European Human Exposome Network

HEDIMED

Human Exposomic Determinants of Immune Mediated Diseases

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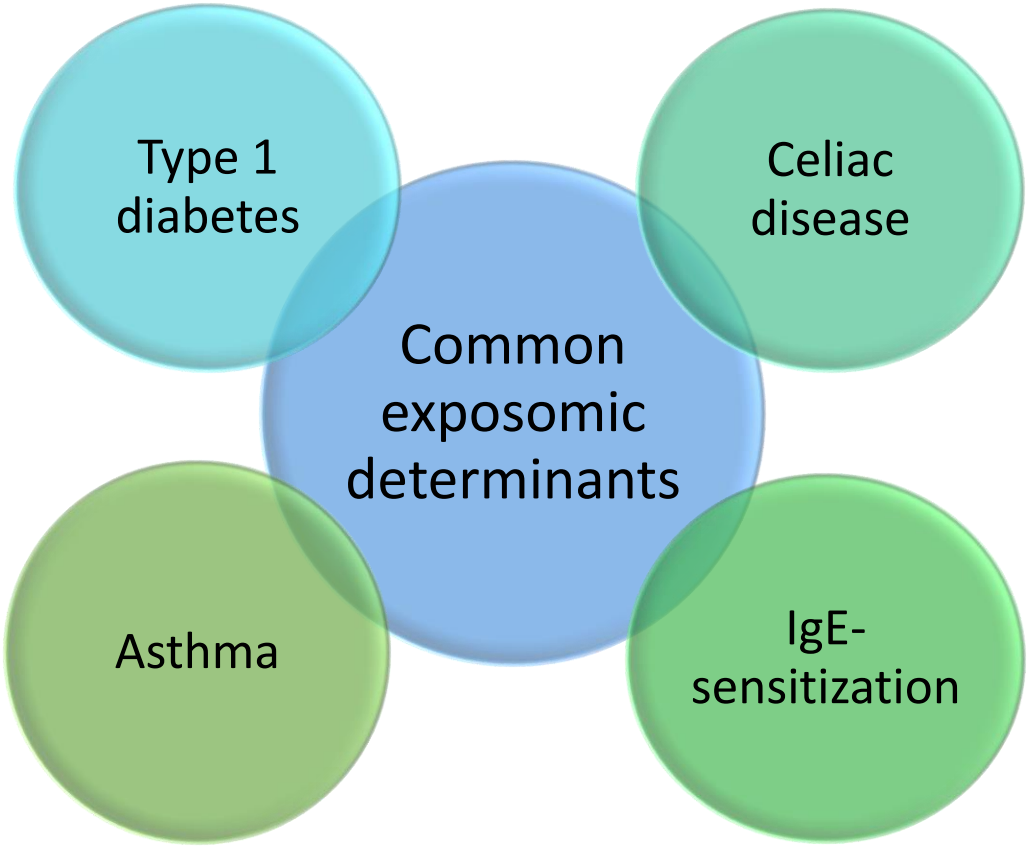
What is HEDIMED about?

- Identification and modelling of exposomic factors relevant for immune-mediated diseases (IMDs)
- Key exposomic factors under study
  - Microbes
  - Environmental biodiversity
  - Toxins
  - Diet
  - Physiological factors
  - Physical activity
  - Host response to exposomic factors



Why is this important?

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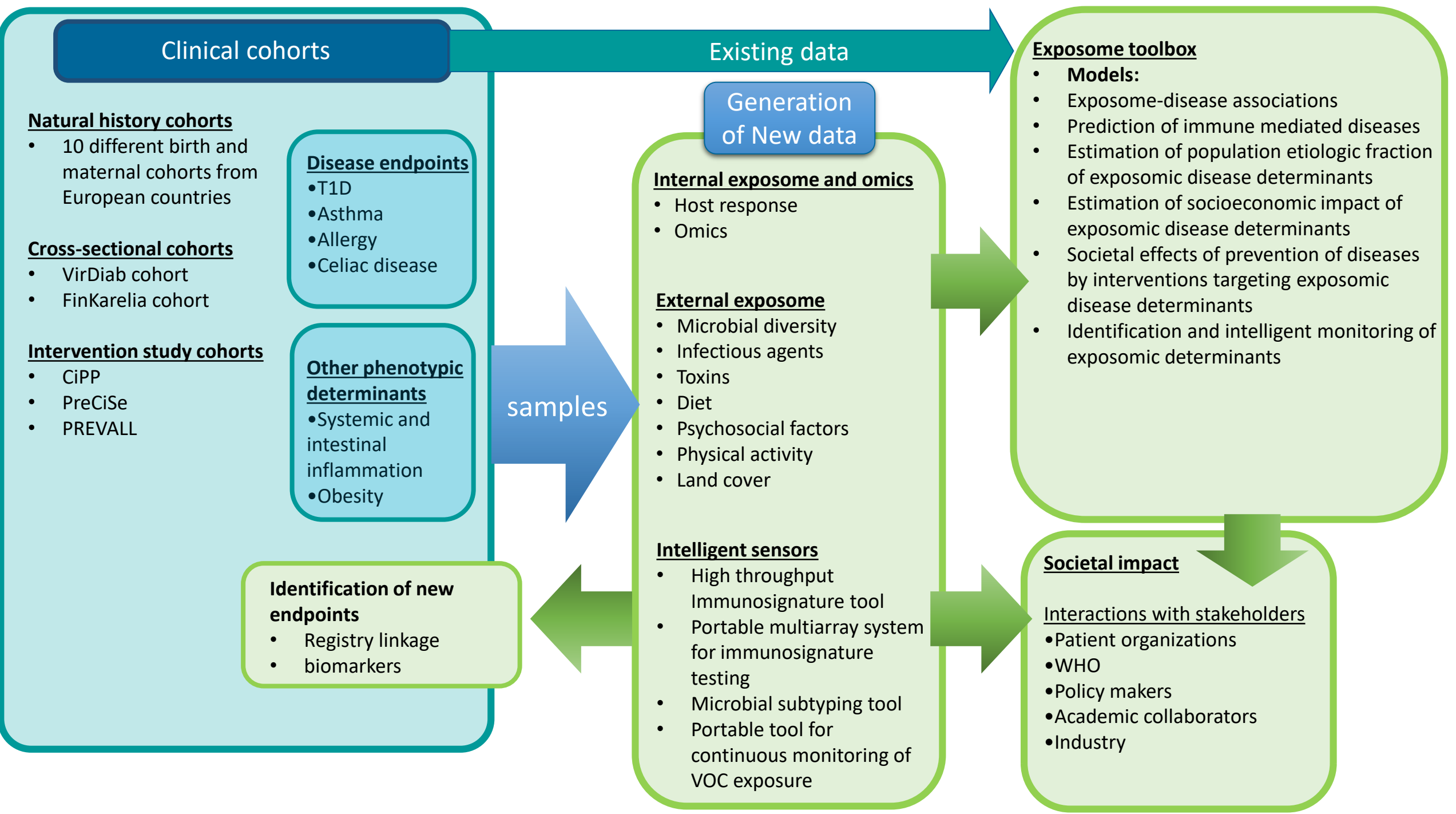
- explores the role of exposome in **several IMDs** to identify disease-specific and common exposomic determinants.
- utilizes samples and data from **unique clinical cohorts and trials** providing huge number of study end-points (diseases) in different populations.
- is based on **multidisciplinary research** allowing identification of novel exposomic determinants, their interactions and mechanisms of actions.
- includes development of **new technologies** for the identification of exposomic determinants of diseases.
- will make data, research tools and latest discoveries **available for various stakeholders (toolbox)**

