OCTOBER

CAROLINA AUTISM AND NEURODEVELOPMENT RESEARCH CENTER

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CAN SCIENCE - OCTOBER

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October is Down Syndrome Awareness Month! Turn to page 7 to learn about two of CAN's Down syndrome researchers and their projects.

OCTOBER

CAROLINA AUTISM & NEURODEVELOPMENT RESEARCH CENTER

A MESSAGE FROM THE EXECUTIVE DIRECTOR:

CAN was officially recognized as a center by USC through a review by the provost and Board of Trustees. This designation means that we are officially recognized at the state and university levels which is important as we move forward to advance CAN's impact and engage with key university and state stakeholder.

CAN was highlighted at the recent McCausland College of Arts and Sciences Board of Visitors meeting focused on Brain Health at the end of September. This was a fantastic opportunity to showcase CAN's impact on research, training and clinical support in this area and to solicit input to accelerate these efforts. There were faculty talks highlighting research in Brain Health as well as a panel of students sharing their experiences as neuroscience majors or minors. CAN's community engagement was an important discussion topic as well.

BOV members hear from current Neuroscience undergraduates on their experience in the new major.

Sincerely,

Jane Roberts, PhD

Carolina Distinguished Professor

CAN Executive Director

Caitlin Hudac
CAN Steering Director
chudac@mailbox.sc.edu

Cheers,
Caitlin

Happy October

I sometimes wonder if people realize the full breadth of CAN science because “autism” is listed before “neurodevelopment” in “CAN”. This month we are proud to feature work and provide relevant information related to Down syndrome – perhaps the most common of all chromosomal conditions, occurring in ~ 1 out of every ~750 live births. We are also highlighting the first CAN P50 that is focused on *FMR1* mutations demonstrating the breadth and strength of CAN science. Consider joining CAN at October’s “Buddy Walks” to celebrate with families.

Updates from the September CAN Executive Committee Meeting

- We highlighted recent grant awards (see page 5 for more details!)
- We reviewed a recent data pull from the Neurodevelopment Research Registry:
  - 3,346 families currently enrolled
  - Out of 2,497 records that provided child diagnostic data:
    - 738 (30%) autism
    - 335 (13%) ADHD
- See page 4 for the new USCeRA feature we discussed during this month’s meeting - please consider adding CAN as a Center in your internal documentation. That will help us track the work you are doing!
- We discussed ways to increase and support trainee engagement across all disciplines ahead of the first Trainee Committee of the year. See page 13 for the first trainee event of the year!

Recap from September 2025 Community Advisory Board meeting

- Reviewed upcoming events
- Talked about feedback from “mini-CAB panel” at the August retreat. CAB members answered tough questions and provided guidance that will really help bridge the gap between science and community impact.
- CAB member Kris Beard and Jessie Bradshaw shared newly launched **parent-perspective study** to learn more about their thoughts on early diagnosis. We encourage CAN members to distribute to their networks - they are especially looking for dads parents with lived experiences
- We also discussed current climate and how best to combat misinformation. The CAB would like to hear more from CAN members about their perspectives. The CAB also encouraged share as many family stories as possible and consider opportunities for families to feel supported. They also encourage short-form media with links to our website to help families not feel isolated or alone. Lastly, an emphatic message was to spread autistic and disability joy!

It's not goodbye, it's see you later!

After a wonderful year with CAN, it's time for me to say goodbye and close this chapter as Program Coordinator.

It's been a joy contributing to such a cutting-edge research center and working with so many talented people . Thank you for the support, the collaboration, and humoring my basic science questions (I'm looking at you, Biology Department).

