



Institute of Cannabis Research

COLORADO STATE UNIVERSITY PUEBLO

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The Neuroscience Lab at CSU-Pueblo

PI: Dr. Jeff Smith, Chair and Professor of Biology, CSU Pueblo

The Department of Biology at CSU-Pueblo has a neuroscience laboratory that has contributed to the field with consistent external funding and publications in the medical literature since 2006. In 2015, we began contributing to the ICR at CSU-Pueblo with a dramatic shift in our research focus. The lab currently involves five students who are working on our projects: Mandy Shipman, Sarah Schenk, Tamara Corley, Kai Kokesh, and Leah Carrasquillo. We also have a full-time staff scientist, Amy Uhernik MS, MBA, who works closely with myself to develop and implement our projects. While COVID restrictions have seriously limited our ability to acquire new data, the students have been working on analysis of previously acquired image data that was aimed at evaluating the effects of cannabinoids on changes in the cell-surface expression of the GluN2B subunit of the NMDA receptor. This subunit is known to be important for essential cell-signaling events that facilitate fear learning and memory. Therefore, the work is important for guiding an understanding of the potential for cannabinoids, like Cannabidiol (CBD), to be safely used as therapeutics for disorders of learning and memory such as stress disorders and neurodegenerative conditions such as Alzheimer's Disease. With the recent relaxation of COVID restrictions, we are very pleased to be advancing in our collection of new data that will compare the impact of CBD and a selective serotonin reuptake inhibitor (SSRI) on the neural network activity that is invoked during the acquisition of new fear memories.

CONTENT

ICR Supported Research Project - Dr. Jeff Smith	1
Funding Opportunities - RFA	2
Education - Dr. Chad Kinney, Director, ICR	2
Governing Board Member - J. Scott McWhorter	3
Guest Contributor - Dr. Steve Ziegler	4
ICR Webinar Series	6

This work has a similar importance for understanding whether cannabinoids are useful as therapies for treating neurological disorders, and will provide new insights into how these two very different classes of drugs are similar and different in their effects on brain activity during the processing of new memories. We are also, very pleased to announce that we anticipate a new publication in the ICR's own Journal of Cannabis Research which should be available late this year, pending final acceptance after a few minor editorial changes that were suggested by the editor. This work highlighted the comparative effects of CBD and Citalopram (an SSRI) in fear memory acquisition and early consolidation in female mice. The manuscript showcases the work of a former MS student in the lab, Zack Montoya, who should graduate very soon. Ongoing work is projected to carry on until at least June, after which, new funding will be necessary for our projects to continue. But as always, we continue to pursue that.



Dr. Smith gathering data in his electrophysiology lab at CSU-Pueblo.

Request for Application (RFA) for ICR Research Funding Fiscal Year 2022

The Institute of Cannabis Research is pleased to announce the Request for Applications (RFA) for cannabis research funding for projects to start July 1, 2021. The FY22 ICR RFA will open on November 1, 2020. Applicants are required to submit a letter of intent by December 1, 2020, and full proposals are due by 5 pm MST on February 1, 2021. Interested applicants are strongly encouraged to review the full RFA for details including areas of research supported, eligibility, and budget limitations.

Key Dates:

- Application Open Date: November 1, 2020, 5 PM (MST)
- Letter of Intent Due Date: December 1, 2020, 5 PM (MST)
- Application Due Date: February 1, 2021, by 5 PM (MST).
Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the deadline.
- Anticipated Award Notice Date: May 1, 2021.
- Anticipated Project Start Date: July 1, 2021

Click on the link below for the Application Portal

<https://csupuebloicr.infoready4.com/CompetitionSpace/>



Cannabis Education at Institutions of Higher Education

The impacts of the shifting landscape of/within cannabis legalization in Colorado and in other states, whether related to medical or recreational cannabis, goes well beyond the production and sale/distribution of cannabis products. There are new regulatory as well as testing infrastructures that must be established. There are existing professionals in multiple disciplines that need to understand the new landscape in which they operate. There is a public eager to pose questions and seek answers from professionals and educators. Truly, the impacts of cannabis are far reaching, and we are starting to see institutions of higher education develop comprehensive programs, courses, and resources to meet some of the education gaps that have been created.

In Colorado the first such educational programs have been approved and launched within the last year. The Institute of Cannabis Research Governing Board, which was constituted this past fall, has a statutory requirement to provide the Colorado Commission on Higher Education with input on any cannabis degree or certificate program as part of the State's approval process for such programs.

