Cold Spring Harbor Laboratory

Researcher Perspectives – NIH Generalist Repository Ecosystem Initiative (GREI) Workshop

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Generalist Repository Ecosystem Initiative (GREI) Workshop, Online
January 2023

DOWNLOAD SLIDES

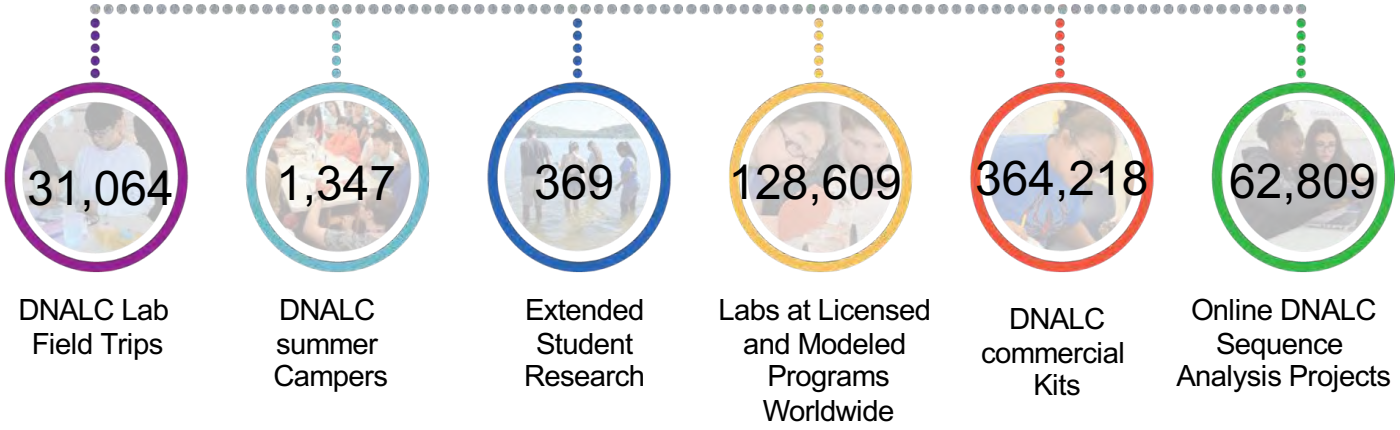
bit.ly/grei-jan-2023


Cold Spring Harbor Laboratory

“Prepare students and families to thrive in the gene age…”

