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### Brighter future on the way for batteries

Aldemaro Romero Jr.

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## Regional

## Brighter future on the way for batteries

Electric batteries are everywhere. They seem as important to us as the electricity that comes out of plugs. Yet, batteries that are able to store enough energy for long periods of time — just what is needed to make electric cars a viable alternative — are large and heavy. Despite the fact that batteries have been around since 1800 when the Italian scientist Alessandro Volta invented them, the “perfect” battery remains elusive to researchers.

One scientist working in the research and development of batteries — among many other areas — is Mike Shaw, a professor of chemistry at Southern Illinois University Edwardsville. Born in Quebec, Canada, Shaw obtained his bachelor's degree in chemistry from Mount Allison University and his doctorate from the University of British Columbia. He is today a world-renowned electrochemist.

Although the term electrochemistry sounds esoteric to many, research in this area involves devices that are essential to everyday life. Electrochemists study fundamental phenomena in nature such as photosynthesis and get involved in the development of devices such as alcohol detectors for drivers and blood sugar meters for diabetics.

“What I saw when I came here was a group of dynamic faculty in the Department of Chemistry involved in effective teaching and research, and the facilities I needed for my research,” said Shaw.

He not only found the type of facilities and

### Dr. Aldemaro Romero College Talk

colleagues he needed for his work, but has been able to attract numerous students to work with him in his lab. He credits the key of his success in student recruitment to his ability to offer students unique experiences.

“I believe that the best experience for students is to have hands-on experiences, and that is why I offer those kind of opportunities to students all the time,” Shaw added.

His success goes beyond numbers. In the natural sciences there is a relatively small pool of African-Americans and Hispanics and Shaw has made a special effort to attract members of those underrepresented groups into his research. To that end he has reached out to historically black colleges. With major grant funding that Shaw has received, he has been able to bring many of these students to SIUE. “I have been lucky attracting minority students into my lab,” he said modestly.

Another area in which he has been heavily involved is in outreach efforts, that is, in bringing science to the local communities. “I have some grants that include a community outreach component where we try to communicate to people what we do, particularly at schools,” explained Shaw.

Some of those grants have come from prestigious funding agencies, such as the federally funded National Science Foundation,



Photo courtesy of Rebecca Lindell

Dr. Mike Shaw, center, at graduation for students Jeff Crisman, left, and Nathan Motl, who both are now in Ph.D programs.

which expect their grantees to impact local communities with their work.

Shaw has also been involved in practical applications of his work. For example, he has patented a method for relaxing the so-called involuntary or “smooth” muscles, such as the ones we find associated with blood vessels, the eyes, and the respiratory and digestive systems.

“We work with molecules attached to

metals that by coming off from the body could reduce blood pressure by relaxing the muscles that constrict blood vessels,” explained Shaw.

Returning to batteries — in which Shaw maintains an active research program — he said that he sees a bright future. “The substances we use for making batteries are the fundamental limitations, because we use metals that need to be wired, but current

advances in material science allow us to engineer them in more effective ways,” he said.

“Making the batteries smaller helps, and the manufacturer has the main responsibility for that,” Shaw said. “In the past, you had to be very careful with rechargeable batteries but today you can almost abuse them and get the job done.”

He added that today's batteries have a significantly lower impact on the environment than older versions.

“Today's batteries contain a lot less mercury,” Shaw said. “Solid batteries are much safer, so the environmental impact of batteries is decreasing.”

Shaw said he sees the horizon expanding for research in all areas of electrochemistry. The job market for people with electrochemistry background continues to grow. As the industries grow, so too does student interest, Shaw said, especially after they realize all of the possible applications of their work.

“Incoming students have so many options that one particular area such as electrochemistry can be lost in the clamor of fields,” Shaw said. “But when they see the possibilities, they really get into it.”

*Aldemaro Romero is the Dean of the College of Arts and Sciences at Southern Illinois University Edwardsville. His show, “Segue,” can be heard every Sunday morning at 9 a.m. on WSIE, 88.7 FM. He can be reached at College\_Arts\_Sciences@siue.edu.*