

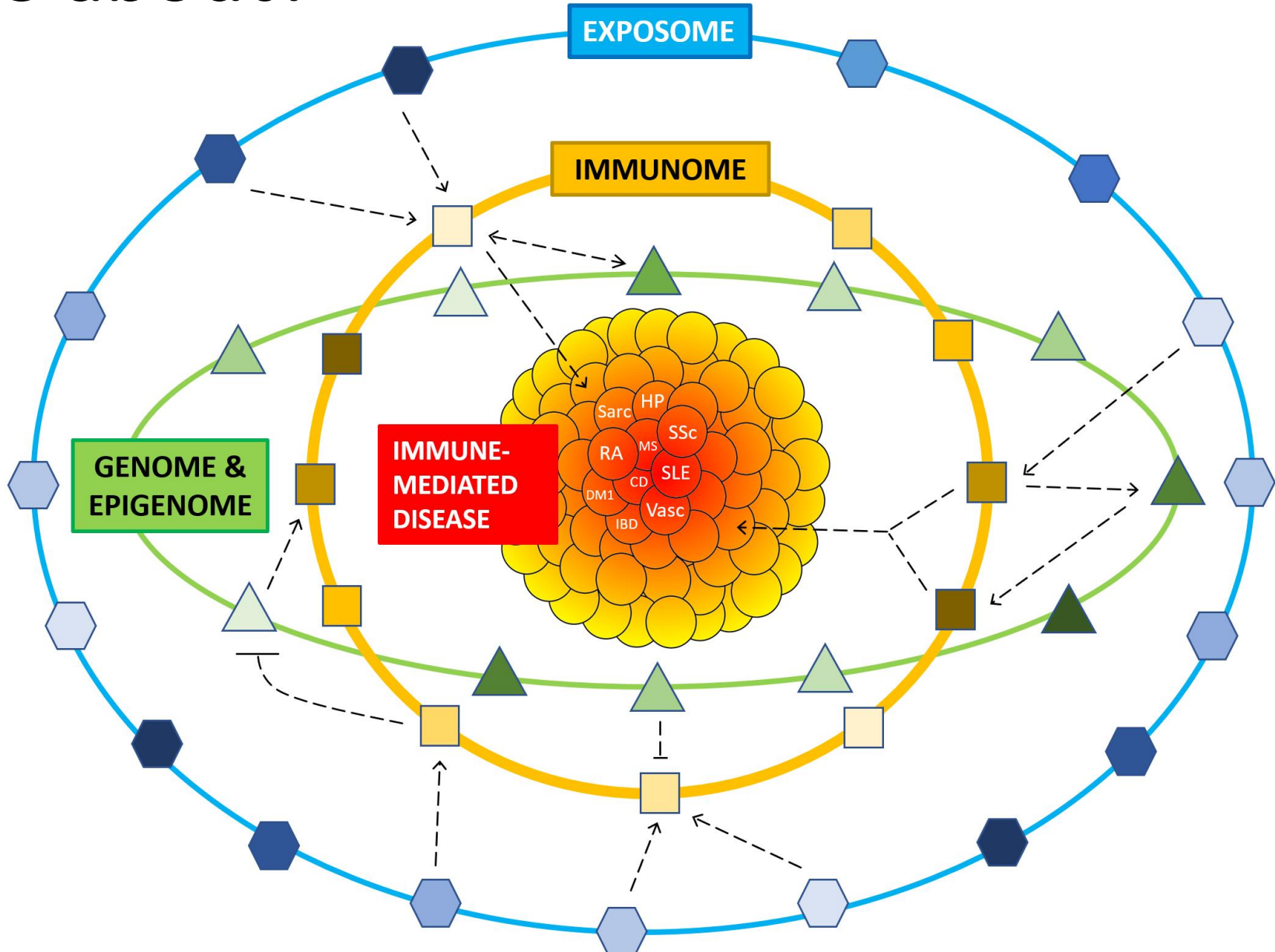
EU-Humane Exposome Project

EXIMIUS
Mapping Exposure-Induced Immune Effects

Peter Hoet



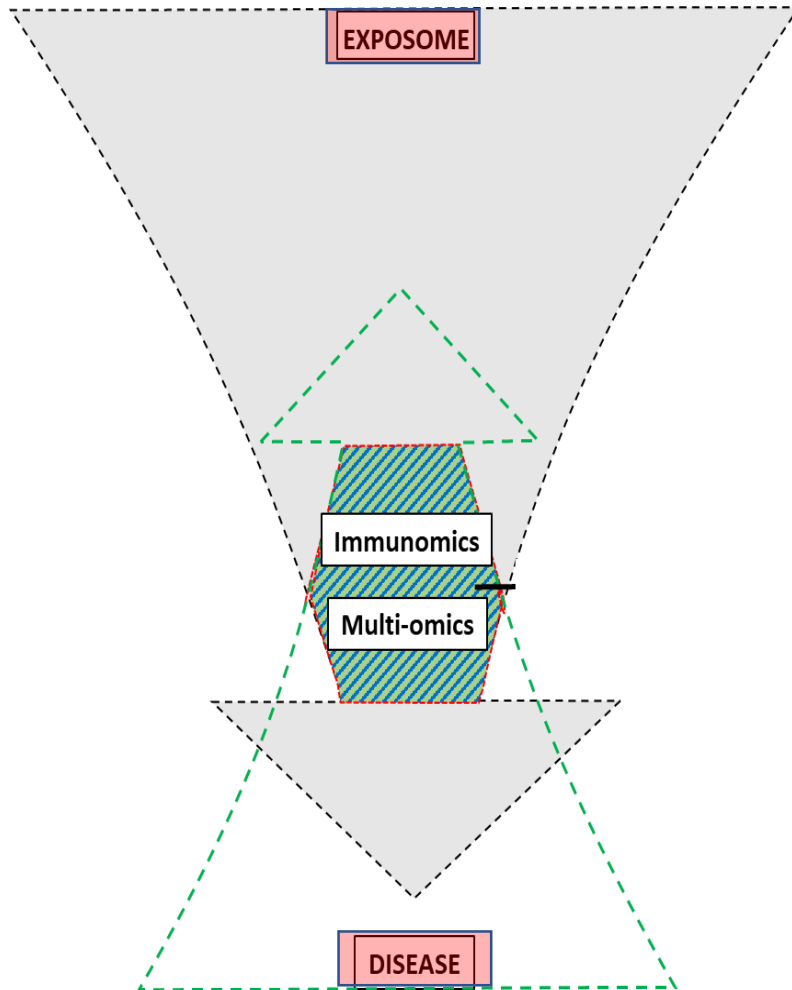
What is EXIMIOUS about?



Why is this important?

- Immune-mediated disorders such as autoimmune diseases (AD) are **non-communicable chronic** diseases → pivotal role of **immune system**.
 - Affecting **7.6–9.4% of the EU** population .
 - Autoimmune diseases are a leading **causes of death** in **women** under the age of 65.
 - **Socio-economic factor** → poorer people being at much greater risk.
 - Financial costs (USA) annual **expenditure associated with AD** ~ **\$100 billion**
- World Health Organisation (WHO) recognised **the involvement of environmental exposure** BUT underlying **causes, mechanisms** and **prevention** remains **underexplored**
- Immune-mediated disorders **represent in the hundreds of diseases or syndromes**
→ generic vs disease per disease approach

How will EXIMIOUS reach these goals?



FIRST APPROACH: STARTING FROM THE EXPOSOME

Cohorts that cover the **entire lifespan**: general and birth cohorts (LifeLines, DOC*X and DOC*X Generation, ENVIRONAGE) and

Occupational cohorts (park workers, paint factory workers, miners, metallurgy workers, waste handlers and administrative workers).

SECOND APPROACH: STARTING FROM THE DISEASE

Cohorts with potentially **exposure-related, immune-mediated diseases**

e.g. systemic sclerosis (SSc), systemic lupus erythematosus (SLE), rheumatoid arthritis (RA), sarcoidosis and hypersensitivity pneumonitis (HP).

What will EXIMIOUS deliver in 5 years

Overlapping markers → 'Immune Fingerprint'

- Exposure

→ Reflecting person's lifetime exposome (~ biomarker)

