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## **Sac State professor's biomed device granted a patent**

Sacramento State's Warren Drew Smith, a professor of electrical and electronic engineering, is a renowned specialist in biomedical engineering whose cutting-edge research has produced some exciting medical breakthroughs.

Smith's most recent breakthrough is a battery-operated fanny pack that tracks the movements of youngsters who have cerebral palsy, documenting the frequency of their falls. The device was developed in collaboration with Shriners Hospital in Sacramento. Shriners financed the project for three years.

The device has just been patented, protecting its intellectual property. The next step is securing a licensing agreement that will allow the device to be produced and marketed by a firm and ultimately produce revenue for the University and Shriners Hospital.

Smith and colleague Anita Bagley, co-director of the Shriners Motion Analysis Laboratory, developed the fanny pack to facilitate better treatment for the children at Shriners. Several companies have shown interest in the device but first want evidence that it has wider application.

Smith believes the fanny pack device is applicable to other medical treatments. He sees military veterans with leg prosthetics, individuals with muscular dystrophy, and the elderly as potential beneficiaries of the device's data.

Additional research is needed to demonstrate the device's efficacy for these wider applications. That means finding funds to conduct the research.

Smith's a patient man, having waited several years for patent approval. But he's open to fast-track funding through the National Institutes of Health, Shriners and/or a private company that would accelerate the process.

"I became a biomedical engineer because I wanted to use my engineering know-how to help people with medical needs," he says. Smith and his students have worked with anesthesiologists to improve methods of monitoring the level of a patient's anesthesia. He also developed a way to measure the performance of anesthesia monitors, called prediction probability, which has been adopted as a worldwide standard.

Not content to rest on his laurels, Smith hopes to become more proactive in tapping campus and commercial resources.

A case in point is earlier this year when a team of Sacramento State undergraduate engineers and business students won the first Idea-to-Product (I2P) Early-Stage Commercialization competition put on by the California State University System Program for Education and Research in Biotechnology. The team created a computer-controlled device that prepares stem cells taken from diabetic patients for injection into the patients' feet to improve their circulation. The device could reduce the risk of amputation among diabetic patients with poor foot circulation.

Achieving that synergistic connection of University-based research and commercial application is the next chapter in Smith's quest to help people with medical needs.

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