In spring 2016 CLEAR will celebrate its third anniversary, an important milestone for CLEAR programming on campus and an opportunity to examine the significant data collected over this time. Since the launch of CLEAR we have been assessing all aspects of our programming, gathering information ranging from student attendance at OWLS sessions to the number of first-year students who visit the Quantitative Skills Center, from the days and times most popular for Quantitative Center drop-in visits to the number of interdisciplinary faculty collaborations that arise from our workshops and curriculum development grants. These data, together with feedback from students and faculty, help us gauge our progress and continue to refine and strengthen our programming. None of this would be possible without Special Projects Researcher Tabassum Haque and Ross Peacock, Assistant Vice President of Institutional Research, who have worked with CLEAR on institutional research and data analysis from the beginning. They enable all that we do to be data-driven, and many thanks to them both.

In addition to implementing and assessing activities on campus, CLEAR has represented Oberlin on a collaboration with Bryn Mawr College, Harvey Mudd College, Keck Science Department (of Claremont McKenna, Pitzer and Scripps Colleges), Lewis & Clark College, Macalester College, St. Olaf College, and the Educational Psychology Department at the University of Minnesota. Funded by the Howard Hughes Medical Institute (HHMI) as an addition to the colleges’ current grants, the project is developing an assessment instrument that measures student skills with the quantitative topics deemed essential for life science. Over the last two-and-a-half years, the consortium has developed, piloted, and refined a 20-item instrument called the Biology Science Quantitative Reasoning Exam (BioSQuaRE), and CLEAR Director Marcelo Vinces, Tabassum Haque and Jason Belitsky, working with 10 other consortium members on development of a paper on BioSQuaRE for submission for peer review. At Oberlin we are using BioSQuaRE to longitudinally measure gains of students in the life sciences. Looking forward, we aim to use all information at our disposal to ensure continued excellence in CLEAR programs and events.

-Marcelo Vinces, Director
Curricular Development Workshop and Grants

Two faculty development lunches and a workshop were held in the 2014-15 academic year to facilitate greater curricular collaboration among departments. The lunches, held on September 25 and October 17, 2014, were designed to catalyze discussion among faculty from different departments on the merits of working beyond departmental borders, models for structuring such partnerships, the challenges that can arise in multidisciplinary curricular initiatives, and ideas for courses that would benefit from cross-departmental affiliations. The workshops brought together 23 faculty from ten departments and programs (Anthropology, Biology, Biochemistry, Computer Science, Education Studies, Environmental Studies, Geology, Mathematics, Neuroscience, Physics, and Psychology). The workshop, held on January 13, 2015, was an opportunity for potential interdisciplinary teams to discuss ideas for new courses or new multidisciplinary enhancements to existing courses, for experienced faculty to share the benefits and challenges of such team-teaching with colleagues, and for teams to start developing proposals for summer 2015 curriculum-development grants through the HHMI grant. The workshop yielded several innovative proposals, and curriculum-development grants were awarded to three teams, one involving faculty from Biochemistry and Religion; another faculty from Environmental Studies and Education Studies; and the third faculty from Biology, Comparative Literature, and History.

OWLS Update

The OWLS (Oberlin Workshop and Learning Sessions) program continues to flourish, with more courses and students supported each year through peer-led, active-learning sessions based on the Supplemental Instruction model. The peer leaders (known as OWLS leaders) are students who have previously taken the course they are supporting. They participate in a comprehensive orientation led by CLEAR Director Marcelo Vinces that focuses on best practices, learning from peers, and facilitation of group recitation sessions that actively engage students in the course with material presented in the class lectures. Through OWLS sessions, students not only reinforce and test their understanding of the course concepts and content but also practice effective study skills. One student who regularly attends OWLS sessions commented, “I really like the activities that are presented differently than they are taught in lecture. It pushes me to think about the information in a different way. I really enjoy getting questions and having to brainstorm and answer them with partners. It helps to facilitate group discussion and helps me get the viewpoints of others.”

The OWLS leaders also greatly benefit from the program, which deepens their understanding of concepts and materials in the courses they support, better preparing them for advanced coursework, collaborative research with faculty, tests such as the MCAT, or post-Oberlin employment. In addition, OWLS leaders have noted that the program affords them valuable experience in public speaking, new group-learning opportunities through OWLS leader training and reflection activities during the year, and closer intellectual ties with faculty, with whom they meet regularly as part of the program.

In 2014-15, CLEAR partnered with the Office of Communications to produce a video – from the viewpoints of students in the courses, faculty, and OWLS leaders themselves – about the program and why it is successful. The video – available at http://new.oberlin.edu/office/clear/for-students/owls/index.dot – will help increase awareness of the program among current and prospective students.

