Bioinfo4Women Research: Women's Health and Sex and Gender Equality in AI

Bioinfo4Women, Life Sciences Department
Barcelona Supercomputing Center (BSC)

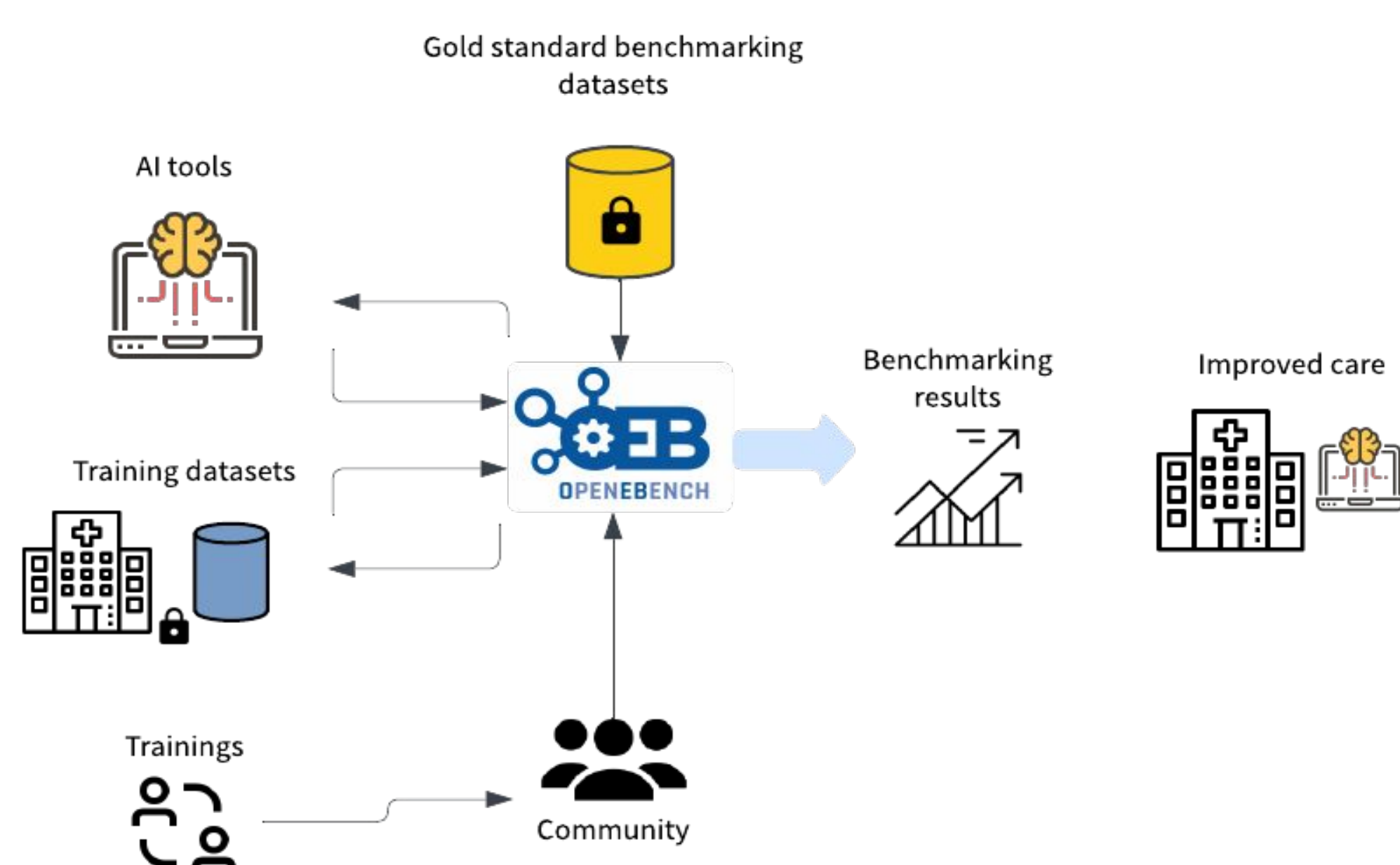## *ELIXIR All Hands , 10-12 June 2024, Uppsala, Sweden*

Bioinfo4Women Research

The Bioinfo4Women Research group advances computational biology and artificial intelligence (AI) with a focus on sex and gender perspectives, aiming to enhance personalized medicine and scientific research.

