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. Existing testing procedures require expensive equipment. And chemistry undergraduate students exercised on cycle ergometers as part of their 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 chromatography instrument to quantify the electrolytes in the sweat.

“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 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.”