IHI Call Days | Call 9

Mechanisms of comorbidities in immune-mediated diseases via federated data analysis and modelling

Contact person name: Venkata Satagopam

Organisation: University of Luxembourg, LCSB

E-mail: venkata.satagopam@uni.lu

Link to the IHI brokerage platform:

- [Proposal sharing tool]

- [Participant profile]

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Challenges and objectives

- **Challenge:** understanding mechanisms of immune-mediated diseases (IMIDs)
  - Increasing medical burden
  - Systemic and heterogeneous
  - Overlap of genetic and environmental risks suggests common underlying mechanisms
- **Objective I:** mobilise clinical and omics cohort datasets from EU-funded consortia
  - Datasets and disease maps for five different IMIDs from five ongoing and past EU projects (1x Horizon, 3x IHI, 1x LU national initiative)
  - Federated analysis architecture supported by two ongoing IHI projects
- **Objective II:** understand molecular IMID mechanisms by combining datasets and knowledge bases via a federated architecture

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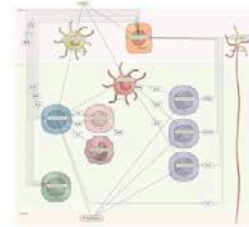initiative

Your approach to solve the problem
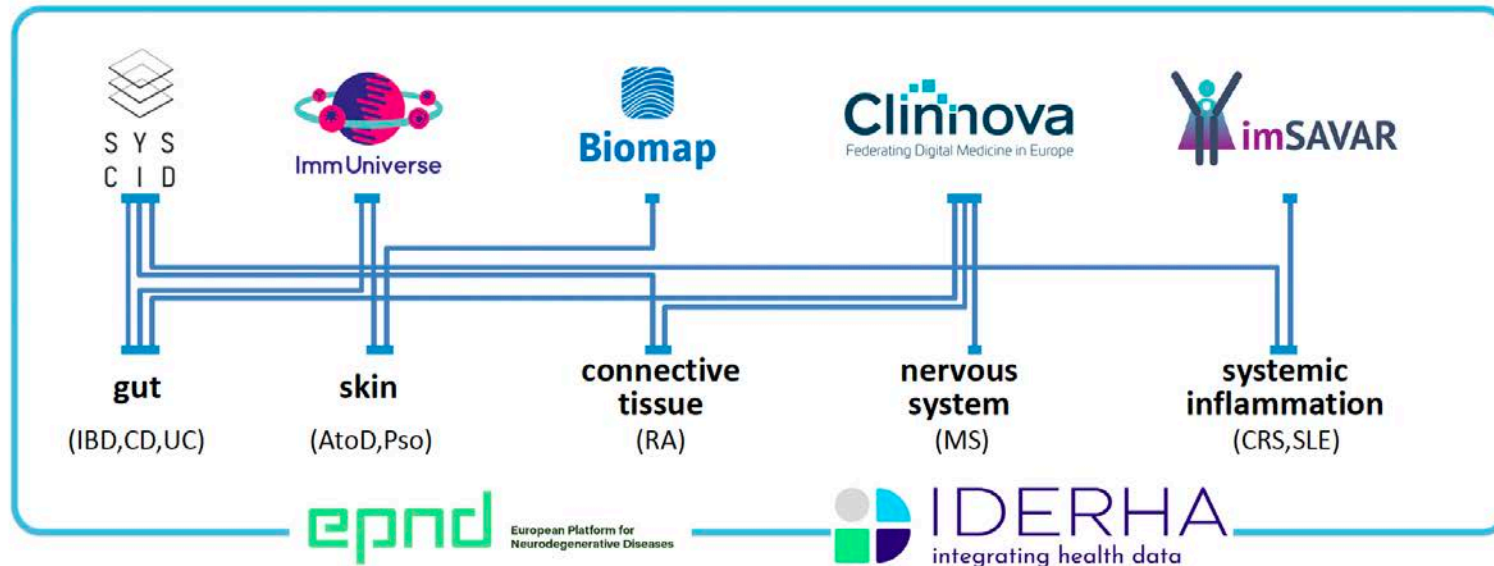
- Federated analysis and modelling
  - Develop diagnostic and mechanistic biomarkers
  - Combine rich data and modelling resources
  - Analyse and simulate common mechanisms

Glossary - *AtoD: atopic dermatitis, CD: Crohn's disease, CRS: cytokine release syndrome, IBD: inflammatory bowel disease, Pso: psoriasis, RA: rheumatoid arthritis, SLE: systemic lupus ertyhematosus, UC: ulcerative colitis*

Is your project suitable for IHI?

- Datasets, samples and federated data analysis solutions are mostly from IMI/IHI consortia (academia and industry)

- Both academia and industry want to bring available datasets into a state-of-the-art federated data analysis environment for their value in research

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Outcomes and Impact

- Biomarkers of IMID comorbidities
- Large-scale federated analysis of cohort and omics data across IMIDs
- Federated validation of comorbidity biomarkers

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Expertise and resources

- We have:
  - federated data analysis
  - computational workflows for omics data processing
  - clinical and omics data curation, harmonisation and structuring
  - building systems biology repositories of disease mechanisms
  - analysis and modelling of disease processes

- We are looking for:
  - clinical expertise across various IMIDs
  - laboratory expertise and resources to validate key biomarkers

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