Human Health and Environmental Pollution

BioHealth Department Symposium

2022-11-17, Montpellier, France
a leading project of the University of Montpellier

- Laureate of the ExcellenceS nationwide call (French ministry of higher education, research & innovation)
- Supported by the Occitanie region

- Integrated in the perennializing Montpellier University of Excellence (I-Site MUSE) consortium (47k students, 6k researchers) and related programs:
  - international graduate school (IDIL)
  - strategic international partnerships
  - Montpellier Institute for Data Science

→ 5.8 M€ p.a. over 8 years

ExposUM partners
Long-standing tradition of cooperating with LMICs and strong international network of partner countries already organized by IRD, Cirad, CNRS, and Inserm (400 researchers in 50 countries).
WHO global assessment of the burden of disease from environmental risks (Prüss-Ustün et al. 2016)

- 24% of morbidity
- 23% of deaths
- 36% of deaths in children under 15
Ambient air pollution & household air pollution are associated with 7 million premature deaths annually (WHO 2021)
The set of environmental and social factors the proper effects of which, combined with the intrinsic characteristics of individuals, underlie the onset, the course and the severity of non-communicable and communicable human diseases.
exposome as a research field

Hu et al. 2022 CREST

mechanisms

measures

modelling

leverages prevention & care

Lewontin 2000 Harvard Univ Press
218 out of 375 of infectious diseases confronted by humanity worldwide have been at some point aggravated by climatic hazards.

Mora et al. 2022 Nature Climate Change
emerging exposome: West Nile fever

Culex pipiens

1127 WNV infections & 74 deaths in EU/EEA and neighbouring countries in 2022.
From 0 (2017) to 65 locally-acquired cases (9 clusters) of dengue in metropolitan France (Jun–October 2022).
goals & organisation

Make an innovative, multi-disciplinary, off-site framework to

• **Generate** – accelerating the acquisition of fundamental knowledge in a coordinated, non-segmented, transdisciplinary manner,

• **Apply** – initiating comprehensive mitigation strategies adapted to local contexts and encourage innovation,

• **Transmit** – promoting the education of the next generation of scientists,

**Exposome science.**
Annual thematic calls for proposals

- Broad to multiple topics (contexts, processes, patterns, methods; e.g. the exposome in the city of tomorrow)
- Strong incentive to transdisciplinarity, new collaborations, development of local resources, LMICs-oriented

Chairs

- 2-year renewable mandates
- Supported by PhD/post-docs
December 2022: 1st research call; Early 2023: kick-off meeting, 1st chairs & nexus call.

- Translate societal demands into research questions through participatory and collaborative approaches with societal actors.
- Create a Science-Society interface to valorise the results.

- Decompartmentalised curricula
- Training through research
- Improve skills in autonomy, determination, work ethic and teamwork
- Further integrate the link with the South.

**Doctoral nexus**
- Research-intensive excellence curriculum
- 4+3 PhD p.a.

**Specific curricula**
- Specific high-level training
- 6 Junior teams p.a.

**Univ. Montpellier abroad**
- Outward
- 2 Graduate School tracks

**Mentoring**
- 6 Junior teams p.a.

**Transitions Laboratory**
- Collaborative space for sharing knowledge and experimentation between scientists and public authorities.

**Interdisciplinarity incubator**
- Construction of new interdisciplinary research questions

**Public actors → Associations & private sector → Outreach**
- Bringing out research demands from society
- Enable the economic valorisation of innovations

**B.I.M.**
- Booster Innovation Montpellier

**Trait d'Union**
- Fatir ensemble de la MSH Sud