

WISE’s overall product is called the “WISE-Med System,” and the latest prototype of the handheld unit looks like something out of Star Trek: a sleek, black, hand-held, wireless, pen-based computer terminal the size of a notebook that a clinician can carry anywhere in his or her facility.

With it, the clinician can access scheduling information and patient histories, write and retrieve hand-written notes, order tests, and generate the correct billing, all without assistance or paper.

Brekka says the most significant challenges for WISE have been developing the RF network infrastructure and clinical cache, endowing the system with “think speed” (fast response time), and ensuring the integrity of the data on the system.

“The first time data are lost on the system will be the last time the system is used,” Brekka says frankly. WISE has therefore built in several layers of safeguards and is guaranteeing no loss of data within five seconds of input, thus making all information almost immediately available to users.

WISE is currently working with Stanford’s OB/GYN department to make sure the system meets the everyday needs of clinicians. Pedden and Arnold have identified almost a half million dollars that can be saved annually in OB/GYN with the APES and $2.6 million per year clinic-wide. “That will more than pay for the system,” says Arnold.