



# Electronic Lab Book use cases @ IGC/GIMM

*Tiago Paixão - Forum GDI 22-11-2024*

# About me: *How I got here*

2003-2007

2008-2011

2012-2017

2018-2020

2020-...

**IGC**

**University of Houston**

**IST Austria**

**ImageBiopsy Lab**

**IGC (now GIMM)**

Stochastic gene expression  
Mathematical modeling of  
immune system

Evolution of gene regulatory  
networks  
Predictability of evolution  
Sex ratio evolution in *T. thermophila*  
Germline mutation rates

Quantitative genetics  
Thermodynamic models of gene  
expression  
Computer science approaches to  
speed of adaptation  
Evolutionary approaches to  
optimization algorithms

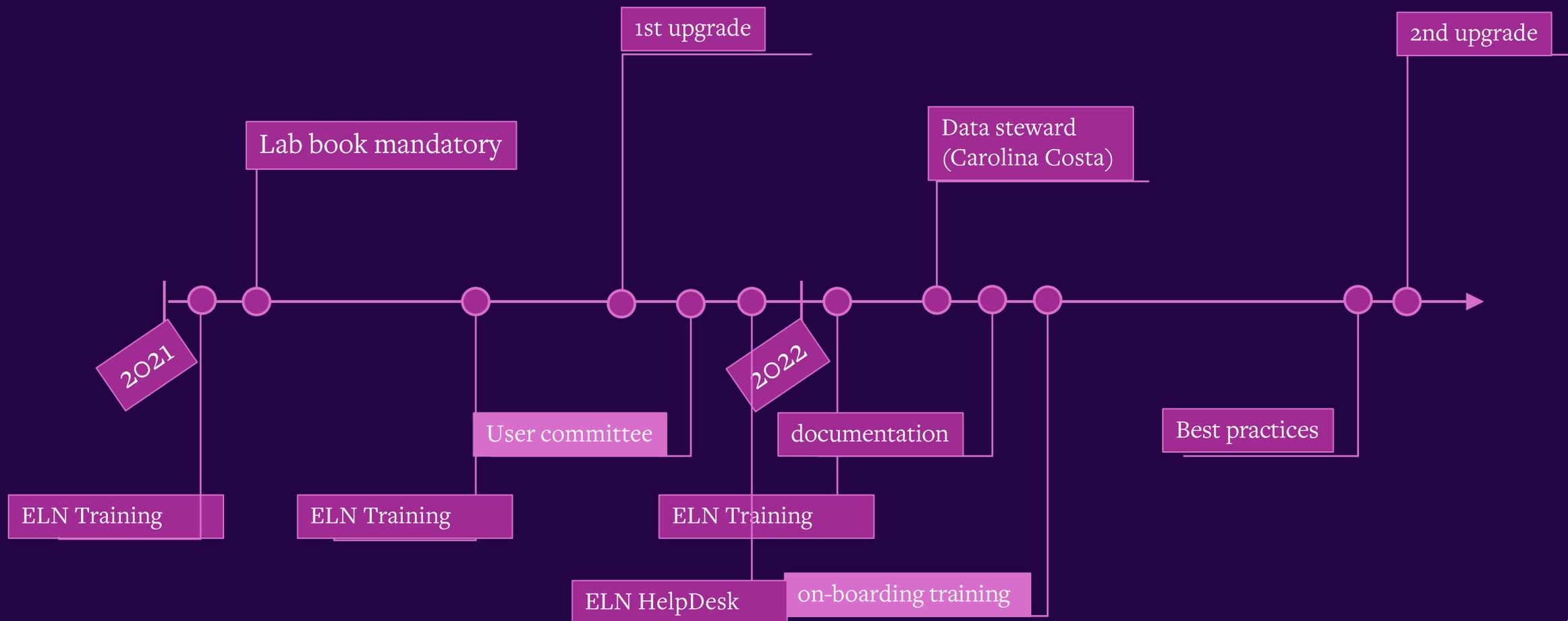
Machine learning models for disease  
incidence and progression  
Clinical and statistical validation of  
software  
US FDA clearance of AI-based  
medical software