CSHL DNA Learning Center

588,416 Annual Exposures

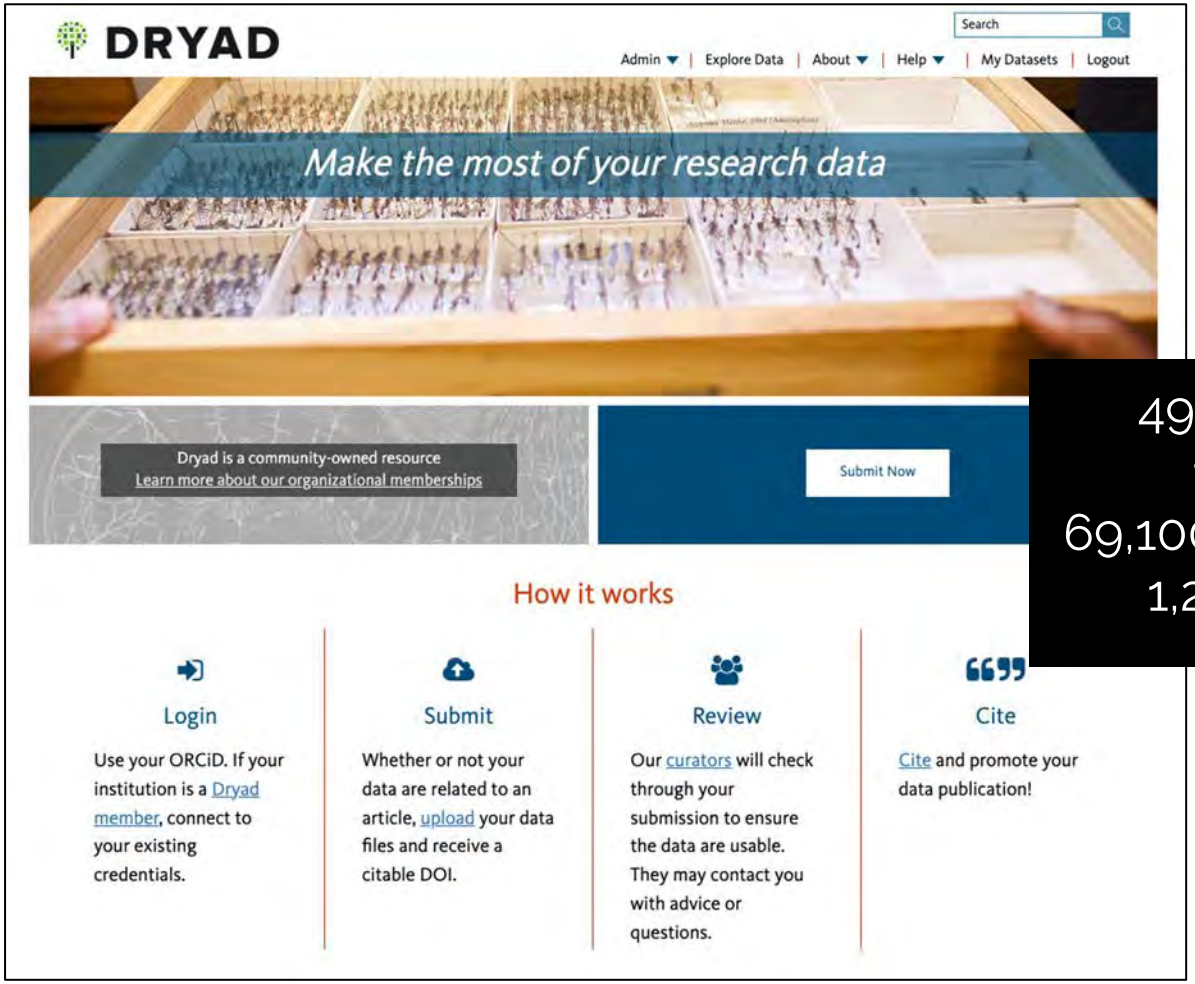


An **open data publishing platform & community** committed to the **open availability and routine re-use** of all research data

