OrganicERs Newsletter Vol. 11 No. 1

Organic Education Resources

a community of teaching scholars

www.organicers.org

In This Issue

2025 ALOC Virtual Workshop

Jennifer Chaytor, Rick Mullins

This June, the OrganicERs community gathered to host the 2025 Active Learning in Organic Chemistry (ALOC) virtual workshop, a six-session workshop designed to explore and deepen our collective understanding of evidence-based teaching practices in organic chemistry. The workshop was organized and facilitated by a team of eight OrganicERs Fellows and two members of the Leadership Board. Held over several days, the workshop brought together faculty to collaborate on strategies for making organic chemistry more engaging and inclusive through active learning. In total, there were 29 participants, with 24 coming from across the United States and the remaining international faculty from El Salvador, Hungary, India, Lebanon, and Nigeria. With participants grouped by core course content areas, the workshop emphasized collaboration, course and assessment design, and reflective teaching.

Throughout the sessions, participants used active learning strategies to engage with a variety of topics, including backward design, formative assessment, flipping the classroom (with and without video), project-based and research-driven lab instruction, and inclusive teaching. The workshop also included discussions around open educational resources (OERs), green chemistry, and alternative grading strategies such as specifications grading. Each session was scaffolded with pre-, during-, and post-session activities that encouraged preparation, collaboration, and reflection. Participants worked in topic-focused teams, such as spectroscopy, stereochemistry, and aromatic substitution, to build tools tailored to their own teaching needs. These topic-focused teams allowed participants to develop relationships with their own small group for the duration of the workshop.

As we look ahead, the ALOC leadership team encourages all participants to stay engaged with the community through upcoming OrganicERs workshops and faculty learning communities planned for the 2025–26 academic year. These events offer opportunities to continue supporting one another as we refine our teaching practices. Whether you're new to active learning or continuing to evolve your approach, we hope to see you at future events and discussions!

OrganicERs at the ROChET Symposium: Bridging Communities Across Continents

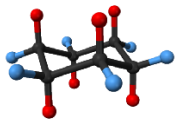
Alexey Leontyev

In May 2025, OrganicERs leaders Justin Houseknecht (Wittenberg University) and Alexey Leontyev (NDSU) presented at the inaugural ROChET (Research-Oriented Chemistry Education Team) Symposium—an international virtual gathering aimed at fostering collaboration between organic chemistry education researchers and practitioners in the U.S. and Germany. Representing OrganicERs, they shared the community's mission to advance evidence-based instructional and assessment practices in organic chemistry through workshops, curricular resource sharing, and online faculty learning communities.

Their presentation introduced the history and growth of the OrganicERs community, highlighted its commitment to long-term professional development, and engaged attendees in a discussion about what instructors need to implement more evidence-based practices. Through breakout discussions, symposium participants identified shared challenges—including lack of time, institutional support, and access to high-quality instructional materials—and expressed enthusiasm for future collaborations.

This event marked an important step toward expanding the OrganicERs network internationally and exploring joint opportunities for research, professional development, and knowledge exchange with the ROChET community.

2025-26 Faculty Learning Communities and Curriculum Development Teams



OrganicERs is excited to sponsor nine faculty learning communities (FLCs) and two curriculum development teams for the 2025-26 academic year. Teams will meet approximately monthly in groups of 9 or less. Each team will be led by a team of at

least 2 experienced facilitators that will select appropriate literature and activities for the group. Teams will develop specific objectives, but the general objective of all teams is to reduce barriers to effective implementation for participants and other adopters.

The primary purpose of the **faculty learning communities** is to support faculty in developing and implementing instructional materials for their classrooms. We hope that every participant will contribute an item for peer review.

The primary purpose of the **curriculum development teams** is to develop curricular materials that can be readily adopted by OrganicERs members. Teams will collaborate to develop and implement these at a range of institutions before submitting them for peer review.

You can sign up for FLC's and CDT's now.

They are all set to start either in August or September but dates have not been finalized. In the sign up, some FLC's are listed as 1 pm (+/- 1h, EDT). The final time hasn't been determined but will be within one hour of 1 PM.

Authoring learning objectives that work for your classroom and considering Learning Assessment Techniques to refine them. Friday @ 2 pm (ET).

