The Green Biome Institute

Cal State East Bay

Braddock Center for Science and Innovation

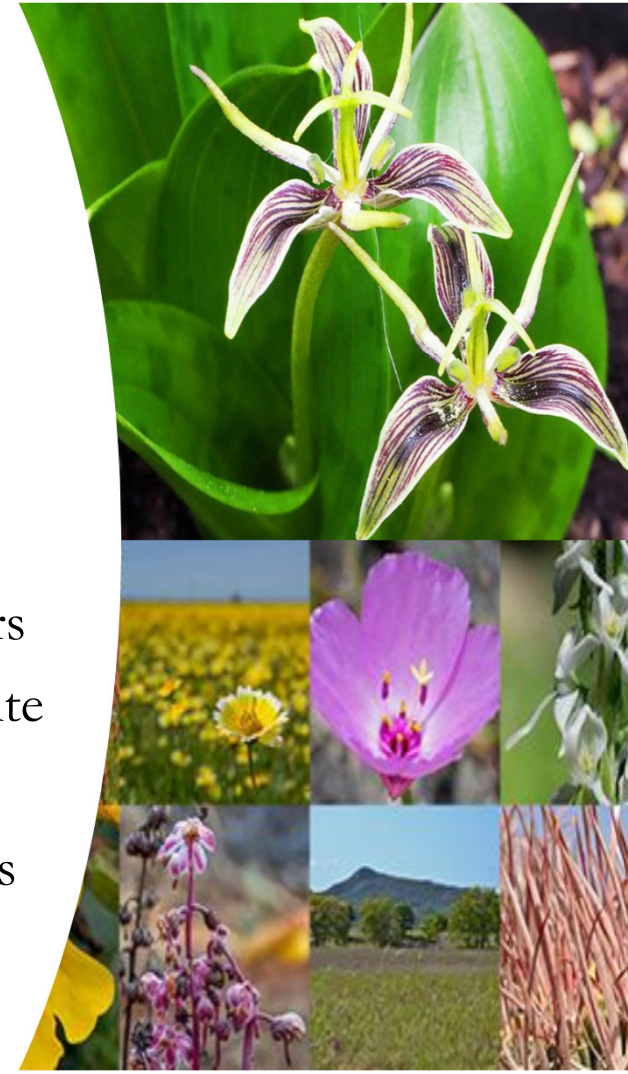
GREEN BIOME INSTITUTE
CAL STATE EAST BAY

The Green Biome Institute (GBI)
Program Update
December 20th, 2025

GREEN BIOME INSTITUTE
CAL STATE EAST BAY

GBI Review

- Welcome
- Mission Statement
- Current Academic Activities
- Student involvement
- Gardens, Collections, and Partners
- Data Available on the GBI Website
- The GBI Team and Contacts
- Appendix- Conservation Websites



GREEN BIOME INSTITUTE
CAL STATE EAST BAY

GBI Mission Update

Conserving biodiversity, improving human health, and growing tomorrow's leaders through genetic research and conservation of California's endangered plants.

**** Contribute to conservation and medicinal research by producing draft sequence assemblies of the nuclear genome, the chloroplast, and the microbiome for 250 endangered California plants by 2027.**

**** Support the conservation of plant species by providing population genomics data and by advancing propagation and seed banking of hard-to-store plants in collaboration with Botanical Gardens and other conservation-focused institutions.**

**** By using genomic sequencing data and metabolomics, uncover the medicinal potential of endangered California plants and contribute to the discovery of new sources of important medicinal compounds by 2027.**

**** Make all GBI data public and freely available.**

**** Sponsor meaningful, state-of-the-art student training and mentorship to prepare our future leaders in the Sciences, including Conservation Biology, Genomics, and Drug Discovery.**

Current Academic Activities

- 30+ species of medicinally important Manzanita Nuclear Genome Assemblies complete, Illumina Transcriptomes in process, Metabolome in process.
- Low pass sequencing protocol for Population Genomics in development.
- US Forest Service- Pop Gen Arctostaphylos myrtifolia, Susan Frankel
- EPA-Pop Gen Arctostaphylos pallidia, Russell Huddleston
- SF Bay, US Fish and Wildlife- Pop Gen Erysimum, Bridgette Williams
- U.S. Fish and Wildlife Service- Pop Gen Lilium pardalinum, S. Howland
- Santa Clara University- Ref Sequencing Dudlya setchellii, J. Whittall
- Performing Comparative Analysis across 80+ unrelated species to showcase data, including barcode distribution, BUSCO genes, and ploidy.
- Ludwig Maximilians, University of Munich- Plant propagation, Ricardo Pereira