How will HEDIMED reach that goal?


Clinical cohorts
Existing data
Natural history cohorts
• 10 different birth and maternal cohorts from European countries
Cross-sectional cohorts
• VirDiab cohort
• FinKarelia cohort
Intervention study cohorts
• CiPP
• PreCiSe
• PREVALL
Disease endpoints
•T1D
•Asthma
•Allergy
•Celiac disease
Other phenotypic determinants
•Systemic and intestinal inflammation
•Obesity
samples
Generation of New data
Internal exposome and omics
• Host response
• Omics
External exposome
• Microbial diversity
• Infectious agents
• Toxins
• Diet
• Psychosocial factors
• Physical activity
• Land cover
Intelligent sensors
• High throughput Immunosignature tool
• Portable multiarray system for immunosignature testing
• Microbial subtyping tool
• Portable tool for continuous monitoring of VOC exposure
Identification of new endpoints
• Registry linkage
• biomarkers
Exposome toolbox
• Models:
• Exposome-disease associations
• Prediction of immune mediated diseases
• Estimation of population etiologic fraction of exposomic disease determinants
• Estimation of socioeconomic impact of exposomic disease determinants
• Societal effects of prevention of diseases by interventions targeting exposomic disease determinants
• Identification and intelligent monitoring of exposomic determinants
Societal impact
Interactions with stakeholders
•Patient organizations
•WHO
•Policy makers
•Academic collaborators
•Industry

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What will HEDIMED deliver in 5 years

- Concrete points of to be delivered
  - identification of exposomic determinants of IMDs

- What will HEDIMED contribute to the Exposome Toolbox
  - tools for identification of exposomic determinants of IMDs
  - tools for prediction of disease risk
  - novel exposure strategies to reduce the risk of IMDs
  - information of latest discoveries
  - tools for decision-makers, stakeholders and public to reduce the risk of IMDs

IMD = immune-mediated disease (such as type 1 diabetes, celiac disease, allergies and asthma)

Link to panel discussion

- How will HEDIMED elucidate the biological effects of the exposome

What are the critical needs for success

- What interaction with stakeholders do you need to make your project a success?
  - exploitation and dissemination of the findings
    - Identification of associations between exposomic factors and the risk of IMDs
    - development of novel exposure approaches to reduce the likelihood of IMDs
  - funding opportunities for new research initiatives
  - feedback from the end-users of toolbox
- What interaction with other projects is needed to make the network a success?
  - exchange of expertise, methods, samples and knowledge
  - common procedures for exploitation and interactions with stakeholders
  - creation of common metadatabase and website

Acknowledgements

- Involved partners:

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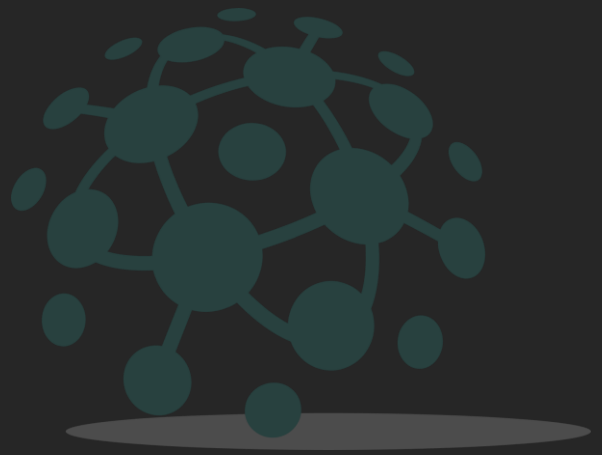

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2	University of Lund (ULUND)	SE
3	University of Helsinki (UH)	FI
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5	University of Turku (UTU)	FI
6	University of Oulu (UOULU)	FI
7	Tartu University Hospital (TUH)	EE
8	University of Siena (UNISI)	IT
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