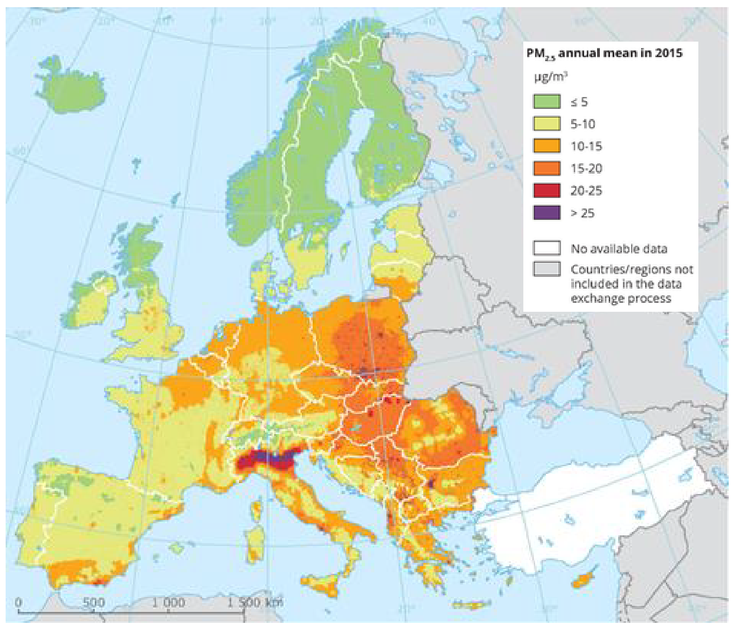
AeroToX: Measurements for mitigating adverse health effects from airborne particulate pollutants

Ian S. Mudway, King's College London, UK; Katrin Hoffmann, Bundesanstalt für Materialforschung und -prüfung, Germany; Alejandro Keller; University of Applied Sciences Northwestern Switzerland, Switzerland; Monika Kåredal, Lund University, Sweden; Anna-Karin Larsson-Callerfelt, Lund University, Sweden; Zaira Leni, University of Bern, Switzerland; James Noble, National Physical Laboratory, UK; Paul Quincey, National Physical Laboratory, UK; Ute Resch-Genger, Bundesanstalt für Materialforschung und -prüfung, Germany; Karri Saarnio, Finnish Meteorological Institute, Finland; Mike J. Shaw, National Physical Laboratory, UK; Konstantina Vasilatou, Federal Institute of Metrology METAS, Switzerland

The Need:

In Western, Central and Eastern Europe long-term exposures to $PM_{2.5}$ is related to

- 430,000 premature deaths;
- 7 million plus years of healthy life lost.
- Economic cost: $1.6tn a year



The unmet question:

Which PM features (particle size, number) or components are the most important in terms of their toxicity?

Scientific objectives to address this question:

1. **WP1**: Production of compositionally-defined synthetic ambient aerosols.
2. **WP2a**: Improved cell models to achieve in vitro-in vivo correlation for particle testing.
3. **WP2b**: Improved aerosol delivery to cell models that mimic the natural inhalation.
4. **WP3**: Development of quantitative, high-resolution imaging to investigate particle uptake and toxiclogically relevant endpoints.
5. **WP4**: Provison of new reference material and methodolgies to the scientific community. Engagement with policy makers and clear engagement with European citizens.

Why the lack of progress?

1. PM reference standards that have little relevance to the current European airshed.
2. Reductive toxicity strategies using compositionally complex real -world samples.
3. Little standardisation of toxicological methods.
4. Significant shortcomings in current cells and tissue models that fail to replicate in vivo reality.
5. An inadequate focus on in vitro to in vivo correlation.

Partners

METAS

NPL National Physical Laboratory

BAM

Fachhochschule Nordwestschweiz

King's College London

Finnish Meteorological Institute

Universität Bern

Lund University

Stakeholders

DiagnostikNet BB – Netzwerk Diagnostik Berlin-Brandenburg e.V.

VERT Association

COMEAP – Committee on the Medical Effects of Air Pollutants

University of Basel

beco Berner Wirtschaft Economie bernoise

M Squared

Jing

Swiss TPH – Swiss Tropical and Public Health Institute, Schweizerisches Tropen- und Public Health-Institut