AN OPEN DATA PUBLISHING PLATFORM & COMMUNITY

Vision: **All research data is openly available and routinely re-used**

Mission: **Enable and promote** the re-use of research data

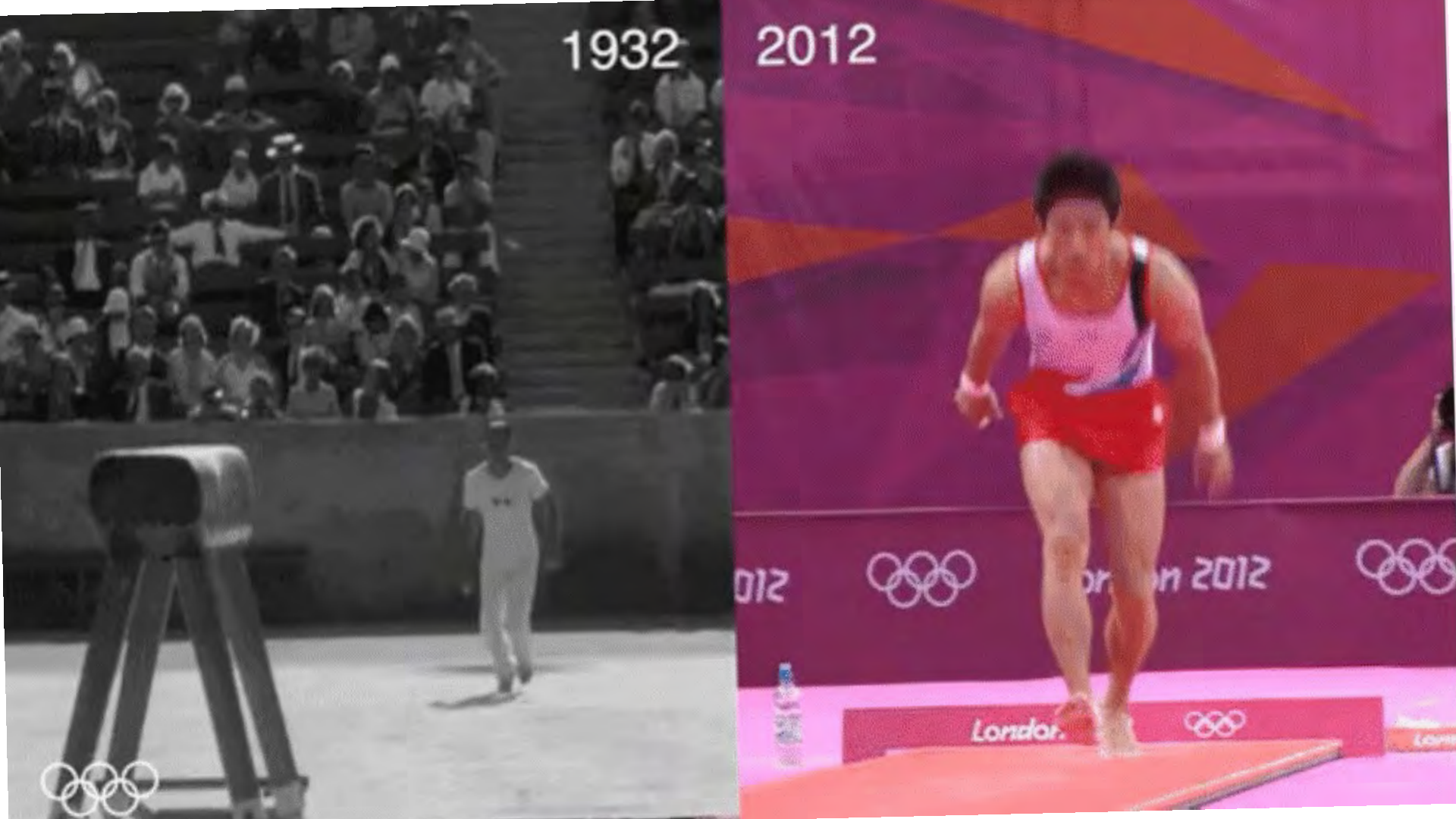


49,600+ data publications
193,300+ researchers
69,100+ international institutions
1,270+ academic journals

