PARC: Relevant projects related to NAMs

Philip Marx-Stoelting & Mirjam Luijten

Workshop on implementing EC Roadmap on phasing out animal testing in pesticides and biocides

21/10/2026

PARC

What is PARC?

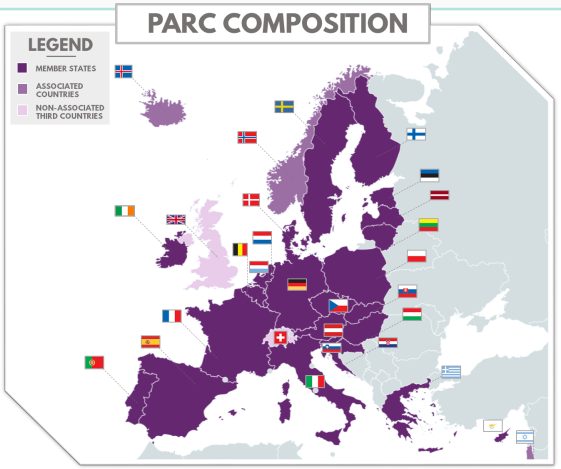
- A public-public **partnership** under Horizon Europe
- An initiative where the **European Union**, prepared with early involvement of **Member States and Associated Countries**, together with public partners (EU and National Risk Agencies, Universities, Public Research Organisations), commit to **jointly support the development and implementation of a programme** of research and innovation activities in relation with **the assessment of risk of chemicals.**

HORIZON EUROPE

Public-Public

Co-Fund Budget
EU 50/50 MS, AC
400 M€

Started : 01/05/2022
Duration : 7 years
~200 Partners



29 countries

24 Member States: Austria (AT), Belgium (BE), Croatia (HR), Cyprus (CY), Czech Republic (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (EL), Hungary (HU), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Netherlands (NL), Poland (PL), Portugal (PT), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE)
3 Associated countries: Iceland (IS), Israel (IL), Norway (NO)
2 Non-associated Third countries: Switzerland (CH), United Kingdom (UK)

