Saying YES! to STEM Outreach!

The YES! Youth Engaged in Science Initiative is an outreach program started by OHSU’s Fair Neuroimaging Laboratory in Fall 2012. The YES! program was created to address educational and health disparities in underrepresented minority communities. We offer enriching science educational programs to middle- and high-school students. We also offer information and resources for families on mental health disorders and the importance of community participation in research and clinical studies.

Since its launch in Fall 2012, YES! has hosted students at OHSU for lab tours and “lab shadowing”, given Brain-in-a-Box presentations at middle schools, provided cultural competency training for research staff, and hosted a community info session on ADHD, Autism, and mental health. YES! has also participated in OHSU-sponsored diversity outreach event and OMSI’s annual Brain Fair.

YES! is continuously working to build relationships within the community. By partnering with other organizations that target underrepresented families, such as Portland Public School’s Head Start, we hope to increase our visibility and reach.

YES! is on the move! Thanks to Dr. Dan Dorsa and the Office of the Vice President for Research, Dr. Norwood Knight-Richardson and the Center for Diversity and Inclusion, Eric Orwoll and the Oregon Clinical & Translation-al Research Institute, and Bobby Heagerty and the OHSU Brain Institute for the support and resources to get youth engaged in science!

YES! Partners w/ SAIL@PSU Summer Program

In July 2012, the Fair Lab hosted a group of 10 incoming 9th graders from the Summer Academy to Inspire Learning (SAIL) at PSU program at OHSU. The group got a snapshot view of how the Fair & Nigg labs use psychological and neuroscience tools to study ADHD in children.

The SAIL students visited the ADHD Research Study lab and were given a tour of the 7T MRI in the Advance Imaging Research Center (AIRC) by staff scientist, Tom Barbara. Students observed how the Fair Lab prepares research participants for an MRI scan—this included wearing a custom fit mask while watching movie trailers in the AIRC’s 0T mock scanner.

YES! was asked to host SAIL for a week at OHSU this summer, to give students broader exposure to research and medicine at OHSU. On July 16-18, SAIL students will learn about the teenage brain (in-a-box), get hands-on research experience with the Portland Alcohol Research Center, learn how to be surgeons with VirtuOHSU, go ape for science at the Oregon National Primate Research Center, and talk with diverse OHSU professionals about what it takes to be in STEM or medicine when they grow up.

For more information on SAIL@PSU, contact Josh Winicki at fjwinicki@gmail.com.
In November 2012, a group of middle school boys, parents, and Sabin SUN School instructors traveled to OHSU for an evening YES! tour. The group had previous knowledge of neuroscience from the Sabin “Braaains!!!” program, taught by Fair Lab research assistant and YES! volunteer, Marc Rudolph. With the help of the ADHD Research study staff, the students learned about the ADHD study’s neuropsychological testing measures and how the tests are administered.

Students also received tours of the Advanced Research Imaging Center’s 3T MRI and 0T mock scanners, led by staff scientist, Xin Li. Two enthusiastic students were chosen to be mock study participants and watch movie clips inside the 0T scanner.

YES! also hosted a lab tour in February 2013, to a group of middle and high school students, mentors and parents from the EMBODI and Delta GEMS mentoring programs. This group also toured the ADHD Research Study lab, 3T, 7T, and 0T mock MRI scanners. The group also had an opportunity to discuss research opportunities and STEM education and careers.

In February 2013, YES! hosted another lab tour when 400 high school and college students from diverse and underrepresented backgrounds came to OHSU for the Center for Diversity and Inclusion’s annual Multicultural Health, Science & Engineering Career Conference. The program featured a panel with OHSU medical students. Conference attendees visited OHSU’s simulation labs with specialized teaching mannequins used to teach future health care providers.

Visiting students also had the opportunity to take campus tours. YES! took 15 of these conference attendees for a tour of the AIRC imaging facilities based on their interest in neuroscience and psychology-related careers. Students received a tour of the 0T, 3T, and 7T MRI scanners by AIRC students Audrey Selzer and Yossi Berlow.

At the end of the lab tour, conference participants had the opportunity to ask YES! volunteers questions about which educational tracks are best suited for their desired careers, and programs they can tap into to gain experience in medicine and research.

