

UGRADRESEARCH.UCONN.EDU/FRONTIERS2022

UConn

ENRICHMENT PROGRAMS

OFFICE OF
UNDERGRADUATE RESEARCH

2022

FRONTIERS

UNDERGRADUATE RESEARCH ONLINE EXHIBITION

Welcome

to the 2022 Frontiers Online Exhibition! This year, the online exhibition is offered alongside in-person exhibitions at Storrs and Stamford, providing students opportunities to share their projects in different modalities. For the online exhibition, students prepared posters and short video presentations. Links to those materials, hosted on the Portfolium e-portfolio platform, are included in this exhibition program alongside the individual project listings.

In addition to viewing and commenting on the projects in Portfolium, we invite you to participate in four live, online presentation sessions to hear from student researchers and ask questions about their projects and experiences. Details about the live sessions are available on pages 3-4 of this program.

We thank students, faculty mentors, and staff colleagues for their patience, support, and positivity as Frontiers moved to a hybrid modality. We are pleased to have this opportunity to celebrate students' ideas, questions, explorations, discoveries, and creations in ways that keep UConn Nation safe, healthy, and connected.

- UConn Office of Undergraduate Research

About Frontiers in Undergraduate Research

The Frontiers Exhibition is a multidisciplinary forum showcasing undergraduate research, scholarship, and creative projects at the University of Connecticut. Frontiers 2022 is the twenty-fifth annual Frontiers event sponsored by the Office of Undergraduate Research (OUR) and the third that includes an online exhibition. Across modalities, well over 200 students are sharing their engagement in experiential learning at Frontiers this year.

Students' projects span the disciplines, with some pursued by individuals and others by groups of student collaborators. The projects presented reflect the invaluable contributions of research mentors, including graduate students, postdoctoral scholars, staff, and faculty members. We hope you enjoy learning about our students' innovative projects by viewing the online exhibition!

About the Office of Undergraduate Research

The Office of Undergraduate Research (OUR) is a resource for students interested in enriching their undergraduate experience through participation in research, scholarship, and creative activity. OUR provides information and advising to assist students in identifying relevant opportunities, as well as several funding programs to support students and their faculty mentors.

Many of the Frontiers presenters have received financial support for their projects; OUR awarded over \$630,000 in 2020-21 in support of students' research and creative endeavors. These awards are funded by OUR with generous support from the Office of the Provost, the Office of the Vice President for Research, the deans of the schools and colleges, and donations from alumni, parents, and other friends of UConn and undergraduate research.

Acknowledgments

The Office of Undergraduate Research wishes to thank the deans of the represented schools and colleges, the Office of the Provost, the Office of the Vice President for Research, and generous donors to OUR and the Honors Program for their support of undergraduate research through contributions to OUR funding programs. In addition, we thank the following individuals for their support:

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Interim President, University of Connecticut

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Alex Clonan '22 (ENG, CLAS)

Claire Fresher '22 (ENG)

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Elisa Shaholli '23 (CLAS)

Drew Tienken '22 (CLAS)

Humza Zaidi '22 (CLAS)

Chloé Zampetti '22 (CAHNR)

Event Program



INTERIM PRESIDENT'S REMARKS

We invite all student presenters, mentors, and audience members to view remarks made on the occasion of the 25th Annual Frontiers Exhibition by UConn's Interim President, Radenka Maric. View Interim President Maric's message at s.uconn.edu/frontiers22remarks

LIVE PRESENTATION SESSIONS

Monday, April 11, 2022 • 6:00-7:00pm
s.uconn.edu/frontiers22live1

Ling Chi '22 (Biomedical Engineering, ENG)

Workflow Integration of a Standard Social Determinant of Health Screening Program

Liam Cohen '25 (Sociology, CLAS)

How Gendered Character Creation in Video Games Affects Trans People

Jacob Esposito '23 (Chemistry, CLAS)

Extraction of CBD and Other Cannabinoids from Dark Chocolate Truffles Followed by Liquid Chromatography Coupled with UV Detection

Maria Latta '20 (PHARM), '22 Pharm.D.

Drugs, Information, and Innovation: How Can Pharmacists Improve Patient Opioid Knowledge?

Wednesday, April 13, 2022 • 4:30-5:30pm
s.uconn.edu/frontiers22live2

Madelyn Dupre '22 (Animal Sciences & Pathobiology, CAHNR)

Investigating mRNA Expression of Genes Involved in Epigenetic Modification in the Liver of F1 Offspring of Poorly Fed Mothers Using a Sheep Model

Kelly George '22 (Allied Health Sciences, CAHNR)

Alex Clonan '22 (Electrical Engineering, ENG & Molecular and Cell Biology, CLAS)

Assessing Self-Harm in Adolescents Before and During the COVID-19 Pandemic in Relation to Geographic Location

Harsha Jain '22 (Engineering Physics & Computer Science and Engineering, ENG)

Entrepreneurial Venture of a Smart Real Time Monitoring Device for Plants

Uma Mehta '22 (Biological Sciences, CLAS)

Comparing the Expression of EGFR Gene Alternative Transcripts: Isoform A and D

Thursday, April 14, 2022 • 4:30-5:30pm

s.uconn.edu/frontiers22live3

Aaron Beams '22 (Biomedical Engineering, ENG)

Intracellular Protein Delivery Using Nanopieces for Anti-Cancer Applications

Jessie Gentilella '22 (Human Development and Family Sciences, CLAS)

Social Media and Body Image during COVID-19 among Female College Students

Sarah Platt '22 (Biological Sciences, CLAS)

Seema Patel '22 (Molecular and Cell Biology, CLAS)