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Bundesamt für Umwelt BAFU
Office fédéral de l'environnement OFEV
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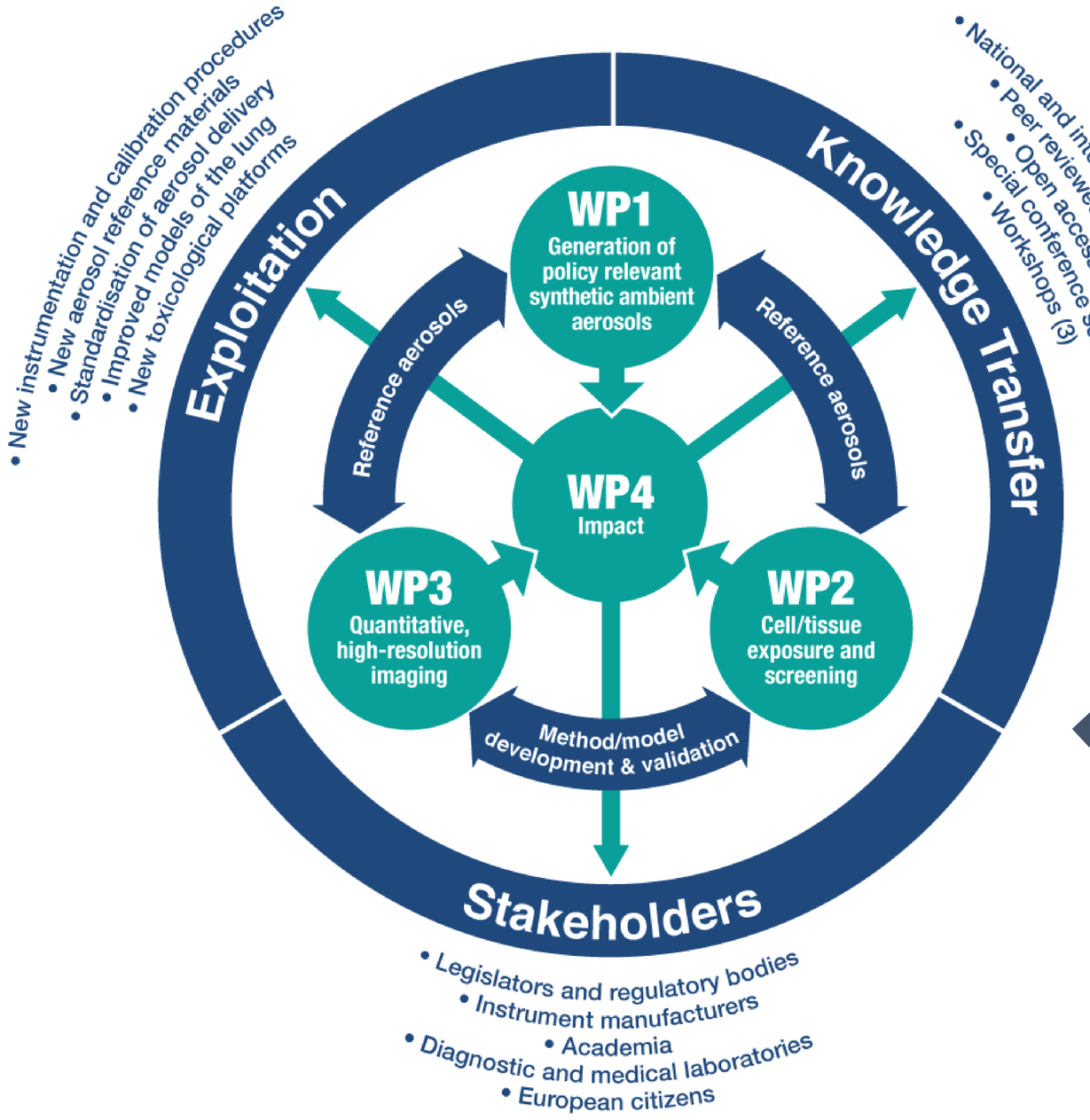
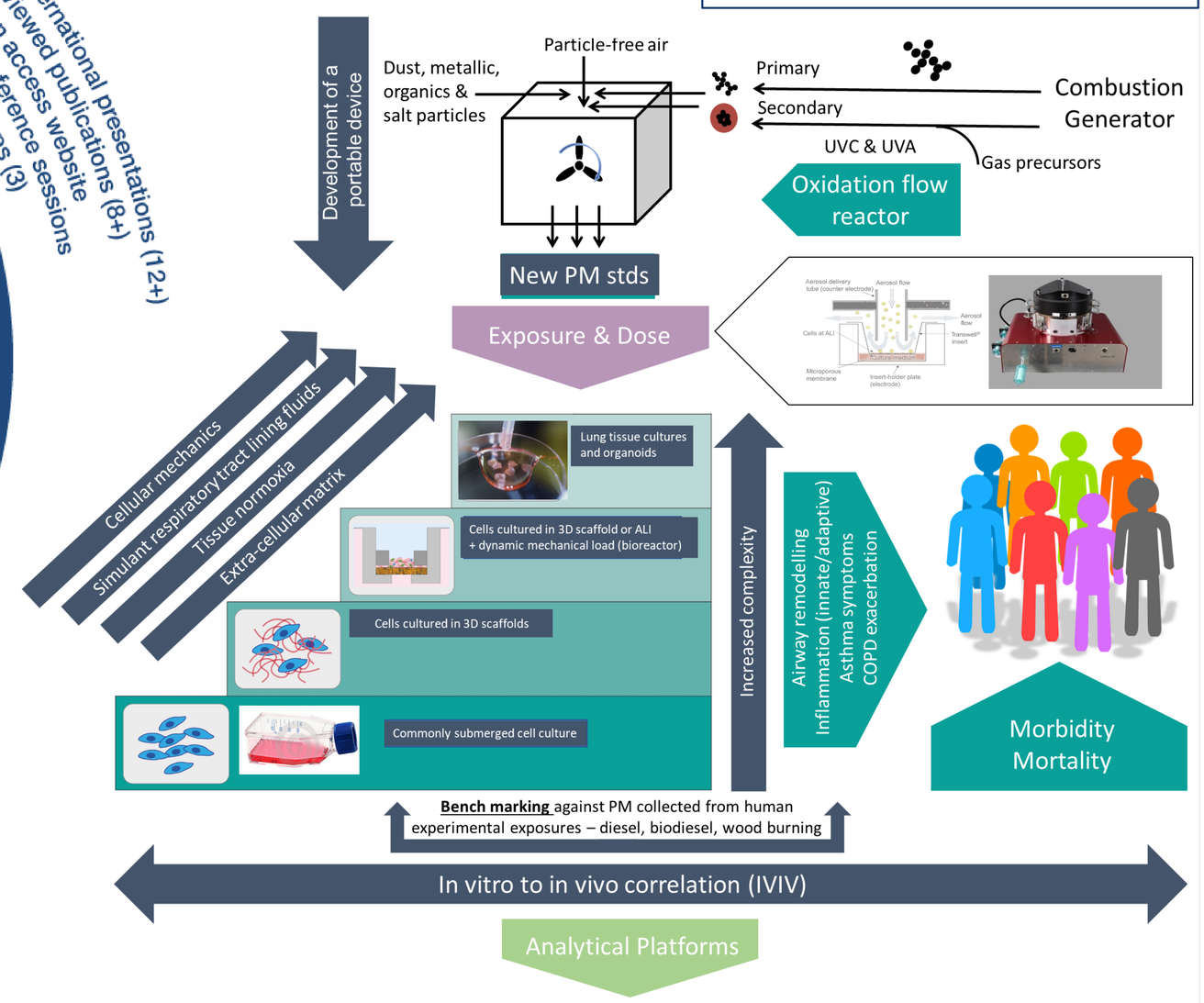
krebsforschung schweiz – recherche suisse contre le cancer – ricerca svizzera contro il cancro – swiss cancer research