The Skaggs School of Pharmacy and Pharmaceutical Sciences (SSPPS), located at the Anschutz Campus in Aurora, has launched a 3 pronged approach to cannabis educational needs by addressing continuing education, developing a graduate certificate, and adding an area of specialization within their Masters of Science in Pharmaceutical Sciences program. The [Medical Cannabis Education for Health Care Providers](#) continuing education program is an 8 week intensive program that consists of 20 hours of continuing education credits that is geared towards pharmacists, nurses, and physicians. At the other end of the spectrum is a new [Cannabis Science and Medicine](#) area of emphasis that is one of five options for specialization for students in the Masters of Science program at SSPPS. Other specialty options include Biotechnology and Drug Delivery, Drug Discovery, Molecular and Systems Toxicology, and Pharmacokinetics and Pharmacodynamics. All of the programs at SSPPS are for learners at the postbaccalaureate level. (Con't)

At Colorado State University Pueblo the College of STEM just launched the new [Cannabis Biology and Chemistry](#) degree program. This is a program at the undergraduate level that prepares students to meet the scientific and research needs of the cannabis industry with a strong background in biology and chemistry along with coursework specific to cannabis and natural products. Students completing the Cannabis Biology and Chemistry program will earn a degree that is almost a (comparable to a) double major in Biology and Chemistry and should be well prepared to move into a lab or research environment or to continue their education in graduate or professional school. If a program in the cannabis sciences is not what you are looking for, Colorado State University Pueblo also offers a minor in [Cannabis Studies](#). The Cannabis Studies Minor focusses on the social, legal, historical, political, and health-related impacts of cannabis on society.

Other cannabis education options in Colorado includes the University of Colorado Boulder specialization in the [Health Effects of THC and CBD](#) through Coursera.

This Medical Cannabis focused program is geared towards the risks and benefits of different types of cannabis which consists of 4 courses that when completed will result in a certificate. Colorado State University in Fort Collins has a wealth of resources available, particularly related to hemp through its [Hemp Resource Center](#). This includes insect management for hemp, links to hemp resources through the Colorado Department of Agriculture, and information on hemp production.

However, Colorado does not hold a monopoly on cannabis education and resources. Doane University in Nebraska has a [Seeds to Needs Cannabis Certificate Program](#); Lake Superior State University in Michigan has an undergraduate program in [Cannabis Chemistry](#); and Thomas Jefferson University in Pennsylvania has two graduate certificate programs in [Cannabis Medicine](#) and [Cannabis Science](#). Much like the rapidly changing (evolving) legalization of cannabis to differing degrees in states across the US, institutions of higher education in Colorado and beyond are working to meet the scientific, medical, and social educational needs to match (reflect) these changes.

Meet Mr. J. Scott McWhorter, designee for the Colorado Commission on Higher Education, ICR Governing Board



J. Scott McWhorter BSME, MBA, is the owner and CEO of Rocky Mountain Extraction Services (RMES) Windsor, CO. RMES is a certified organic, mid-scale, industrial hemp extraction facility and lab. Scott is actively involved in the development of the emerging industrial hemp market and specifically focuses on compliance, regulation, and innovation of processes and products to better serve the market. As the CEO he interacts with many organizations including the USDA, FDA, CDA, the National Organic Program, and the Colorado Department of Public Health and Environment. The extraction process is mid-stream between the agricultural elements of industrial hemp and the consumer-based market for

CBD and other products. As result, Mr. McWhorter works with a huge variety of businesses ranging from farmers, to start-up consumer brands, to large well-established consumer facing companies. Prior to starting RMES Scott worked in the industrial turbine controls segment for 30 years in various rolls including engineering, project management, new product development, marketing, and management. Mr. McWhorter is a 5th generation native Coloradoan and graduated from the Colorado School of Mines with a B.S. in Engineering. In the middle of his career he attended the University of Colorado graduating with a Master's in Business Administration.

Mr. McWhorter joined the ICR Governing board in 2019 as the designee for the Colorado Commission on Higher Education. His role is to work with the Director and other board members to review proposed cannabis related degree programs proposed by colleges and universities in Colorado. He also participates as a representative of cannabis-related industries.

ICR Guest Contributor

Research that can improve lives: A story about pain, \$3 million dollars and a rowboat

By Steve Ziegler



Pain.

It is something we all feel.

For most of us it's minor, it comes and goes, and life goes on.