Quantitative & Digital Science  
Advanced Data Analysis



# Timeline

*Milestones in the implementation of elabFTW*



# Key moments:

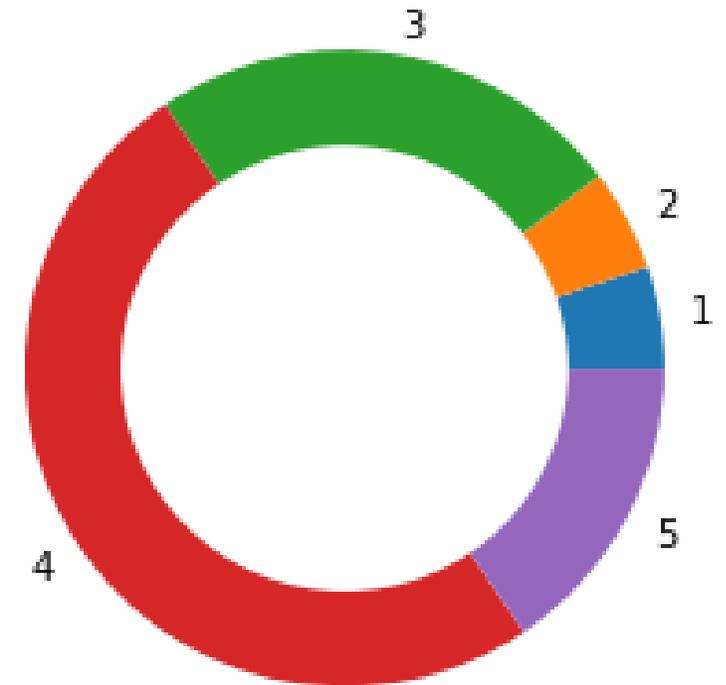
- 1st upgrade
  - *Creation of user committee*
  - *QA for upgrades*
  - *Collection of feedback*
- Dedicated support person (Carolina Costa)
  - *Issues / Bugs / feature requests*
  - *Onboarding / training materials / Documentation*
  - *Making the bridge between Users, IT and development*



# Listening to feedback

- Surveys
- Regular meetings with User Committee
  - Lab managers
- Community meetings
  - Share experiences
  - Share use cases

*How do you rank the current ELN?*



# Listening to feedback

- Surveys
  - Regular meetings with User Committee
    - Lab managers
  - Community meetings
    - Share experiences
    - Share use cases
- *“Revolutionized the way we do data sessions”*
  - *“Simplified my life as a lab manager”*
  - *“Searching experiments is a big improvement over paper notebooks”*



# Suggested features

Users can suggest **new features** or **tools** to eLab. eLabFTW is a collaborative project and your contributions are very welcome!



Hide experiments from archived users (Mariana Faria)



Add write setting for imported csv/zip (Sophie Dias)



Add note about utf-8 for csv export (João Coelho)



# Acting on feedback

*Developing new tools based on the use cases*

- eLabFTW Dashboard
- Bloxberg timestamping
- Data Structuring app
  - Extra JSON fields



# Admin dashboard

- Needed a way to monitor usage
  - Resources (disk usage, etc)
  - Team Usage (# users, # entries)
  - Forecast server needs
  - Monitor Compliance
- Developed a dashboard



# Overview elabFTW Dashboard

elabFTW\_report [Current Status](#) [Change](#)