Reviving Recipes, Rethinking Our Food System: A Community Cookbook Project for CT Shoreline Residents

Emily Trocchi '22 (Physiology and Neurobiology, CLAS)

The Effects of Heat Shock on Arf Guanine Nucleotide Exchange Activity of IQSEC2, an Intellectual Disability-Linked Protein

Thursday, April 14, 2022 • 6:00-7:00pm

s.uconn.edu/frontiers22live4

Julia Chrostowski '22 (Biological Sciences & Sociology, CLAS)

Effects of Tissue-Specific Indy Reduction on Fly Metabolism and Longevity

Shihab Khalfalla '23 (Computer Science and Engineering, ENG)

A Model For Quality Prediction and Efficient Data Monitoring in Additive Manufacturing

Mehak Sharma '22 (Chemistry, CLAS)

The Dreamer Movement: Understanding Why and How #DREAMers Keep Dreaming

Chelsea Valdez '22 (Human Development and Family Sciences, CLAS)

Mindfulness Yoga: Community-Based Intervention with Resettled Refugee Children from Afghanistan



VIEWING PROJECTS IN PORTFOLIUM

The following controls are available to you when viewing projects in Portfolium.

Move between pages in a multi-page document

Standard View

Zoom in or out

Scroll to the previous slide (project component)

Scroll to the next slide (project component)

Show fullscreen slide

Move between pages in a multi-page document

Fullscreen View


Zoom in or out

Scroll to the previous slide (project component)

Scroll to the next slide (project component)

Scroll between slides (project components)

Exit fullscreen view



Student Projects

The Effects of Fibrodysplasia Ossificans Progressiva on the Tongue

Amy Backal '22 (Molecular and Cell Biology, CLAS), University Scholar

Advisor: David Goldhamer, Professor, Molecular and Cell Biology

Supported by: SURF Award

Online Materials: <https://portfolium.com/entry/the-effects-of-fop-on-the-tongue>

Fibrodysplasia Ossificans Progressiva (FOP) is a rare genetic disorder in which skeletal muscle and associated connective tissue progressively turn to bone through the process of heterotopic ossification (HO). The tongue is a skeletal muscle that contains a population of cells of origin for bone growth, and yet it seems to be spared from HO. My project will consider the environment of the tongue and the subpopulations of cells that reside there as possible inhibiting factors for bone growth. The goal is to stimulate further research on preventative factors for HO which will be helpful for developing new therapeutics.

Voting Patterns of Latino Subgroups

Ariana Bahavar '24 (Political Science, CLAS)

Advisor: Beth Ginsberg, Assistant Professor in Residence, Political Science

Supported by: SHARE Summer Apprenticeship

Online Materials: <https://portfolium.com/entry/voting-patterns-of-latino-subgroups>

This presentation looks into data from the Current Population Surveys (CPS) to determine how certain variables influence Latino voter turnout. Specifically, the presentation explores whether Latino subgroups vote differently from one another based on variables such as age, education, etc.

Intracellular Protein Delivery using Nanopieces for Anti-Cancer Applications

Aaron Beams '22 (Biomedical Engineering, ENG)

Advisor: Yupeng Chen, Associate Professor, Biomedical Engineering

Supported by: UConn IDEA Grant

Online Materials: <https://portfolium.com/entry/intracellular-protein-delivery-using-nanopieces-fo>

Using novel JBNp technology to intracellularly deliver apoptosis inducing proteins into the cytoplasm of ovarian cancer cells.

Strategic Innovation Within Corporate Social Impact and Responsibility (CSIR) Through People, Planet and Profit

Zoe Butchen '22 (Individualized Major: Social Impact and Organizational Leadership, CLAS)

Advisor: Travis Grosser, Associate Professor, Management

Online Materials: <https://portfolium.com/entry/strategic-innovation-within-csir>

This project explores corporate social impact and responsibility from an innovation angle, identifying policies, practices, and programs being implemented at the cross-section of business and human rights to advance social responsibility and sustainability globally. This is evaluated through the triple bottom line within CSR: people (social), planet (environmental), and profit (economic).

The Effect of Social Comparison and Fear of Missing Out on Anxiety Symptoms in Late Adolescents

Hailey Byrne '22 (Psychological Sciences, CLAS)

Stephanie Ballas '24 (Psychological Sciences, CLAS; Diagnostic Genetic Sciences, CAHNR)

Lindsey Daly '24 (Psychological Sciences, CLAS)

Yamini Pant '24 (Psychological Sciences, CLAS)

Advisor: Kimberli Treadwell, Associate Professor, Psychological Sciences

Supported by: OUR Conference Presentation Award

Online Materials: <https://portfolio.com/entry/social-comparison-and-fear-of-missing-out>

This study examined social comparison in the form of fear of missing out (FoMO) and how it relates to anxiety in late adolescents. Fifty undergraduate participants completed a 7-day daily diary examination of their FoMO and anxiety. Results indicated that daily FoMO predicted feelings of anxiety, that this relationship was consistently significant over a 7-day period within each person, and that this interaction existed for all persons in the study.

Social Determinants of Health and the COVID-19 Pandemic

Catherine Cantelmo '23 (Nursing, NUR; Chinese, CLAS)

Advisor: Kelley Newlin Lew, Associate Professor, Nursing; Deborah Chyun, Dean, Nursing

Supported by: SHARE Award

Online Materials: <https://portfolio.com/entry/social-determinants-of-health-covid-19-disparity>

I am researching disparities in the Hispanic population related to the COVID-19 pandemic. I chose this project because it was frightening to me how different my experience with the pandemic was than other communities and populations.