YES! was excited to be asked to be a part of On Track OHSU!, which is an outreach program that reached out to 10th grade students in advanced science classes from Jefferson and Woodburn High Schools. In February, YES! joined a team of other OHSU researchers to teach students about the different body systems and how OHSU uses advanced technologies for research and patient treatment.

Jeff explains how EEG measures brain activity to Jefferson students.

“Come on! You can do it! Just think harder!”

Kamari, Marguerite, and Fair Lab researcher Jeff Erikson talked with students about the nervous system and how researchers use advanced imaging technologies—such as EEG and MRI—to study the brain’s function and how it becomes disrupted in disease or mental disorders such as ADHD and autism. Students also got to play a biofeedback game called Mind Flex! Mindflex uses EEG-like technology to use brain waves to steer a ball through an obstacle course.

“Can I really control this ball with my thoughts?”
In February 2013, YES! co-directors Kamari Aykes and Marguerite Matthews and Joanne Brown from the OHSU Brain Institute visited Ms. Lorna Nomie’s three 7th-grade science classes at Reynolds Middle School in Gresham for Brain-in-a-Box presentations.

Brain-in-a-Box is an exciting educational program started by the OHSU Brain Institute to bring neuroscience into middle school science classes. The goal of Brain-in-a-Box is to change students’ knowledge, skills, attitudes, and behaviors associated with brain health. Students have the opportunity to learn how the brain works, the plasticity of the teen brain for learning/maturing, and factors that change how the brain functions (e.g., sleep, nutrition, drugs). The presentation includes PowerPoint slides, interactive demonstrations, brain models, and fun games.

One month later, YES! also took Brain-in-a-Box to Ms. Tracy Klosterman’s 6th, 7th, and 8th grade sciences classes at King School in NE Portland, where the majority of students are ethnic minorities and from low socioeconomic backgrounds. Kamari, Marguerite, and Damien Fair not only taught King students about the brain, but also talked about their own experiences in education, their career paths, and fielded questions about opportunities in STEM and medicine.

For many of the King and Reynolds students, this was their first time learning what a PhD is and/or meeting young professionals with them. Students enjoyed the presentations, learned many new things, and expressed interest in learning more about the brain.

Ms. Klosterman expressed her appreciation for YES! exposing her students to scientists of color, giving them new role models to look up to. Many King School staff clapped and cheered for Kamari and Marguerite as they were leaving King—enthused for the investment that was made in their students.

YES! was invited back to both schools next school year for more brain education and fun!

A Curious Day w/ the Fair Lab

Aiden and Hughes, two middle school students, spent their day off from school shadowing Fair Lab employees in March 2013. The young men wanted to learn what a day in the life of a scientist looked like and they got just that!

The young men got a tour of the 3T MRI scanner in the AIRC and pretended to be study subjects using the 0T mock scanner. They learned how the Fair Lab uses neuropsychology testing to study autism—by helping research assistant Corinne Stevens train to administer the testing protocols. Also, each Fair Lab member took time to talk with Aiden and Hughes about their respective research projects and how they used various analytical tools to study how the brain is connectivity.

The researchers-for-a-day also helped YES! prepare for the OMSI Brain Fair. The young men got to test out the Mindflex game, and help make prism goggles—goggles that horizontally shift vision. Before the day was over, Aiden and Hughes, along with other members of the lab, tested out the goggles by throwing brain-shaped stress balls at each other in the hallway. Lesson learned: Science is fun!
**YES! Goes to the OMSI Brain Fair**

On March 9, 2013, YES! participated for the first time in the annual OMSI Brain Fair, the major event for the OHSU Brain Institute’s Annual Brain Awareness Season. The Brain Fair makes the brain easy to understand for the public through interactive exhibits, real human brains, demonstrations, and OHSU neuroscientists explaining their groundbreaking research. The Brain Fair attracted roughly 1,000 visitors this year.

YES! had a table and display with information about research opportunities at OHSU as well as information about its outreach efforts, including past events (e.g. Brain in a Box, Lab Tours, mentoring/shadowing, On Track OHSU). YES! also provided visitors with the fun activities to learn about how their brains work. With the prism goggles (goggles that horizontally shift vision), participants wore the goggles while trying to catch a ball thrown to them. It took most participants a few tries to catch the ball. This activity demonstrates plasticity, how our brains adapt to changing sensory cues.