## USERS

**Users**  
**339**

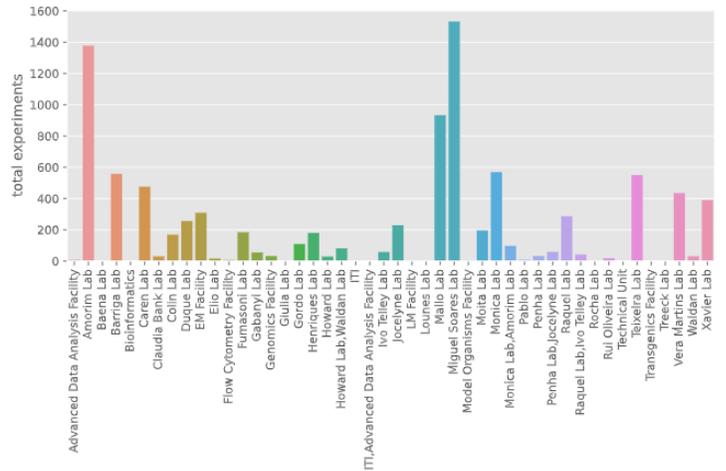
## ENTRIES

**Entries**  
**9355**

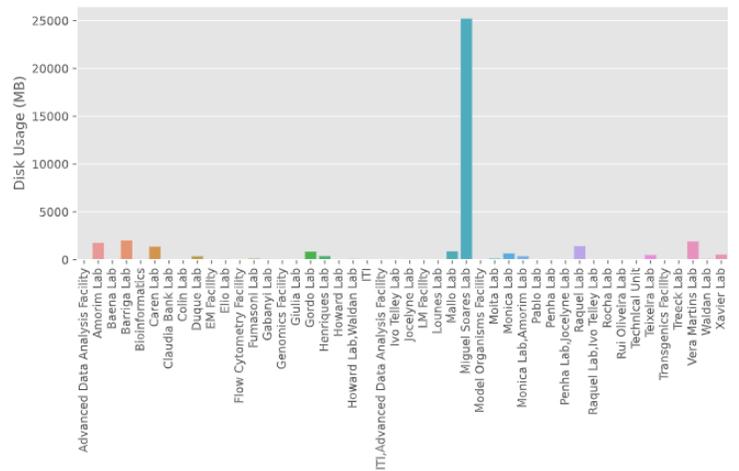
## DISK

**Disk Usage**  
**37.73 GB**

## GROUP ENTRIES



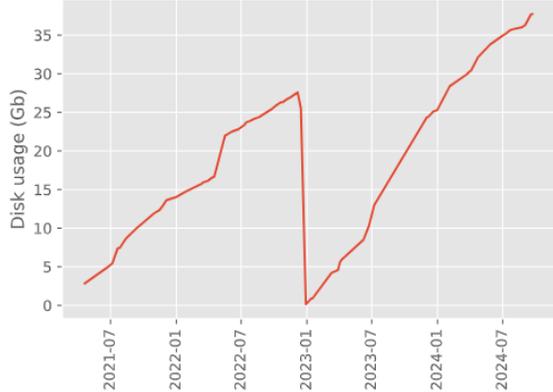
## GROUP DISK SPACE



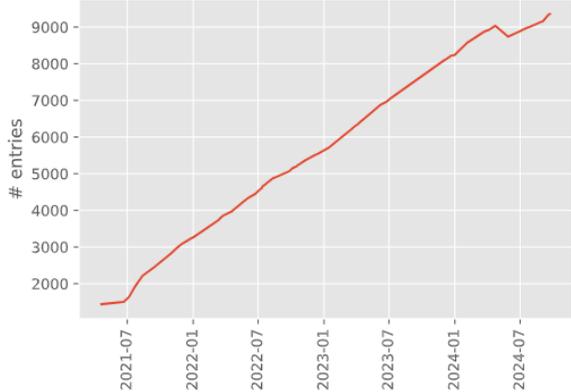
# Overview elabFTW Dashboard

elabFTW\_report [Current Status](#) [Change](#)

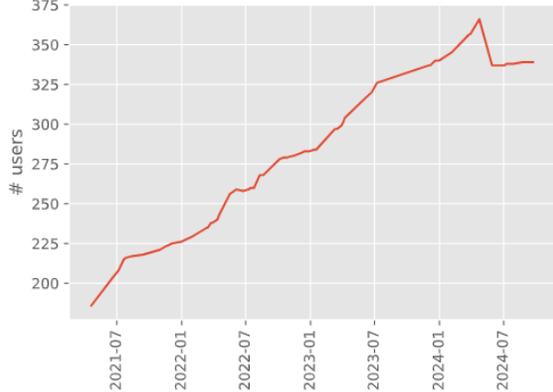
DISK SPACE



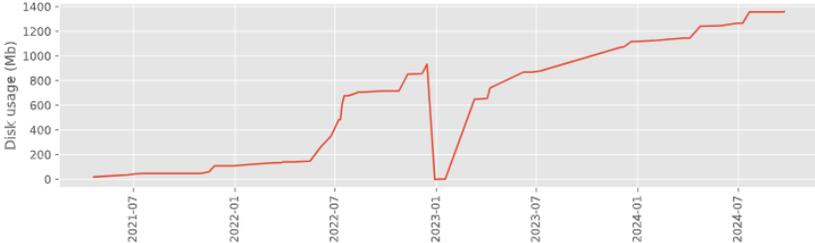
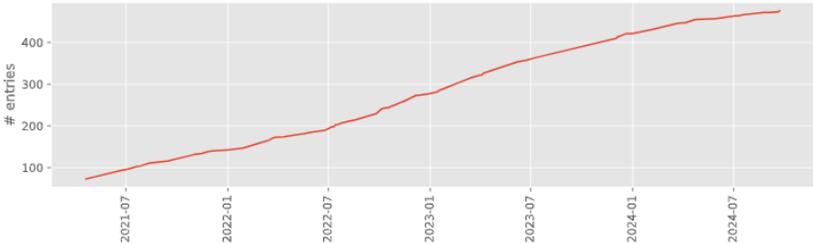
TOTAL EXPERIMENTS



USERS



Caren Lab



# Bloxberg integration

- Decentralized network of research institutions
- Enables a trustless immutable record
- IGC is a core member and runs a validation node
  