Pricing Perpetual American Put Options Using Stochastic Calculus

Alex Chen '22 (Finance, BUS; Computer Science and Engineering, ENG),

Advisor: Yaacov Kopeliovich, Associate Professor in Residence, Finance

Online Materials: <https://portfolio.com/entry/pricing-perpetual-american-put-options>

This project explores a closed-form solution to pricing the perpetual American put option. This project outlines early attempts to model American options using numerical and analytical methods that arose in the 1970s and 1980s, derives a solution to the valuation of the perpetual American put option, and explores applications of the derived formula.

Workflow Integration of a Standard Social Determinant of Health Screening Program

Ling Chi '22 (Biomedical Engineering, ENG)

Advisor: Christopher Steele, Assistant Professor, Medicine; Robert Stanley, Chief Medical Information Officer, Medicine

Supported by: UConn IDEA Grant

Online Materials: <https://portfolio.com/entry/social-determinants-of-health-in-clinical-workflow>

The purpose of this study is to perform a needs assessment of UConn Health providers to determine when it is best to systematically identify and address social determinants of health within outpatient clinical workflows. Based on the data collected from a literature review and a survey of UConn Health providers, the goal is to later develop protocols so that anyone looking to implement the suggested solutions can begin program and/or technical development relatively quickly.

Effects of Tissue-Specific Indy Reduction on Fly Metabolism and Longevity

Julia Chrostowski '22 (Biological Sciences & Sociology, CLAS)

Advisor: Blanka Rogina, Professor, Genetics and Genome Sciences

Supported by: Health Research Program

Online Materials: <https://portfolium.com/entry/effects-of-tissue-specific-indy-reduction>

INDY is a plasma membrane transporter of Krebs cycle intermediates and it has been found at high levels in the midgut, fat body, and oenocytes--tissues important for uptake, utilization and storage of nutrients to extend longevity. This past year I have been examining the effects of oenocytes-specific Indy reduction on fly stress resistance.

How Gendered Character Creation in Video Games Affects Trans People

Liam Cohen '25 (Sociology, CLAS)

Advisor: Micah Goodrich, Adjunct Faculty, Women's, Gender, and Sexuality Studies

Online Materials: <https://portfolium.com/entry/nonbinary-representation-in-video-games>

I ran a study asking over 80 transgender people how gendered character creation in video games affected them. The results of the study show just how important representation in video games can be.

Queer Affirmation and the Emo Scene of the 2000s

Eli Collins '22 (Linguistics/Psychology, CLAS)

Advisor: Margaret Breen, Professor, English

Supported by: SURF Award

Online Materials: <https://portfolium.com/entry/queer-affirmation-and-the-emo-scene-of-the-2000s>

An examination of the relationship between queerness and the 'emo' rock music. The history of rock and its subgenres as vehicles for exploration of sexuality and gender identity, and the subsequent queer spaces created as a result.

Why Talk About Your Worries? Problem Anxiety Talk with Friends and Parents

Colleen Coogan '22 (Psychological Sciences & Women's, Gender, and Sexuality Studies, CLAS)

Advisor: Kimberli Treadwell, Associate Professor, Psychological Sciences

Supported by: OUR Conference Presentation Award

Online Materials: <https://portfolium.com/entry/why-talk-about-your-worries-problem-anxiety-talk>

This study is about the common mental health concern of anxiety, especially in the youth and we attempt to understand the possible interpersonal impact on anxiety development and maintenance. This study examines anxiety talk in late adolescent friendships as a potential contagion mechanism. We found that anxiety talk significantly predicted anxiety symptoms in late adolescents in both friend and parent relationships.

A Study of Families' Experiences with PANS/PANDAS

Steph Davey '22 (Cognitive Science, CLAS)

Advisor: Cesar Abadia-Barrero, Associate Professor, Anthropology Department; Maria Assistant Professor, Human Development and Family Sciences

Supported by: SHARE Award

Online Materials: <https://portfolium.com/entry/human-and-institutional-dimensions-of-pans>

This project looked at the ways family functioning was affected by the onset of PANS/PANDAS, a novel childhood chronic condition. The affected child, parents, siblings, extended family, and larger social structures at hand were examined to understand the lived experiences of and challenges faced by these families.

LGBTQ+ COVID-related Relationships and Well-being (CREW)

Makayla Dawkins '23 (Human Development and Family Sciences & Women's, Gender, and Sexuality Studies, CLAS),

Advisor: Eva Lefkowitz, Professor, Human Development and Family Sciences

Supported by: SHARE Summer Apprenticeship

Online Materials: <https://portfolio.com/pp/FAAABA1F-C30F-4471-904F-D29748ABC282>

I was involved in the coding of themes from the open-ended questions answered by subjects about how the pandemic affected their gender and sexual identity, and their relationship with their parents. My apprenticeship taught me how to code qualitative data; how to work on research generally; and, by attending regular research meetings, learn about a range of aspects of the research process.

The Medicaid Blockade: Analyzing the Impact of Gubernatorial and State Legislature Partisanship in the Ballot Initiative Process for PPACA Medicaid Expansion

Samuel Dorman '22 (Political Science, CLAS)

Advisor: Matthew Singer, Associate Professor, Political Science

Supported by: CLAS Alan R. Bennett Honors Fund

Online Materials: <https://portfolio.com/entry/frontiers-2022-dorman-the-medicaid-blockade>

This study examines whether the political affiliation of elites affects the outcome of the Medicaid expansion decisions. Using a state panel dataset from 2005 to 2019 and a two-way fixed effects model, I test whether the Medicaid expansion is less likely in states with a divided or unified government, specifically in the application of the ballot box initiative process. I employ a mixed-methods approach using a qualitative case study of selected states to explore unique political situations that occurred after the ballot initiative process expanded Medicaid eligibility.