3 European Agencies :

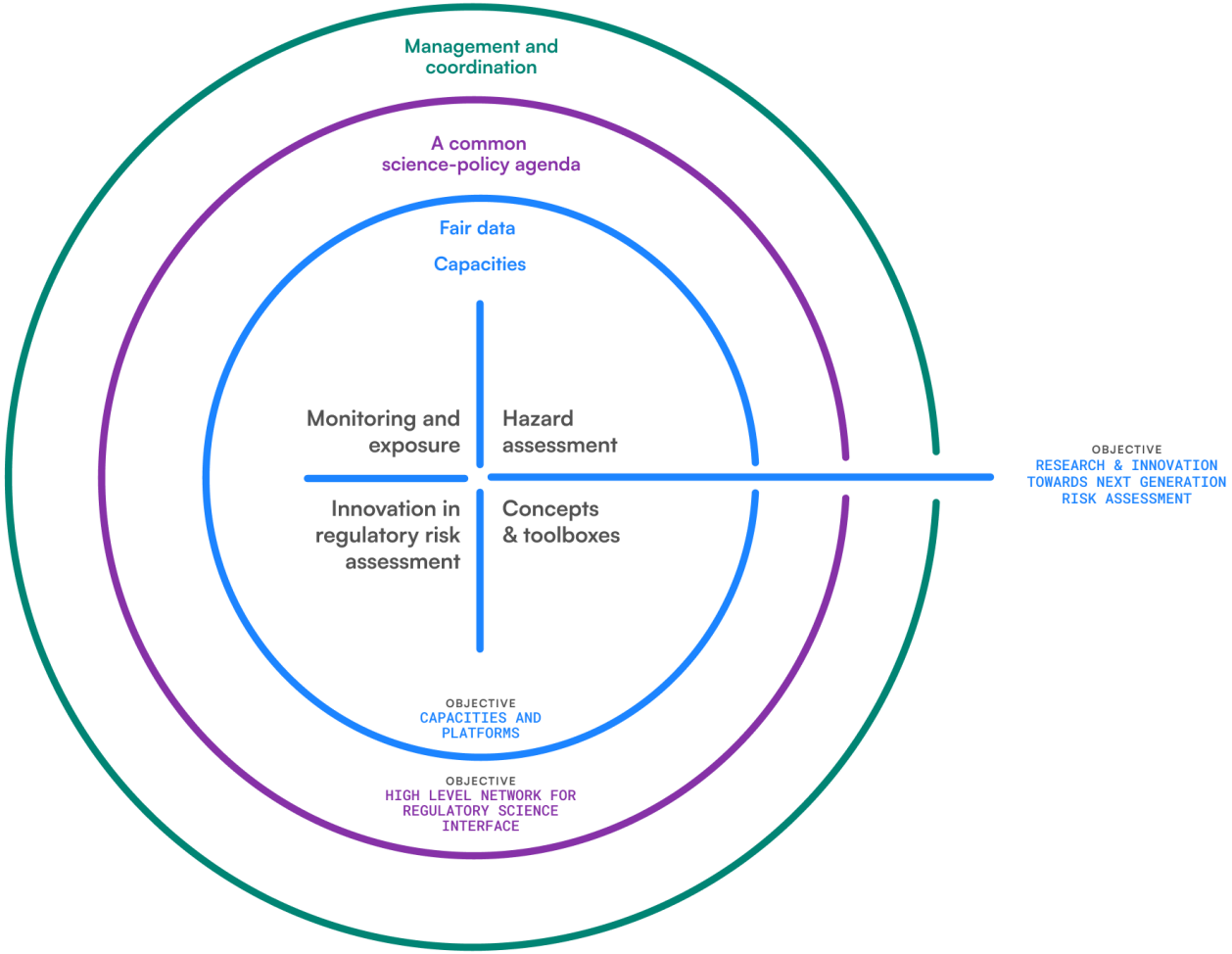
European Environment Agency
efsa European Food Safety Authority
ECHA EUROPEAN CHEMICALS AGENCY