<table>
<thead>
<tr>
<th>Semester</th>
<th>Number of courses supported by OWLS</th>
<th>Total number of enrollment</th>
<th>Number of departments represented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2014</td>
<td>11</td>
<td>620</td>
<td>6</td>
</tr>
<tr>
<td>Spring 2015</td>
<td>11</td>
<td>465</td>
<td>5</td>
</tr>
</tbody>
</table>
CLEAR’s third annual Lab Crawl was held on October 10, 2014 to showcase the significant student-faculty STEM research that occurs at Oberlin and to help students explore research opportunities on campus. The Lab Crawl continues to grow, both in the number and range of faculty opening their labs or research spaces for the event and the number of student participants. From 23 stations representing 9 departments and approximately 242 visitors in its inaugural year, the Crawl increased to 34 stations in 11 departments and an estimated 570 visitors in fall 2014. Importantly, CLEAR was also successful to expanding Lab Crawl stations across campus, including in 2014 less visited locations such as the Conservatory’s TIMARA (Technology in Music and Related Arts) labs in Bibbins Hall and the 3D-Printing Lab in Wilder Hall. The fall 2015 Lab Crawl will be Halloween themed and take place on Friday October 30. Lab Crawl is an excellent opportunity for students to explore lab spaces, meet students and faculty conducting research on campus, and learn – from peers in a fun, informal setting – about the kinds and quality of research Oberlin undergraduates carry out on campus.

In fall 2014 11 courses (representing total enrollment of 620) from 6 departments (Biology, Chemistry/Biochemistry, Computer Science, Mathematics, Neuroscience, Physics) with 25 OWLS leaders.

Spring 2015 courses: 11 (representing total enrollment of 465) from 5 departments (Biology, Chemistry/Biochemistry, Computer Science, Mathematics, Neuroscience) with 22 OWLS leaders.

In fall 2015, CLEAR will support eleven courses from five departments (Biology, Chemistry/Biochemistry, Computer Science, Mathematics, and Neuroscience) through 23 OWLS Leaders and 3 OWLS student coordinators who serve as experienced student mentors to fellow OWLS and in the operation of the program. Emphasis is placed on providing OWLS for introductory courses, which tend to have larger enrollments and lay the foundation for science, technology, engineering, and mathematics (STEM) majors and pre-med study.
Quantitative Skills Drop-in Center

The Quantitative Skills Center will mark its second anniversary in September 2015. Use of the Center continued to grow in the 2014-15 academic year, both in the number of student visitors and the range of courses for which they sought support. In 2014-15, the Center received a total of 443 visits by 211 students, up from 286 visits by 148 students in 2013-14. The Center was staffed by 13 students in the fall 2014 and 16 students in spring 2015, all of whom were trained in active listening and peer tutoring and were mentored by CLEAR Director Marcelo Vinces. The 2014-15 students represented ten majors (Biology, Biochemistry, Chemistry, Computer Science, Economics, Geology, Mathematics, Neuroscience, Psychology and Physics) as well as pre-med. We have continued the experimental model of having course-dedicated tutors who serve as point people for specific courses that have requested support from the QS Center. Courses with dedicated tutors rose from four in 2013-14 to eight in 2014-15: BIOL 087 (Crops and Climate), CHEM 045 (Chemistry and Crime), CHEM 103 (Topics in General Chemistry), GEOL 235 (Applied GIS), MATH 231 (Multivariable Calculus), MATH 301 (Advanced Calculus), PSYC 200 (Research Methods I), and PSYC 214 (Abnormal Psychology). A large proportion of visits were for these courses, which adding something evaluative about the courses served or the impact of the dedicated tutors on the courses would be helpful.

ABRCMS 2014

For the second year, Oberlin was represented by a team of students at ABRCMS, one of the largest minority-serving science conferences in the United States. A group of seven, which included Biology, Biochemistry, Neuroscience, and Physics majors, attended the meeting in San Antonio, Texas, where they took part in a program of scientific sessions, professional-development workshops, networking events, student presentations, and talks by leading scientists. The Oberlin team came home with prizes for their poster and oral presentations. They also met with one of the keynote speakers, science journalist and Oberlin alumna Sonia Shah ’90, who will deliver a convocation address entitled Pandemic: Tracking Contagions from Cholera to Ebola and Beyond at Oberlin on October 27, 2015.

Funding for the Oberlin team’s ABRCMS attendance came in part from alumni donations raised through a successful crowdfunding initiative (https://crowdfund.oberlin.edu/campaign/detail/3959).
CLEAR Newsletter Fall 2015

Student Skill Sessions

CLEAR continued to organize or co-sponsor a range of student skill-development sessions designed to enhance student learning in class and lab. Activities in 2014-15 included sessions on: spreadsheets and graphing using Excel and RStudio; computational modeling; and preparing figures and data visualization. Information sessions on undergraduate research were held in Winter Term (January 23, 2015; 16 attendees) and in spring (February 6, 2015; 49 attendees), the latter in collaboration with the Office of Undergraduate Research, the Career Center, the Study Away and Winter Term committees, and Oberlin Shansi.