Breath, Body and Spirit: Navigating Jewish Memory in Israel/Palestine

Matan Doron '22 (Individualized Major: Science, Medicine and Ethics & Biological Sciences, CLAS), University Scholar

Advisor: Sarah Willen, Associate Professor, Anthropology; Lewis Gordon, Professor, Philosophy; Regina Barreca, Professor, English

Online Materials: <https://portfolio.com/entry/breath-body-and-spirit>

The original purpose of this project was to investigate the ways that breath-as-allegory is used in the theological, philosophical, and sociopolitical discourse. Overtime this project morphed into a reflection on Jewish memory within the context of Israel/Palestine. Through this project I explore various forms of thought, engaging philosophical, anthropological, and theological works to advocate for a democratic Israel/Palestine.

Investigating mRNA Expression of Genes Involved in Epigenetic Modification in the Liver of F1 Offspring of Poorly Fed Mothers Using a Sheep Model

Madelyn Dupre '22 (Animal Science & Pathobiology, CAHNR),

Advisor: Kristen Govoni, Associate Professor, Animal Science

Supported by: OUR Supply Award

Online Materials: <https://portfolio.com/entry/maternal-nutrition-epigenetic-factor-expression>

Under- or overfeeding during gestation causes altered growth and metabolism in the offspring after birth. Epigenetics, the heritable change in gene expression without altering the DNA sequence, is a possible mechanism of this. This study aimed to investigate the effects of under- or overfeeding during gestation on male offspring mRNA expression of various epigenetic factors in liver tissue using real-time PCR methods.

Extraction of CBD and Other Cannabinoids From Dark Chocolate Truffles Followed by Liquid Chromatography Coupled With UV Detection

Jacob Esposito '23 (Chemistry, CLAS)

Advisor: Anthony Provatas, Assistant Research Professor, Chemistry & Center for Environmental Sciences and Engineering

Online Materials: <https://portfolium.com/entry/extraction-of-cbd-from-chocolate-truffles>

In 2019, Connecticut legalized all CBD hemp products. For CBD hemp products to be legal, they must contain 0.3% or less of tetrahydrocannabinol (THC). It is important to test the potency of THC and CBD in these hemp products being distributed to the public labeled as 0.3% or less of THC to make sure they are as advertised.

The Neutrality of Scientific Journal Articles: Does "Performing Gender" Affect Scientific Debate?

Allison Gauvin '23 (Psychological Sciences & Sociology, CLAS)

Advisor: Christin Munsch, Associate Professor, Sociology

Supported by: SHARE Summer Apprenticeship

Online Materials: <https://portfolium.com/entry/the-neutrality-of-scientific-journal-articles>

A strength in the scientific method is the ability to discuss and debate research methods and experiments, in order to come closer to understanding our world and what transpires within it. Scientific journals allow scientists and researchers to publish their work in order to create an open dialogue and further discoveries in different areas of study. My SHARE project is one piece of a larger project looking deeper in the world of publishing within a scientific journal, to understand if gender plays a role in how discussions take place in scientific journal's comments and replies. Are researchers willing to accept responsibility if they have committed an error in their research or do they "double-down" to avoid public correction?

Self-Adaptive Bioinspired Network on Sensor Device

Agron Gemajli '23 (Computer Science, ENG)

Advisor: Kriti Bhargava, Assistant Professor in Residence, Computer Science and Engineering

Online Materials: <https://portfolium.com/pp/05AF3017-ED60-4359-A5A6-DA86FF3D0403>

The main goal of this research and creative project is to try and bring intelligence over to edge devices. In our case, the edge device is the Arduino Nano 33 BLE Sense. Work has previously been done that proposed techniques of analytics on devices constrained by their memory resources as well as their computational power. In this project, we strive to implement machine learning models on the sensor device to create a self learning network that can evolve on the data retrieved.

Social Media and Body Image during COVID-19 among Female College Students

Jessie Gentilella '22 (Human Development and Family Sciences, CLAS)

Advisor: Rebecca Puhl, Professor, Human Development and Family Sciences; Leah Lessard, Postdoctoral Research Associate, InCHIP Rudd Center

Online Materials: <https://portfolium.com/pp/6222F07F-B4DC-4AD5-9284-96E6381F53BE>

The COVID-19 pandemic resulted in significant changes to people's lives, affecting their daily functioning, social interactions, and health. To date, there has been very little research on how body image and associated social media use have been impacted by the pandemic. College-aged women were particularly vulnerable to social media messages about physical appearance during this time period as they were exposed to messages about avoiding weight gain and methods to lose weight via different social media platforms. The present study examined how college-aged women's body image and social media habits were impacted by the pandemic.

Assessing Self-Harm in Adolescents Before and During the COVID-19 Pandemic in Relation to Geographic Location

Kelly George '22 (Allied Health Sciences, CAHNR)

Alex Clonan '22 (Electrical Engineering, ENG; Molecular and Cell Biology, CLAS)

Advisor: Amy Hunter, Assistant Professor, Public Health Sciences

Supported by: OUR Conference Presentation Award

Online Materials: <https://portfolio.com/entry/assessing-self-harm-in-adolescents>

The purpose of our study was therefore to compare Emergency Department self-harming behaviors in the state of Connecticut before and during Covid-19, and how that relationship differed by geographic location. We hypothesized that children living in more urbanized ED areas would show greater incidents of self-harm than those living in rural areas. Additionally, we hypothesized that there will be a decrease in overall prevalence of self-harm records during the pandemic.