Objectives

- Uncover sex and gender bias in technology and AI to prevent discrimination and inequality.
- Develop guidelines for integrating sex and gender dimensions in research projects.

AI & women's health

BAHIA (Bias in AI Health Applications)

BAIHA fosters a multidisciplinary community on ELIXIR's **OpenEBench** platform, which includes experts from biomedicine, AI, healthcare, ethics, legal concerns and sex and gender biases. It establishes a set of metrics designed to **evaluate the sex and gender biases** in training datasets and the outcomes of ML models.
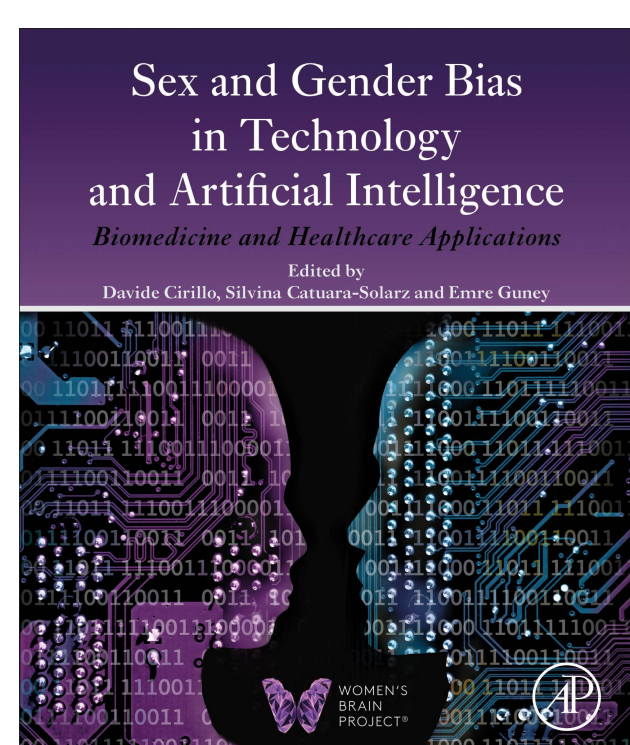
Abortion and misscariage on Twitter

We examined **Twitter data** on international safe abortion and pregnancy loss days in 2021 and 2022, with the intervening overturn of Roe v. Wade in the US.

The results indicate that regardless type of discussion, negative **polarity** and high **subjectivity** lead to lower engagement, while positive polarity and objective posts have more impact.

Also, we found that **men** achieve greater online impact, while **women**'s reach is more affected by negativity and subjectivity.
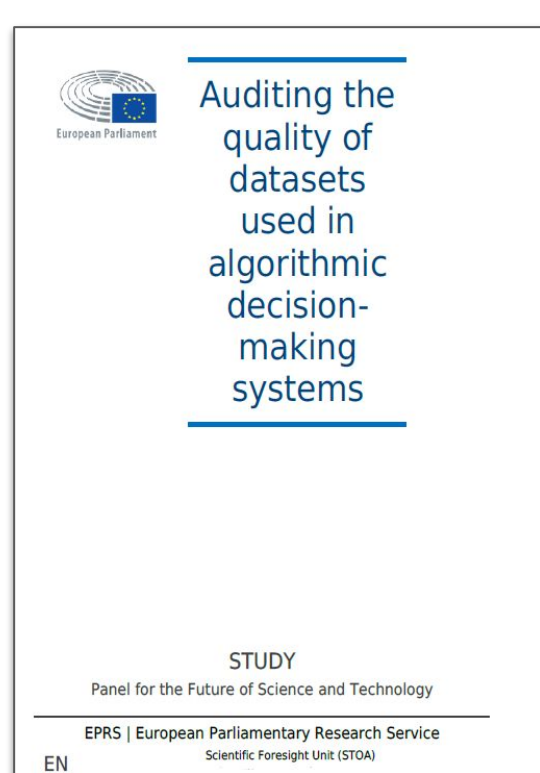
Our presence at ELIXIR BioHackathons

2021 ELIXIR BioHackathon Europe

Sex imbalance in data repositories
Our analysis of metadata from the European Genome-phenome Archive (**EGA**) and the U.S. database of Genotypes and Phenotypes (**dbGaP**) revealed a significant imbalance in samples classified as male, female and unknown.