CLEAR also provided assistance for a student-initiated event called “Applying to Grad School: What We Learned,” in which five student panelists shared their experiences and tips for applying to graduate school (April 30, 21 attendees). The student panelists were 2015 graduates Emma Eisenberg (English), Taylor Field (Sociology), Gabriel Moore (Biology), Alex Riordan (Neuroscience), and Amanda Strominger (Computer Science), and the session was chaired and organized by Amanda and Taylor.

QS Center Hours

Fall 2013
18 hours per week
Sunday, Tuesday, and Thursday:
7:00-11:00 PM
Monday and Wednesday:
8:00-11:00 PM

Spring 2014
20 hours per week
Sunday:
2:00-4:00 PM and 7:00-11:00 PM
Monday, Tuesday, Wednesday:
7:00-11:00 PM
Thursday:
8:00-10:00 PM

Fall 2015
22 hours per week
Sunday:
2:00-4:00 PM and 7:00-11:00 PM
Monday-Thursday:
7:00-11:00 PM

Student Awards

Talia Greenberg ’15 has been awarded a 10-month Fulbright English Teaching Assistantship (ETA) in Taiwan. She will begin her fellowship August 1. A psychology major with a minor in Jewish studies and concentrations in cognitive sciences and education studies, Talia worked in the Quantitative Skills Drop-in Center and in the psychology department with Professor of Psychology Patty deWinstanley.
Student Awards continued...

Annika Nelson ’15 has been awarded a National Science Foundation Graduate Research Fellowship in life sciences, ecology. In the fall, Nelson will attend the University of California, Irvine, to study plant and insect ecology. She will conduct field research during the summer at the Rocky Mountain Biological Laboratory (RMBL) in Crested Butte, Colorado. Annika majored in biology, serving as a teaching assistant in Organismal Biology, and worked as a tutor at the Quantitative Skills Drop-in Center.

Quantitative Skills tutor and past OWLS Leader Tommy Tullius ’15 received an honorable mention for the NSF Graduate Research Fellowship in life sciences, biochemistry.

Workshop on Quantitative Reasoning Pedagogy & Computational Modeling with Nova Software

On June 15 and 16, 2015 CLEAR hosted a workshop on QFR pedagogy that drew fifteen faculty participants from six institutions, including seven faculty from Oberlin. The workshop was led by Eric Gaze, current head of the National Numeracy Network and Director of the Quantitative Reasoning (QR) Program at Bowdoin College. He has given talks and led workshops on such topics as QR across the curriculum, creating QR entry point courses, writing with numbers, QR assessment, and running a QR program, has served on review teams of QR programs and is the developer of the Quantitative Literacy and Reasoning Assessment (QLRA), which Oberlin and many other institutions use to assess the quantitative skills of students.

The workshop covered aspects of QR that can be incorporated into courses across the curriculum, and presented data on the science of learning.

CLEAR staff also helped organize a three-day workshop on computational modeling that immediately followed the QFR sessions. The computational workshop gave participants hands-on experience with NOVA – a free, versatile and user-friendly platform for dynamic systems modeling and agent-based modeling – developed by a multi-campus, multidisciplinary team, led by Professor of Computer Science Richard Salter, with support from a National Science Foundation grant.

Eric Gaze
The Celebration of Undergraduate Research

CLEAR was proud to partner again with the Office of Undergraduate Research on the annual Celebration of Undergraduate Research. Held on September 25 and 26, the 2014 Celebration featured the research of students representing 20 disciplines and included 40 poster presentations, 17 oral presentations, an alumni panel, and a keynote address. Alumni panelists in 2014 were Sharon Sutherland ’87, Quality Improvement Officer for Ob/Gyn & Women’s Health Institute at the Cleveland Clinic; Terri Burgess Sandu ’88, Director of the Entrepreneurship Innovation Institute and Executive Director for Workforce Development at Lorain County Community College; and Eboni Johnson ’97, Reference and Instruction Librarian at Oberlin College. Dean of Arts and Sciences Tim Elgren delivered the keynote talk entitled The Power of Student-Faculty Research Collaborations, highlighting ways that undergraduate research represents a high-impact practice in undergraduate education.