GREEN BIOME INSTITUTE
CAL STATE EAST BAY

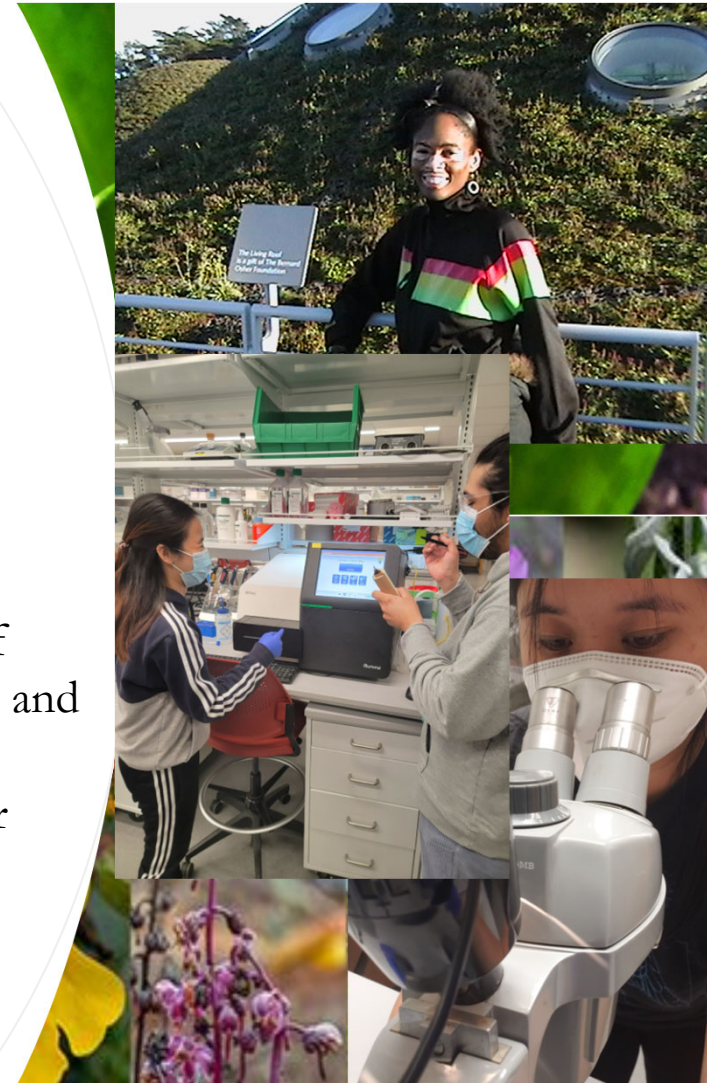
Student Involvement

Student Training

The foundation of the GBI is our students. GBI goals are attained through student training.

1,138 students have worked on GBI projects since 2019

GBI-sponsored reagents and plant material are used in one segment of undergraduate DNA Seq and PCR, and Molecular and Cell Biology classes. The GBI also supports the summer High School biotech program and numerous Biology Grad students every year.



GREEN BIOME INSTITUTE
CAL STATE EAST BAY

Student Involvement 1,138

- 2019 54 Undergraduate Students
  4 Graduate Students
  7 High School Students
- 2020 57 Undergraduates (Covid)
  5 Graduate Students
  2 High School Students
- 2021 240 Undergraduates
  8 Graduates
  7 High School Students
- 2022 261 Undergraduates
  7 Graduates
  14 High School Students
- 2023 237 Undergraduates
  6 Graduates
  12 High School Students
- 2024 201 Undergraduates
  5 Graduates
  11 High School Students

GREEN BIOME INSTITUTE
CAL STATE EAST BAY

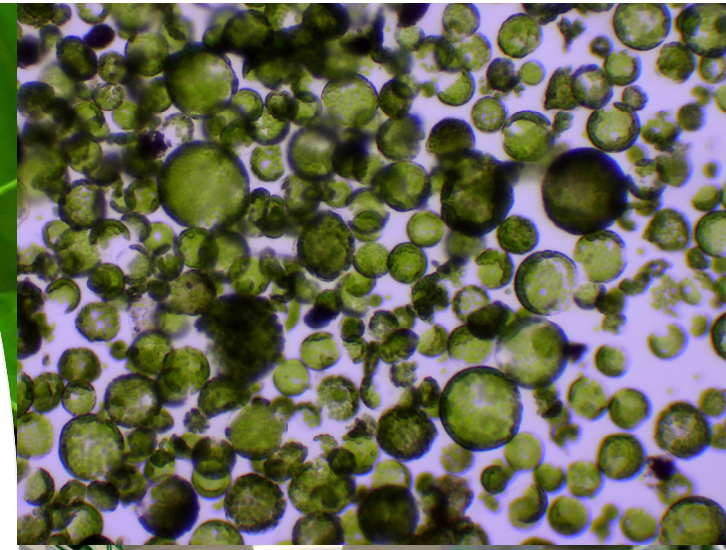
Botanical and Conservation Partners

- UCSC Botanical Gardens
- UC Berkeley Botanical Garden
- Tilden Regional Park
- SB Botanical Garden
- SF Botanical Garden
- California Botanical Garden
- San Diego Zoo
- Luther Burbank Gardens
- U.S. Forest Service
- U.S. EPA
- SF Bay Delta Fish and Wildlife Office of U.S. Fish and Wildlife
- Santa Clara University
- California Native Plant Society