2022 ELIXIR BioHackathon Europe

An AI model to parse scientific articles
We investigated the prevalence of sex imbalance in scientific research by analyzing the content of open access published articles stored in **EuroPMC**. For this task we developed a BERT LLM that parse Material & Methods section retrieving the counts of reported male and female.

2023 ELIXIR BioHackathon Germany

Sex imbalance in publicly funded research
We evaluated the effect of funding on sex representation in research projects. We analysed publications and funding data from European programs (2007-2022) reported in **CORDIS** database as well as US NIH projects (1980-2022) reported in **RePORTER** database.

2024 ELIXIR BioHackathon Europe

Gender representation in ELIXIR articles
We aim to evaluate gender representation in bibliographic data of ELIXIR publications retrieved from academic search engines, including **Google Scholar** and **BIP! Finder**, to examine gender and visibility biases.

**JOIN OUR TEAM
AT #BioHackEU24!!**
Project #9

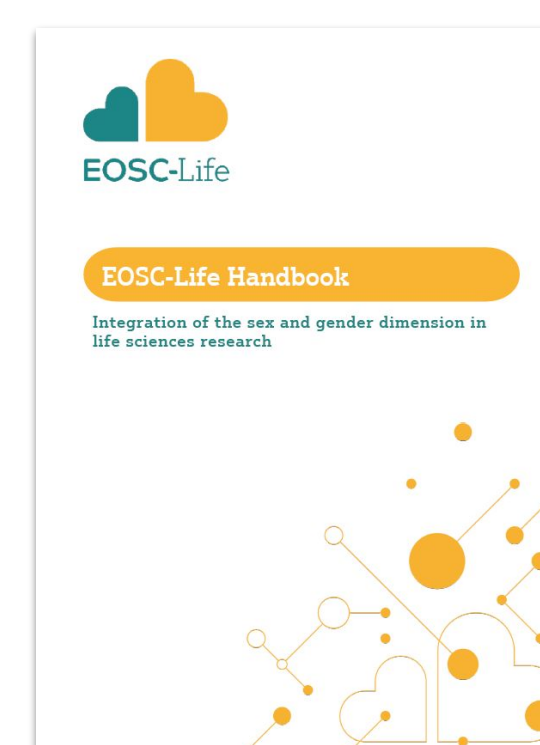## Selected Guidelines & Publications

Our book on sex & gender AI bias
In collaboration with the Women's Brain Foundation and Elsevier, we published the **first scientific book** on sex and gender bias in AI, featuring contributions from both academia and industry.

Our policy options for Europe
The **EU Parliament** commissioned us to draft a report on sex and gender bias in datasets used to train AI, which included policy recommendations that were incorporated into the **AI Act.**

