

# Bioinformatics and Computational Biology in the Liberal Arts

## Workshop Proposal Submitted to the Alliance to Advance Liberal Arts Colleges

Timeline: Summer 2023

Location: Reed College, Portland, Oregon

### Workshop Leaders:

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### Workshop Description

**Rationale:** Incredible strides in DNA sequencing and imaging technologies have revolutionized many fields of biology, resulting in data-intensive experiments that require researchers to develop computational skills to be prepared for these scientific fields. At the same time, novel computational problems have emerged from these datasets that require efficient and accurate solutions. Bioinformatics and computational biology are fields at the intersection of biology and computer science, and are quickly becoming an important curricular topic at liberal arts colleges. While societies and larger institutions have developed curricula for bioinformatics and computational biology, at AALAC and similar institutions these topics are often mentioned in one or two courses across STEM. We are at a pivotal moment to consider the role of bioinformatics and computational biology training in the liberal arts, and share strategies for pedagogical and research support across the AALAC.

**Intended Audience:** This workshop is intended to bring computational scientists and molecular and cellular biologists together to discuss the curricular and research opportunities for bioinformatics and computational biology in the liberal arts. While biology and computer science are the main focus, faculty from chemistry, neuroscience, the social sciences, statistics, or math may also be interested in the workshop. In light of the pandemic's widespread disruptions, we think it is also important to set aside time for potential collaborative discussions related to faculty research.

**Workshop Goals:** The goals of the workshop are to (1) share the state of bioinformatics and computational biology education at AALAC schools, including topics that are currently covered and topics that need coverage, (2) brainstorm and share teaching ideas, pedagogical materials, and course resources, and (3) network with workshop attendees to identify potential research collaborations and funding opportunities.

**Intended Impact:** We hope that attendees will gain a better understanding of how bioinformatics and computational biology is being taught at peer institutions, as well as some resources for their own courses. We also hope that this serves as a point of potential research collaborations across AALAC institutions.

**Tentative Schedule and Format:** This will be an in-person 2-day workshop with two invited speakers: one from biology and one from computer science. Each session will include an organizer overview talk, attendee flash talks and discussion.

- Day 1 Morning: Existing bioinformatics and computational biology curricula
- Day 1 Afternoon: Future bioinformatics and computational biology curricula
- Day 2 Morning: Faculty research in bioinformatics and computational biology
- Day 2 Afternoon: Funding Panel and collaboration discussions

**Follow-Up Activities, Assessment, and Products:** Workshop organizers will compile curricular resources and faculty profiles for a web-page, which include a summary of the workshop and serve as a resource after the workshop concludes. The workshop will be assessed through surveys 6 months out and one year out about the workshop's impact in terms of (1) whether resources have been used in the classroom or in research and (2) whether attendees continued collaborations after the workshop.