Seattle Hub for SYNTHETIC BIOLOGY

SeaBridge

ALLEN INSTITUTE

Chan Zuckerberg Initiative

UNIVERSITY of WASHINGTON

SeaBridge Postdoctoral Fellowship Program: *Information Session & Scientific Panel*

June 24, 2025

Welcome and today's agenda

- SeaBridge Introductions & Overview
- Brief overview of the Seattle Hub for Synthetic Biology
- Examples of Fellowship Proposals
- FAQ's & Pre-submitted Questions
- Q & A
- Wrap-up

SeaBridge Introductions –
Today's Session

Marion Pepper
Co-Director,
Seattle Hub for
Synthetic Biology

Jesse Gray
Director of Strategy &
Science Operations,
Seattle Hub for
Synthetic Biology

Carrie Brockway
Executive Director,
SeaBridge

Renee Ireton
Director of Integrative
Operations,
SeaBridge

Alison Stanbery
Program Director -
Fellowship & PROPEL NW,
SeaBridge

Overview of SeaBridge

We will grow the local scientific ecosystem by investing in training and the development of Seattle Hub for Synthetic Biology human cell & genome programming technologies

- SeaBridge is a 5 year program
- SeaBridge will fund up to 10 Fellows per year
- Rolling application process
- Fellowships are 2 years, including reporting requirements
- Fellows will opt into either Entrepreneurial or Discovery tracks; we provide each track with training to support the Fellows desired focus

Washington Research FOUNDATION

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Overview of Seattle Hub for Synthetic Biology

- Unique partnership between three entities
- Agreement finalized December 8, 2023
- Launched January 1, 2024
- Funding from CZI ($35M) and Allen Institute ($35M)
- Science at UW and Allen Institute/Dexter Yard
- 5-yr renewable commitment

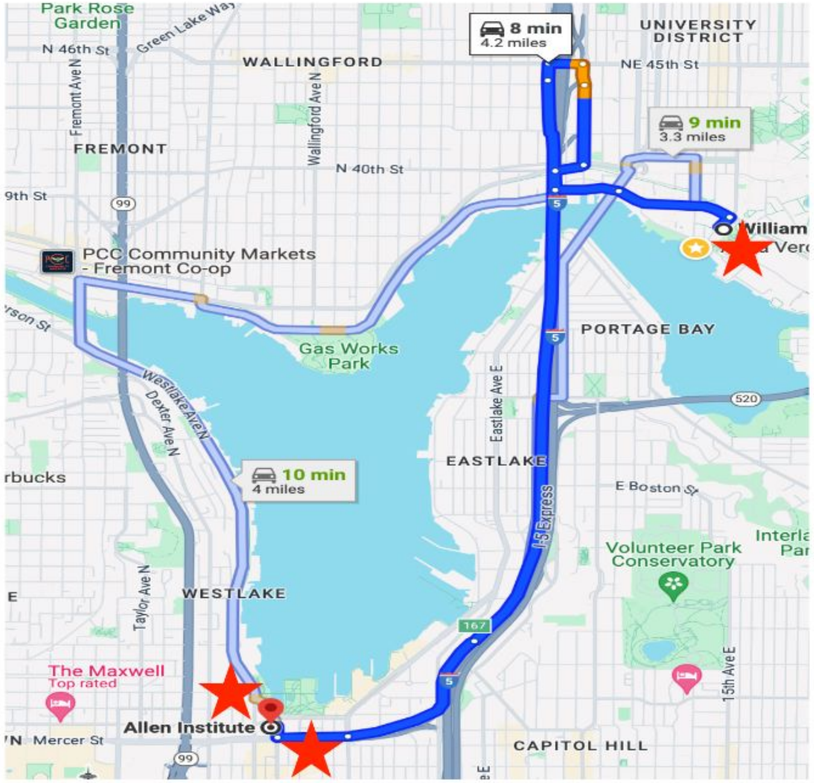
Jay Shendure
Lead Scientific Director

Marion Pepper
Co-Scientific Director

Cole Trapnell
Co-Scientific Director

Jesse Gray
Director of Strategy & Science Operations

Robin Prentice
Director of Operations



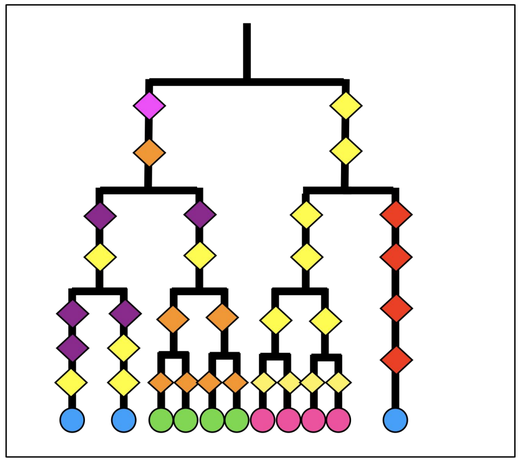
seabridgefellowship@uw.edu

Seattle Hub for Synthetic Biology
Mission & Science

Our mission is to generate the foundational datasets, models and molecular infrastructure to reengineer cells to record their own histories and reprogram disease to health.