PARC

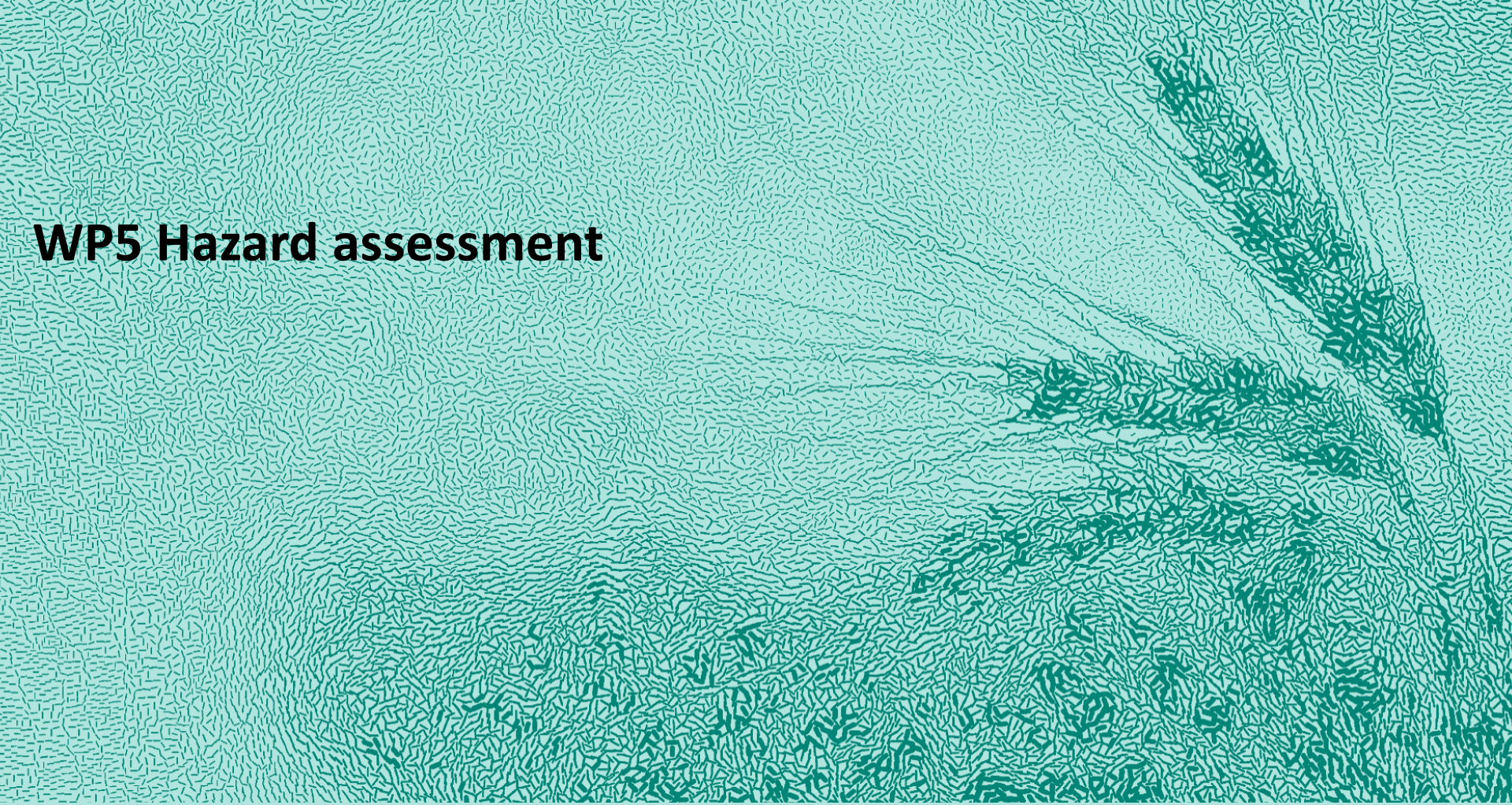
PARC Objectives

Global Objective

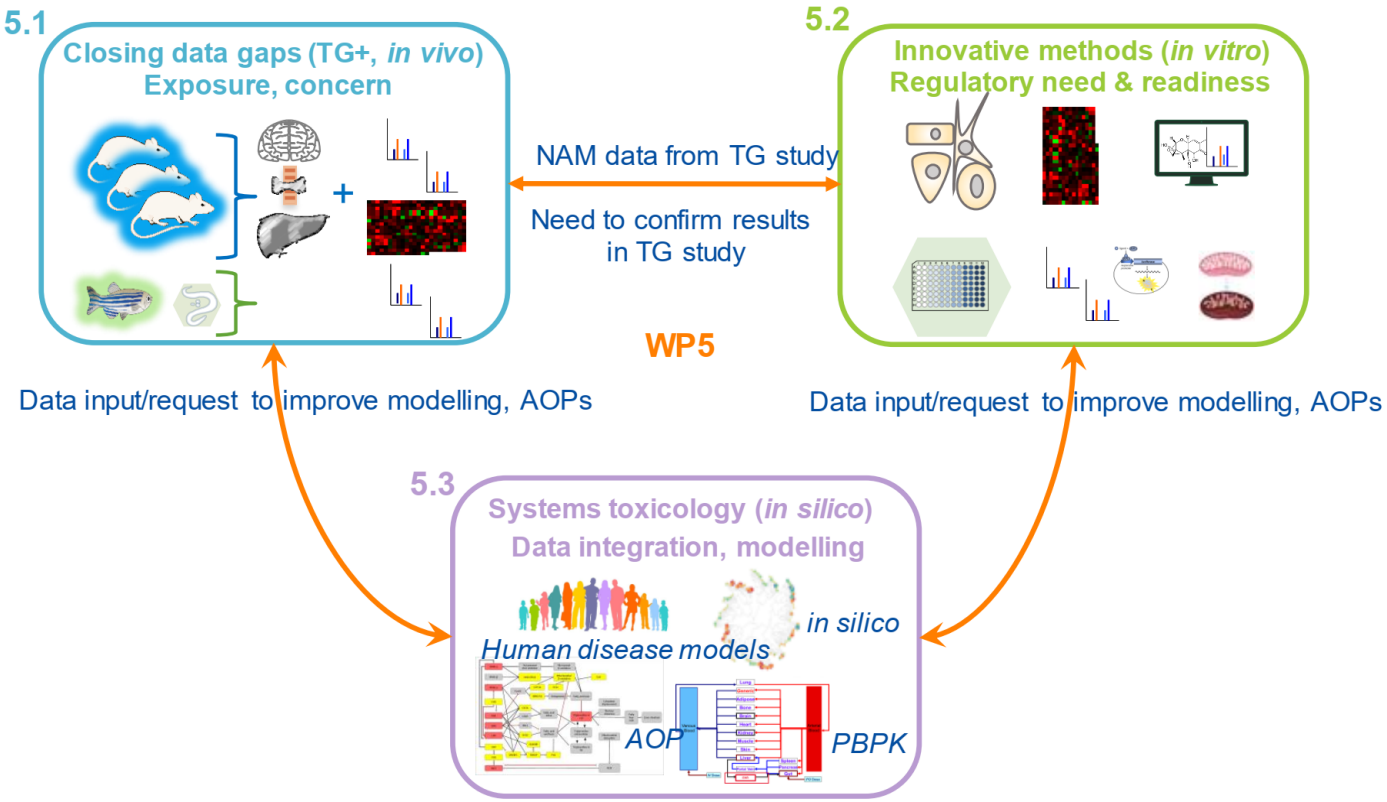
To consolidate and strengthen the EU's R&I capacity for **chemical risk assessment** to protect human health and the environment and to contribute to a non-toxic environment and a circular economy.



WP5 Hazard assessment



WP5


5.1
Closing data gaps (TG+, *in vivo*)
Exposure, concern
NAM data from TG study
Need to confirm results in TG study
5.2
Innovative methods (*in vitro*)
Regulatory need & readiness
WP5
Data input/request to improve modelling, AOPs
Data input/request to improve modelling, AOPs
5.3
Systems toxicology (*in silico*)
Data integration, modelling
in silico
Human disease models
AOP
PBPK

Task 5.1 – closing data gaps

Data Gaps Filled

Preliminary results published in scientific publications &
D5.4 1st Report on Data Gaps"

Human Health

✓ Genotoxicity, Endocrine Disruption and Immunotoxicity of Enniatin & Alternaria toxins
✓ Endocrine Disruption of BPA alternatives.

TG + Studies First TG+ for Enniatin B1 launched.
✓ Dose Range Finding 14-day study completed

