

ALTERNATIVE – Building the Innovative Platform to Assess the Cardiotoxicity of Chemicals

What the ALTERNATIVE project is about

Horizon 2020 research project ALTERNATIVE develops an innovative platform and an integrated approach for testing and assessment of the potential of chemicals to induce cardiotoxicity. The novel approach will strengthen the capacity of regulators and industry to prevent cardiotoxic co-exposures to industrial chemicals and pharmaceuticals in an effective way.

Key results

- ALTERNATIVE normal and aged cardiac in vitro 3D model platform development
- Omics markers and functional read outs for cardiac toxicity
- Machine-learning in silico cloud system for mixture risk assessment
- Kinetic in vitro to in vivo extrapolation model
- Adverse Outcome Pathway (AOP) based Integrated Approach for Testing and Assessment (IATA) of the potential cardiac toxicity of chemicals and mixtures for regulatory purposes
- Careful interaction with regulators to support the regulatory use of the S ALTERNATIVE project results

Major challenges

For the regulation of chemicals there is so far very little experience with the following topics:

- Cardiac toxicity
- Complex 3D in vitro models
- Use of -omics data
- Protection of vulnerable sub-populations
- Toxicological assessment of mixtures
- Protection against chronic low level chemical exposure
- Qualification of integrated non-animal testing and assessment approaches based on toxicological mechanisms of action

In order to achieve its planned results, ALTERNATIVE will tackle all of these challenging topics.



ALTERNATIVE

Project Factsheet

Target audiences

- Policymakers and regulators
- Pharma companies and agricultural industry
- National health services in Europe
- Environmental and health-related NGOs and citizen initiatives in Europe
- Scientific community in the areas of toxicology and biomaterials

Expected impacts

The ALTERNATIVE project results are expected to have the following impacts:

- Improved understanding of the regulatory utility of complex in vitro 3D models versus simpler 2D models
- Scientific evidence to enable prevention and mitigation of co-exposure to pharmaceuticals and industrial chemicals in the environment and the technosphere
- Improvement of existing risk assessment approaches to reduce the most critical exposures, including setting limit values Assessment of new regulatory approaches such as Mixture Assessment Factors
- Support of activities for the Chemical Strategy for Sustainability Towards a Toxic-Free Environment, particularly activities on combined exposures as relevant for the Strategic Approach to Pharmaceuticals in the Environment
- Decrease of the regulatory dependency on animal testing methods in line with the goals of the Directive 2010/63/EU for the protection of animals used for scientific purposes

ALTERNATIVE at a glance

Full project title: environmentalAL Toxicity chEmical mixtuRes through aN innovative platform based on aged cardiac tissue model

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Beneficiaries: 11 partners **Duration:** 1 October 2021 – 30 September 2024 (36 months)

Type of Project: Horizon 2020 Research and Innovation Action (RIA) **EU contribution:** € 5.5m

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ALTERNATIVE has received funding from the European Commission under the European Union's Horizon 2020 programme – grant agreement number 101037090. The European Union has no responsibility for the content of this publication.