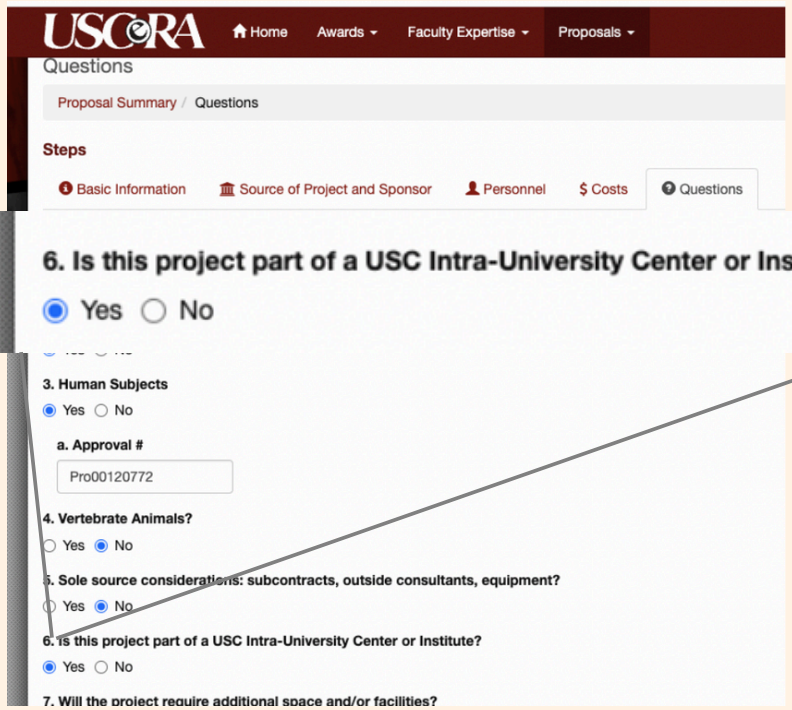
I'm excited for what's to come, but am so grateful for this experience and have learned so much. Seriously, I know just enough about EEG caps to be dangerous now!

Finally, I'd love to stay in touch. You can find me at sydneyarsenault97@gmail.com or 803-508-3562. Wishing you all continued success (even if it is with fewer emails from me).

Best,

Sydney

USCeRA Update 2025



THE UPDATE:

Faculty may now list CAN as an affiliated-center when submitting a proposal in the USCeRA system!

HOW TO:

When submitting a proposal, select 'yes' to question 6 about USC Intra-University Centers and Institutes. Select 'CAN' from the drop down menu.

WHY: This helps CAN Leadership track research needs and successes to develop and plan programming and supports

FACULTY GRANT AWARDS

Award: NIH P50 Award
Title: Translation of the FMR-1 Premutation Phenotypes Across the Lifespan

Overall PI: Jane Roberts
Project 1 mPI: Jane Roberts/Abby Hogan
Project 2 PI: Jessie Klusek
Administrative Core mPI: Jane Roberts/Jeff Twiss
USC Co-I's: Holley Arnold, Caitlin Hudac, Amanda Fairchild, Sarfaraz Serang, Meisam Arjmandi

Why it matters:

Ataxia Syndrome (FXTAS) and Fragile X-associated Neuropsychiatric Disorders (FXAND). Despite significant impacts including functional limitations, reduced quality of life, poor health, and even reduced life expectancy that are associated with these conditions, tremendous knowledge gaps exist that constrain accurate risk prediction and treatment. Variation across age, developmental stage, socioenvironmental contexts, and sex has not been sufficiently quantified for FXTAS and FXAND. This lack of knowledge translates to poor understanding on whether, when, and how these FMR1-associated conditions emerge and affect individuals and families.

Project Aims:

PROJECT 1 identifies the trajectory, underlying mechanisms (auditory processing, molecular-genetic variation), and relationship of social communication to FXAND in preschoolers with FXpm

PROJECT 2 focuses on the timing, trajectories, and profile of FXTAS-related symptoms in FXpm women and whether language/vocal features, clinical risk factors, hearing loss, environmental variables, or molecular-genetic variation influence FXTAS trajectories

Dr. Christian O'Reilly

Assistant Professor

Computer Science and Engineering

Molinaroli College of Engineering and Computing

Award: NSF CAREER Award
Title: Multiscale Model-Driven Analysis of the Brain and its Disorders

Why it matters

The brain is an incredibly complex organ that can be studied at many different levels. For example, we can look at broad patterns of brain activity as it develops over time, or zoom in to the millisecond-by-millisecond chemical exchanges happening at a single synapse. To truly understand brain function, and the roots of neurodevelopmental disorders, we need an integrated view across these scales.

The goal

We aim to build a multiscale model that links small-scale neural processes to large-scale brain activity measured with non-invasive tools like EEG and fMRI. This will help researchers connect the biological mechanisms of the brain to the symptoms observed in different disorders.

BUDDY WALKS

Engage with the community during Down Syndrome Awareness Month!