False Positive Binary Supermassive Black Hole Detection Rate for Vera Rubin Observatory

Kaylee Grace '22 (Physics & Women's, Gender, and Sexuality Studies, CLAS)

Advisor: Jonathan Trump, Associate Professor, Physics

Online Materials: <https://portfolio.com/entry/false-positive-binary-smbh-detection-rate-for-vro>

Supermassive black holes are the most massive objects in the universe and they exist at the centers of galaxies. When two galaxies merge, these supermassive black holes can find themselves in pairs that are incredibly difficult to detect. Determining the false-positive detection rate of these pairs, especially for the revolutionary Vera Rubin Observatory, is vital to confirming their existence.

Social factors Influence Solo and Dyad Male Rat Pairs During Novel Open Field Exploration

Qingli Hu '22 (Physiology and Neurobiology & Psychological Sciences, CLAS),

Advisor: Etan Markus, Professor, Psychological Sciences

Supported by: OUR Conference Presentation Award

Online Materials: <https://portfolio.com/entry/social-factors-and-rats-exploring-an-open-field>

Exploring novel environments is critical for survival, providing information on food, shelter, mates, and sources of danger. Few studies have investigated the influence of social conspecifics on open field activity. Here we provide a demonstration of solo or dyad male rats exploring and interacting across repeated exposures to a novel open field.

Modeling Tools for NBA Data

Nailah Hutchinson '22 (Individualized Major: Data Science, CLAS), LSAMP Scholar

Advisor: Ofer Harel, Professor, Statistics

Online Materials: <https://portfolio.com/entry/modeling-tools-for-nba-data>

An analysis of certain measures to determine an NBA team's overall performance.

Entrepreneurial Venture of a Smart Real Time Monitoring Device for Plants

Harsha Jain '2022 (Engineering Physics & Computer Science and Engineering, ENG)

Advisor: Jonathan Moore, Instructor in Residence, Operations and Information Management

Supported by: UConn IDEA Grant

Online Materials: <https://portfolio.com/entry/smart-real-time-plant-monitoring-device>

Many busy households and gardening enthusiasts want to improve longevity of their plants by providing a proper environment for them. Our smart real time monitoring plant device helps users achieve this goal by efficiently tracking plant health via a mobile application.

An Exploration of Magnetic Field Effects in Organic, Donor-Bridge-Acceptor Constructs

Samuel Johnson '22 (Chemistry, CLAS), University Scholar

Advisor: Tomoyasu Mani, Assistant Professor, Chemistry

Supported by: SURF Award

Online Materials: <https://portfolium.com/entry/magnetic-field-effects-on-electron-pathways>

The goal of this project is to create affordable, organic biomedical probes based for fluorescent guided surgery (FGS). The probes will act to improve current tumor recognition in FGS by introducing a novel method to tune fluorescent intensity via an external magnetic field, improving contrast against background fluorescence.

Examining Factors of Trust in Undergraduate Student-Instructor Relationships

Steven Kao '22 (Physiology and Neurobiology, CLAS)

Advisor: Xinnian Chen, Professor in Residence, Physiology and Neurobiology

Online Materials: <https://portfolium.com/entry/examining-undergraduate-student-instructor-trust>

Developing trust between a student and instructor in undergraduate classrooms has been shown to provide numerous educational outcomes such as retention in the field, commitment to the material and teaching practices, and improved final grade outcomes. This study seeks to examine what traits and practices of a professor can foster trust between a student and instructor in an undergraduate class. Virtual interviews were conducted with students from the University of Connecticut, Southern Connecticut State University, and Yale University asking students to recall their favorite professors and to describe their traits or practices.

A Model For Quality Prediction and Efficient Data Monitoring in Additive Manufacturing

Shihab Khalfalla '23 (Computer Science and Engineering, ENG), McNair Scholar

Advisor: Farhad Imani, Assistant Professor, Mechanical Engineering

Online Materials: <https://portfolium.com/entry/efficient-data-monitoring-and-prediction-in-am>

Recent integrations of Image Processing with Additive Manufacturing has led to an explosion of new, high dimensional data, which can be used in ML models for a range of purposes, such as quality prediction and analysis. However, models such as neural networks require an abundance of high quality, labelled data, which is not available with these images, due to the cost and manpower required. This project introduces a new classification model that is able to predict the quality of these prints with only minimal labelled data.

What Are We Missing? Undescribed Variation in Feather Microstructure

Jamie Kurowski '22 (Ecology and Evolutionary Biology, CLAS)

Advisor: Margaret Rubega, Professor, Ecology and Evolutionary Biology

Online Materials: <https://portfolium.com/entry/undescribed-variation-in-feather-microstructure>

I document the variation found in feather microstructure across seven bird species, which has been widely ignored by ornithological literature. Documenting this variation is a fundamental step in redefining how we look at and use feathers.

Drugs, Information, and Innovation: How Can Pharmacists Improve Patient Opioid Knowledge?

Maria Latta '20 (Pharmacy Studies, PHARM), '22 Pharm.D., University Scholar

Advisor: Nathaniel Rickles, Professor, Pharmacy Practice; Tiffany Kelley, Visiting Associate Professor, Nursing; David Noble, Associate Professor, Management

Online Materials: <https://portfolium.com/entry/drugs-information-and-innovation>

The opioid epidemic, which was declared a public health emergency in 2017, has only worsened during the SARS-CoV-2 pandemic. Over 80 percent of heroin users first misused prescription opioids; therefore, it is paramount that healthcare providers pursue innovative solutions to improve safe use of prescription opioids. Through an FDA clinical trial of an opioid packaging prototype, I aim to identify unmet needs in accessing opioid education. My secondary goal is to create an online opioid education tool to consider factors that influence changes in attitudes or behaviors and measure its impact on medication information delivery.