OSRI: Oberlin Summer Research Institute

In summer 2015 the Oberlin Summer Research Institute sponsored professional-development and social activities for more than 130 students conducting research on campus, the large majority of whom were pursuing research in the natural sciences. While the undergraduate researchers most of their eight to ten summer weeks investigating projects that ranged from tracing sediment movement in central China to studying the effects of pesticides and heavy metals on diseases that affect the human brain, OSRI programming helped build community among students and faculty across departments and gave students opportunities to discuss and reflect on their research. A partnership of the Office of Undergraduate Research and CLEAR, OSRI hosted many well-attended events that enriched students’ experiences of living and conducting research in Oberlin during the summer, including a visit to Cleveland museums, blueberry picking, a bike ride to Elyria, a young alumni panel, and workshops on research ethics, working effectively with mentors, and other topics.

STRONG: Science and Technology Research Opportunities for a New Generation

Additionally, in summer 2015 CLEAR played a supporting role in the Office of Undergraduate Research’s launch of the new STRONG program, which brought incoming Oberlin first-year students to campus for the month of July to participate in innovative research with Oberlin faculty, meet other students interested in STEM, and begin familiarizing themselves with the Oberlin community. The program is designed to afford greater access to STEM majors for students from groups still underrepresented in the natural sciences disciplines, including women, students of color, Pell Grant-eligible students, and students who are the first in their families to attend college. The STRONG students conducted research in the labs of 12 faculty in the departments of Biology, Computer Science, Environmental Studies, Geology, Neuroscience, Physics, and Psychology, and participated in workshops and sessions led by staff from the Bonner Center for Services and Learning, CLEAR, Student Academic Services, Office of Disabilities Services, and the Environmental Dashboard Project.
OSRI Lab Profile: Gabe Hitchcock ‘17

Gabe Hitchcock is a rising junior doing biology research in Tracie Paine’s neuropharmacology lab.

What kind of work is your lab doing over the summer?

In Tracie Paine’s neuropharmacology lab we work to elucidate some of the underlying molecular pathologies of schizophrenia. Specifically, we focus on gamma-aminobutyric acid (GABA, a neurotransmitter) receptors and their role in schizophrenic etiology. It has become clear through our research, as well as through the research of other labs, that alterations in the densities and function of these receptors leads to some of the symptoms of schizophrenia. Furthermore, we investigate the subunits of these pentameric GABA receptors (which appear in various configurations throughout the brain) in order to understand their behavioral roles in non-pathological contexts. We do this by using various drugs that target these receptors with high affinities and known pharmacokinetics.

What is your role in that work, as a student researcher?

Because Prof. Paine and I work alone on this project, my role within our lab is an important one. I handle, train, and test each cohort of rats throughout the week. Furthermore, I collect and analyze both behavioral and molecular data using various techniques, including behavioral assays and immunohistochemistries. Together, Prof. Paine and I decide upon each course of action following the collection and analysis of these data sets.

What are your future goals in science?

Following my graduation from Oberlin in 2017, I plan to attend a graduate program in neuropharmacology. I would like to continue my study of the ways by which drugs interact with our brains, with the goal of contributing to the growing field of addiction research. Specifically, I would like to know what predisposes individuals to developing addictions and dependencies on illicit substances. With a PhD in neuropharmacology, I hope to discover novel and effective pharmacotherapies that improve people’s lives.

What are some other activities, interests, or hobbies that you pursue?

Outside of my research, I am heavily involved on campus. I am the Editor-in-Chief of, as well as an active contributor to, The Synapse, Oberlin’s only student-run, science magazine. Furthermore, I am the Co-Chair of the Neuroscience Majors Committee, an LRA in the FEAST cluster, a percussionist in the Arts and Science Orchestra, a panelist for freshmen orientation, and an accidental Art History minor.

Read other lab profiles and find more information at:

oberlinclear.tumblr.com
facebook.com/oberlincollegeclear
twitter.com/oberlinclear

UPCOMING EVENTS

Core activities of CLEAR will continue in 2015-16, including the OWLS program, the Quantitative Skills Center, faculty-development workshops, competitive curriculum development grants, and the Roots & STEM series. A collaborative initiative of CLEAR, the Gender, Sexuality and Feminist Studies Institute, and the Multicultural Resource Center, Roots & STEM aims to highlight connections between science and society, with a special emphasis on gender, race, and ethnicity in the natural sciences. The October 27, 2015 convocation by science journalist Sonia Shah ‘90 is expected to draw the largest audience to date for a Roots & STEM event, and Sonia Shah’s science journalism has focused on how the complexity of challenges such as malaria and Ebola cannot be solved by science and medicine alone, as their roots lie also in environmental degradation, war, political will and poverty.

CLEAR STAFF

Marcelo Vinces
Director

Jason Belitsky
HHMI Program Director

Marta Laskowski
HHMI Program Director

Pamela Snyder
Grant Administrator

Tabassum Haque
Special Projects Researcher

Rosalind Soltow
Administrative Assistant