Chemistry Department Anti-Racism Report

Here we address the issues raised in Provost and Dean of the Faculty Catherine Epstein's "message to all chairs on August 10, 2021," and we explicitly highlight each of the four overarching goals outlined by the provost at the appropriate points in our report.

Department Commitment ("That your department work to create an inclusive and welcoming culture for all students and work to build community among majors.")

The Chemistry Department is committed to equity, inclusion, and anti-racism in our teaching, mentoring, advising, and research. As chemistry educators, we recognize that our discipline is embedded within the broader cultural context and that we are not immune to the racism and discrimination that plagues our society as a whole. We are devoted to educating ourselves on the history and pernicious effects of racism and systemic oppression and are committed to dismantling these systems. We will continue to listen, learn, and strive for a just and inclusive community.

We aim to make all members of the Chemistry Department – students, staff, faculty, and visitors – feel valued and welcome and strive to establish a community that respects each member, views difference as strength, and is open and transparent to the need to actively work to dismantle systemic biases especially for those who identify as Black, Indigenous, and People of Color (BIPOC).

The Chemistry Anti-Racism Action Committee (CARAC) ("That students further their understanding of issues surrounding race and racism;" "that your department work to create an inclusive and welcoming culture for all students and work to build community among majors.")

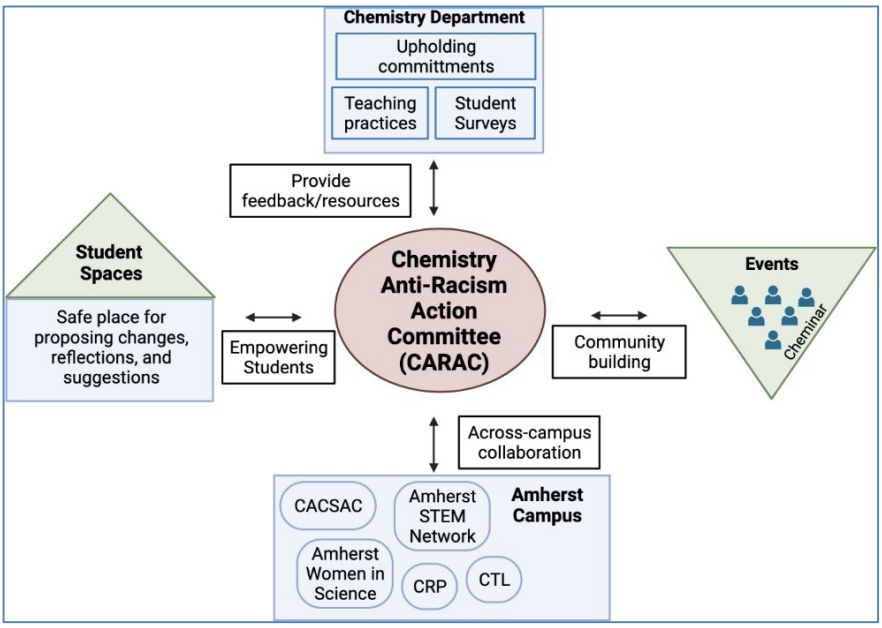
CARAC was formed in summer of 2020, and is composed of students (including two paid interns), staff, and faculty members who regularly meet to brainstorm new initiatives, process suggestions from the larger community, and interface with the department at large. Ultimately, the goal of CARAC is to support the Chemistry Department in upholding the commitments outlined above.

CARAC's activities can broadly be grouped into four pillars: building community, empowering students, providing feedback and resources for the Department, and collaborating across campus. Specific examples associated with each of these activities are listed below.

Build community and engage in reflection and discussions on equity, inclusion, and anti-racism through regularly scheduled events.

- The Chemistry Department's weekly seminar series, "Cheminar," has committed to devoting at least one slot per semester to programming decided by CARAC. Please see the seminar section for examples of events CARAC has hosted in this venue.
- A virtual homecoming event was hosted by CARAC to showcase our ongoing efforts to support Diversity, Equity, and Inclusion in the Chemistry Department. *November 1st, 2020.*

Organizational Schematic of the Chemistry Department Anti-Racism Action Committee



- A liquid nitrogen ice cream event, "What's the scoop on your scoop?" was hosted for all SURF students. While the ice cream was being made, CARAC spotlighted a black chemist and ice cream expert, Dr. Maya Warren. *July 2nd, 2021*.
- CARAC hosted a workshop, "HSTEM Metamorphosis: from an incubating pupa to a flourishing butterfly," for the STEM Incubator students in which students read accounts of the scientific journeys taken by scientists from underrepresented groups and reflected on their own journeys. *July 14th, 2021*.