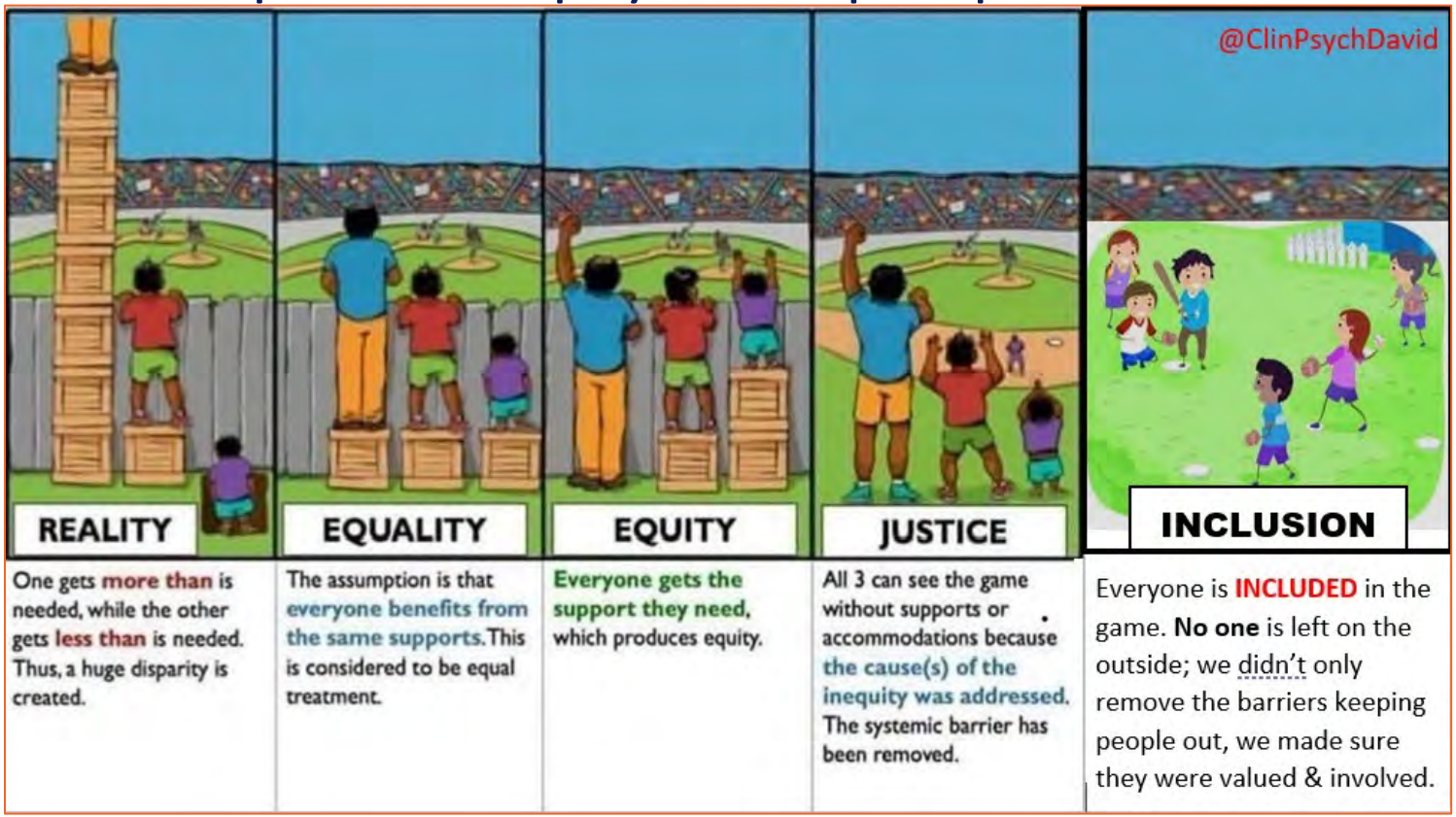
I went to school for…

I need to know this for my research…

```
import urllib2
eutils = 'http://www.ncbi.nlm.nih.gov/entrez/eutils/'
efetch = 'efetch.fcgi?'
s = eutils + efetch

targets = ['J04243','M60064']
idString = 'id=' + ','.join(targets)
s += idString + '&db=nucleotide&rettype=fasta'
fileObject = urllib2.urlopen(s)
data = fileObject.read().strip()

entries = data.split('\n\n')
title, sequence = entries[0].split('\n', 1)
print title.split(' ',1)[0]

# prints:
# >gi|154102|gb|J04243.1|STYHEMAPRF
```


