

Unmasking a killer

SCIENTISTS AT the University of Maine may have found a treatment for a blood-stream infection that kills more than 30 percent of the patients it infects.

UMaine Assistant Professor of Microbiology Robert Wheeler and his team study a fungus, *Candida albicans*, commonly found on human skin and in the gastrointestinal tract, that can be deadly for people with compromised immune systems.

The fungus, which typically stays dormant, has developed a sort of camouflage that prevents the immune system from eliminating it. At the same time, the immune system is able to prevent the fungus from creating an infection.

A special sugar, β -Glucan, is found in the protective coating of *Candida albicans*. The human immune system has developed a receptor for β -Glucan, providing immunity for the fungi when it's activated. However, when a person's immune system is too weak, the fungus can be deadly.

In addition to being the fourth most common cause of bloodstream infection, *Candida* can cause vaginitis in healthy women, and thrush in newborns and AIDS patients.

Wheeler and colleagues at the Whitehead Institute for Biomedical Research are now working to develop a drug to remove the camouflage and unmask β -Glucan, allowing the immune system to recognize and fight the infection.

Their findings were published in the Public Library of Science's *PLOS Pathogens*.



Powerful promise

IN A DAVID VERSUS GOLIATH matchup, University of Maine senior Christopher Look of Jonesboro, Maine, went up against some of the world's renowned technology companies with his invention to aid soldiers in the field. And while he didn't win the \$1 million United States Department of Defense Wearable Power Prize (the DuPont/Smart Fuel Cell (SFC) team took top honors), Look was a top 20 finalist out of the 170 teams that entered the international competition.

Last spring, Look, a specialist in the Army National Guard, began working with UMaine professor Charles Hess on his capstone project to create a system to provide soldiers with lightweight, wearable power for their combat equipment. Such portable "Land Warrior" devices power cell phones, portable water filtration systems, ventilators, mapping equipment and temperature-regulated clothing.

On an average four-day mission, a soldier carries about 20 pounds of batteries to power such equipment. That's why the military is working to reduce the weight and size of the power supply.

Look's design is an unassuming black box, about the height and width of a legal notepad, about 3 inches thick, with nylon straps that attach to a soldier's vest. The device weighs 8 pounds and lasts longer than the current battery packs used by soldiers.

Look continues development on his invention, and has received requests from the U.S. Navy for more information on his design.

Early talk of reading disability

YOUNG CHILDREN who are later found to have reading disabilities use slower, shorter speaking turns with more pauses, according to speech-language researchers at the University of Maine and Lehman College.

In a longitudinal study of 27 prereading youngsters at ages 2 and 3, the researchers measured fewer syllables per second in the nine children subsequently identified in grade school with developmental reading disability, a disorder that runs in families. Those youngsters also demonstrated significantly different patterns of pausing between speakers, and shorter turns at speaking, as compared to their peers who later learned to read normally.

The researchers — Allan Smith, Susan Smith



The research provides a perspective on how speech and language deficits may manifest during spontaneous verbal interactions between young children and adults.

and Jane Bennett of UMaine, and John Locke of Lehman College — looked at early speech in ages 2–3, a developmental time associated with rapid language development. For instance, in a year's

time, youngsters without later reading disability demonstrated a sharp growth in syllables — from three to seven — per speaking turn, and a decrease in between-speaker pausing.

Their findings were published in the *Journal of Speech, Language, and Hearing Research*.