Cathy Welder (Dartmouth C) and Lucas Tucker (Siena C)


Participants will learn the basics of writing Learning Objectives at the course and topic level. We will read Part I of *Learning Assessment Techniques, A Handbook for College Faculty* (by Barkley and Major) together and then each participant will select a technique from Part II, design and implement one activity, then debrief with the FLC.

F.A.C.T (Formative Assessment Collaborative Team). Monday @ 1 pm (MT)

Leslie Nickerson (Idaho State) and Janell Mahoney (U Nevada, Reno)


Participants in this FLC will create formative assessments which are tailored to their curriculum and learning goals, and implement the formative assessment in their classroom. Participants will then use student feedback and performance data to reflect on the effectiveness of assessment and to make improvements to the assessment for future iterations. By the end of the FLC, members will have a toolkit of tested formative assessments and a framework for designing, assessing, and refining instructional activities that support student learning.

Learning Assessment Techniques and Formative Assessment. Thursday @ 3 pm (ET)

Cathy Lugo (Texas A&M) and Stephanie Brouet (Saginaw Valley State)


This group will explore formative assessment and learning assessment techniques. After reading and discussions, participants will design an activity to implement in their classroom and present to the group. We will use the *Learning Assessment Techniques: A Handbook for College Faculty* by Claire Howell Major and Elizabeth F. Barkley as a guide.

Formative Assessment and Specifications Grading Preparation. Friday @ 2 pm (ET)

Matt Leathen (Truckee Meadows CC) and David Quist (Trine U)


Participants in this FLC will create formative assessments which are tailored to their curriculum and learning goals, and implement the formative assessment in their classroom. Participants will then use student feedback and performance data to reflect on the effectiveness of assessment and to make improvements to the assessment for future iterations. This FLC will also discuss challenges and approaches for implementing Specifications Grading in their classroom.

The Flipped Classroom. Friday @ 12 pm (ET).

Gidget Tay (Pasadena City C) and Laura Sessions (Valencia C)


The purpose of this learning community is to provide a space for instructors to share ideas and experiences about flipping their classroom. Whether you have experience flipping your class and want to share your practices and refine your practices or you are new to flip class and want to learn more, this is the faculty learning community for you!

Inclusive Teaching. Friday @ 4 pm (ET)

Ian Rhile (Albright C), Ashley Steelman (U Kentucky), and Jennifer Chaytor (Saginaw Valley State)



This FLC will discuss methods to make both large and small classes more inclusive. We will use the book *Inclusive Teaching, Strategies for Promoting Equity in the College Classroom* by Hogan and Sathy to guide our discussions. We can tailor our discussion and discussion resources based on the group's interests.

Effective use of AI in Organic Chemistry. Friday @ 1 pm ($^{+}$/- 1 h, ET).

Dee Jacobs (Rider) and Jeremy Klosterman (UCSD)

Either Effective use of AI in Organic Chemistry or Effective use of 3D Printed Models in the Classroom will be run based on interest.


There are many ways we can envision using AI, or combatting AI, in organic chemistry. From the instructor perspective, How can we effectively use AI to design assignments, assessments, and active-learning activities? How can we design assignments to be essentially AI-proof? For the student perspective, how can we (as instructors) incorporate AI into the classroom in a way that helps direct and model effective and ethical use for our students? What do we even consider effective and ethical use? Can we, and should we, exploit the existence of AI to shift our student learning outcomes from more knowledge-based to skill-based? Whether we are pro- or anti-AI, we can't ignore its existence (it's even embedded in our textbooks). Jeremy is anti-AI, and Dee is pro-AI, so this FLC would certainly have some lively conversation. Again, we would start off with a general discussion on the current state of AI and existing

resources before moving into more applied instances of AI use in organic chemistry, The final goal would be the development of course materials related to AI, from active-learning activities that explicitly preclude or include ethical AI use to recommendations or policies on AI use in the organic chemistry classroom.

or

Effective use of 3D Printed Models in the Classroom. Friday @ 1 pm ($^{+}$/- 1 h, ET).

