

Productive Uncertainty in a Laboratory Setting: Engaging Students with Autism Spectrum Disorders (ASD) in Scientific Research

Program Information and Application

Program Statement

Scientific disciplines consistently seek creative and unconventional thinkers. Those with autism spectrum disorders (ASD) may have untapped potential in their capabilities to navigate a scientific research environment if a proper training regimen is in place. The aim is to establish a sustainable route for ASD student success in active scientific research environments by facilitating their development of productive uncertainty. Progress in this program will help to build and extend comfort in the unknown and unfamiliar - which is a primary challenge in scientific research. In particular, the goal of this program is to give ASD students a broad opportunity for guided scientific research on a topic of their interest. We seek to learn how best to accommodate ASD students and their particular needs in order for them to successfully conduct scientific research. Our ultimate goal is to have the capacity to train ASD students to be in the pool of future thought leaders. We will strive to give these students the necessary guidance and reassurance in building their confidence to thrive in scientific environments. Our priority is their success and we aim to individualize implementing the program specific to their interest and skills-set.

Targeted Program Participants

1. One (1) matriculated student who has an autism spectrum disorder (ASD)
2. One (1) matriculated student from the Special Education/Intervention Specialist program

Program Details

This program is a part of The University of Akron's Five Star Fridays Initiative. A total of two candidates will be selected for this program. Applicants for this program must be matriculated at The University of Akron. The ASD student participant will be selected through the Office of Accessibility to be a research assistant in the group of Dr. Ruel McKenzie in the Department of Polymer Engineering in the College of Polymer Science and Polymer Engineering. The research assistant will be given the opportunity to develop an exploratory research project of their own interest under the guidance of Dr. McKenzie. The program will be tiered into discrete levels over the course of the academic year to nurture the capacity for the student to productively manage uncertainty in a laboratory setting. To meet the needs of the ASD participant, the program will be individualized under the guidance of the program administrators. This program aims to develop effective pedagogical tools to equip ASD students with the training necessary for high-level activity in scientific research environments. As such, the other candidate will be selected from the Special Education/ Intervention Specialist program in The College of Education (CoEd) to assist, monitor and document progress in the development of productive uncertainty for the ASD participant. The ASD CoEd participant is key to the success of this program as their role is to essentially function as an intermediary for the ASD participant. The progression of this program will rely on the intimate knowledge gained from the ASD CoEd participant. This program will count towards one (1) research credit (*Course No. 9841:498-Research Problems in Polymer Engineering*) for the ASD student participant and field experience for the CoEd student (*Course No. 5610:XXX Special Education Programming*.)

Zip ID Number: _____

ASD Student Participant

- Will commit 3-5 hours each week during the program
 - Ideally on Fridays from 9 AM to 2 PM; however, the day and time slots are flexible
- STEM areas of interest for the program include, but are not limited to:
 - Chemistry
 - Physics
 - Biology
 - Mathematics
 - Computer Science
 - Polymer Science
 - Engineering (Polymer, Chemical, Mechanical, Electrical, Materials, Computer, Biomedical, Environmental, Civil)
- As the program timeline evolves, the list of responsibilities will gradually increase.
- Sample program timeline for Semester 1
 - Week 1 – Orientation
 - Short presentation about program
 - Meet program participants, program administrators and research group
 - Attend group meeting
 - Weeks 2-5 – Lab Rotation Training/Literature Survey
 - Each week a new laboratory activity will be introduced to the ASD student
 - To begin the exploratory project, ASD students will be introduced to library services and conducting literature surveys
 - Weeks 6-8 – Focused activity: Learning empirical approach
 - ASD student picks one scientific activity to focus on
 - Example: collecting data from a specific apparatus
 - Weeks 9-12 – Data analysis and interpretation
 - ASD student will learn data analysis techniques.
 - ASD student will be introduced to presenting research summaries
 - ASD student, depending on progress, may be asked to share a slide on research progress at group meeting
 - Weeks 13-15 – Focused activity: Developing exploratory project
 - ASD student will work closely with research advisor to develop research plan and white paper proposal for independent project

CoEd Student Participant

- Schedule expected to closely mirror ASD student participant
 - May generate up to 75 hours of field work
- Not expected to be highly knowledgeable in STEM fields
- Will apply and develop knowledge in special education to help benefit ASD participant in STEM research environments.
- Monthly progress meetings to review and discuss program trajectory
- End of semester report describing activities, outcomes and insights gained
- End of semester presentation to program administrators and other stake-holders summarizing activities and key developments

Zip ID Number: _____

Name: _____

Zip ID Number: _____ Email: _____

Major: _____ Projected Graduation year/term _____

ASD Student Participant Application Form

To be considered for the program, please respond to the questions below. You may use the blank page provided, if additional space is needed. Paper applications should be submitted to Ms. Jessica DeFago (jld4@uakron.edu, ext: 7928) in the Office of Accessibility. Please direct any questions to Dr. Ruel McKenzie (rmckenzie@uakron.edu, ext: 5344). The deadline for applications is August 1, 2019. The selected participant will be notified by August 19, 2019. Please note if any assistance was needed to fill out the application form by initialing _____.

1. If known, what is your ASD level? (Circle appropriate response; leave blank if unknown)

Level 1 – Requiring Support

Level 2 – Requiring Substantial Support

Level 3 – Requiring Very Substantial Support

2. Have you ever conducted scientific research? If so, what type of research did you do?

3. Are you interested in science? If so, what aspects of science do you find most interesting?

4. Have you ever done any science experiments at home, school or anywhere else? If so, what is one of your more memorable experiences from this activity?

5. If you had the opportunity to explore an idea, what would it be, and why?

Zip ID Number: _____

