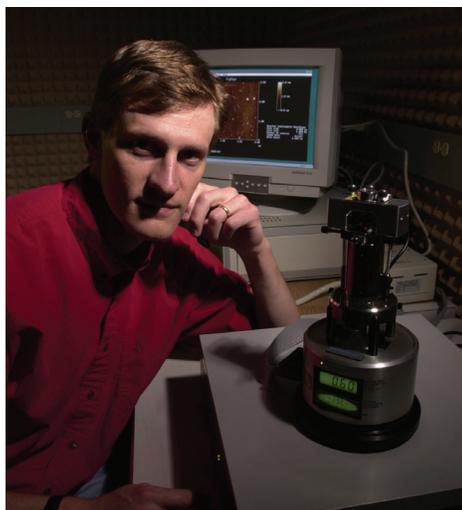


FACULTY newsletter

CPMS Physical and Mathematical Sciences



ABOVE Adam Woolley is working to develop a device that can effectively detect cancer in its early stages.

Chem Professor Develops Cancer Detector

When the threat is cancer, the current three-day waiting period for test results can be a tense, long stretch of time.

But if Adam Woolley, a BYU professor specializing in analytical chemistry, has his way, those at risk for cancer will soon receive their test results in only thirty minutes. That means quick, convenient and reliable cancer detection while you wait. Woolley's new early cancer detection technology is a big deal at a small scale.

Driven by his interest in miniaturization, Woolley has created a device to sift the complex components of blood and quickly isolate target proteins that may indicate cancer. A series of micro channels, similar to computer circuits, are created by bonding two embossed plastic slides. The blood sample is then shuttled through the channels and, as voltage is applied, the target proteins are driven past a detector. Once the proteins are isolated and quantified, doctors can determine the patient's risk level and then advise appropriate follow-up.

Woolley's method is not only quick, but it is also innovative because it will allow patients to receive test results at the doctor's office, rather than depending on busy clinical labs. This disposable device is a great leap forward in both

sophistication and ease – requiring only a finger stick, instead of a full blood sample.

Woolley is confident about the application of this technology and he is preparing to test it on a protein marker associated with liver cancer. As more proteins are identified as indicators of disease, the technique may find wider application, even possibly helping doctors to recognize heart disease early on.

"It's essentially universal," Woolley remarked. "As long as we have the right antibody, we can pull out the protein."

BYU Ph.D. candidate Weichun Yang is already pursuing additional applications, working with Woolley to analyze a panel of four cancer-related proteins.

The biggest challenge standing in the researchers' way? "Dust," says Woolley. "The channels are about equal to the size of a particle of dust, so they can get clogged."

While certainly not without their own unique obstacles, it seems Woolley's mini protein sorters are bound to bring about big improvements in the process of early cancer detection.

by: Katie Pitts



ABOVE David Embley recently received a prestigious award and fellowship from the International Conference on Conceptual Modeling.

CS Professor Receives Award, Fellowship

David Embley, a professor in the Department of Computer Science was recently selected as the 2009 recipient of the Peter Chen Award and named as an ER Fellow.

Both of these honors are bestowed by the International Conference on Conceptual Modeling. Conceptual modeling is a form of database management, and entity relationship (ER) is a type of model.

The Chen Award honors one person annually for his or her exceptional contributions to the field of conceptual modeling. Embley considers his work on information extraction, a method of consolidating scattered information into a coherent structure, to be one of

his major contributions. The award also recognizes Embley's success in training numerous students who, in turn, have made significant contributions to conceptual modeling. He has also authored two books on conceptual modeling.

Embley's selection as an ER Fellow recognizes, in particular, his years of service to the ER conferences. The fact that he was given both awards at the same conference underscores the fact that Embley is a highly respected member of his research community.

by: Natalie Wilson



ABOVE Shane Reese, Jeff Humpherys, Eric Christiansen and Michael Ware all received college awards for their service.



ABOVE Darlene Willey received the Outstanding Staff/Administrative Employee Award for her work in the college advisement center.

Faculty, Staff Receive College Awards

Four faculty members and one full-time administrative staff member received awards at the annual college awards banquet.

Darlene Willey, the Assistant Director of the College Advisement Center, was recognized with the Outstanding Staff/Administrative Employee Award. Dean Scott Sommerfeldt acknowledged her contributions stating that, "She provides exemplary service to students, department contacts and advisement staff, and is constantly thinking of ways to solve the problems that arise in the Advisement Center."

