Benchmarking the Granuloma-Like Structure model as a novel translational tool for tuberculosis drug development

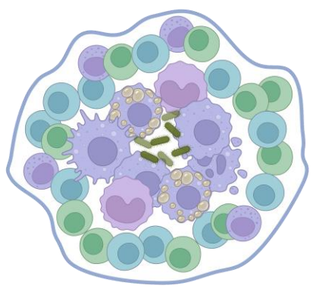
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FACTS & FIGURES

Start date:	Jan 2020
End date:	Dec 2026
IMI funding:	89 815 600 €
EFPIA in kind:	55 837 633 €
Other:	62 310 658 €
Total Cost:	207 963 891 €
Project website:	era4tb.org
Social media:	@ERA4TB

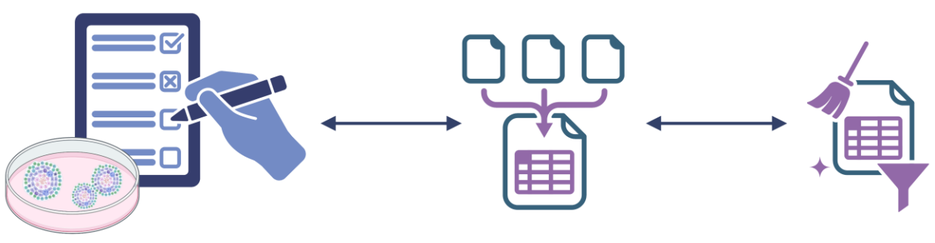
CHALLENGE

The **general challenge** in developing new anti-TB treatments lies in the limited ability of conventional *in vitro* models to faithfully replicate the granuloma environment.



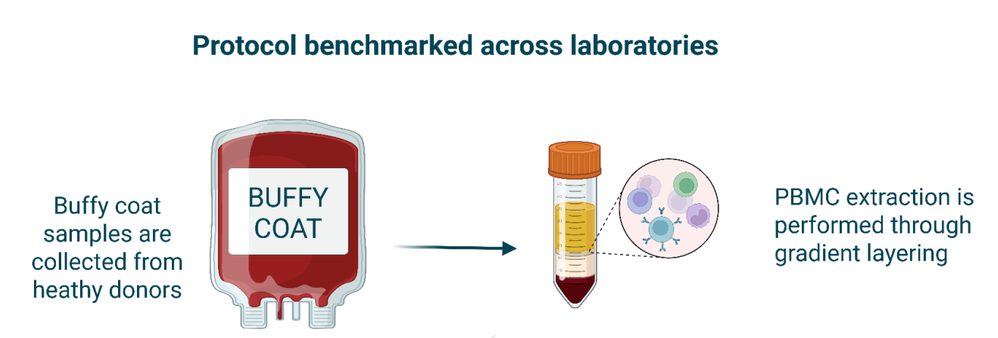
Developing a **robust, reproducible and quantitative granuloma-like structure (GLS) model** required:

- Harmonizing protocols and readouts across laboratories
- Integrating microbiological, imaging, immunological and computational approaches

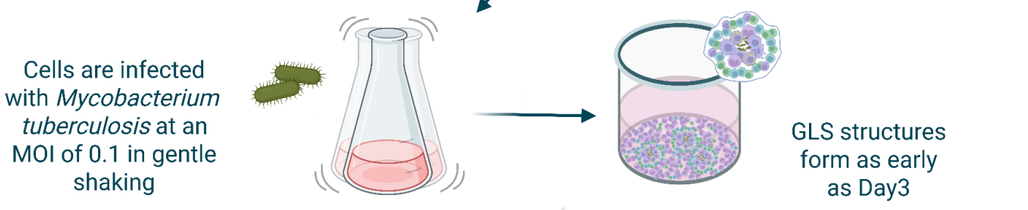


APPROACH & METHODOLOGY

Protocol benchmarked across laboratories



Additional characterizations of the system



RESULTS

Collaborative efforts allowed us to:

Optimize our protocol and standardize it across 3 independent laboratories

Fig1. Accept/Reject pipeline

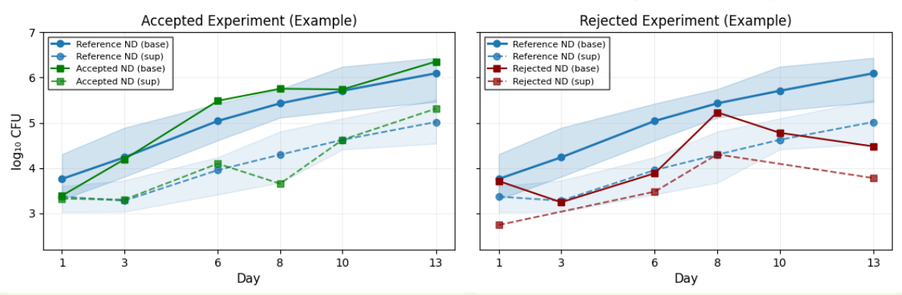
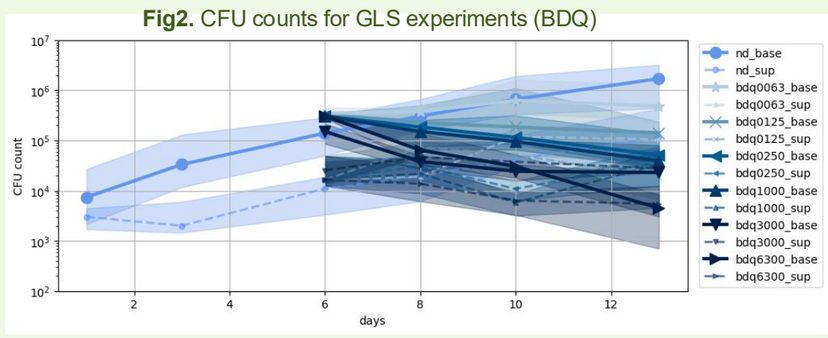
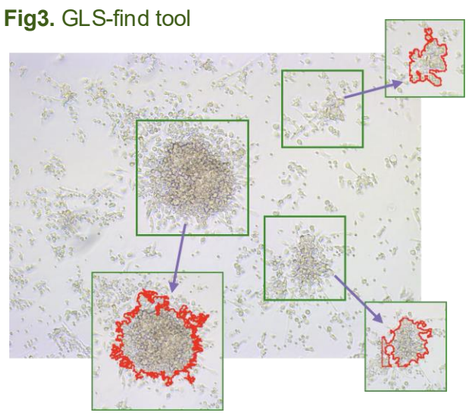


Fig2. CFU counts for GLS experiments (BDQ)

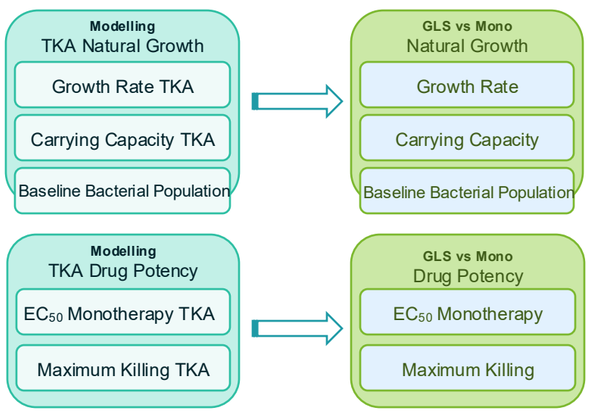


Benchmark the protocol against 30+ classical anti-TB drugs

Fig3. GLS-find tool



Manually train an AI-assisted image analysis pipeline to automatically compare GLS size and numbers across experiments



Integrate our results with Time Kill Assay (TKA) data provided by other ERA4TB partners to progress to the testing of drug combinations and host-directed therapies

VALUE OF IMI COLLABORATION

Within the framework of **ERA4TB** and **IMI**, a consortium of **nine research groups and industry partners** brought together complementary expertise, resources, and experimental and computational approaches to **develop and standardize a complex, translational human GLS model beyond the capacity of a single institution.**



CAREER IMPACT

ERA4TB gave me the **tools and opportunities** to work across disciplines and institutions, and transformed me from a **researcher**, to a **collaborative scientist**, to an **effective communicator**.

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http://www.imi.europa.eu

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