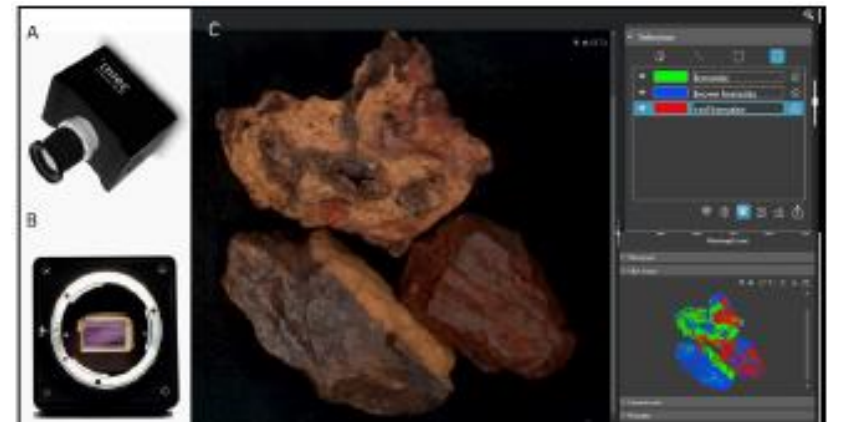
- Disease

→ Reflecting person's health

Predictors of disease at the individual level

Hyperspectral imaging (HSI) sensors:

- Rapid determination of environmental samples



How will EXIMIOUS elucidate the biological effects of the exposome

- Specific **exposures** & **genetic** predisposition & **immune** interactions
- Better **prediction of disease risk** by acquiring new knowledge on the influence of external **exposures** on **biological pathways** at different **life-stages** and identification of **early signs of health damage** caused by environmental factors.
- Common elements in genesis of immune-mediated disorders.

What are the critical needs for success

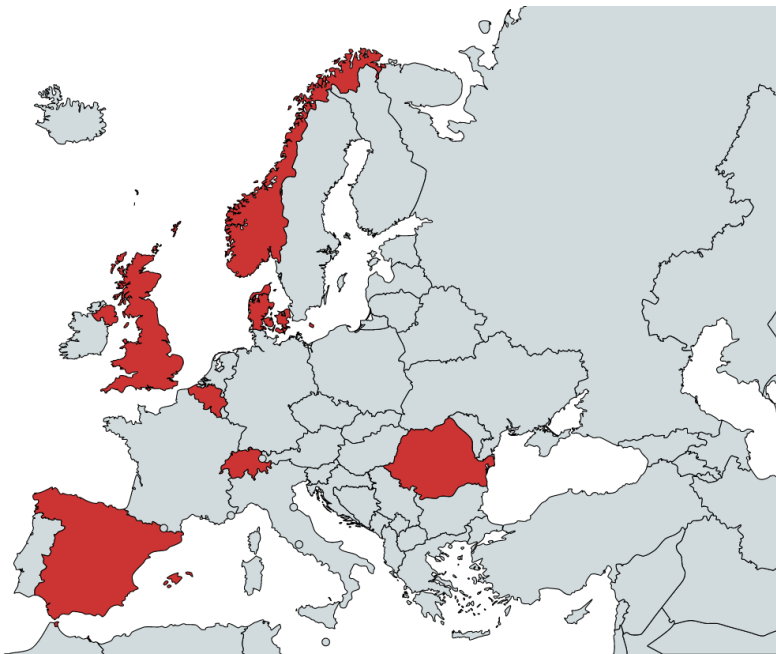
Stakeholder involvement

- Diseased cohorts & past exposure
- Database based analysis – capturing existing data

Exposome network

- Exposure at work → JEM's
- Environmental exposure close to polluting sites → models

Acknowledgements



Participant No. *	Participant organisation name	Short name	Country
1 (Coordinator)	Katholieke Universiteit Leuven	KUL	Belgium
2	University of Hasselt, Centre for Environmental Sciences	UH	Belgium
3	Norwegian Institute of Public Health, Toxicology and Risk Assessment	NIPH	Norway
4	National Research Centre for the Working Environment	NRCWE	Denmark
5	Belgian Center for Occupational Hygiene	BECOH	Belgium
6	imec, Leuven	IMEC	Belgium
7	Université Catholique de Louvain, Louvain Centre for Toxicology and Applied Pharmacology (LTAP), Brussels	UCL	Belgium
8	Babraham Institute, Cambridge	BI	UK
9	Queen's University Belfast, School of Pharmacy, Belfast	QUB	UK
10	Region Hovedstaden	REGIONH	Denmark
11	Biogenity	BioG	Denmark
12	Vall D'Hebron Research Institute, Barcelona	VHIR	Spain
13	Aarhus University, Section of Atmospheric Modelling, Department of Environmental Science	AAU	Denmark
14	University of Medicine, Pharmacy, Science and Technology of Targu Mures, Department of Occupational Medicine	UMFST	Romania
15	Acceloptment	ACCEL	Switzerland

Thank You



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 874707.

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