

SoapyCilantro: A Hands-On Introduction to Genomics 2021-2022 STEM Scale-Up Program

Grade Levels: 6-12, available in school and out of school

Information Sessions: January 26, 4pm via zoom

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Video Link: <https://vimeo.com/492622238>

Website: <https://www.drake.edu/cphs/soapycilantro/>

Award Provides:

- 5-day, 45 hr Professional Development
- Consumables: molecular biology grade reagents, disposable and consumable plastics, and copies of instruction manuals for each DNA analysis kit (for 25 students)
- Non-Consumable equipment: Four micropipettes, one microcentrifuge, one thermocycler, one gel electrophoresis apparatus including a constant voltage power supply, and an imaging station.
- \$50 travel/day support/educator
- \$120/day stipend to attend training
- Continuing education credits (3)

Additional Cost(s) to Awardee In 2021-2022:

Optional continuing education credits

Approximate Sustainability Cost After Award Period:

- \$825 in consumable materials/25 students
- \$150-250 to train a new educator
- \$1,250-1,400 to replace equipment (every 4-5 years)

Program Summary:

The SoapyCilantro practicum offers hands-on learning experience in Precision Medicine connecting genomics to human health and agriculture. In this Iowa-grown program, students isolate and analyze their own DNA in their classroom. Students taste fresh cilantro leaves and note down the taste: Spicy, mild spicy or soapy. They collect their own buccal (cheek) cells, purify genomic DNA, amplify their gene responsible for cilantro taste and detect their genotype. Students correlate their genetic and taste-test results and discuss implications of genetic variations to human health using this innocuous 'cilantro taste' human trait. Student centered: students isolate and analyze their own DNA, and relate it to their own genetic trait.

Connecting genetic variations to individual health brings it into the realm of 'real-world' scenarios where students relate to issues like health insurance, patient privacy and social responsibility. The hands-on learning experience engages students in acquiring fundamental knowledge about principles of genetics, molecular biology and bioinformatics. They also learn how to apply these principles and the knowledge to improve human health and/or agriculture. Additionally, students acquire transferable research skills such as building and testing hypotheses, planning and conducting experiments, as well as collecting, recording, analyzing, interpreting and presenting results. Learners also gain experience in team-work, communication, leadership and time management.

What is Required to Implement the Program:

- Attendance at 5-day (45 hour) summer professional development.
- Participation in the spring STEM Scale-Up Evaluation.

Professional Development:

Our week-long enquiry-based course combines didactic, hands-on and team-based learning experiences. In the morning sessions, participants learn basic concepts and select applications of Precision Medicine (PM) through lectures and team discussions. In the afternoon, participants conduct laboratory and bioinformatic protocols to isolate and analyze human DNA, and learn to apply this information to human health. Through team-based discussions, participants explore the ethical, social and legal implications of Precision Medicine, in preparation for implementation and discussion with students in class. Successful completion of this course enables participants to receive three continuing-education credits.

Duration: 5 day (45 hours)

Date(s): July 19-23 and August 9-13

Location: TBD