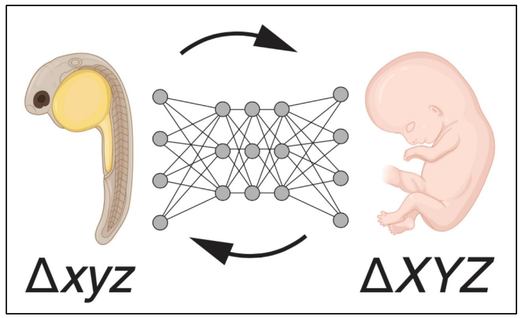
Longitudinal recording

- Turning cells & organisms into their own historians via DNA-based molecular recording (*e.g.* DNA Typewriter, ENGRAM)
- Initial focus on tech-dev, development and immunology



Embryo-scale reverse genetics

- Systematically mapping the conserved genetic program of vertebrate embryogenesis at single cell resolution
- Initial focus on zebrafish embryos and mammalian gastruloids



Fellowship proposal example 1

I am an immunologist interested in recording specific types of T cell cues in the tumor microenvironment. I propose to work with SeaHub scientists to introduce ENGRAM-based recording of WNT signaling in skin-resident T cells in my model of melanoma using CD8+ transgenic T cells into which we introduce recording constructs.

I am interested in working with the Sense Team at SeaHub's Dexter Yard platform to accomplish this.

Fellowship proposal example 2

I plan to study the generation of heart cells from iPSCs* and would like to use SeaHub's DNA Typewriter system or related biological recording technologies to optimize the differentiation process.

I am interested in working with the Write team at SeaHub's Dexter Yard or the Shendure lab at UW to accomplish this.

*There are many examples of different systems in which lineage recording or biological recording more broadly can be applied:

- Development of different organ systems
- Applications in different model systems

Fellowship proposal example 3

SeaHub is using large scale genetic and chemical perturbations to map gene regulatory networks that activate and govern cell-type specific gene expression programs in healthy tissues, but how to engineer synthetic programs that shift cells from pathological to healthy states remains unclear.

1) Construct a software tool that uses SeaHub gene regulatory networks to identify the minimal set of extrinsic signals or genetic perturbations needed to restore a given disease-specific cell state to one or more healthy states.
2) Design an ENGRAM-based mouse with a "disease state" recorder that can be used for quantifying the efficacy of interventions meant to restore diseased cells to health, for example to measure pro-fibrotic signals. Use perturbations like bleomycin exposure, or other insults (+ known anti-inflammatory interventions or ideally interventions proposed by the tool in Aim 1)

I am interested in working with the Trapnell lab and the Sense Team

Fellowship proposal example 4

I would like to implement and optimize multiplex signal recording in an organ-specific organoid model in which my lab has expertise and interest.

I am interested in working with the Sense team at SeaHub's Dexter Yard and the Shendure lab at UW to accomplish this.

Non-exhaustive List of Potential Projects

- Use of ENGRAM to improve target identification in drug development
- Development of DNA Typewriter compatible sensors
- Use of Typewriter/ENGRAM to improve CAR-T manufacturing
- Use of Typewriter/ENGRAM to improve CAR-T performance *in vivo*
- Use of Typewriter/ENGRAM for autoimmune target identification
- Development of HSV as a tool for big DNA delivery in mouse-making
- Engineering iPSCs to reduce the need for growth factor addition
- Use of ENGRAM as a tool to evaluate toxicity of drug candidates
- Using biological recorders to create datasets for ML training
- Programmable cell therapies from iPSCs
- Implement and optimize multiplex signal recording in an organoid model in which my lab has expertise and interest

Q & A

FAQs and Pre-submitted Questions

Visit our FAQs page on our website for more commonly asked questions.
(www.seabridge.uw.edu)

Eligibility:

1. I am currently on my 37th month of postdoc employment. Will I still be eligible to apply?

Capacity/Program:

1. When do you anticipate the first cohort of Fellows to begin their fellowships?
2. Will receiving the fellowship impact other benefits (retirement, etc.)?

Application content/process:

1. If an applicant is rejected, can they improve their application and re-submit?
2. When is the first review expected to take place?
3. Is there a recommended application timing for initial applicants?
4. How closely does the proposal need to be related to current research aims at SeaBridge? I.e. how specific vs. broad of research topics are you looking for?
5. Do we need to be specifically collaborating with someone at SeaBridge?

FAQs and Pre-submitted Questions

Eligibility:

1. **I am currently on my 37th month of postdoc employment. Will I still be eligible to apply?**
   Our criteria is that applicants may have 0-36 months of postdoctoral fellowship experience at the time of application. Postdocs with more than 36 months of experience are ineligible.

Capacity/Program:

1. **When do you anticipate the first cohort of Fellows to begin their fellowships?**
   We anticipate that the first round of fellows would begin their fellowship in Jan 2026.
2. **Will receiving the fellowship impact other benefits (retirement, etc.)?**
   Funding will be provided as an award, thus the employment status of postdoctoral fellows at their institution should not change if they are offered a SeaBridge Postdoctoral Fellowship Award.