Booth visitors also got to play Mindflex, using their brain waves (measured w/ EEG technology) to steer a ball through an obstacle course. The games were popular and people got to learn how researchers use similar technology to study brain activity.

**Partnering w/ PARC on Alcohol & Athleticism**

YES! was asked by OHSU’s Dr. Mark Rutledge-Gorman to accompany him on a visit to talk with over 100 student athletes at Grant High School to talk about the effects of alcohol on athleticism. The presentation was given to all student athletes at the school during an assembly period.

Students received detailed descriptions about how drugs and alcohol can influence athletic performance. YES! volunteers and Fair Lab staff talked with students about the effects of alcohol on the developing adolescent brain.

For a hands-on experience of the effects of alcohol on the brain, “prism goggles” of different gradients were used to demonstrate coordination impairment in relation to varying blood alcohol content levels.

**Neuroimaging Staff Learn Cultural Competency**

On March 21, YES! held an Afrocentric Cultural Competency Training for the Nigg Lab ADHD Research Study, the Nagel Developmental Brain Imaging Lab, and Fair Neuroimaging Lab staff, facilitated by Danette Haynes, LCSW, clinical director of the OHSU Avel Gordly Center for Healing. Cultural competence is an important piece in effectively attracting and maintaining minority research participation.

Staff from each research group received a 2-hour training that 1) provided historical information in understanding barriers facing African-Americans participating in systems of care, 2) assisted staff in beginning to review their own beliefs about and experience in working with African-Americans and 3) offered practical tips in working sensitively and effectively with African-American clients.

Attendees found the training very helpful and eye-opening, and many felt they could apply what they learned from the training outside of the workplace.
YES! hosted its first large community engagement event on May 22, 2013 at Highland Christian Center in Northeast Portland. The YES! Advisory Committee, comprised of OHSU's Dr. Damien Fair, Dr. Joel Nigg, Ms. Danette Haynes, and Highland Christian Center’s Pastor William Hardy, to create an event program that would address the curiosities and concerns of the African American community surrounding mental health disorders such as ADHD and Autism Spectrum Disorder (ASD).

The main goal of the event was to provide the community with information and resources on mental health, but also for researchers and clinical professionals to learn from the community how they can better serve the community.

Over 90 adults gathered to learn more about mental health.

To achieve these goals, the event had three major aims: (1) to provide adults in the community with information on Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD), and general mental health and wellness; (2) to expose youth aged 4-17 to neuroscience education and STEM (science, technology, engineering and math) careers; and (3) to get feedback from the community about building relationships with OHSU.

The team of experts – Dr. Nigg, Dr. Eric Fombonne, and Ms. Danette Haynes (of the OHSU Avel Gordly Center for Healing) sat down in groups with adult attendees to have open dialogues about ADHD and ASD, clinical treatments, and best practices in dealing with children and loved ones suffering from mental health disorders. People also had the opportunity to speak with Dr. Fair about careers in science and medicine, as well as opportunities to be involved in research studies at OHSU.

Meanwhile, YES! volunteers (consisting of research staff, graduate students, and postdoctoral trainees) got to be kids again working with the youth. Children aged 4-10 traveled through various stations to learn about animal and human brains, played the Mindflex game, color brain pictures, and other fun activities. Children aged 11-17 learned about the teenage brain with Brain-in-a-Box and discussed higher education in STEM and career opportunities.

The event attracted over 100 attendees with about 30 children participating in the science education portion. We received overwhelming positive evaluations and feedback from all age groups.

“Please do this again. It was the start that I needed. Thank you.”

“I truly appreciated the information shared. I would love to learn more and hopefully develop improved skills so I can better parent and also serve those that I work with in the schools and/or the community.”

“Thanks again so much for all the info given on today. It was a blessing to me and my family.”

“Great speakers, fun activities. Do it again!”

“I thought it was a great idea to bring awareness to these matters discussed today. Thank you for taking this time out.”

Table filled with literature on ADHD, ASD, culturally sensitive treatment resources, and YES! outreach.

Battle of the Mindflex.

Each of the experts meeting with their groups in dialogue about various mental health topics.

The team of experts – Dr. Nigg, Dr. Eric Fombonne, and Ms. Danette Haynes (of the OHSU Avel Gordly Center for Healing)
MEET THE YES! TEAM

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