Computational Investigation into Mutational Allosteric Effects on Tau Protein-Antibody Binding

Katherine Lee '22 (Structural Biology and Biophysics, CLAS), University Scholar

Advisor: Eric May, Associate Professor, Molecular and Cell Biology

Online Materials: <https://portfolium.com/entry/computational-studies-of-tau-antibody-binding>

Machine learning methods exhibit high potential for predicting protein biochemical function given structural data. This project uses a novel piece of software, Diffnets, to apply these concepts to analyze conformational ensembles of an antibody to hyperphosphorylated tau protein, which causes neurofibrillary tangles that are associated with the initial stages of Alzheimer's disease. While these antibodies are used clinically to diagnose the condition, they do not exhibit strong or specific binding; improving the affinity and specificity of a promising antibody mutant could revolutionize diagnostic and therapeutic methods not only for Alzheimer's disease but also other conditions with similar pathology.

Excipient Testing for Levonorgestrel Intrauterine Systems

Kimberly Ma '22 (Pharmacy Studies, PHARM),

Advisor: Diane Burgess, Distinguished Professor, Pharmaceutical Sciences

Supported by: OUR Supply Award

Online Materials: <https://portfolium.com/entry/excipient-testing-of-lng-intrauterine-systems>

Intrauterine systems (IUSs) are one of the most efficacious methods of long-term contraception. However, numerous barriers have prevented companies from developing/ manufacturing a more affordable and accessible generic product. Accordingly, the current research focuses on obtaining a better understanding of these complex drug products through investigating the formulation design, manufacturing process, drug release mechanisms, and developing methods of accelerated release testing. The main parameter I am focused on testing is the impact of various excipients and excipient concentrations on the drug formulation.

Comparing the Expression of EGFR Gene Alternative Transcripts: Isoform A and D

Uma Mehta '22 (Biological Sciences, CLAS)

Advisor: Caroline Dealy, Associate Professor, Craniofacial Sciences, Biomedical Engineering, Orthopedic Surgery & Cell Biology

Supported by: SURF Award

Online Materials: <https://portfolium.com/entry/comparing-expression-egfr-isoform-a-and-d>

The EGFR gene is important to developing tests for and treating cancers. In studying the genomics and molecular biology of EGFR more closely, we have come to conclude that there are alternative transcripts of this gene. Isoform D is the most abundant soluble splice of the EGFR, and this project focuses on how this version of the protein differs from the receptor tyrosine kinase, Isoform A.

Ethics Violations Committed by Judges

Susana Mejia '23 (Political Science & Latino and Latin American Studies, CLAS)

Advisor: Virginia Hettinger, Associate Professor, Political Science

Supported by: SHARE Summer Apprenticeship

Online Materials: <https://portfolium.com/entry/ethics-violations-committed-by-judges>

What happens when a judge is rude to a litigant in a court room or commits a crime while on the bench? How will states deal with judges accused of ethics violations? This project worked on documenting the ethics violations judges committed and how the state dealt with them.

Intersection of Notch and Hedgehog Signaling in Zebrafish Mandible Regeneration

Vilmette Mendoza '23 (Biological Sciences, CLAS)

Advisor: Daniel Youngstrom, Assistant Professor, Orthopedic Surgery

Supported by: Health Research Program

Online Materials: <https://portfolium.com/entry/notch-and-hedgehog-signaling-in-zebrafish>

Both Notch and Hedgehog signaling pathways are important for mandible regeneration in zebrafish. In this project we are examining how these pathways promote bone regeneration and we hope to someday apply our knowledge from this research to create treatments for mammalian bone defects.

Effect of Biochar Types and Inorganic Fertilizer Amendments on Nutrient Leaching

Monique Michaud '23 (Sustainable Plant and Soil Systems, CAHNR)

Advisor: Huijie Gan, Postdoctoral Research Associate, Plant Science and Landscape Architecture

Supported by: USDA-NRCS Connecticut Conservation Innovation Grant

Online Materials: <https://portfolium.com/entry/the-effect-of-biochar-on-nutrient-leaching>

Excessive applications of inorganic fertilizers in farming systems can cause nutrient buildup in soils, leaching into water sources, and is an overall large contributor to the pressing issue of climate change. Biochar, a natural amendment resulting from pyrolyzing organic matter under high temperature conditions, is suggested as a way to optimize productivity of crops in an environmentally sustainable way by reducing leaching and increasing water productivity. This project investigates the role of different biochar media types and sizes, in combination with inorganic amendments, on nutrient leachate concentrations.

Correlating Sex Steroid Hormones with Gene Expression in the Rat Lateral Amygdala

Shreya Patel '23 (Physiology and Neurobiology & Psychological Sciences, CLAS)

Advisor: Linnaea Ostroff, Assistant Professor, Physiology and Neurobiology

Supported by: SURF Award

Online Materials: <https://portfolium.com/entry/sex-steroid-hormones-gene-expression-in-rat-la>

Traditional research focused on understanding the function of parts of the brain, specifically the Lateral Amygdala which controls fear and anxiety, tends to remain incomplete because of bias towards research in male rats over female rats. My project deals with tracking the estrous cycle in female rats through hormone measurement (ELISA) and reproductive tissue analysis & staining to gather both quantitative and qualitative data. The overarching goal of my proposed project is to learn and understand differences present in the female rat lateral amygdala versus the male rat lateral amygdala in the presence of fear expression, accounting for sex differences that are typically dismissed.