Act as a liaison between the Chemistry Department and other organizations at Amherst College with similar goals.

- CARAC has worked with the Center for Restorative Practices (CRP) in moderating both public and private discussions.
- CARAC is in discussions with SURF program directors about institutionalizing pathways for underrepresented groups to apply for and attend conferences that specifically support scientists from these backgrounds. Example conferences include that hosted by the Society for Advancement of Chicanos/Hispanics & Native Americans in Science (SACNAS) and the Annual Biomedical Research Conference for Minority Students (ABRCMS).

Provide feedback and resources for the Department on student desires, anti-racist pedagogy, mentorship practices, and responding to external events.

- CARAC has helped the Chemistry Department build a Chemistry Equity, Inclusion, and Anti-Racism page on the department website. This page is managed by CARAC and serves as a resource bank for chemistry students and instructors.

- National events, such as the anti-Asian hate crimes that spiked in the spring 2021, require timely and thoughtful response. CARAC has helped the department formulate unified responses to such events.
- Recent efforts leading to a DEI requirement for the Chemistry major (see below), have involved CARAC soliciting feedback from both students and faculty (at multiple events) and sharing this feedback with the department as well as proposing courses of action.
- Ongoing efforts aim to provide general resources for chemistry students that may be particularly helpful to students from underrepresented groups. These include advice on how to approach office hours, using peer tutoring, college counseling, the Q Center, and curriculum mapping.
- Ongoing efforts aim to provide instructors with curated anti-racist resources – for example, a slide deck that connects the course material to the life story of prominent chemists from underrepresented groups.

Create spaces in which students can feel empowered to discuss racism and oppression in the sciences, propose reforms, and engage in restorative practices.

- CARAC meetings themselves are often student run and serve as an avenue for students to feel empowered to enact meaningful change at the department level. Toward this end, CARAC also hosts one open meeting per semester to which all students in the department are invited to share their ideas and new members are recruited.
- Cheminar events designed by CARAC aim to give students space to discuss racism and oppression and also to suggest constructive paths forward.

Roles of CARAC Members:

- *Interns* – In this role, student workers assist in planning CARAC events, in compiling anti-racism resources, in maintaining the Chemistry Equity, Inclusion, and Anti-Racism website, and in creating anti-racism pedagogy for use in the department. The interns also perform academic research on the topic of anti-racism in chemistry and help develop new initiatives with the overarching goal increasing diversity, equity, inclusion, and anti-racism in the Chemistry Department. The student workers are provided a small budget for student-driven publications, CARAC swag, food for events, and other community building activities. Students who have served on CARAC for at least a semester are eligible to apply for the one-semester CARAC intern position.
- *Student members* – Chemistry students attend CARAC meetings, contribute to discussions, and engage in specific tasks as time allows.
- *Faculty members* – Rotating members from the faculty and staff serve as liaisons for the entire department and provide departmental feedback and support for various CARAC activities.

Chemistry Department Seminar ("That students further their understanding of issues surrounding race and racism;" "that your department work to create an inclusive and welcoming culture for all students and work to build community among majors.")

- We now seek to explicitly include speakers whose research and identity contribute to ongoing conversations on anti-racism.
- The schedules for visiting speakers have been reformatted to include conversations with students on identity, personal journey, and practicing anti-racism in chemistry.

Seminar events organized by CARAC:

In the 2020–2021 academic year:

- A "Summer in the Chemistry Department" welcome back event during the first week of the fall semester, in which CARAC members introduced themselves to the department.
- A reading/discussion about anti-racism in chemistry by Dr. Sibrina Collins.
- A "Chem-unity" community-building workshop inspired by our *Being Human in STEM* course (see below). This event featured students and faculty sharing their personal journeys through STEM.

In the 2021–2022 academic year:

- Chemistry DEI Requirement Fishbowl. CARAC partnered with the college's Center for Restorative Practices (CRP) to host a fishbowl discussion on how a DEI major requirement can benefit *all* members of the Amherst community. The fishbowl circle is based upon indigenous circle-keeping practices, and we honored this tradition with a land acknowledgment at the beginning of the event.
- Chem-unity end of year reflections event allowed seniors, younger students, and faculty to work in small groups and reflect on what has helped them in their scientific journey.