But that is not the case for millions of people in the United States and around the world who suffer from chronic long-term diseases, those who undergo surgery, and those who are dying.

We know that medical cannabis, whether in the form of marijuana, hemp, or derivatives, has the potential to treat medical conditions including pain.

While the majority of the states have legalized cannabis in some form, critics throughout the world continue to oppose widespread legalization by claiming that it cannot be effectively regulated or that there just has not been enough research.

Fortunately, Colorado recognized the value of research by creating the Institute for Cannabis Research at Colorado State University Pueblo.

And while governments throughout the United States and world are recognizing the value of cannabis research, governments rarely, if ever, bother to determine if the laws or drug control policies they create actually work, who they harm, or how they could be improved.

For example, did you know that the primary legal difference between hemp and marijuana is just 0.3% THC? In fact, if the THC exceeds 0.3%, it suddenly becomes marijuana and is subject to destruction which could result in a massive waste of resources and harm to the environment.

The question then becomes, where did the 0.3% in the federal law come from? I asked Congress, and their response?

They did not know.

The following is a story about my efforts to change that and improve the way governments create drug policies; a story involving pain, three million dollars, and a rowboat.

I have been in the pain management and drug policy space for over two decades, trained as both a social scientist and as an attorney, my motivation throughout my career has been the reduction of unnecessary human suffering.

I had two competing interests in college: anesthesiology and politics.

Although I had no interest in being a politician, I recognized early on how politics and our legal system had the potential to improve lives – many lives.

I would learn, however, that not all laws are created equal and more than a few lack a rational basis, or at least were not based in reason.

In 1904, United States Supreme Court Justice Holmes wrote that bad laws and bad court decisions can often be traced to what he called "an immediate overwhelming interest which appeals to the feelings and distorts the judgment. These immediate interests exercise a kind of hydraulic pressure ... where even well settled principles of law will bend."

This has certainly been the case with drug policy, and one of the biggest challenges to studying cannabis has been its illegality for almost a century.

So, having been a professor, I sought to improve the way pain was treated and legal drugs are controlled by seeking to create what is called an endowed chair. The position would enable me to focus all of my time on pain management and drug policy research, education, and outreach to help make the information accessible and understandable to a broad audience who could in turn influence public policy for the better.

(Con't)

I was making some progress. I met with a university in the western United States and they were quite receptive to my proposal and looked forward to creating such a position.

But they only needed one thing to make this innovation happen:

Three million dollars.

And I was exactly 3 million dollars short.

Public universities are often short on funds because they rely on state legislatures to provide the funding to reduce the cost of tuition for its citizens. This certainly had been the case for decades. For example, in the 1980s, state tuition in Texas was only \$4 a semester hour; today, with fees, it is \$769 an hour.

But lacking the necessary 3 million dollars, I found myself in a boat in the middle of lake without any wind.

So, I started rowing.

I subsequently founded the Center for Effective Regulatory Policy and Safe Access (CERPSA), a sponsored project of the Colorado Nonprofit Development Center. CERPSA would be a think-and-do tank, a non-profit research organization that would essentially do the same thing as the endowed chair, it would just not be located at a university.

Of course, I still needed to raise 3 million dollars, but how hard could it be given that people routinely pay \$293,000 for a meal at a political fundraiser?

But within a few months of launching the think and do tank, the pandemic hit.

Millions of people were now out of work and it was comparable to the Great Depression of 1929.

Not the best time to create a nonprofit and try to raise 3 million dollars.

So, I started rowing again.

A podcast was always something I considered, and I thought it would become one of the many ways to make our research more accessible.

But instead of becoming a component, it became the centerpiece.

As a new podcast, it had achieved some success. Over 1800 independent downloads over the course of five months, and people throughout the United States and across the globe were listening (Australia, the UK, Germany, France, Canada, South Africa, Argentina, Japan, India, and Ireland to name a few).

And all of this was possible because of the donations we received helped pay the bills and I very much appreciated that support.

But as the executive director and founder of what has been an all-volunteer nonprofit, engaging in fundraising, and dealing with the impact of a global pandemic became a lot like trying to change a tire while driving down the freeway at 75 mph.

The question then became: in light of COVID's impact on what was intended to originally be a research organization, is it really necessary for a podcast to be organized as a nonprofit considering its unique costs?

Having nonprofit status has its benefits, but it also has its costs.

So, I recently started exploring alternatives to a nonprofit podcast and found YouTube.