Understanding Ventricular-Subventricular Zone Development: Neural Stem Cell Lineage Tracing and Structural Configuration Modeling

Amisha Paul '22 (Physiology and Neurobiology & Economics, CLAS)

Advisor: Joanne Conover, Professor, Physiology and Neurobiology

Supported by: OUR Supply Award

Online Materials: <https://portfolio.com/entry/understanding-ventricular-subventricular-zone>

This project seeks to understand the development and function of the ventricular-subventricular zone (V-SVZ) stem cell niche, an area essential for human brain development and for overall brain function. I have collected data that will be used to create computational models of stem cell-mediated differentiation and organization along the ventricular system. I have also used 3-d visualization software to model ventricular size and structural changes in early human brain development.

A Simulation of Heat Stress in Hartford County: The Case for Mitigation of Climate Change Induced Health Risks Through Residential Infrastructure Renovation

Amisha Paul '22 (Physiology and Neurobiology & Economics, CLAS)

Advisor: David Simon, Associate Professor, Economics

Supported by: OUR Supply Award

Online Materials: <https://portfolio.com/entry/a-simulation-of-heat-stress-in-hartford-county>

As climate change continues to accelerate, its impact on the health of our communities will continue to grow more apparent. This project seeks to simulate the impact of heat stress in communities in Hartford County while accounting for population risk factors in order to provide recommendations for target areas for housing renovation to combat climate change-induced health risk.

Reviving Recipes, Rethinking our Food System: A Community Cookbook Project for CT Shoreline Residents

Sarah Platt '22 (Biological Sciences, CLAS)

Seema Patel '22 (Molecular and Cell Biology, CLAS), University Scholar, Rowe Scholar

Advisor: Phoebe Godfrey, Associate Professor in Residence, Sociology; Rupal Parekh, Assistant Professor, Social Work

Supported by: UConn Co-op Legacy Fellowship - Change Grant

Online Materials: <https://portfolio.com/pp/ED7669BE-F3D5-4E3A-ADB0-25F55F4B28B3>

Sow Grow Savor (SGS) is a student-led initiative established through a 2020 IDEA Grant. From the development of a community garden at the Madison Senior Center to collaborations with local farms, SGS has successfully delivered its promise of promoting social cohesion among shoreline residents. With the support of a Change Grant, we furthered our mission and broadened our impact by 1) planned forums to discuss the future of the local food system, and 2) created a community cookbook that underscores the critical bonds between people and food.

Problems with Tolerance

Asija Qyteza '24 (Psychological Sciences & Political Science, CLAS)

Advisor: Zehra Arat, Professor, Political Science

Supported by: SHARE Summer Apprenticeship

Online Materials: <https://portfolio.com/entry/problems-with-tolerance>

Is tolerance truly a virtue? Does it protect human rights? This project explores the relationship between the 'tolerant' and the 'tolerated,' arguing that tolerance creates an uneven relationship between the two and can even sustain hatred. This project makes recommendations for protective laws to reject hate speech and crimes.

Can Satire Change Perceptions Of Sustainability Among Undergraduates?

Khaleel Rahman '22 (Biological Sciences, CLAS)

Advisor: Margaret Rubega, Professor, Ecology and Evolutionary Biology; Anne Oeldorf-Hirsch, Associate Professor, Communication

Supported by: SURF Award

Online Materials: <https://portfolium.com/entry/can-satire-change-sustainability-perceptions>

For my thesis, I wanted to examine whether satire could impact perceptions of eco-friendly behavior among undergraduate students compared to traditional journalistic sources. I had students read either a satirical article from The Onion or a Washington Post article and then had them fill out a survey inquiring their opinions on sustainable actions.

Does Anodal tDCS Over the Left Prefrontal Cortex Using the C3-RSO Montage Improve Cognitive Control?

Jhoan Rodriguez '22 (Physiology and Neurobiology, CLAS)

Advisor: Eiling Yee, Associate Professor, Psychological Sciences

Online Materials: <https://portfolium.com/entry/the-potential-current-study-for-tdcs>

tDCS is a device that changes the likelihood of neurons firing. Therefore, by using a C3-FSO montage -- via tDCS -- we will stimulate the left prefrontal cortex to see if it will improve cognitive control.

Existential Anthropology as Validating Experience: A Comparative Analysis of C. L. R. James and Michael D. Jackson

Robin Rouleau '22 (Philosophy & Linguistics / Psychology, CLAS)

Advisor: Lewis Gordon, Professor, Philosophy

Supported by: UConn IDEA Grant

Online Materials: <https://portfolium.com/entry/existential-anthropology-as-validating-experience>

The goal of this project is to examine the manner in which anthropological methodology is conceptualized, misapplied, and misunderstood. In drawing upon the works of C. L. R. James and Michael D. Jackson, I will explain how one may respect the autonomy of marginalized groups through existential anthropological methodology and thus correct its misapplication.

Probing the Anti-Arthritic Effects of Cannabidiol

Isabella Sanchez '2022 (Nursing, NUR)

Advisor: Steven Kinsey, Professor, Nursing

Supported by: SURF Award

Online Materials: <https://portfolium.com/entry/probing-the-inflammatory-effects-of-ra>

This project is essentially looking to investigate the reduction of inflammatory effects that are present in Rheumatoid Arthritis. Through using the collagen induced arthritis models, the effectiveness of Dexamethasone in treating RA was measured in various ways. This project also probed the efficacy of different forms of Collagen induced arthritis models.

The Dreamer Movement: Understanding Why and How #DREAMers Keep Dreaming

Mehak Sharma '22 (Chemistry, CLAS), University Scholar

Advisor: Francoise Dussart, Professor, Anthropology

Online Materials: <https://portfolium.com/entry/dreamer-movement-what-it-is-says-about-the-us>

This project will analyze the Dreamer Movement that emerged when the DREAM Act was being pushed in Congress in 2010, which was legislation that would grant legal status/citizenship to the children of illegal immigrants who came to the United States and attended school here. This project will explore the methods of activism and overall success of this social movement with the goal of understanding why it is not as well-known, understood, or covered by the media compared to the MeToo or Black Lives Matter movement, for example.

