Research Tips

Vice Chancellor for Research: RJ Traystman, PhD

DR. T'S CORNER

Diabetes-alert dogs can help patients by providing advance notice of trending low and high blood-sugar levels in their owners before those levels can become dangerous. The dogs are trained through a lengthy and repetitive process for about eight months, based on a positive-reward training method. They also undergo basic obedience training, learning voice commands and hand signals, and receiving public access training, which desensitize the dogs to the distractions of worldly environments. They are also trained to smell the chemical changes produced by the human body associated with high and low blood-sugar levels, and are rewarded with treats for accurate alerts.

The idea of a cute furry glucose monitor evidentially has much appeal. Eight-year-old Emma Brussell from Long Island, NY, who has type 1 diabetes wanted one of these dogs, and began to sell her art online in order to finance the project. She ended up raising $15,000, according to a Newsday report. Brussell and her mother submitted an application to Diabetes Alert Dogs of America. She can be matched with a pet after spending eight to 10 weeks on a waiting list.

It can cost from $5,000 to $15,000 to train these dogs. And while any dog breed can be trained to alert an owner of changes in blood glucose levels, "sporting breeds" are preferred. They are most successful and the favorite breeds are the Labrador retriever, golden retriever, labradoodle, goldendoodle, and the standard poodle. They are typically matched with a patient when the dog reaches maturity, usually between the ages of one to two years.

The dogs alert the patients by "pawing" at their leg when blood sugar spikes or drops outside of the target range (80 mg/dl to 150 mg/dl). They continue that action until blood sugar reaches a safe level. If the patient is sleeping, the dog can jump on the patient's bed to wake them up.

The dog knows when a patient's blood sugar is outside of the target range based on saliva samples collected from the matched patient during the training process.

Of course, living with these animals is different than having a pet. For example, as a working dog, Diabetes Alert Dogs of America explained, they have their attention fully on the patient for the first two months together. After that "attachment" period, patients may go out on their own, such as to a school dance, so the dog gets a break. But, as working dogs, these animals cannot be turned away from public places. When traveling on airplanes they get to sit at the patient's feet instead of in the kennel or storage area of the plane.

In recent years, it has become more and more popular for diabetes patients to have a diabetes alert dog. The dogs are about 87 percent accurate in completing their jobs every day. These dogs can provide emotional security, a sense of balance, and help patients lead more confident and independent lifestyles.
The University of Colorado Denver was the first American university to hire a tenure-track Applied Ecologist. Dr. Greg Cronin of the Department of Integrative Biology and CLAS Sustainability Minor is driven to help CU Denver achieve its mission “...applies knowledge to improve the health and well-being of Colorado and the world.” Greg developed the approach he calls "transdisciplinary scholarship", integrating "transdisciplinary research" with Boyer’s model of academic scholarship. He works with scholars from many disciplines, stakeholders, and policymakers to discover, engage, integrate, apply, and teach knowledge.

An extraordinary amount of ecological damage comes from the global food system. Greg conducts research on aquaponics, a technology that combines "aqua"culture with hydro"ponics" in recirculating, non-polluting, water-efficient engineered ecosystems made up of edible species. Greg's lab works with local stakeholders to promote food production, including the passing of Denver’s food-producing animal ordinance, constructing the first aquaponic facility in a US jail (Denver County), establishing fruit trees and community garden on Auraria campus, and conducting a life-cycle assessment of an aquaponic farm in a large Denver food desert. Greg was the scientific leader of a transdisciplinary team that discovered plastic microbeads in the South Platte River. This study directly led to a state ban of plastic microbeads from personal care products such as toothpaste and facial scrubs. Later that year, the US Congress unanimously passed the Microbeads Free Waters Act, reducing the amount of plastic debris that pollutes aquatic ecosystems.

Greg uses the transdisciplinary approach in Haiti, where the most degraded ecosystems in the western hemisphere exist. Using the arts to engage stakeholders, he asks you to visit these links to see the efforts of his non-profit YonSel Lanmou which means "One Love" in Haitian Kreyol: http://YonSelLanmou.org/  https://www.youtube.com/watch?v=s_1L5GizN70

Greg received his BS in Biochemistry & Chemistry in 1989 from Kansas University and his PhD in Marine Sciences from University of North Carolina in 1994. He is an Associate Professor at CUDenver in the Department of Integrative Biology.

OFFICE OF RESEARCH DEVELOPMENT AND EDUCATION (ORDE)

Responding to NIH’s Rigor & Reproducibility Requirements

The NIH’s new Rigor and Reproducibility requirements are in full swing according to many study section reviewers. Reviewer reports of the discussions and emphasis being given to these requirements are reinvigorating the discussion amongst NIH funded researchers and those aspiring to be funded by NIH around the best way to respond to these requirements. As a reminder, these new requirements fall into four general categories: Scientific Premise, Rigorous Experimental Design, Relevant Biological Variables, and Authentication of Resources.

Dr. Jennifer Kemp, the Director of the Research Office in our Department of Medicine recently offered some tips on how to address these requirements. Even if your research has always met these requirements, you need to be more explicit about them in your grant proposals. Each of these requirements should be addressed under a subheading naming it in your proposal. Scientific Premise should be addressed in the Significance section, Rigorous Experimental Design and Relevant Biological Variables should be addressed in Approach, and Authentication of Resources should be addressed in a new attachment.

For more information, see ORDE’s full blog: http://orde-cu.blogspot.com/2017/01/responding-to-nihs-rigor.html

FACULTY AWARDS FOR OUTSTANDING MENTORING OF STUDENT RESEARCH AND CREATIVE ACTIVITIES CU DENVER AND CU AMC

Nominations are now being accepted for the CU Denver and CU AMC Outstanding Mentoring Awards in recognition of exemplary mentoring by faculty of undergraduate and graduate students in research, creative, and other original scholarly activities conducted outside the traditional classroom on our campuses.

Two awardees, one from each campus, will be recognized at the CU Denver Research and Creative Activities Symposium (RaCAS) on Friday, 28 April 2017. In addition, one of the two awardees will be selected to deliver The LYNx Talk, a short keynote address 15-20 minutes in length that describes the awardee's scholarly activities and philosophy regarding the mentoring of undergraduate and/or graduate students.

The awardees' departments/units will each receive a $500 prize earmarked to support professionally relevant dissemination of scholarly work by undergraduate or graduate students in that department or unit (e.g., student travel to meetings, page costs, registration or entry fee).

A nomination form may be completed by a current student or alumnus, faculty member, administrator, or staff member, who may also write a letter of support; individuals may also self-nominate. To access the nomination form and obtain additional details, see: http://www.ucdenver.edu/student-services/resources/ue/urca/Pages/Outstanding-Faculty-Mentor-Award1108-3174.aspx

Nomination materials including personal statement, CV, and letters of support must be submitted as a single pdf to Leo.Bruederle@UCDenver.edu on or before 1 March 2017.

These awards have been made possible by the Office of the Chancellors for the University of Colorado Denver and the University of Colorado Anschutz Medical Campus in collaboration with the CU Denver Office of Undergraduate Experiences.