Our handbook for EOSC-Life
In collaboration with BBMRI and EATRIS, we authored a handbook on integrating sex and gender dimensions in research, and piloted its use in a **Train the Trainer** that we organized as part of the 3rd **EOSC-Life** Training Open Call.
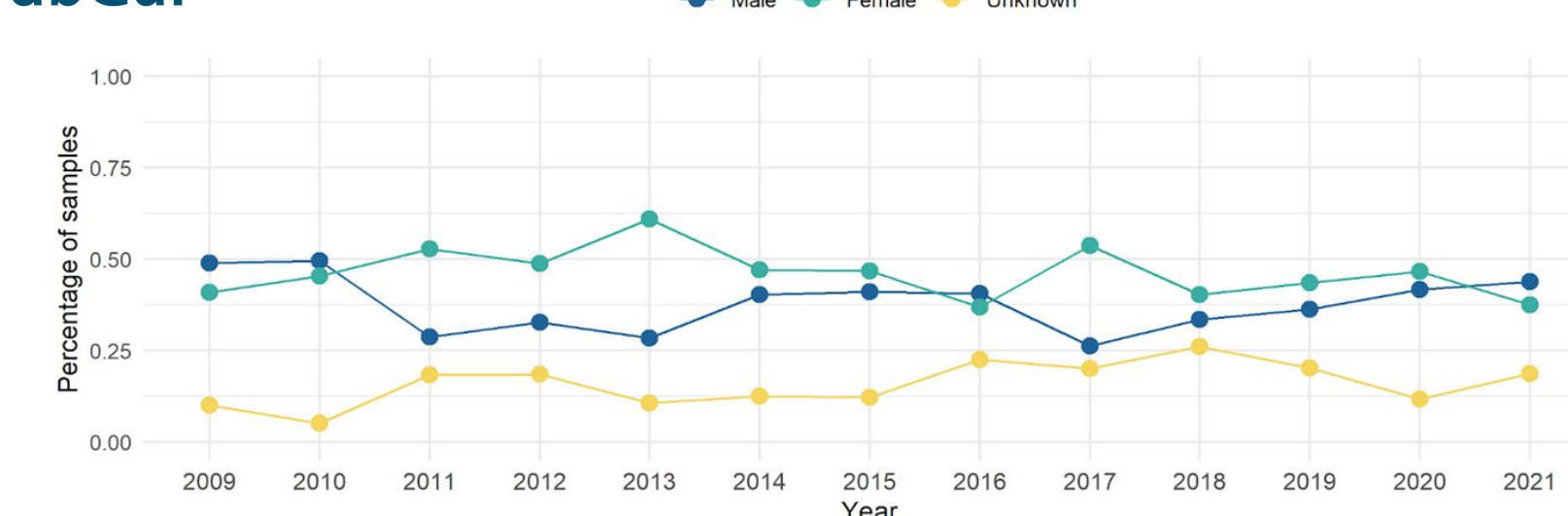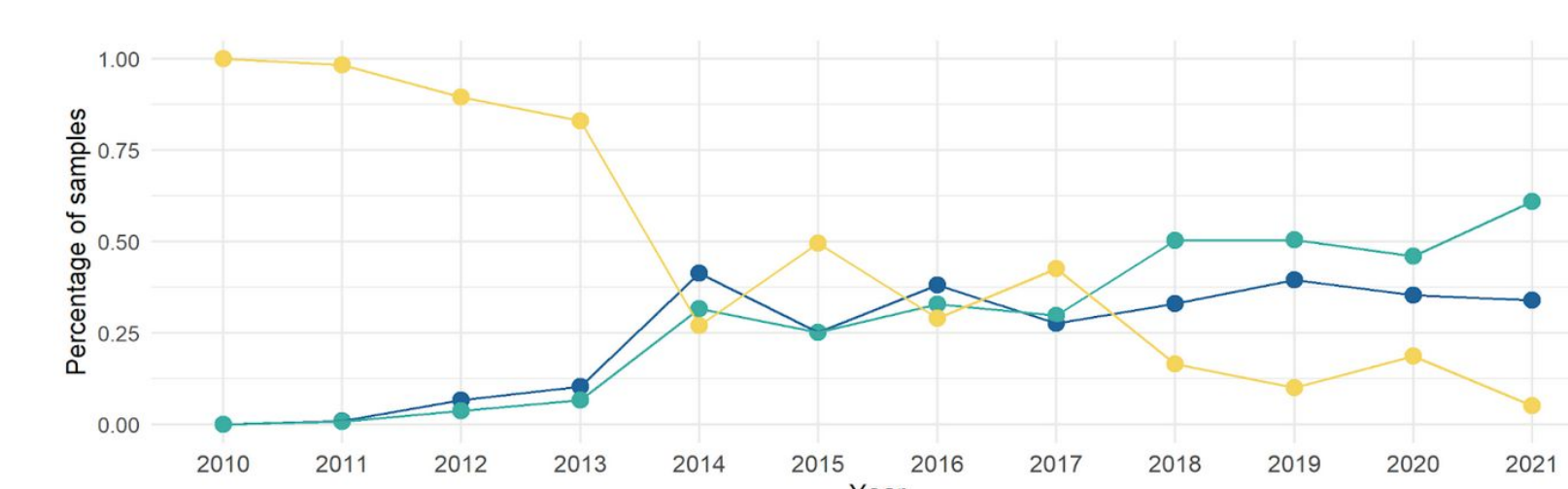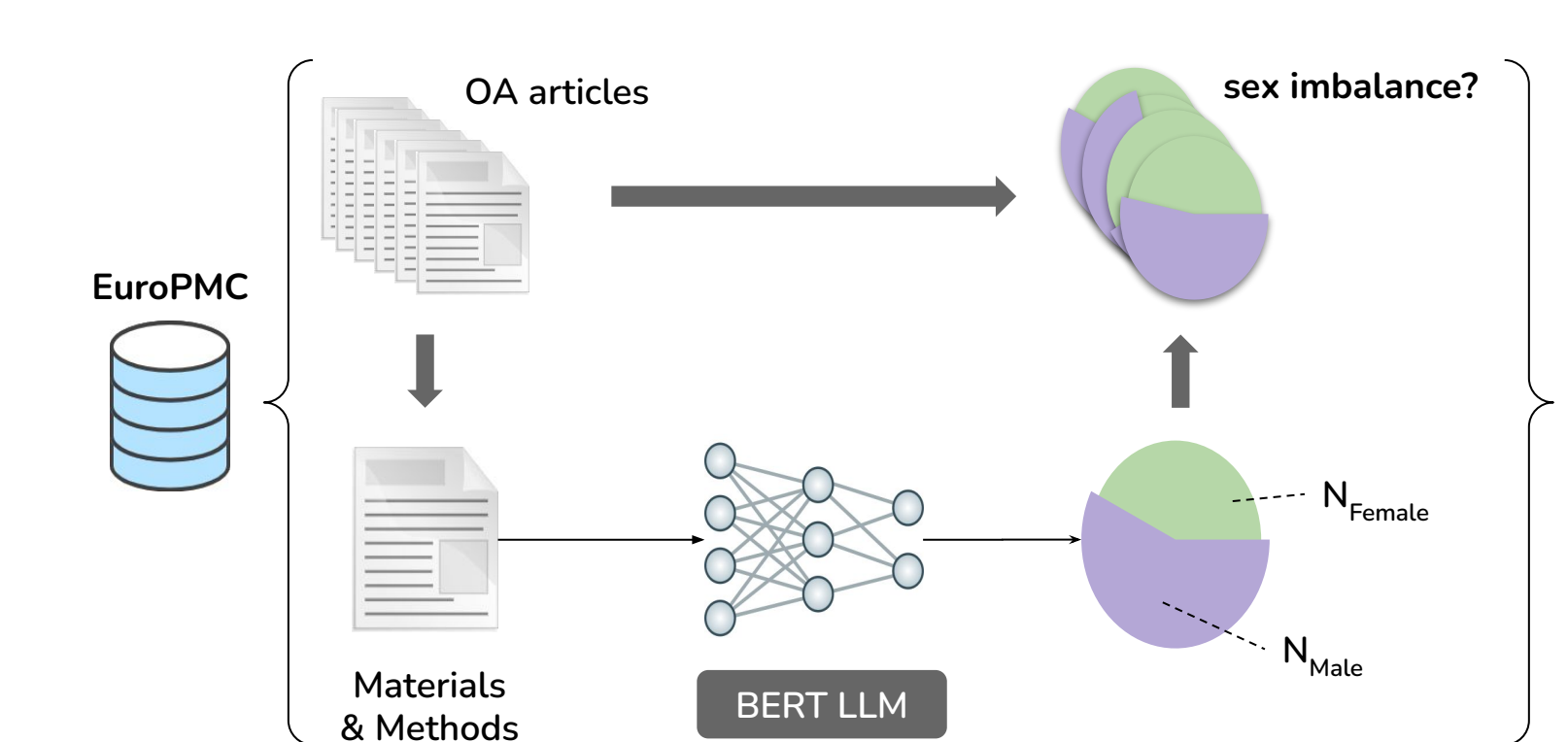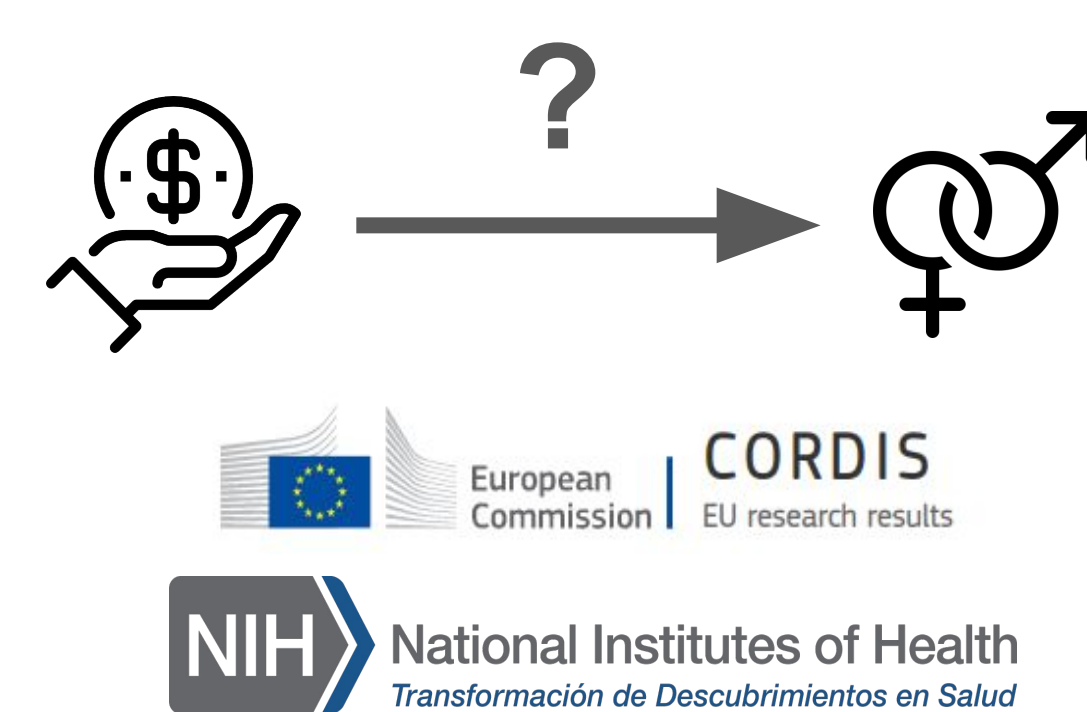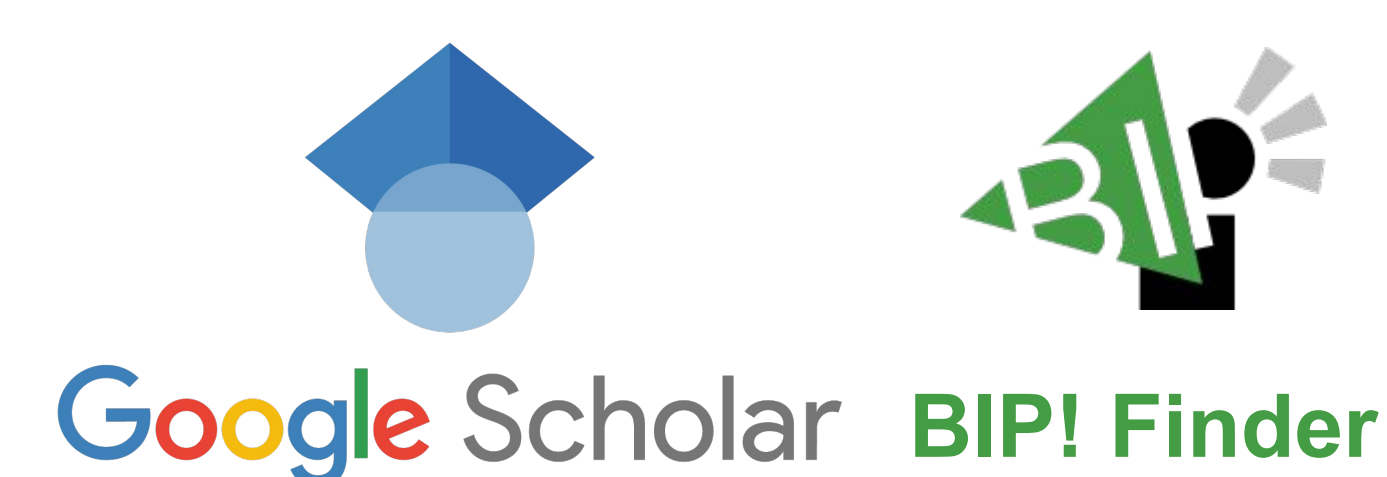
Contact

Bioinfo4Women
Life Sciences Department, Barcelona Supercomputing Center
E-mail: bioinfo4women@bsc.es
Web: https://bioinfo4women.bsc.es
Social media: @Bioinfo4women bioinfo4women