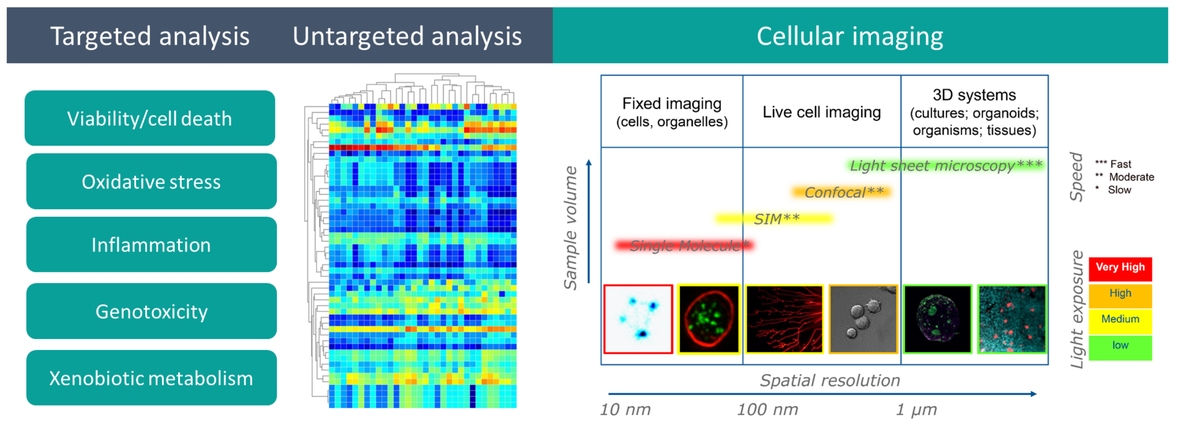
TNO innovation for life

LNE – Sharing a passion for progress

National Research Council Canada







Impact:

1. Improved evidence-based AQ legislation
2. Better health and productivity for European citizens
3. Reduced economic costs
4. Technology innovation and dissemination of best-practice

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