I launched my own YouTube channel about a month ago and released a satirical video involving a tough love session with the CDC about its prescribing guideline. A guideline that has negatively impacted millions of people in pain (and a policy the CDC has yet to evaluate).

That video received over 400 downloads in the first week of its release and while the YouTube channel is a work in progress, you can get a glimpse of the sausage making by visiting [YouTube.com/painpolitics](https://www.youtube.com/painpolitics).

The channel is about pain, politics, and satire. Although pain treatment and drug policy are serious matters, satire has a history of bringing about positive reforms, making information more accessible, and even improving politics.

If there was ever a time in our politics for more satire, or at least more cowbell, that would be today.

The global pandemic has impacted all of us in a variety of ways, and CERPSA was certainly not spared. Although I will be closing the project at the end of October, the podcast episodes will continue to be accessible on a new platform and new RSS feed at Archive.org, a nonprofit library. My own website and YouTube channel will continue to grow, and you can watch that growth at www.painpolitics.com.

In the end, drug laws and regulations are not necessarily a bad thing, they just need to be improved. Consequently, I will continue to look for that elusive 3 million dollars. And I will continue to explore ways I can help improve lives.

But most of all, I'm going to keep rowing.



ICR WEBINAR SERIES

Institute of Cannabis Research

COLORADO STATE UNIVERSITY PUEBLO

"Cannabis Derived Products -From the University of Mississippi"



The ICR is pleased to host Dr. Mahmud ElSohly for our December webinar, on Thursday, December 10 at 1:00PM MST. Please watch our webpage by clicking on the link below for the link to the webinar and other forthcoming information.

<https://www.csupueblo.edu/institute-of-cannabis-research/webinar.html>.

Mahmoud A. ElSohly, Ph.D., is President and Laboratory Director of ELI. He serves as Research Professor in the National Center for Natural Products Research, Research Institute of Pharmaceutical Sciences, and Professor of Pharmaceutics in the School of Pharmacy at the University of Mississippi. Dr. ElSohly is the director of the Marijuana Project at the University of Mississippi, which is funded by the National Institute on Drug Abuse.

Dr. ElSohly received a B.S. in Pharmacy and Pharmaceutical Chemistry and a M.S. in Pharmacy and Pharmaceutical Sciences from Cairo University, Cairo, Egypt, and a Ph.D. in Pharmacognosy from the University of Pittsburgh. He is board certified by the American Board of Forensic Medicine (BCFM) and the American College of Forensic Examiners (BCFE).

Dr. ElSohly holds more than 30 patents dealing with the processing, testing, and detection of drugs of abuse along with other patents dealing with biologically active natural products and compositions for the treatment of cancer and other in the diagnostics area. He has authored over 250 scholarly articles and more than 200 presentations at scientific meetings of professional societies relative to drug discovery, analysis, and metabolism, and many of his articles deal with forensic issues of drugs of abuse.

January 2021 Webinar

We will be hosting a webinar on Thursday, January 14th at 1:00 MST. Please watch our webpage by clicking on the link below for forthcoming information.

<https://www.csupueblo.edu/institute-of-cannabis-research/webinar.html>

Reminder: Thursday, November 12, 1:00MT

Dr. David Shurtleff, Deputy Director of the National Center of Complementary and Integrative Health will be presenting on "Cannabinoid Research Funding Opportunities at NCCIH"

https://csupueblo.zoom.us/webinar/register/WN_96ZwkYXISaayveFQSQg2Ag

The Cannabis Research Conference 2021

The Institute of Cannabis Research Conference is now the Cannabis Research Conference. This is the fifth annual installment of this event. The theme for the conference this year is Exploring Cannabis Research Frontiers. The Institute of Cannabis Research at Colorado State University-Pueblo and the Global Hemp Innovation Center at Oregon State University are proud to host researchers and attendees from every field of cannabis expertise.

If you are interested in helping shape the program for the Cannabis Research Conference 2021, please submit a session proposal for the conference. The deadline for the session proposal submission is January 15, 2021. Session proposals will be reviewed on a rolling basis as they are received. Proposed sessions should fit within the following broad areas:

- Biology, chemistry, physiology, and agronomy of Cannabis
- Medical & clinical research
- Hemp cultivation, processes, and uses
- Non-medical (industrial) hemp
- Cannabinoid pharmacology
- Public health and education
- Public policy and regulation
- Economic and social impact
- Quality assurance and quality control of Cannabis products
- Research administration and collaboration