GREEN BIOME INSTITUTE
CAL STATE EAST BAY

Analysis and Data Posting

- 151 rare plant nuclear sequencing datasets are through Analysis Pipeline and data posted to NCBI.
- 67 Draft Genome Assemblies being scrubbed for mitochondrial sequence.
- *This is the single largest number of rare and endangered plant genomes sequenced in the United States*



GREEN BIOME INSTITUTE
CAL STATE EAST BAY

Website Data Available and Downloadable

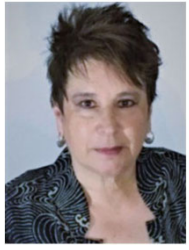
1. Link to all Sequencing Data and Accession Numbers
2. Link to Cal Flora Plant Phenotypic Data
3. Link to Smithsonian Barcode Analysis for all Plants
4. Link to Table of BUSCO genes across all Plants
5. Link to Compilation Spreadsheet of CA. Native Plant Society Rare Plant Listing, Seed Bank Listing, California Dept Fish and Wildlife and U.S. Dept. of Fish and Game Rare Plant Listing, and 6 California Botanical Garden's Living Rare Plant Inventories.

GREEN BIOME INSTITUTE
CAL STATE EAST BAY

The GBI in Pictures

GREEN BIOME INSTITUTE
CAL STATE EAST BAY

Team - GBI Scientists



Chris Baysdorfer - Director, Professor of Biology, Plant Genomics, Berkeley

Weilun Tan - Lab Manager, Bioinformatician, Masters Student CSUEB

Brian Perry - Assoc. Director, Professor of Biology, Fungal & Environmental Genomics, Harvard

Ana Almeida - Assoc. Director, Biology Dept. Chair, Plant Medicinal Compounds, Berkeley, Medical Degree EBMSP, Brazil.

Joanna Garaventa- Staff Scientist, Botanist, senior member of the California Native Plant Society, CSUEB and SFSU.

GREEN BIOME INSTITUTE
CAL STATE EAST BAY

Team – GBI Advisors

A solid team from Industry, Government, & Academia

Flint Mitchell - Principal, Mitchell Engineering Services, Plant Bioinformatics

Kevin Corcoran - Past VP Agilent Technologies & Pacific Biosciences

John Preece - Past Head of the National Clonal Germplasm Repository at UC Davis, Riverside, and, Peltier, CA.

Lee Kozar - Director Computational Services and BioInformatics Facility, Stanford University

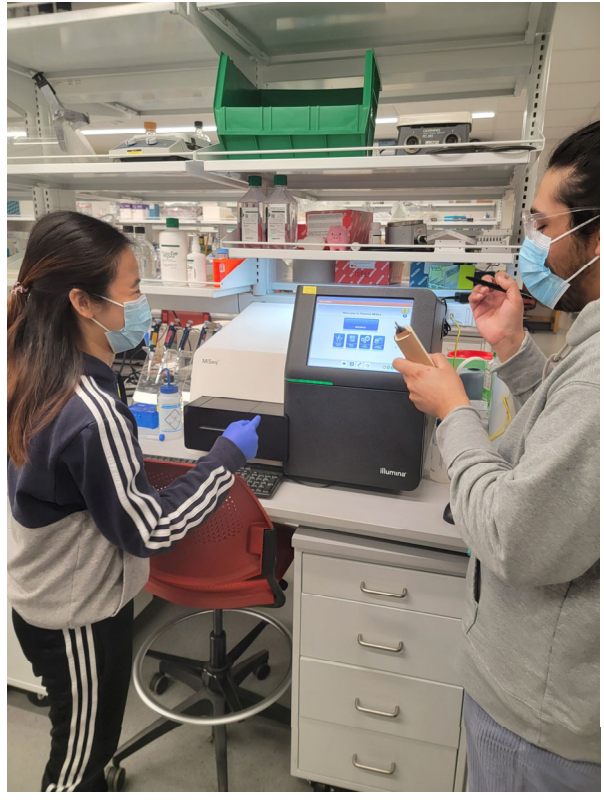
Randy Davis – Past Co-Founder and VP R&D Genia Technologies, Past Mgr. UCSF Genome Core

GREEN BIOME INSTITUTE
CAL STATE EAST BAY

How to reach the GBI!

https://www.csueastbay.edu/csci/green-biome-institute/

Or simply google-
Green Biome Institute!



GREEN BIOME INSTITUTE
CAL STATE EAST BAY

Appendix
Conservation Websites

- Green Biome Institute Mission Statement
- List of Conservation Websites
- List of all 545 CSU Institutes
- GBI Working Plant List
- Criteria for GBI Plant Selection
- List of Endangered Medicinal Plants
- CA Botanical Gardens that handle Endangered Plants
- CA Native Plant Society Endangered Plant List
- CA Dept Fish and Wildlife Diversity Database and Seed Bank List
- Links to Worldwide Genomics Projects
- Example Rare Plant Photos and Geographic Locations