What is a Buddy Walk?

Buddy Walks are held each year in honor of families who have a child with Down syndrome. Starting in September, families, individuals, and businesses are invited to start fundraising, then in October, we gather together for an afternoon of fall festivities, family-fun, a mini-walk, and an awards presentation to honor each of the participating buddies and top fundraisers!

Attend a Buddy Walk near you! Clink the links below to learn more!

- 10/11 Down Syndrome Association of the Upstate 2025 Buddy Walk
- 10/18 Grand Strand Buddy Walk & Festival
- 10/19 Lowcountry Buddy Walk 2025
- 10/19 2025 Aiken Buddy Walk
- 11/02 Columbia Buddy Walk 2025!

Interested in tabling at a Buddy Walk with CAN?
Email CAN@sc.edu!

From Cells to Community: USC Researchers Explore Down Syndrome from Every Angle

Written by Caroline Toburen,
ATOBUREN@email.sc.edu

As we recognize October as Down Syndrome Awareness Month, it is a moment to highlight the individuals and families touched by Down syndrome, which occurs in about 1 in every 700 births. Here at the University of South Carolina's CAN Center, researchers are tackling this complex condition from every angle—from the microscopic building blocks of the brain to the real-world community support. The work of two scientists, Dr. Kristy Welshhans and Dr. Liz Will, perfectly captures this comprehensive "lab to life" approach.

Dr. Welshhans, who joined USC in 2020, is driven by a fundamental question: how does the extra copy of chromosome 21, the genetic hallmark of Down syndrome, alter the brain's earliest development? Her lab focuses on the crucial period when the brain is forming its connections, also known as wiring. She and her lab study a process called "axon guidance," wherein the projections (i.e., axons) extending out from newly formed neurons must navigate a complex path to make the right connection. Think of it like wiring a house—every wire must land in the correct spot for the electrical systems to work. A key player in this process is a gene on chromosome 21 called DSCAM. It acts as part of the "roadmap" for these traveling neurons. Dr. Welshhans is investigating what happens when there are three copies of this gene instead of

Dr. Kristy Welshhans with some of her lab members.

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the usual two. The hypothesis is that too much signaling from a protein known as DSCAM could disrupt the brain's wiring instructions from the very beginning, contributing to the intellectual and developmental disabilities associated with Down syndrome. To study this, Dr. Welshhans uses groundbreaking technology called induced pluripotent stem cells (iPSCs). iPSCs are "personalized stem cells" generated from a person's own donated cells, often from a simple, non-invasive urine sample. These cells are then guided to grow into cortical organoids—three-dimensionalstructures often called "mini-brains"—right in the lab. This incredible tool allows her team of researchers to watch how an individual's unique brain cells connect and grow, providing a powerful window into the immense variability seen across the Down syndrome community.

Dr. Liz Will and lab member attend a local Buddy Walk for Down syndrome awareness

While Dr. Welshhans works to understand the cellular blueprint, Dr. Liz Will focuses on the whole person and their journey through life. Dr. Will's research identifies developmental risk profiles in children with Down syndrome. Her lab investigates why a significant number of individuals with Down syndrome—potentially as high as 40%-- also experience co-occurring conditions like autism or ADHD. Her approach is deeply personal and community based. Dr. Will travels throughout the Southeast to meet with families directly. To gather this information, parents complete surveys, and children take part in play-based tasks and cognitive tests. Dr. Will also uses equipment to measure the precise details of each child's movement. The ultimate goal is to use this knowledge to inform specific, targeted interventions. By understanding these unique developmental profiles, she hopes to help adapt effective therapies, so they can better serve children with Down syndrome, and even help improve access to effective behavioral therapies, like Applied

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Science Communication Corner

CAROLINA AUTISM & NEURODEVELOPMENT RESEARCH CENTER

Behavioral Analysis, for all children with Down syndrome, not just those who have a co-occurring autism diagnosis.

The work of Dr. Welshhans and Dr. Will may seem worlds apart—one with pipettes and "mini-brains," and the other with families and questionnaires—but they share a unified vision. The fundamental discoveries made in Dr. Welshhans' lab about how the brain is wired could one day help predict the developmental risks that Dr. Will studies in the community. Together, their research creates a powerful synergy, pushing the boundaries of our understanding and paving the way for a future where every individual with Down syndrome has the personalized support they need to thrive. This Down Syndrome Awareness Month, the work at the CAN Center is a testament to the hope and progress being made, from the cell to the community.

