

ABSTRACT ID: 2967394

ABSTRACT TITLE: Bringing interdisciplinary drug discovery research methods into the organic chemistry laboratory (final paper number: 872)

SESSION: Research-based Activities in Chemistry Classroom & Laboratory

SESSION TIME: 2:00 PM - 5:00 PM

PRESENTATION FORMAT: Oral

DAY & TIME OF PRESENTATION: Tuesday, July, 31, 2018 from 4:40 PM - 5:00 PM

ROOM & LOCATION: 204-DeBartolo Lecture Hall

Novel methods of teaching through research are changing the way that chemical skills are taught from more traditional laboratory classes using well-known and predictable experiments to incorporating research questions which can potentially lead to publishable results. We present a description of a course modeled after a drug discovery effort towards a therapeutic for Alzheimer's disease through both the Organic Chemistry and Cell Biology laboratory classes. Modeled after a research group, students meet at group meeting weekly as a pre-laboratory lecture to discuss research questions, propose synthetic analogs, determine biological assays and discuss results. Students are first introduced to curcumin, our target molecule, and its' potential therapeutic effects. In laboratory, students start with isolation of curcumin from turmeric and biological experiments to validate activities with pure curcumin. Throughout the course, the students learn organic reactions (aldol, hydrogenation, acylation, diazole formation) through the synthesis of analogs that will probe specific structural features of curcumin that could be responsible for activity (Figure 1). The students concurrently run biological experiments to explore whether these structural analogs are biologically active. Ultimately, students design their own two-week capstone project to synthesize analogs of interest. During both laboratory sections students learn many skills including data collection and characterization, as well as research skills such as reading literature and determining research questions.

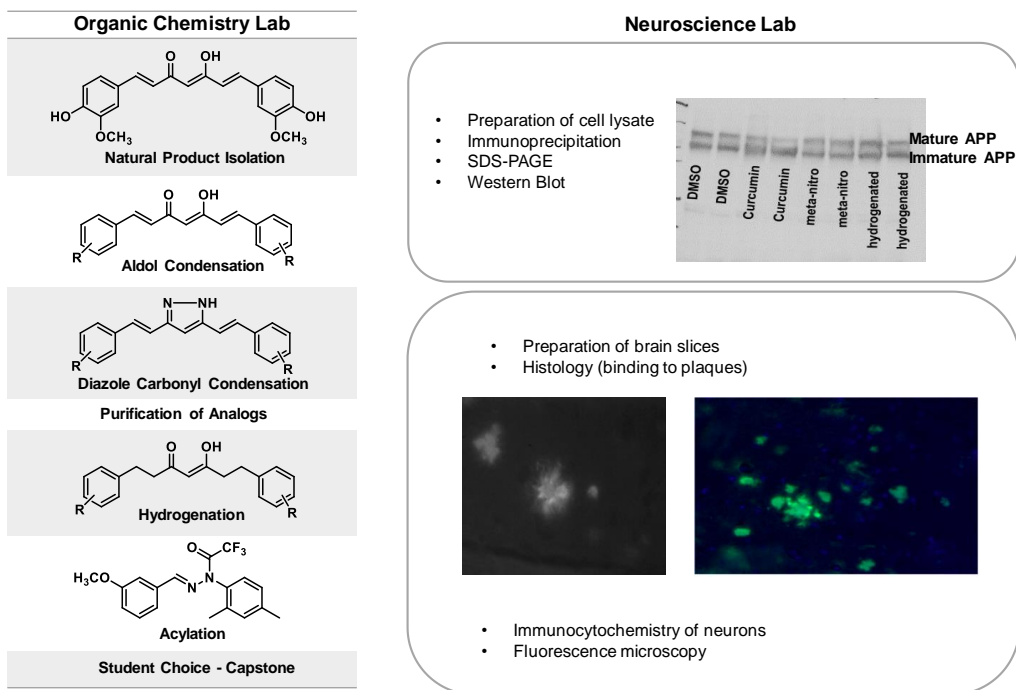


Figure 1. Overall course structure of both organic chemistry and neuroscience lab components.