Dee Jacobs (Rider) and Jeremy Klosterman (UCSD)

In the first few sessions we would explore how 3D-printed artifacts have enhanced undergraduate learning in the chemistry classroom. We will learn about small and large molecular models, ball/stick and space filling models, depictions of orbitals, perhaps even devices/instruments/reactors that have been constructed with the aid of 3D printing. Initial discussions would focus on available resources and the 3D printing and design process (i.e. how to). The focus would then move to the primary objective, where we identify student learning outcomes that require a strong representational literacy and visuospatial thinking that can and should be support by models. The goal would be the development of in-class active-learning activities that would exploit and manipulate such three-dimensional artifacts. 3D printing is the gateway, but the end goal is the use of 3D models (whether they are printed, bought online, or inherited by an old colleague) to support development of visuospatial skills and reasoning.

Green Chemistry. Wednesday @ 2 pm (ET)

Alexey Leontyev (NDSU) and Joan Schellinger (U of San Diego)


As part of this Faculty Learning Community (FLC), we support instructors in integrating Evidence-Based Instructional Practices (EBIPs) into their courses and laboratories with a focus on green chemistry. Participants will receive tailored guidance to address implementation challenges and will be encouraged to design innovative, greener laboratory experiments—complete with assessment strategies aligned with their green chemistry goals. The FLC also offers curated resources and personalized support to help faculty navigate and adopt sustainable practices in their teaching.

Innovative Laboratory Modules and Assessments. Friday @ 2:30 pm (ET).

Animesh Aditya (Kennesaw State) and Ami Johanson (Aurora U)


The purpose of this FLC is to explore innovative laboratory material and assessments. The discussions will span from the adding value to the traditional cook-book laboratory modules to exploring non-traditional laboratory instruction (CUREs and open-ended labs). The FLC members will identify the key learning outcomes for the group.

Development of activities and assignments to support equity and inclusion in OChem. Friday @ 4 pm (ET)

Jennifer Muzyka (Centre C) and Kay Johnson (U of Pikeville)


The purpose of this CDT is to develop activities and/or assignments that can be used in organic chemistry courses to highlight the accomplishments of chemists from underrepresented groups and bring student awareness to issues of equity and inclusion. Our intent is to submit material for peer reviewed status on the OrganicERs site.

Consensus Learning Objectives and Skills for Organic Chemistry. Tuesday @ 4 pm (ET)

Justin Houseknecht (Wittenberg U) and Kristen Barrett (Rowan U)


The purpose of this CDT is to describe the desired learning in undergraduate Organic Chemistry with a set of learning objectives and skills that are applicable to the widest possible faculty audience.

Community of Communities

Jennifer Muzyka

The leaders of the VIPEr community (Joanne Stewart, Barb Reisner, and Jeff Raker) organized a meeting to allow members of various chemistry communities of practice to gather at Hope College in Holland, Michigan. Jennifer Chaytor, Alexey Leontyev, Rick Mullins, and Jennifer Muzyka attended to represent OrganicERs at the conference. The meeting has been more like a workshop than a traditional conference, with numerous think-pair-share with the pair sharing happening with the people at our assigned tables. The table assignments were made so that each table has representatives from six different communities of practice. There are 15 communities represented, with 36 attendees. The meeting started with a gallery walk with informative posters about each of the communities, where attendees were encouraged to add post-its with questions about the communities. Other discussion topics have included funding, challenges and successes, community building, and opportunities for collaboration. Links to posters about each of the communities and other information about meeting activities are available on the meeting website. Plans are being made to organize a symposium on Community of Communities for the upcoming BCCE, which will be held at University of Wisconsin, Madison in July 2026.

MACRO: Advancing Polymer Education Through Community and Collaboration

The Macromolecular Alliance for Community Resources and Outreach (MACRO), winners of the 2025 James Flack Norris award for Outstanding Achievement in the Teaching of Chemistry, invites the OrganicERs community to explore their educational resource offerings and collaborate with educators in the field of polymer chemistry. Current MACRO leaders Elizabeth Sterner (Curriculum, PMSE co-chair), Philip Costanzo (Outreach, POLY co-chair), and Piril Ertem (Professional Development) welcome you to our website: https://www.macro-poly-pmse.org/

It is our goal to infuse polymers throughout chemistry education, creating crosslinks between the established subdisciplines and bridges to other areas of science like physics, biology, and engineering.