Join a buddy walk!

See page 6

Register for Columbia's Buddy Walk here (link)

Science Communication Corner is a new feature of CAN's monthly newsletter. Written by Psychology PhD student Caroline Toburen, it will feature new scientific findings from CAN faculty and trainees, discuss hot topics in the field of autism and neurodevelopment, and MORE--but always written in lay-language. Together, we CAN make science more accessible!

Want to be featured in an upcoming Science Communication Corner? Email can@sc.edu!

Welshhans Lab of Developmental Neurobiology

Developmental Dynamics Lab

Thank you Dr. Kristy Welshhans and Dr. Liz Will for contributing!

THINK ABOUT HOSTING A

SENSORY FRIENDLY HALLOWEEN

Sensory Friendly Activites

While trick or treating may be fun, it can be difficult for those who struggle with unexpected changes or have sensitivities to noise, touch, and light. Other activities such as a movie night, sensory bins, or candy scavenger hunts may be less overwhelming!

Prioritize comfort

Beware of your child's sensory needs when picking a costume. Some materials may feel itchy or tight. Have a Halloween "dress rehearsal" to assess your child's comfort in their costume.

Sensory Regulation

If you do go trick or treating, don't forget to bring headphones and sensory toys with you! These may help your child regulate if they become overwhelmed.

Looking for a local event?

Accessibility morning at SC state museum

The Truth About Autism Research

CAUSES OF AUTISM

Autism is *not* caused by vaccines or parenting, but rather by a combination of complex genetic and environmental factors.

COMMON MISCONCEPTIONS

According to evidence, medications taken during pregnancy or in infancy cannot cause autism. There is also no evidence revealing vaccines to be the cause of autism. At this time, there is not enough evidence pointing to a single cause or treatment for autism.

CAUTION!

Autism is a complex condition requiring science-based interventions. Misinformation about the causes or treatments of autism can cause harm to the community.

WHAT YOU CAN DO

Children and adults with autism need support from their community! Always speak to your healthcare provider regarding any concerns about you or your child. They are there to help you understand new research and provide evidence based care.

TEXT WAS DEVELOPED AND APPROVED BY
SOCIETY FOR DEVELOPMENTAL & BEHAVIORAL PEDIATRICS

Upcoming CAN Programming

Fall 2025

October: Buddy Walk; 10/14 CAN Trainee Board Game Bash

November: CAN spotlight at SCSM Accessibility Morning

December: Holiday party

Spring 2026

January: "Big ideas" CAN seminar

February: SCAND in Columbia 2/27

March: Visiting Scholar-Dr. Sarabeth Broder-Fingert (3/23-24); Disability Advocacy Day

April: Research Roundup; Neurodiversity Among Us; AutismConnect 2026

...and more to come!

go.sc.edu/CAN
can@sc.edu

CAROLINA AUTISM & NEURODEVELOPMENT RESEARCH CENTER

Stay tuned for details on events and additional trainee events!

SAVE THE DATE!

THE CAN RESEARCH CENTER

HOLIDAY Party

Location and RSVP info to come!

12/12/2025

Join The CAN Trainee Committee

BOARD GAME BASH

@ HUNTER-GATHER BREWERY

Bring your own games or play some of ours while you meet other CAN trainees!

Students and families welcome!

OCTOBER 14, 2025

5:00 PM - 7:00 PM

1402 Jim Hamilton Blvd. Columbia, SC 29205

For more information email: caileen@mailbox.sc.edu

MARK YOUR CALENDARS!

2026 SCAND Symposium

The SCAND symposium is a free research conference that provides an opportunity for researchers to learn about science targeting autism and neurodevelopmental disorders within South Carolina

February 27, 2026
Riverbanks Botanical Gardens
1300 Botanical Parkway,
West Columbia, SC 29169

Join us for:

- Faculty and trainee talks
- Discussions
- Networking and community
- Posters

Symposium 2026 will be held in-person at The Riverbanks Botanical Gardens in Columbia, SC. This research conference is free.

Information on registration, keynote speaker, and poster presentations to follow!

www.scandconsortium.org/symposium