1932
2012

Gaps multiply and perpetuate

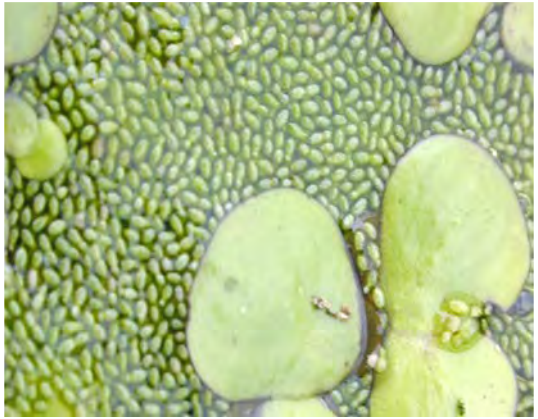


Credit: Saskatoon Health Service; Revised version - David Murphy

Sequence-a-genome camp

2021

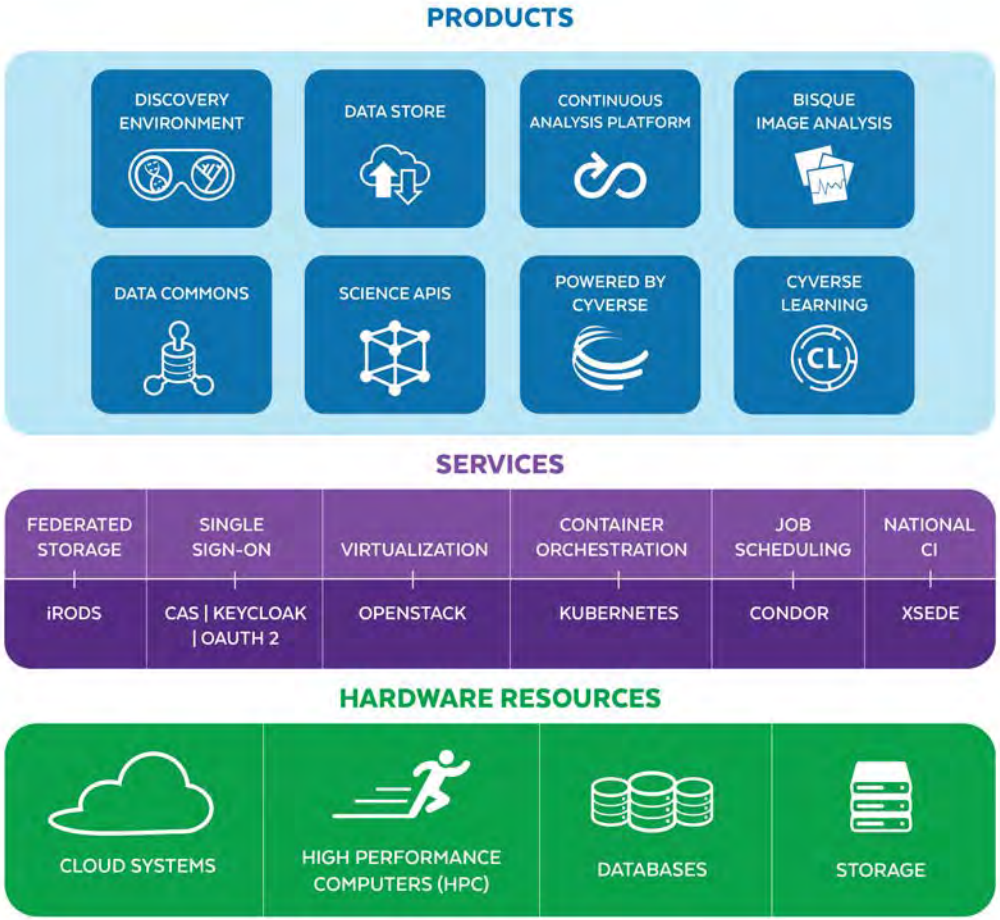
- **Species**: Duckweed (S. polyrhiza ~150 mb)
- **Relevance**: Biofuels and climate change
- **Partners**: CSHL/HudsonAlpha
- **Results:** ~7Gb DNA sequence and partial assembly



Two species of duckweeds (*Wolffia globosa* and *Spirodela polyrhiza*) taken in Waimanalo, Hawai'i by Eric Guinther

2022

- **Species**: Jamaican Broom (C. glandulosa v. mirabilis ~unknown mb)
- **Relevance**: Endemic/endangered
- **Partners**: U. Puerto Rico
- **Results:** +9GB and counting; in-progress



