



Memorandum

To: Provost and Chief Academic Officers

From: State of Ohio Organic Chemistry Transfer Assurance Guide (TAG) Panel

Date: May 6, 2020

Subject: Teaching of Organic Chemistry Laboratory Courses During Covid-19 Pandemic

Dear Chemistry Department Colleagues,

As institutions deal with the challenges associated with delivering their chemistry curricula through remote teaching and learning as a result of the current Covid-19 pandemic, the Organic Chemistry Transfer Assurance Guide (TAG) Panel wishes to share with the Ohio chemistry community our concerns about the use of fully at-distance (virtual) organic chemistry laboratory course sequences to fulfill the laboratory component of the Organic Chemistry TAG. These concerns relate both to (i) major safety concerns if students move on in their degree studies and/or careers without adequate preparation in mastering safe laboratory procedures, and (ii) pedagogical issues relating to the replacement of an inherently practical and active hands-on training involving extensive laboratory technique development with a more passive at-distance approach where students cannot readily achieve the same learning.

The approved documentation for the Organic Chemistry TAG (OSC010), which details transfer between Ohio state institutions of the full-year sequence of Organic Chemistry (with labs), explicitly states that “[a]ll experimental organic chemistry lab work will be performed in a traditional hands-on lab setting.” Through Spring and Summer 2020, the Chancellor of the Ohio Department of Higher Education has permitted the use of on-line delivery for all courses, including labs. However, in the event that classes continue to be delivered via remote teaching and learning for Fall 2020 or beyond due to this pandemic, and an institution wishes to temporarily use virtual/at-distance labs for delivery of some components of its organic chemistry lab curriculum during this period, then the panel wish to emphasize that the **onus is on that institution to ensure that the learning outcomes of the Organic Chemistry TAG are met and assessment of the learning outcomes can be adequately measured**. For your information, attached herein are the currently approved Organic Chemistry TAG Guidelines.

If you do intend to continue to teach your organic chemistry laboratory courses during this challenging period, we urge you to find creative approaches which will ensure that your students achieve the best possible laboratory experience. As a short-term solution this summer, one institution is videotaping each of the experiments in the lab course as they are conducted in the lab by the instructor. The students must watch this recording, make observations and complete all other tasks and write-ups that are normally required for each experiment. Among approaches that are being examined going forward for possible Fall implementation, in the event that we remain at-distance, is the repackaging of activities between the two semesters of the organic chemistry lab sequence to allow for a virtual first semester experience heavy in activities that focus on areas that are more amenable to virtual learning, such as single and multi-technique spectral interpretation, TLC, and mechanistic exploration through video interpretation. A subsequent face-to-face second semester organic chemistry lab course for these students, to be held when classes can again be held on campus, could then emphasize during the first several weeks important hands-on technique development usually covered in the first course, followed by the practical application of these techniques in conducting a broad range of synthetic transformations. Although certainly not ideal, it should be possible through such an approach to achieve the core learning objectives of the organic chemistry laboratory sequence.

In closing, we wish to emphasize that, in line with the recent statement from the *American Chemical Society's Committee on Professional Training* on laboratory learning during this Covid-19 outbreak, “[o]nce institutions revert back to face-to-face instructions, all laboratory experiences must be performed face-to-face as well.”

We wish you well as you design appropriate organic chemistry laboratory experiences for your students during this Covid-19 pandemic.

Sincerely,

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Bryant Gilbert, Zane State College
Christopher Hadad, Ohio State University
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