What we offer:

- Professional development resources for undergraduate and graduate students and early career professionals, including periodic webinars and online panel discussions
- A repository of polymer science outreach demonstration activities that include facilitator guides, handouts, and equipment lists
- A growing set of free, downloadable polymer education modules designed to be dropped into existing chemistry courses
- A collection of scientific resources applicable to polymer research
- Events at ACS meetings that are open to all

Of particular interest to the OrganicERs community are our introductory and organic polymer chemistry curriculum modules. Each module consists of a set of slides that can be used in the classroom and an instructor support document with recommendations for teaching the content and offering extra context, background, and concepts. The introductory slides cover the key differences between small molecules and macromolecules, key vocabulary and properties, and the fundamentals of polymer molar mass. The organic modules cover making polymers from alkene-containing monomers, using acyl substitution reactions to make polymers, and the stereochemistry of polymers.

Don't hesitate to reach out to Liz (esterner@lvc.edu) with questions about the modules or how to use them, or if you would like to get further involved! MACRO is always looking for volunteers to create or review our materials, serve as panelists, organize symposia, or develop outreach activities.

Meet the Inaugural Fellows

Animesh Aditya

Animesh Aditya is a clinical assistant professor at Kennesaw State University, GA where he teaches lecture and lab courses in Organic and Medicinal Chemistry. Prior to joining KSU in 2017, Animesh served as a visiting faculty at Purdue University where he explored active learning in large-enrollment organic chemistry lectures. Upon attending Active Learning in Organic Chemistry (ALOC) workshops in 2022, Animesh started offering his organic chemistry-II lectures in a flipped-lecture format to dedicate lecture time exclusively to in-class problem solving. In addition to teaching various lecture courses, Animesh also serves as the faculty coordinator for the organic chemistry laboratory sequence at KSU. During last three years, Animesh has offered his laboratory courses in an open-ended project-based format to foster course-based undergraduate research (CURE) in the organic teaching laboratory.

Jennifer Chaytor

Jennifer Chaytor is a Professor of Bioorganic Chemistry at Saginaw Valley State University, where she has been teaching since 2012. Her primary teaching responsibilities include organic chemistry lectures and labs as well as a survey of biochemistry course for non-majors. Jennifer attended the ALOC workshop in 2022 and has since been involved in Faculty Learning Communities as both a participant and a co-facilitator. Additionally, she was part of the team that facilitated the 2025 ALOC Online Workshop. Jennifer has received several awards for her teaching and mentoring, including the SVSU Undergraduate Research Program Faculty Mentor Award in 2017, the Frank A. Landee Award for Teaching Excellence in 2020, and most recently in 2025 was the recipient of SVSU's Excellence in Online Teaching Award. Jennifer has developed an active undergraduate research program in both synthetic organic chemistry and in chemistry education. To date she has mentored more than 45 undergraduate students and 10 high school students on independent research projects. Jennifer enjoys exploring evidence-based practices that help students be successful in organic chemistry as well as mentoring and supporting faculty, and she looks forward to continuing these efforts as an OrganicERs Fellow.

Jonathan E. Dannatt

Jonathan E. Dannatt, Ph.D., is a dedicated teacher-scholar whose work centers on fostering deep, inquiry-driven learning in the chemical sciences. Since joining the University of Dallas faculty in 2019, he has taught Organic Chemistry I and II, both lecture and lab, as well as a chemical literature course that emphasizes critical analysis and scientific communication. He has also designed and taught special topics courses exploring reaction mechanisms, total synthesis, and medicinal chemistry—providing students with advanced engagement in the discipline and exposure to real-world applications of organic chemistry.

In all of his teaching, Dr. Dannatt blends rigorous content with a supportive and engaging classroom environment. He integrates inclusive and active learning strategies to help students overcome the perceived barriers of organic chemistry and build lasting conceptual understanding. Deeply committed to the teacher-scholar model, he mentors undergraduates in original research projects, empowering

them to develop critical thinking skills, gain confidence as scientists, and prepare for graduate study and careers in science.