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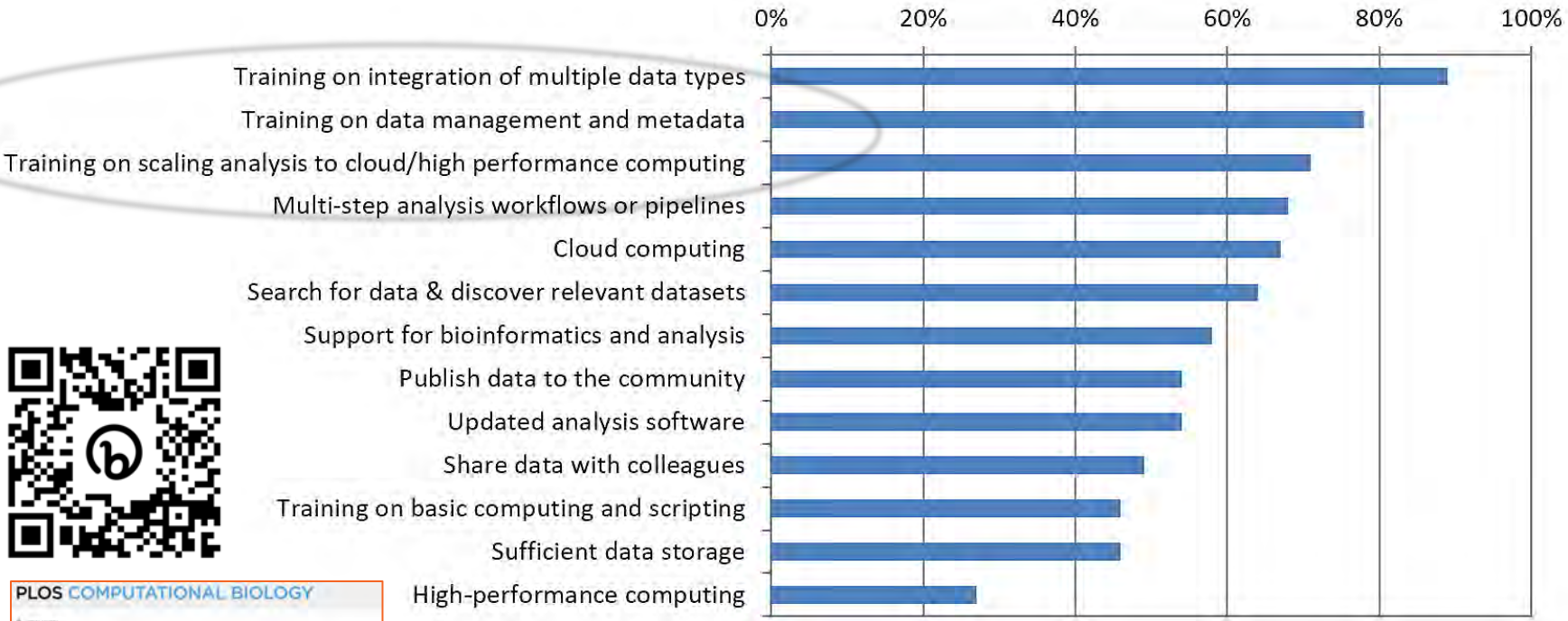
- NSF-Subsidized cyberinfrastructure resources
- Easy-to-use interfaces
- Facilitates national/international collaboration (CyVerse UK, CyVerse Austria)

DBI-0735191, DBI-1265383, DBI-1743442

Training is the biggest need



PLOS COMPUTATIONAL BIOLOGY

Unmet needs for analyzing biological big data: A survey of 704 NSF principal investigators

PLOS ONE

OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

Barriers to integration of bioinformatics into undergraduate life sciences education: A national study of US life sciences faculty uncover significant barriers to integrating bioinformatics into undergraduate instruction

Jason J. Williams, Jennifer C. Drew, Sebastian Galindo-Gonzalez, Srebrenka Robic, Elizabeth Dinsdale, William R. Morgan, Eric W. Triplett, James M. Burnette III, Samuel S. Donovan, Edison R. Fowlks, Anya L. Goodman, Nealy F. Grandgenett, Carlos C. Goller, [...], Mark A. Pauley [view all]

Published: November 18, 2019 • https://doi.org/10.1371/journal.pone.0224288

NIBLSE
Bioinformatics in Life Sciences Education

Effective and Inclusive Career-spanning Training

bikeprinciples.org

This material is based upon work supported by the National Science Foundation under DRL/EHR:2027025.