Examples of ongoing programs involving Chemistry faculty

We maintain a sustained commitment to ***Being Human in STEM (HSTEM)*** (CHEM 250), a nationally recognized course created in response to the 2015 Amherst Uprising. The course is student directed and has been curated from its inception by Professor Sheila Jaswal (Chemistry). Professor Jaswal is the recipient of the 2020 Jeffrey B. Ferguson Teaching Award, given in recognition for her efforts to investigate identity, inequality, and representation within the science, technology, engineering, and mathematics (STEM) fields at Amherst and beyond. She is also the recipient of the 2021 Carl Brändén Award (awarded by the Protein Society) for her HSTEM work. *Being Human in STEM* is offered regularly and has been cross-listed in Biology, Sociology, and Latinx & Latin American Studies and co-taught by faculty in those departments.

Summer Bridge Program: The Chemistry Department plays an active role in the annual Summer Science program, now part of the Summer Bridge Program, which provides incoming first-year students an opportunity to learn about research at Amherst and to navigate the transition from high school to college approaches to math and science. Dr. Richmond Ampiah-Bonney (Chemistry) has participated in the Summer Bridge Program and has welcomed new students into the Amherst

BIPOC STEM community since his arrival at the college in 2007. This year the program will be broadened to include mentoring by alumni and to incorporate social events as permitted.

STEM Incubator Program: The new summer research Incubator Program was launched in June 2020 by Professors Brittney Bailey (Math & Statistics), Chris Durr (Chemistry), and Marc Edwards (Biology). The Incubator aims to help FLI and BIPOC STEM students smoothly transition from first-year STEM courses into the more-advanced curriculum and ultimately to inspire its participants to major in STEM disciplines and to be active members of the college's STEM research community.

Curricular Innovation ("That students further their understanding of issues surrounding race and racism;" "that the demographics of your department's majors better reflect those of the student body;" "that the demographics of your department's senior thesis writers better reflect those of the student body;" "that your department work to create an inclusive and welcoming culture for all students and work to build community among majors.")

Syllabus statement: The Department has devised the following anti-racism statement and strongly encourages its incorporation into all Chemistry Department course syllabi:

The Chemistry Department is committed to equity, inclusion, and anti-racism. As a result of systemic racism, both nationally and here at the College, we are strengthening existing programs and spearheading new initiatives to make chemistry at Amherst College a more welcoming place for all students. We acknowledge that this work is ongoing, and together, we will continue to listen, learn, and strive for a just and inclusive community.

Mellon project: The Chemistry Department was awarded an internal Mellon-funded grant in 2020 to support inclusivity initiatives in the department. In phase one of the Mellon project, issues of perception around the Chemistry curriculum were addressed with the goal of making the major a more accessible and viable option to students with different academic backgrounds, plans, and goals. The second phase of the project will serve as the basis for curricular revisions that incorporate explicit concept integration, active learning strategies, and HSTEM-based inclusive practices to meet the needs of all students who major in Chemistry.

New Chemistry courses with attention to issues of race:

- ***Plant Cultures: Chemical Perspectives on Slavery and the Land*** (CHEM 120, also cross-listed as ARHA 120 and ARCH 120): This course, which was co-taught by Professor Dwight Carey (Art and the History of Art) and Visiting Professor Alberto Lopez (Chemistry) during the January 2021 J-term, introduced students to the social and chemical characteristics of the buildings and landscapes that slaves constructed in North Africa, the Caribbean, Latin America, West Africa, and the Indian Ocean from the seventeenth to the nineteenth century.
- ***Chemistry in Society*** (CHEM 260): The inaugural offering of this course is currently (fall 2022) being co-taught by Professors Jacob Olshansky and Ren Wiscons (both in Chemistry). The course was developed to provide an in-house avenue for students to satisfy the department's new DEI requirement (see below). The Chemistry Department believed that putting this requirement entirely on other departments was not responsible,

and therefore hopes to offer CHEM 260 at least every other year. The course allows students to learn about the historical context and systemic exclusion inherent to the development of western science. Students explore the role that chemistry has played in human society and how social structures have, in turn, influenced the field of chemistry. Students will then execute independent projects to more deeply explore the interconnectedness between topics of identity (such as race, sex, and socioeconomic status), inclusive practices, and Chemistry within the Amherst College community or broader communities.

Rethinking the first course in chemistry: Rather than viewing Chemistry 155 as the "honors" version of general chemistry and Chemistry 151 as the "regular" version, these two courses have been reimagined with an intention of providing an introductory chemistry experience that allows students with all levels of proficiencies in quantitative skills to feel welcomed in either of the two courses. As part of this initiative, artificially imposed enrollment caps have been removed and the laboratory sections for the two courses have been combined (with students from both 151 and 155 side-by-side in every lab section). The courses are also offered during the same time slot. Students may thus enroll in the course more appropriate to their previous experience in STEM without regard to scheduling or enrollment caps. The common laboratory sections of between 15 to 24 students also provide an opportunity for community building exercises in a small-enrollment setting.

