UNIVERSITY OF MINNESOTA

Twin Cities Campus

Office of the Dean
College of Biological Sciences

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To Admissions Committees/Coordinators:

Since fall of 2016, University of Minnesota pre-health students in the College of Biological Sciences (CBS) have been completing the following sequence of general, organic, and biochemistry courses. The University of Minnesota developed this sequence for life sciences majors to focus on topics and principles that are most important for understanding molecular and chemical features in biology. This approach aligns with curricular innovations being implemented at other institutions e.g. UCLA and Purdue University. Evidence-based work (*e.g. Schnoebelen et al, J. Chem. Ed., 2018; Loudon et al, HHMI-funded NEXUS program*) has shown that this approach improves student performance in organic chemistry and is more beneficial for preparing students for advanced life sciences coursework.

This three-semester series was developed specifically to prepare students in life sciences with the chemistry knowledge needed to be successful in their domains. In reducing content that is less central to the life sciences, the sequence allows students to progress through the chemistry content most critical to the life sciences, as well as engage in more advanced coursework sooner. The 13-credit series is as follows:

- **CHEM 1081/1065: Chemistry for Life Sciences I and Lab (4 credits):** Adapted from traditional first-year general chemistry courses, this pairing focuses on fundamentals of general chemistry that are most relevant to the biological sciences and that prepare students for organic chemistry and biochemistry content.
- **CHEM 1082/1086: Chemistry for Life Sciences II and Lab (4 credits):** These courses begin introducing students to organic chemistry content that is relevant to the biological sciences.
- **CHEM 2081/2085: Chemistry for Life Sciences III and Lab (5 credits):** This final semester focuses exclusively on remaining organic chemistry content and its application in biologically-relevant contexts.

This series is the preferred option in the College of Biological Sciences (CBS), fulfills the same degree requirements as the traditional chemistry sequence, and students who complete this rigorous chemistry sequence are ineligible to enroll in additional introductory general and organic chemistry coursework at the University of Minnesota due to duplicate course content and credits. In addition to this three-semester sequence, students in CBS experience a robust preparation in the physical and life sciences through these additional required courses:

- Foundations of Biology series (BIOL 1951, 1961, 2003 and 3004: A nationally-recognized, award-winning foundational biology series of 12 credits that engages students in finding biological solutions to real world problems. Foundations of Biology focuses on the team nature of scientific discovery, hands on problem-solving, as well as foundational biology knowledge.
- Biochemistry (BIOC 3021, 3022 and 4331): Designed as the fourth semester after the three-semester chemistry sequence, our biochemistry courses capitalize on the knowledge built in the sequence to teach more in-depth and cutting edge biochemistry as relates to the life sciences.

CBS students also complete at least 3 credits of molecular biology through introductory and advanced biological sciences coursework in CBS majors. We ask that you review and regard these courses as satisfactory preparation for your programs. Please respond with any questions or concerns to cbsask@umn.edu, and your email will be connected to our pre-health career coach.

Sincerely,

Clay Carter
Professor of Plant and Microbial Biology
Associate Dean for Undergraduate Education, College of Biological Sciences
University of Minnesota Twin Cities