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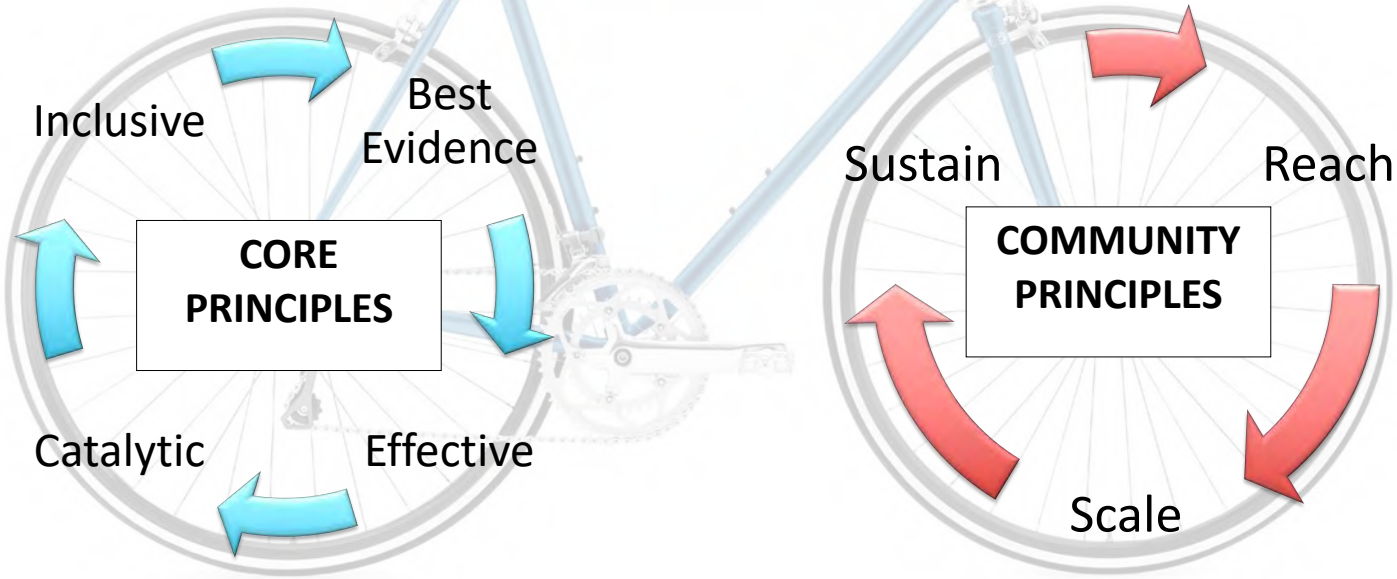
“The bicycle” – good for going far



A. Professionalize the training of short-format training instructors and instructional designers

Doctor studying a textbook

E. Deploy short-format training to counter inequity

Judge in robe fighting for justice

Building a community of practice in training

LIFESCITRAINERS.ORG

ACCELERATING SCIENTISTS

Why short-format training?

In many areas of the life sciences new technologies and approaches (especially, but not only computational ones) are changing rapidly. It's not possible for formal training (undergraduate/graduate) to keep pace, but short-format training can fill these gaps. Short-format training comes with its own set of challenges, and this community works together to address them.

How I Teach Life Scientists…by Using Reproducible and Scalable Learning Environments

The combination of Docker + cloud computing service enables a teacher to create a highly scalable and flexible learning environment

Continue reading »

How I Teach Life Scientists…to Build Reproducible, Scalable Workflows with Nextflow

The term "reproducible research" has been used to describe the idea that a scientific publication should be distributed along with all the raw data and metadata used in the study, all the code and/or computational notebooks needed to produce results…

Continue reading »

March 2022: Community Discussion – The Return to In-Person Training

Many instructors have or shortly will be running their first in-person events since the pandemic, what will change?

Continue reading »

"The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn"
– A. Toffler

https://bit.ly/grei-jan-2023

Thanks!

Cold Spring Harbor Laboratory
DNA Learning Center

NSF

CYVERSE™

DBI-0735191, DBI-1265383, and DBI-1743442

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Principles of Open Scholarly Infrastructure

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How it works

Image CC0 https://doi.org/10.5061/dryad.xd2547dd5

“Data should be of sufficient quality to validate and replicate research findings”

* https://grants.nih.gov/grants/guide/notice-files/NOT-OD-21-013.html#_ftn8

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4. **Promotes data citation**
5. **Makes data count**

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3. **Supports authors**