- IGC made a feature request to enable timestamping through bloxberg



| Blocks                                      |   |
|---|---|
| #27329288<br>Block                          | 2 transactions 1,003 bytes 54 seconds ago<br>Miner Instituto Gulbenkian de..Ciencia (0xaa4870-0fd789)                             |
| #27329287<br>Block                          | 2 transactions 1,970 bytes a minute ago<br>Miner Fraunhofer Institute fo..ogy FIT (0x63fb9a-c4fc6a)<br>Reward 0.000000850108 Berg |
| 27329286<br>Block Mined, awaiting import... |   |
| #27329285<br>Block                          | 5 transactions 1,973 bytes a minute ago<br>Miner Furtwangen University (0x738e6e-1c89c3)  |
| #27329284<br>Block                          | 3 transactions 2,655 bytes a minute ago<br>Miner Politehnica University ..misoara (0xa5f9bf-eb556a)                               |



# Bloxberg integration

- IGC made a feature request to enable timestamping through bloxberg
- Enables trustless timestamping



A screenshot of the eLabFTW web application interface. The top navigation bar is dark grey with the eLabFTW logo and menu items: "eLabFTW", "EXPERIMENTS" (highlighted with a teal underline), "RESOURCES", and "TEAM". Below the navigation bar, the page title is "Experiments &gt; Viewing an entry". A horizontal toolbar contains several icons: a back arrow, a teal pencil icon (active), a document icon, a calendar icon, a stack of three cubes icon (active), and a download icon. Below the toolbar, a teal information box states "Owned by André Barros". Underneath, it says "Started on 2024-08-23" and the main title of the entry is "Bioinfo 004 - MixSvs".



# Data structuring for “item databases”

- Many labs were using elab to store large amounts of items in a sort-of-structured way
- Needed to do bulk updates and other operations
- Developing of an application to convert between (templated) HTML entries and csv entries.

**Type:** Antibody

**Host:** Rabbit

**Isotype:** IgG1

**Dilution for IF:** 1:100

**Dilution for WB:** 1:500

**Storage temperature:** 4C



# Data structuring for “item databases”

**Type:** Antibody

**Host:** Rabbit

**Isotype:** IgG1

**Dilution for IF:** 1:100

**Dilution for WB:** 1:500

**Storage temperature:** 4C



|   | A           | B           | C              | D                      | E                      | F                          |  |
|---|-------------|-------------|----------------|------------------------|------------------------|----------------------------|--|
| 1 | <b>Name</b> | <b>Host</b> | <b>Isotype</b> | <b>Dilution for IF</b> | <b>Dilution for WB</b> | <b>Storage Temperature</b> |  |
| 2 | AntiCD4     | Rabbit      | IgG1           | 1:100                  | 1:500                  | 4C                         |  |
| 3 | AntiCD8     | Rabbit      | IgG1           | 1:100                  | 1:500                  | 4C                         |  |
| 4 | AntiCD45    | Rabbit      | IgA            | 1:100                  | 1:500                  | 4C                         |  |
| 5 | AntiCD4     | Mouse       | IgM            | 1:100                  | 1:500                  | -5C                        |  |
| 6 | AntiCD8     | Mouse       | IgG2           | 1:100                  | 1:500                  | -5C                        |  |
| 7 | AntiCD45    | Rabbit      | IgG1           | 1:100                  | 1:500                  | -5C                        |  |
| 8 |             |             |                |                        |                        |                            |  |



# JSON Extra fields

- Improvement:
  - Developing the JSON Extra Fields
  - Encouraged the development team to prioritize this feature
  - Enables more robust metadata capturing



# JSON Extra fields

- Enables creation of custom UI
- Controlled vocabulary
- From templates
- Allows searching/sorting by these “extra fields”

EXTRA FIELDS

Host ⋮ 🗑️

Rabbit ▼

Rabbit

Mouse

Goat

Chicken

+4 °C ▼

Dilution to use for IF ⋮ 🗑️

Dilution to use for WB ⋮ 🗑️

Number of aliquots left ⋮ 🗑️

Make sure to decrement this when using one!

Add field Load fields



# eLabFTW PT community

*a call to action*

- Sharing of tools
- Sharing of best practices / tips and tricks
- Joint development of tools
- Sharing of training materials



# Lessons learned

- *Create procedures to monitor usage and gather feedback*
- *Pay attention to feedback from users*
- *Coordination with development team*
- *Dedicated person*

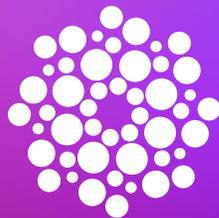


# Future Challenges:

- *More extensive capture of metadata (along the data lifecycle - eg from agenda)*
- *Effective use of best practices for metadata*
- *Integration with data storage*



**GIAMM**



Gulbenkian  
Institute *for*  
Molecular  
Medicine

Thank *you!*