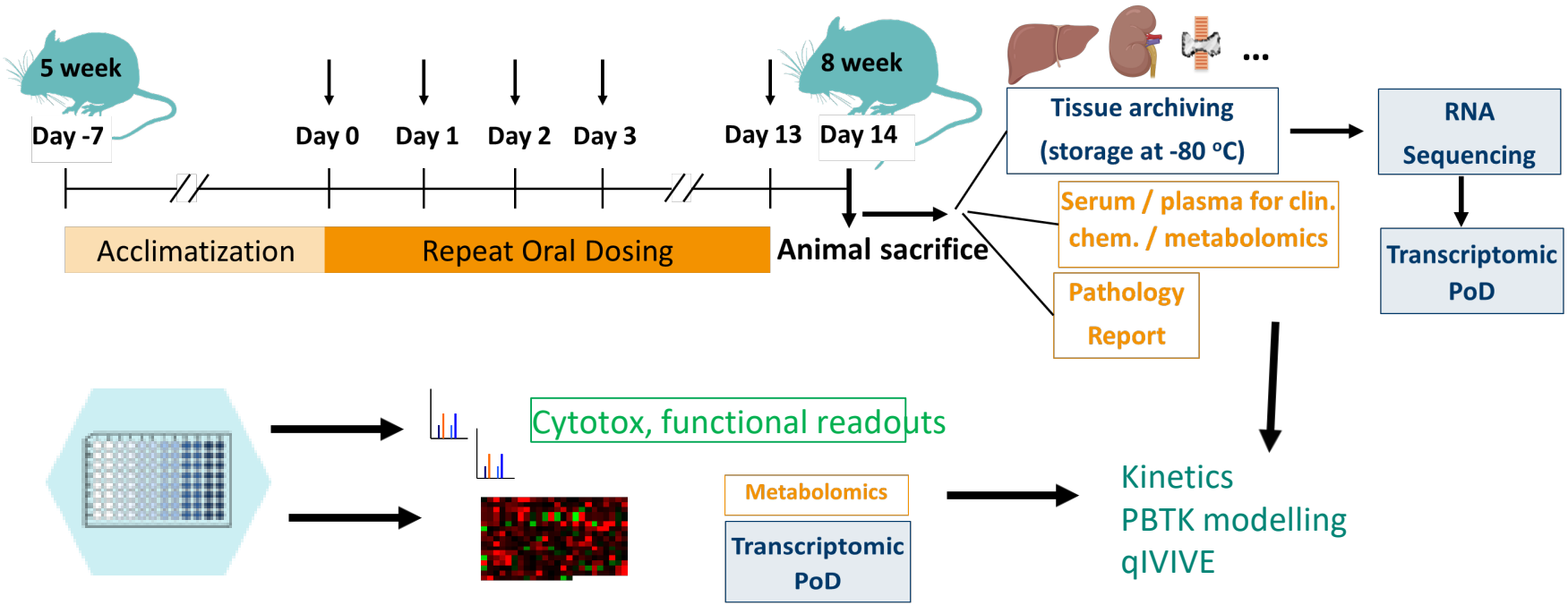
New projects developed (started May 2025)
✓ Plastic Leachates effect on human health

Environment

✓ Toxicity of marine and fresh water algal toxins
(+ mixture in 4 model organisms)
✓ Immunotox, DNT, reprotox, Metabolic disruption and behaviour in 9 model organisms



Combining in vivo work (TG+) with in vitro work)



Task 5.2 Innovative tools

Development of innovative methodologies

Preliminary results published in scientific publications &
D5.1 1st Report on New approach methodologies (NAMs)

Human Health endpoints covered

- ✓ Non-Genotoxic Carcinogenicity (NGTxCs)
- ✓ Metabolic Disruption (MD-ED)
- ✓ Endocrine Disruption – Thyroid (ED-Th)
- ✓ Immunotoxicology
- ✓ Neurotoxicology

New projects developed and supported by PARC prioritization / KARC

- ✓ RegulatoryNAMs, a new (transversal) project derived from the transversal activity (position paper)
- ✓ Developmental and Reproductive Toxicity - ED (DART-ED)
- ✓ Developmental Immunotoxicity
- ✓ Sexual Dimorphism Hepatox

Environment

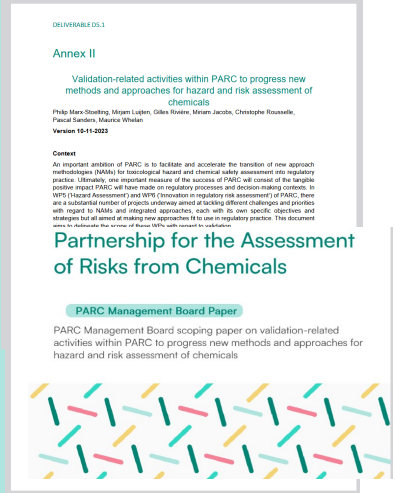
- ✓ i) *in silico* and modelling tools, ii) invertebrate animal models, iii) vertebrate models and iv) complex microbial community