Application content/process:

1. **If an applicant is rejected, can they improve their application and re-submit?**
   Yes, applicants may re-submit an improved application. Applicants may re-submit once per 12 month period after the first submission, as long as applicant meets the eligibility criteria.
2. **When is the first review expected to take place?**
   We anticipate pulling the first round of applications on July 31st.
3. **Is there a recommended application timing for initial applicants?**
   We have a rolling application process to make it as seemless as possible for great candidates.
   We recommend that applicants submit their application at the time that they can put forth their best application and at least 6 months prior to when they would like to start the fellowship.
4. **How closely does the proposal need to be related to current research aims at SeaBridge? (i.e. how specific vs. broad of research topics are you looking for?)**
   Synergy between the proposed project and Seattle Hub science is a major selection criteria for applications. The more synergistic the project is with SeaHub, the better. During the information session, we provided example projects.
5. **Do we need to be specifically collaborating with someone at SeaBridge?**
   No, but the scientific research proposed must involve Seattle Hub for Synthetic Biology technology.

Wrap-up

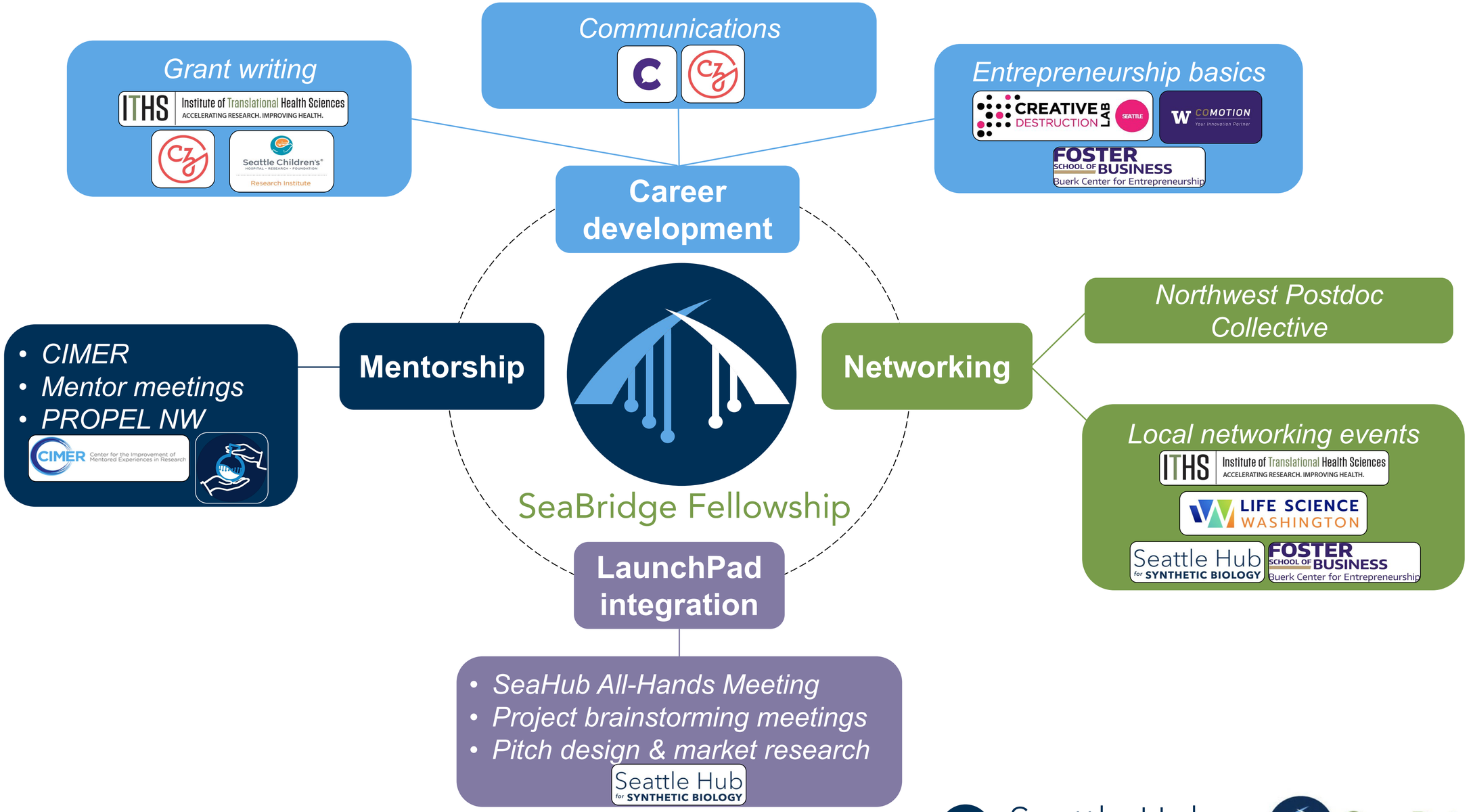
Contact us with additional questions!

Email: seabridgefellowship@uw.edu

SeaBridge website:

Follow us on LinkedIn!

SeaBridge Postdoctoral Fellowship Program



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