Antitumor Properties of Small Molecule Natural Product Mimosine

Jason Shi '22 (Molecular and Cell Biology, CLAS)

Advisor: Adam Zweifach, Professor, Molecular and Cell Biology

Online Materials: <https://portfolium.com/entry/antitumor-properties-of-smnp-mimosine>

This project will be about the small molecule natural product mimosine. It will introduce mimosine as a molecule and discuss research that has been done regarding the drug in terms of its antitumor properties.

The Effects of Heat Shock on Arf Guanine Nucleotide Exchange Activity of IQSEC2, an Intellectual Disability-Linked Protein

Emily Trocchi '22 (Physiology and Neurobiology, CLAS)

Advisor: Randall Walikonis, Associate Professor, Physiology and Neurobiology

Online Materials: <https://portfolium.com/entry/the-effects-of-heat-shock-on-iqsec2>

Found in the space between neurons, known as the postsynaptic density, the gene IQSEC2 produces Arf proteins and guanine nucleotide exchange factors and is linked to intellectual disability, seizures, and other maladies when mutated. A child in Israel who has this mutated version of IQSEC2 experiences seizures that cease for 24 hours only after exposure to heat. We exposed IQSEC2, wild type and mutated version, to varying levels of heat-shock to investigate the effects of heat on this gene.

Mindfulness Yoga - Community Based Intervention with Resettled Refugee Children from Afghanistan

Chelsea Valdez '22 (Human Development and Family Sciences, CLAS)

Advisor: Patricia McDonough Ryan, Adjunct Faculty, Psychological Sciences

Online Materials: <https://portfolium.com/entry/mindfulness-yoga-community-based-intervention-wi>

Refugee children encounter multiple risk factors including probable exposure to trauma during pre-migration, migration and post-migration experiences. Health psychology professor and pediatric neuropsychologist, Dr. Patricia Ryan, and her team implement preventative health in a community based setting with resettled refugee children and families from Afghanistan. In partnership with a multidisciplinary team, I created a yoga video with a focus on mindfulness, health education, and wellness for resettled refugee children from Afghanistan.

Examining the Relationship between Bias, Physician Empathy and Pain Management in Pediatric Health Care Providers

Sai Viswanathan '22 (Physiology and Neurobiology, CLAS)

Advisor: Siddika Mulchan, Assistant Professor, Pediatrics

Supported by: Health Research Program

Online Materials: <https://portfolium.com/entry/pain-management-and-bias-in-pediatric-healthcare>

Broadly, the project focuses on provider-level factors affecting clinical pain assessment and management in the pediatric healthcare setting. Pain assessment and management are areas of high clinical ambiguity due to the subjective nature of pain, which often results in mismatches between provider assessments and patient reports of pain. Thus, this project seeks to examine the relationship between provider empathy, race/ethnicity of the patient/provider, and pain assessment and management in a pediatric health care setting.

Exploring Anti-Inflammatory and Analgesic Properties of β -caryophyllene

Mackenzie Weng '23 (Nursing, NUR)

Advisor: Steven Kinsey, Professor, Nursing

Supported by: SURF Award

Online Materials: <https://portfolium.com/entry/mackenzie-weng-spring-frontiers-2022>

For my project, I wanted to look at the anti-inflammatory and analgesic properties of β -caryophyllene (BCP). The purpose of the project was to perform a series of test to compare the effectiveness of BCP with the clinically applicable medications Dexamethasone and Diclofenac in a lipopolysaccharide (LPS) model.

Zoomed Out: A Documentary About COVID-19

Erin Wu '23 (Nutritional Sciences, CAHNR)

Lily Forand '23 (Political Science, CLAS)

Mahitha Juttu '23 (Physiology and Neurobiology, CLAS)

Advisor: Bradley Wright, Professor, Sociology

Supported by: UConn IDEA Grant

Online Materials: <https://portfolium.com/entry/frontiers-spring-2022-idea-grant-documentary>

A documentary filmed and produced during the course of the pandemic, on how the UConn community deals with COVID-19. Focused specifically on the student experience and shared perspectives.

Early Biomarker in the Retina for Alzheimer's Disease

Humza Zaidi '22 (Molecular and Cell Biology & Individualized Major: Global Health and Reproduction, CLAS)

Advisor: Royce Mohan, Professor, Neuroscience

Supported by: SURF Award

Online Materials: <https://portfolium.com/entry/early-biomarker-in-the-retina-for-ad>

In this SURF project, I worked in the Mohan Lab to identify a potential early biomarker of Alzheimer's Disease within the retina. As a part of the central nervous system, the retina is an easily accessible window into the brain's physiology. Thus, a retinal biomarker for Alzheimer's Disease could prove to be a more effective and less strenuous manner of diagnosis.

Religion as One's Highest Value is Associated with Health and Health-Behaviors in a Nationally Representative US Sample

Madison Zuckerman '22 (Psychological Sciences, CLAS)

Advisor: Crystal Park, Professor, Psychological Sciences

Supported by: OUR Conference Presentation Award

Online Materials: <https://portfolium.com/entry/values-have-been-closely-linked-with-a-variety-of>

Values have been closely linked with a variety of behaviors and with subjective well-being. However, little research has examined the role that values may play specifically in health-behaviors and physical health. Because values are broad principles that guide behavior across situations, we hypothesized that individuals' values- in particular, the value individuals' reported as their highest value- would relate to their health behaviors and health.

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