D5.1 NAMs

Partnership for the Assessment of Risks from Chemicals

Deliverable D5.1

1st Report - New Approach Methodologies (NAMs)


DELIVERABLE D5.1

Annex II

Validation-related activities within PARC to progress new methods and approaches for hazard and risk assessment of chemicals

Version 10-11-2023

Context

Partnership for the Assessment of Risks from Chemicals

PARC Management Board Paper

PARC Management Board scoping paper on validation-related activities within PARC to progress new methods and approaches for hazard and risk assessment of chemicals

The many ways of improving regulatory uptake – the toolbox

1. Co-design of NAMs (OECD WPHA, NIH, PARC)
2. Beta-testing (BfR, PARC)
3. Case studies (RiskHunt3R, PARC, OECD IATA Case study project)
4. Readiness improvement (PARC)
5. [Qualification system (US FDA, EMA, EFSA NAMs4Nano *proposed cooperation)]*

Task 5.3 –Systems toxicology

Progress on

System Toxicology

AD5.7 Draft strategy for the development of bioinformatics tools that are needed to link omics data and other mechanistic information to human relevant disease mechanisms

✓ Tested the implementation of the OECD Reporting Transcriptomic Framework

✓ Successful translation of omics data into human-relevant disease mechanisms and *in vivo* responses (e.g., kidney biopsy dataset)

AOPs

D5.3 1st Report on new AOPs. Inventory on the available AOPs and/or markers in immunotoxicology, non-genotoxic carcinogenesis, endocrine and metabolic disruption and neurodevelopment

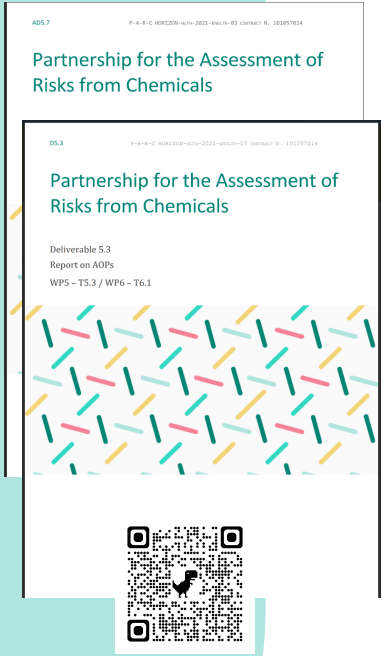
✓ Development of 25 AOPs

PBK Models

D5.2 1st Report on new PBK models. Results from methodological case studies on human microbiome, isoform metabolism, inhalation-absorption, blood brain barrier, and priority compound case study on PFAS

✓ Identified data and methodological gaps

✓ Improved and developed PBK models on relevant ADME processes



WP6 Innovation in regulatory risk assessment

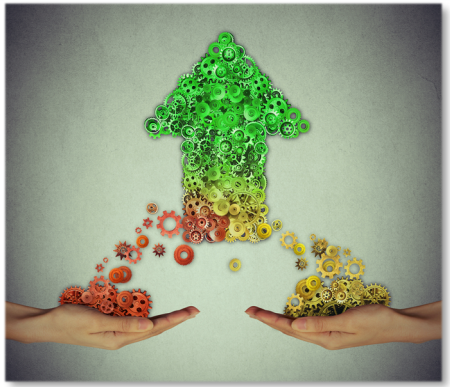
1. Main objective for WP6 for the 7 years

To drive innovation in regulatory risk assessment by strengthening its scientific basis, with implementation of next-generation risk assessment (NGRA) as ultimate goal.