Jeremy Klosterman

Jeremy K. Klosterman has had a uniquely international journey. He earned his Dr. nat. Sc. from the Universität Zürich (2007) and worked as a postdoctoral fellow at The University of Tokyo (2007-2010) and UCLA (2010-2011). In 2011, he began his independent career in the Center for Photochemical Sciences at Bowling Green State University and moved to the University of California San Diego in 2017 to focus fully on teaching organic chemistry labs and lecture. Since then, he has concentrated on developing scientific argumentation skills in laboratory learning and designing active learning activities based on 3D printed molecular models. Jeremy attended the 2021 ALOC Virtual Workshop and continues to leverage online learning to engage students and provide personalized feedback in large classes

Richard Mullins

After graduating from Centre College where he took a senior seminar course with Jennifer Muzyka, Rick Mullins earned his PhD in 2004 from Indiana University in the area of Natural Product Synthesis. Upon graduating, Rick moved to Cincinnati, Ohio where he teaches at Xavier University. He received tenure in 2010 and was promoted in 2017 to the rank of Professor. He has spent time as Chair of the Chemistry Department, Director of Undergraduate Research, Chair of Faculty Committee, and currently runs the low cost MCAT prep course for Xavier students (and any non-Xavier student interested in streaming the course). At Xavier, he has continued to work on the synthesis of small molecules but with the true goal of developing and inspiring undergraduate students toward successful careers in graduate school and beyond. In the classroom, he has been recognized with numerous teaching awards, including the Bishop Fenwick Teaching Award, the highest honor bestowed on a Xavier University professor. He has been a member of the American Chemical Society for 25 years, holding elected office for 18 of them. He has served as the Chair of both the Southern Indiana and Cincinnati local sections and is currently a Councilor for the Cincinnati Section. Hoping to add a unique voice to organic chemistry textbooks, in 2021, he published Organic Chemistry: A Learner-Centered Approach with Pearson Education. he attended the ALOC Symposium in 2023 at North Dakota State University and from that experience has recently begun incorporating specifications grading into his organic chemistry courses. In his downtime, he enjoys playing multiple sports, including golf, speedgolf, baseball, and (slowly) running marathons.

Leslie Nickerson

Leslie Nickerson is an Assistant Professor at Idaho State University where she teaches organic chemistry at both the undergraduate and graduate levels using research-backed active learning pedagogies. After attending the 2023 ALOC workshop, she transitioned to a flipped classroom in her sophomore-level organic chemistry course where she has utilized learning assistants to facilitate collaborative learning efforts. She is developing a learning assistant program to better support and prepare these students and to foster a sense of community and belonging in the classroom. She has recently been recognized for these efforts and was awarded the Excellence in Honors Teaching and the Outstanding Teacher Awards from ISU during the 2024-2025 academic year.

Ian Rhile

Ian Rhile is Professor of Chemistry and Biochemistry at Albright College in Reading, PA, having completed his twentieth year of teaching. He earned a Ph.D. in Organic Chemistry at Cornell University and held a postdoctoral position at the University of Washington. Over his career, he has taught General Chemistry I and II, Organic Chemistry I and II, Advanced Organic Chemistry, a non-majors Science of Food and Cooking course, and the laboratories for each course. Ian earned two teaching awards at the college, including the Lindback Distinguished Teaching Award in 2022. Ian attended the OrganicERs Active Learning in Organic Chemistry (ALOC) summer workshop in 2022. Ian aims to create an inclusive classroom and implements a high structure/flipped class format for organic chemistry.

Peer Reviewed Learning Objects on the OrganicERs Website

OrganicERs is now accepting submissions for peer-reviewed learning objects. If you have developed materials (broadly defined) for either lecture or laboratory, consider submitting them to the OrganicERs website for peer-review. The peer-review process for learning objects is similar to what journal manuscripts undergo where you obtain feedback on your materials from community members. Submissions should include the student-facing materials (handouts, laboratory protocols, etc...) as well as instructor guides (supplemental files, keys, TA guides, etc...) Submissions are scored according to a review rubric. Peer-reviewed submissions may make for a strong addition to merit and promotion files as they show scholarly activity and engagement with the larger community of organic chemistry instructors. If you have participated in an Active Learning for Organic Chemistry (ALOC) workshop or an OrganicERs faculty learning community (FLC) in the past, consider taking what you have developed in these workshops and turning that into a submission to the OrganicERs website. If you are interested in serving as a reviewer for materials, please contact Matt Casselman (matthew.casselman@ucr.edu) to be added to our list of reviewers.