Shane Reese, a faculty member in the Department of Statistics, received the Faculty Excellence in Teaching Award for professors who have taught 3-10 years at the university. Sommerfeldt noted that although Reese is still at an early point in his career, he teaches one of the five GE courses on campus thought by students to be the most difficult. Despite the difficulty of his courses, students identify Reese as a positive impact on their lives.

The Faculty Excellence in Teaching Award for faculty members with more than 10 years teaching was awarded to Eric Christiansen of the Department of Geological Sciences. Christiansen is known as a rigorous and challenging teacher who is equally dedicated to providing the best experience to students no matter whether they are graduates, undergraduates, or non-majors.

Jeff Humpherys was chosen as the recipient of the Faculty Young Scholar Award. The dean identified him as an outstanding young researcher in the Department of Mathematics and an exceptional student mentor.

"Since coming to BYU he has mentored at least 30 undergraduates and 4 graduate students - an accomplishment that is very unusual in mathematics," Sommerfeldt said.

Michael Ware of the Department of Physics and Astronomy received the Distinguished Citizenship Award. Despite gaining little personal benefit, Ware continually advocated for the remodeling of the Underground Lab facility at the north end of the Eyring Science Center. "He knows every inch of the new laboratory, both what you can see and what is behind walls, hatchways, locked doors, and ceilings," Dean Sommerfeldt said.

The college also honored four faculty and staff members with university service awards. Linda Richards and Rod

Scheetz received awards for five years of service.

Richards is the assistant manager of the Chemistry Central Stockroom. She manages inventory, packing, and shipping in the department. Sommerfeldt acknowledged Richards' exceptional commitment to customer service.

"She carefully follows through with each specialty gas order to ensure that the customer gets the right gas on time at the lowest price," he said.

Scheetz is the director of the recently renamed Museum of Paleontology "On any given day he may spend the morning raising funds for the work at the museum and spend the same afternoon raising public awareness of the facility," Sommerfeldt said. "He has spent countless hours working research quarries, and even more hours training students to carefully prepare the bones for publication and display."

Darlene Willey was recognized for ten years of service. Her excellent work in the Division of Continuing Education and in the college's Advisement Center has opened up avenues to "super seniors," facilitating their speedy graduation. She has also revamped the "new student orientation" into a more interactive process, Sommerfeldt said.

Lonnette Stoddard was honored for her 25 years of service to the university. Sommerfeldt distinguished her as "an indispensable part of the Mathematics Department," and further noted, "She especially distinguishes herself by going far out of her way to help each person she works with, whether visitor, faculty, staff, or student," he said.

by: Natalie Wilson



IMPORTANT DATES TO REMEMBER

- [Spring Research Conference Abstract Submission Web Site](#)
CLOSED

February 26, Midnight

- [Spring Research Conference](#)
March 20, 8:00am
1102 JKB



Professor Develops Next-Gen Data Disc



Matthew Linford, a faculty member in the Department of Chemistry and Biochemistry, was recently involved in the development of a next-generation disc capable of storing data for up to 1,000 years.

Teaming with BYU information technologies professor Barry Lunt, Linford lent his expertise in surface properties of materials to the project and helped develop an optical data disc with a much longer lifespan than previously thought possible.

Lunt, the project's progenitor, realized during his seven years working with computer data for IBM that data stored on regular CDs and DVDs would be lost over the space of just a few years, due to disc erosion caused primarily by exposure to sunlight and humidity. After gaining inspiration from a series of 1,000-year-old petroglyphs he found in the rock face of Utah's Nine Mile Canyon, Lunt recruited Linford to help him develop a stronger, more durable data storage unit.

After many months of slow progress and little funding for their research, Linford and Lunt decided to take a different approach.

"We worked on the project together for some time at BYU in our laboratories, although we never had a lot of money to pursue our goals, so at this point I mentioned to Barry the possibility of us starting a company as a way to obtain funding for our project," Linford said in an e-mail. "We eventually got in touch with two businessmen, Henry O'Connell and Doug Hansen, with whom we started [a company]."

With O'Connell and Hansen on-board, the pair developed the Millennial Archival Disc - a backwards-compatible DVD that can be read by all standard drives, but also retains and protects stored information for up to 1,000 years. Linford used his knowledge of materials, continuously honed through his academic research, to help create the new disc from a combination of inorganic, incorruptible substances that can withstand the withering effects of heat and humidity.

The team's company, named Millenniata (a combination of the words "millennium" and "data"), is currently marketing the new technology to businesses and other institutions and has garnered a significant amount of commercial interest.

by: Steve Pierce

COLLEGE PUBLICATIONS

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