Protect human health and the environment; contribute to a non-toxic environment and a circular economy

Scientific basis for NGRA

Quantitative AOP networks
Mechanism-based IATAs, using **New Approach Methodologies**
Multiple route exposure workers and general population
Unintentional mixtures and real-life exposure
Health impact assessment across regulatory silos



Regulatory science

Driven by **regulatory needs**
Determine **feasibility**, within **existing legislations** and in the **future**
Effectiveness of **existing** and **emerging** methods
Data availability and quality
Across legislations
Regulatory acceptance

Generate the best science to answer regulatory questions

Ensure that science meets regulatory needs

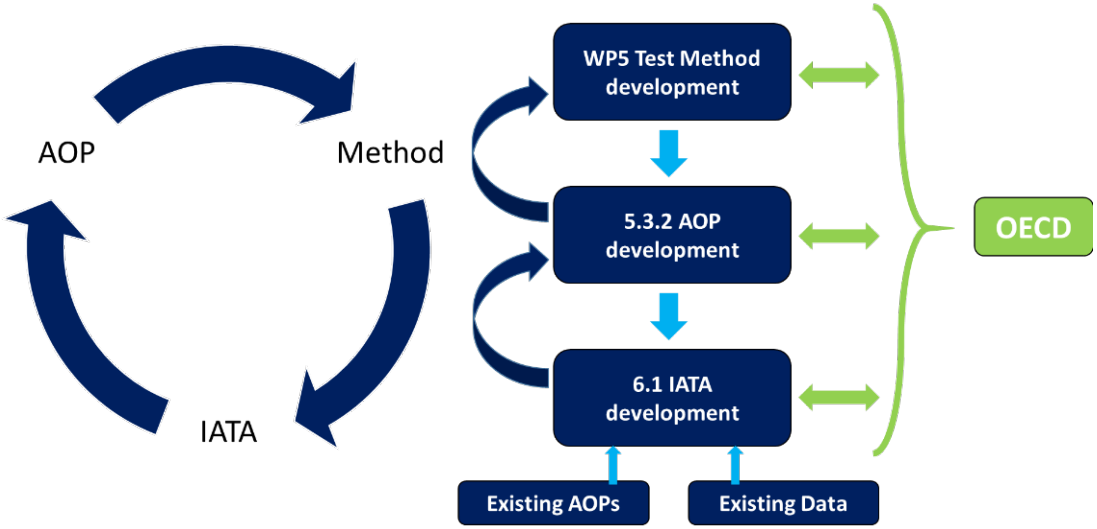
Close collaboration

- Researchers
- Risk assessors
- Risk managers

Improvements that are already achievable

Improvements that require additional development

Task 6.1 Projects



- Endocrine disruption (thyroid disruption/anti-androgenic effects)
- Genotoxicity
- Specific Target Organ Toxicity (liver fibrosis)
- Carcinogenicity
- Metabolic disruption
- Workflow for human relevance assessment

Human relevance assessment

Aim:

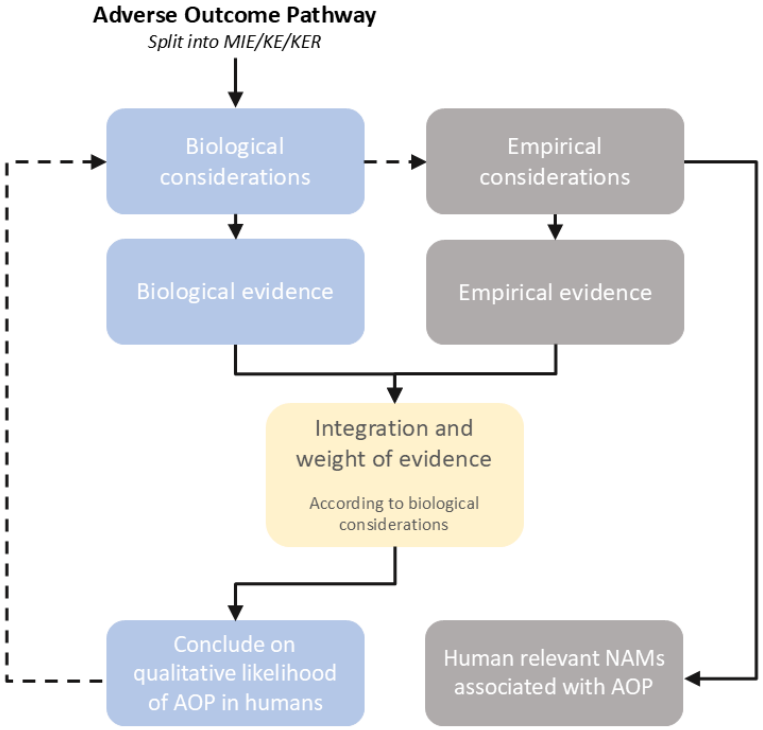
Develop a structured workflow for assessing the **human relevance of AOPs** and **associated NAMs**

