

Sweating it out



EDGEwise

How do you collect sweat? After removing sweat-soaked gauze pads from athletes' forearms, the chemistry students put the pads into tubes, spun out the sweat and stored the contents. The samples were either analysed immediately or refrigerated. The students were then able to study whether storage over time influences the chemical make-up of the sweat. Initial results indicate it doesn't.

The combination chemistry and exercise physiology courses that blossomed into a merger of two disciplines has itself become the subject of research. Mary Glen, a kinesiology honours student, is evaluating the effectiveness of having the chemistry and kinesiology students experience each other's course work.

The lab that the students used for this study is the research centre in UVic's School of Exercise Science, Physical and Health Education. It conducts physiological assessments and counselling services for physically demanding occupations, high-performance athletes and the public.

UVic researchers were awarded more than \$71 million in external research grants and contracts in 2006/07, doubling the research support of the previous five-year period.

TIMES COLONIST
Supporting education in our community



We're going places.

University of Victoria Research

DIANA NETHERCOTT

Research partnership helps Canada's elite athletes reach for gold

Gaul (right) checks the blood pressure of kinesiology student Evan Thomas as he sweats for science. Looking on (centre) are lab instructors Mulligan and Taylor and their students.

by **Patty Pitts**

When Canada's athletes work up a sweat for their country at the Beijing Olympics in August, their ability to replenish the essential nutrients and minerals they lose in the process could influence their chances of ending up on the medal podium.

A collaboration between the University of Victoria and the Victoria-based Canadian Sport Centre Pacific (CSCP) may help improve their odds.

Nutrients and minerals known as electrolytes keep the body functioning normally. Examples are sodium, calcium and potassium. Proper electrolyte balance is vital for optimal muscle coordination, heart and nerve function, and mental concentration.

To maintain this balance, weekend warriors often turn to sports drinks such as Gatorade or Powerade. But can these candy-coloured beverages meet the electrolyte replenishment needs of elite athletes who endure several high-intensity workouts a day?

The only way to judge the effectiveness of sports drinks on individual athletes is to analyse their sweat. But existing testing procedures require expensive equipment. UVic kinesiology grad Wendy Pethick, a physiologist and lab manager at CSCP, needed

to find a more affordable way to replicate those procedures.

A visit by Pethick to UVic chemistry lab instructor Nichole Taylor resulted in a solution. Taylor developed a sweat analysis procedure suitable for CSCP's existing equipment. And chemistry undergraduate student Tim Giesbrecht added fine-tuning.

"Electrolyte imbalance causes cell dysfunction, and that diminishes athletic performance," says UVic kinesiology professor Kathy Gaul. "Sodium plays a big role in muscle contraction and organ function. Sports drinks only address mid-level sodium loss. Athletes with high-level sodium loss end up drinking more fluid than sodium which actually depletes their reserves further."

Kinesiology lab coordinator Greg Mulligan and Taylor saw a unique opportunity to engage undergraduates from two disciplines in an innovative laboratory experience. While senior kinesiology students exercised on cycle ergometers as part of their research into how the body regulates its temperature, chemistry students collected their sweat.

The kinesiology students, in turn, added a visit to a chemistry lab as part of their studies. They observed as chemistry students used an ion chro-

matography instrument to quantify the electrolytes in the sweat.

"It's important for students in their third and fourth year to see how their work can be applied in the real world," says Gaul.

The new sweat analysis procedures give CSCP the ability to develop individualized electrolyte replacement programs for each athlete.

Students from both courses were enthusiastic about the glimpse into each other's disciplines.

"They liked being in another lab, seeing how their chemistry is relevant elsewhere on campus and learning proper methods for sampling," says Taylor. "By offering the course in this way, we help students see the entire process and hear from other students about what happens in the body to produce sweat and the biological function of these electrolytes."

An added benefit is the confidence the students gain from explaining their area of study to those without the same expertise.

"It's one thing to answer a question on an exam," adds Taylor. "It's another to be able to explain your science to another individual. I want my students to be comfortable communicating what they're learning to other people."