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Student to Scientist: Effects of Using Art as a Platform for Discovery in a Microbiology Lab Class

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Student to Scientist: Effects of Using Art as a Platform for Discovery in a Microbiology Lab class

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Course-based Undergraduate Research Experiences (CUREs), replacements to prearranged “cook-book” labs, allow students to generate potentially publishable data in a way that mirrors the authentic practice of science. Students who participate in research are more likely to stay in their science programs and pursue science beyond undergraduate studies. While creativity is essential to the scientific process, it has been neglected in reform efforts. For instance, petri dish art (drawing microbes on agar) is often used in undergraduate microbiology labs to foster creativity, but it has yet to be included in CURE research as a way to engage students.

Reforming microbiology education to include ecology and evolution is of interest given the growing relevance of these topics to health care fields in the genomics age. We reformed a microbiology cookbook lab at our institution into an ecology-focused, art-infused CURE. Students used petri dish art as a discovery platform to develop their own scientific investigation into the ecological interactions amongst novel bacterial isolates. We hypothesized that these students would be more likely to i) identify themselves as scientists and ii) have greater learning gains. These experiments looked at science attitudes pre- and post-(nature of science surveys and focus groups) and learning outcomes post (analysis of student research reports). The results indicate that students in the art-based CURE, compared to a similar cohort in a cookbook lab, were significantly more likely to have more expert like-attitudes about identifying as scientists. The results of this study have implications for infusing creative activities into science reform efforts. Such efforts have ramifications for the student scientist in the classroom and beyond.