Involves:

- Workflow: biological considerations, empirical considerations, and weight of evidence assessment
- Guidance and templates
- Toolbox (sources of information)

Activities:

Case studies, improving approach for weight of evidence assessment, semi-automation to increase standardization

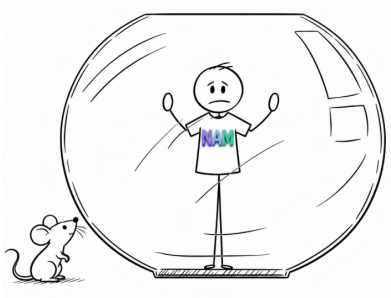


From: Van den Brand et al, Front Toxicol, 2025

Building confidence in the regulatory use of NAMs

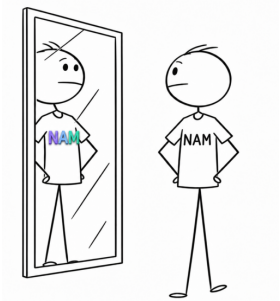
A case-study-based project to support broader NAM implementation in chemical hazard and risk assessment

Broader regulatory use of NAMs remains



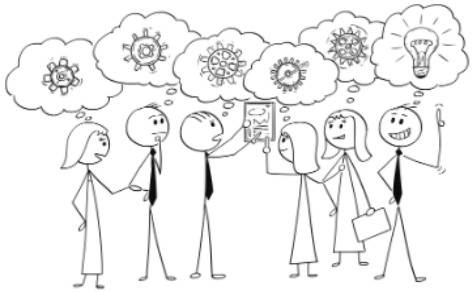
- NAMs still face barriers to broader regulatory use
- Need to demonstrate: robustness, relevance and reliability

Need to build regulatory confidence



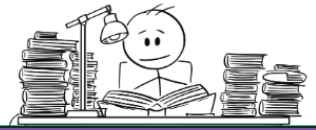
- NAMs need to be fit for purpose and aligned with regulatory needs.
- Clear criteria are needed for evaluation, validation and acceptance

Use NAM-based case studies to demonstrate

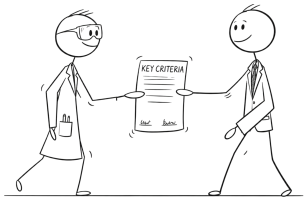


- Different regulatory contexts, uses,endpoints
- Ensuring regulatory relevance and alignment with NAM integration and confidence-building principles
- Test scientific robustness and relevance
- Identify opportunities, limitations and challenges

A harmonised workflow to guide case-study development



Consultation of relevant literature and available guidance documents from EFSA, OECD, etc



Identification of key criteria for building confidence in NAM-based strategies



Continuous dialogue with the Steering Group (EFSA, ECHA, JRC, national authorities)

Translated into a **structured workflow** to **guide case-study design, development and refinement**

- ✓ **Consistency across case studies**
- ✓ **Regulatory question and context of use defined from the outset**
- ✓ **Alignment with regulatory expectations**


THANK YOU!

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PARC Partnership FOR THE Assessment OF Risks FROM Chemicals

Co-funded by the European Union