Spotlight on Peer-Reviewed Organic Chemistry Labs – Now on the OrganicERs Website (2025)

Looking for fresh ways to connect organic chemistry to everyday life? Check out Bruce Hathaway's recently published lab experiment that uses a single-serve coffeemaker to isolate essential oils from spices, from work carried out at LeTourneau University with his undergrads. It's a modern, engaging alternative to the traditional steam distillation labs many of us remember—and one that students are likely to find more relatable.

Wondering how to find it? You have a couple of options:

- Search under *Laboratory Experiments* with *Curricular Materials*

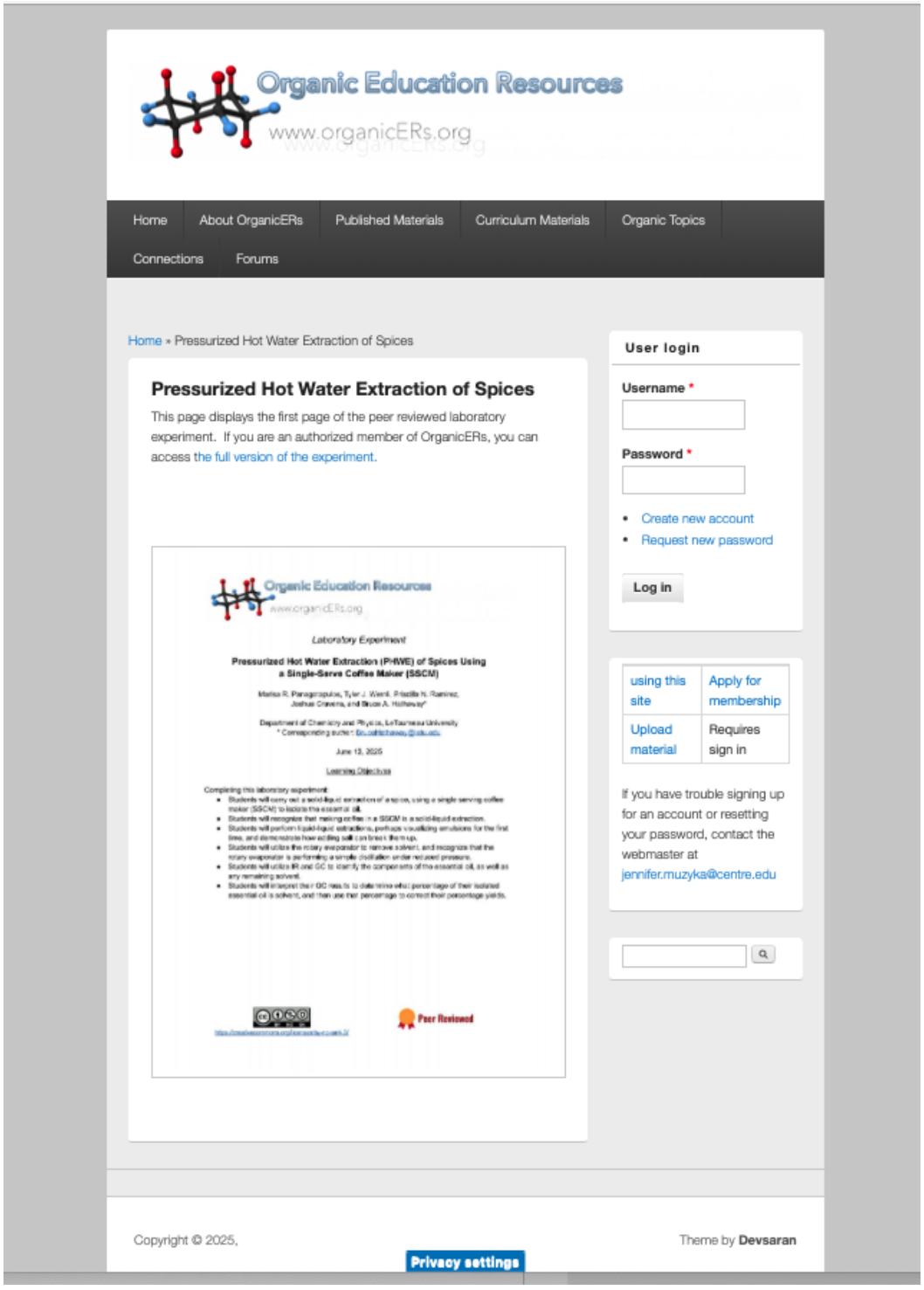
- Or, for a quicker route, check the *2025 Peer-Reviewed Learning Objects* listed under *Published Materials*

Either way, it's a great addition to your teaching toolbox!