DEI elective requirement for Chemistry majors: The Amherst College Chemistry Department is committed to supporting and uplifting all members of our community as well as promoting cross-disciplinary conversations on systemic issues of diversity, equity, and inclusion. As such, the department has recently added (effective with the Class of 2024E) a DEI requirement: Majors must now complete a departmentally approved course that addresses topics of identity (e.g., race, gender and sexuality, socioeconomic status) and their intersections with STEM disciplines.

- Students may choose a course from an approved list that includes offerings by the Chemistry Department, other departments at Amherst College, or within the Five Colleges.
- In consultation with their Chemistry major advisor, students may alternatively propose a course not on this list to be approved by the Chemistry Department.
- Students will share their experience in the course with members of the Chemistry Department through a presentation during the department's seminar series.

Some examples of anti-racist strategies employed in individual Chemistry courses ("That the demographics of your department's majors better reflect those of the student body;" "that the demographics of your department's senior thesis writers better reflect those of the student body;" "that your department work to create an inclusive and welcoming culture for all students and work to build community among majors.")

CHEM 155: This course is typically offered to first year students with strong preparation in chemistry and math, and serves as an introduction to college-level chemistry. Recent iterations of this course have included a number of anti-racist and inclusive practices. The first day of the course includes icebreakers and a discussion on community norms. Each lecture includes active learning worksheets that allow the students to engage with the material in a low stakes environment. Furthermore, lectures often include connections between the course material and real-world examples, a strategy known to increase retention in STEM classes. Finally, every Friday throughout the semester features a 5- to 10-minute segment titled "Humans in Chemistry." These short segments intentionally implement anti-racist practices and are inspired by *Being Human in STEM*. Topics covered have included advice for students in STEM such as using a growth mindset approach to learning, encountering bias in STEM, and recognizing imposter syndrome. These segments have also highlighted the personal stories of notable chemists from underrepresented groups.

CHEM 221/231 Intensive Section: In both the "on-semesters" of Chemistry 151 and 161 (general chemistry) and of Chemistry 221 and 231 (organic chemistry), the department offers an "intensive section" designed for students who may need a bit more practice with challenging problems to help sort out the more complex concepts from the previous week's material. Recent iterations of the intensive section in Chemistry 221 and 231 have included a number of anti-racist and inclusive practices. The first day of the course includes icebreakers, such as a Family Album, or more simply answering a question like what is your favorite meal or aroma. Each intensive section includes active learning worksheets that allow the students to cooperatively engage with the material in a low-stakes environment. Sometimes taking the form of "think-pair-share," the students first think about the problems and attempt them by themselves for 10–20 minutes, then move into groups to talk through the questions with a final sharing out by the groups or by the instructor. The section often opens with a PowerPoint slide that includes either a lesson from *Being Human in STEM* or a highlighting of the relevance of the day's material to the real world. These presentations have also featured the personal stories of notable chemists from underrepresented groups that are related to the topic at hand. Julian Percy, for example, is highlighted in the Chemistry 231 intensive section with regard to his work electrophilic aromatic substitution chemistry. The second lecture of Chemistry 221 in fall 2021 included learning strategies for organic chemistry, and students in the intensive section were asked to write down one strategy for success that they would try or already had tried. The intensive instructor then checked-in with the students a few times during the semester on their chosen strategies.

CHEM 165 and CHEM 351: These courses taught by Professors Leung and Marshall have included short, personal videos recorded by "Real Chemists" from around the world that feature both their research and personal stories. An intentionally diverse group of presenters with respect to gender, sexuality, race, nationality, background, and disability status was chosen.

Demographics of the Department's majors and senior thesis writers ("That the demographics of your department's majors better reflect those of the student body;" "that the demographics of your department's senior thesis writers better reflect those of the student body.")

The department has been adopting inclusive practices for decades and certainly, as outlined above, these efforts have increased even further in recent years. We were extremely gratified to see the that the demographics of our Chemistry majors and thesis writers parallel to a remarkable degree the demographics of the student body as a whole (see the data in "Demographics of Majors: Graduated Classes of 2018–2022" provided by the provost). We would note the *over*representation, in particular, of women students, both among majors and thesis writers. We also recognize the *under*representation of Black students, both as majors and thesis writers.

Needless to say, all of us in Chemistry look forward to actively continuing our anti-racism efforts in the future.