When you get to the list of 2025 Peer Reviewed LOs, you'll see a second laboratory experiment written by Hathaway with a different group of students. This one has students adding acetic acid to 1-alkenes. This reaction is a nice opportunity for students to learn that reality is not as simple and tidy as they might expect from reactions they learn in class. In this experiment students will have the opportunity to observe rearrangement of a secondary carbocation to another secondary carbocation. They'll also see small amounts of alcohol product in addition to the expected esters. Further, they learn that the reaction has different product distributions depending on whether the reaction is carried out at room temperature or under heated conditions.

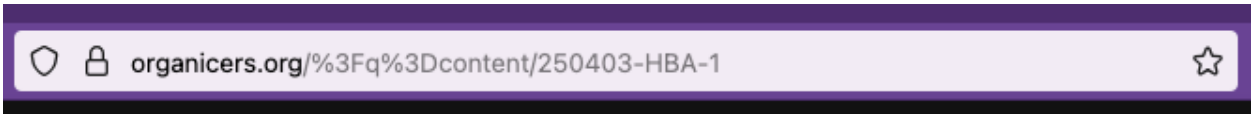
You might have wondered why someone would share their experiments or other learning objects on the OrganicERs site, especially if you are concerned about tenure or promotion requirements. We've been through those processes, so we have tried to set things up in ways that facilitate sharing with deans and tenure committees to acknowledge that these materials have been peer reviewed before their publication on the OrganicERs site. When someone clicks the clink to one of the items in the list shown in the graphic above, they'll come to a page like what appears in the screenshot below. They'll get this page whether or not they are logged in to the OrganicERs site. If you look carefully at the image, you'll

see there's a place where the viewer could log into the site. That login box doesn't appear when the viewer is already logged in.



So, deans and tenure committees can see at a glance that our professional community has had community members examine the content to ensure quality standards before sharing with the community. Lastly, we set up the website so that the authors of a peer reviewed LO can include the URL

to the landing page for their LO on their resume or CV. It's not an official DOI, but it kind of looks like one. See the URL below, for example.



We checked with the editor of *Journal of Chemical Education* about whether sharing a curricular artifact on the OrganicERs site in this way would count as prior publication and prevent future publication in JCE. He said that publications that are SoTL studies using curricular materials that have been shared on OrganicERs should be fine and that authors would basically cite the content on OrganicERs in manuscripts when materials of that type are used in the SoTL projects. If a faculty member is considering publishing a straightforward laboratory experiment in JCE rather than a SoTL study, they should probably avoid sharing that experiment on the OrganicERs site. In that situation, the JCE paper and the OrganicERs dissemination would be essentially duplication.

We are grateful to Bruce Hathaway and his students for being willing to share their cool newly developed experiments on the OrganicERs site while we worked out the details for how to share them in ways that demonstrate that the work has been peer reviewed. We hope that you might consider sharing some of your curricular materials on the OrganicERs site in this way. More details about the peer review process are available on the OrganicERs website.

Leadership Members' Picks

Some publications, presentations, and events that caught our interest.

Alexey Leontyev

Sign Language Incorporation in Chemistry Education (SLICE): Building a Lexicon to Support the Understanding of Organic Chemistry

British Sign Language Glossary - Chemistry curriculum terms

Jonathan Dannatt

A framework for evaluating the chemical knowledge and reasoning abilities of large language models against the expertise of chemists

Upcoming Events

ACS Fall 2025, Washington, DC & Digital, August 17-21

Midwest Regional Meeting, Columbia, MO, Oct 12–14, 2025

Rocky Mountain Regional Meeting, Albuquerque, NM, Oct 23–25, 2025

Western Regional Meeting, San Jose, CA, Oct 25–28, 2025

76th Southeastern and 81st Southwest Regional Meeting, Orlando, FL

Oct 26–29, 2025
Northeast Regional Meeting, Worcester, MA, Nov 1, 2025