



NoMiracle Participants

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-  Natural Environment Research Council
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-  Radboud University
-  University Piemonte Orientale DISAV
-  Vrije Universiteit Amsterdam
-  National Institute for Public Health
-  Cardiff University
-  Cambridge University
-  Jagiellonian University
-  University of Tübingen
-  Wageningen University
-  University of Aveiro
-  University of Antwerp
-  WRC-NSF Ltd
-  LemnaTec
-  Salzburg University
-  Directorate General Joint Research Centre - European Commission JRC
-  Finnish Environment Institute SYKE
-  Kaunas University of Technology APINI
-  Alterra
-  Eidgenössische Technische Hochschule ETH
-  National Institute of Public Health and Environment RIVM
-  LimCo International
-  Aachen University of Technology
-  ECT Oekotoxikologie GmbH
-  Consorzio Interuniversitario Scienze del Mare - Università di Milano Bicocca
-  Environment Park SPA
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Internet

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- www.nerc.ac.uk
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EU Integrated Research Project:



NOvel Methods for Integrated Risk Assessment of Cumulative stressors in Europe

Contract No. 003956

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NoMiracle, an integrated European research project, will develop novel methods and tools to better evaluate chemical risks

How do chemicals influence the environment and human health?

- ★ Can better understanding be found of how living organisms absorb chemicals found in their environment?
- ★ Can we describe complex exposure situations by simple diagnostic measurements?
- ★ Can the health status of wild species such as the Little Owl provide a valuable indicator of the health status of humans?
- ★ Which chemical “cocktails” present more risk to health than individual chemicals? Which interact with pathogenic, climatic and other stress factors to cause even greater impacts?
- ★ Do today’s safety factors, limiting the levels of chemicals allowed to be released in the environment, provide adequate protection to humans and wildlife?
- ★ How should we take into account geographical, ecological, social and cultural differences in risk concepts and risk perceptions across Europe?
- ★ How certain can scientists be about the outcomes of this type of research?
- ★ How certain can managers be about the decisions they should take?
- ★ Will extra safety/precaution measures be required in Europe?

How NoMiracle Will Respond to the Questions

NoMiracle develops methods that will allow scientists to answer the questions asked about environmental health. In testing the methods, NoMiracle already will provide some important answers.

We have organized four distinct Research Pillars (RP). There is communication and collaboration between pillars, for responding to the complex environmental health questions relies on good integration of different research and assessment steps.

RP1

To answer our questions, scientists need to start from concrete situations or scenarios. Interactions between mixtures of chemicals and combinations of stress and fate conditions produce a nearly infinite set of possible scenarios. NoMiracle will develop new methods to guarantee the best possible selection and design of risk assessment scenarios: scenarios that fit European reality, and that will not lead us in subsequent calculations to underestimate the real risk to the environment (animal species) or human populations. We will choose the chemical substances of greatest concern, collect data on their release rates, and look into factors that influence how chemical mixtures finally affect the environment and humans. The scenarios will be used by all the pillars.

RP2

To answer our questions, scientists need to find out how much people and the environment are actually exposed to chemicals. This means looking at exposure sources and pathways. NoMiracle will study mechanisms determining the effective exposure to chemical substances. We will develop methods to quantify the chemicals and mixtures that are actually present (under realistic conditions in for example, water and soil) and assess how much they are taken up by human and animal communities. The methods will be good for whole European regions and also specific “hot spots”, considering both indoor and outdoor conditions and variations over time. Our methods will allow quick screening (estimates based on only little information), while showing what’s needed to get a better picture.

RP3

To answer our questions, scientists need to estimate the hazardous effects when individuals are exposed to a mixture of stressors (chemical, physical and biological agents). NoMiracle will study the effects on human health and environmental species due to exposure to single and combined, chemical and non-chemical stressors. We will investigate how chemical properties shape the outcomes when for example, chemicals, climate, and biological systems act together. The cause-and-effect relationships will be stored in a data base. This will help us generate rules for risk assessment of combined effects, to be applied to exposure scenarios relevant to populations in Europe.

RP4

To answer our questions, scientists should make optimum use of available data and models, ensuring an efficient use of valuable resources. NoMiracle will produce a probabilistic and spatially explicit modelling framework that is tailored to support risk management decisions. We will develop techniques for quantifying the uncertainty that affects decisions throughout the integrated risk assessment process (exposure assessment, effects assessment, risk characterisation and risk management). We will outline options to deal with risk estimates in a multi stakeholder setting, that is, relating to risk perception, risk communication and a prudent application of the precautionary principle.

NoMiracle will help increase knowledge on the transfer of pollutants between different environmental compartments, and on the impact of cumulative stressors, including chemical mixtures. This will facilitate human and ecosystem health monitoring by providing the link with information concerning the condition of air, water, soil and the built environment. By developing and using improved assessment tools and novel models, the project will quantify and aim at reducing uncertainty in current risk assessment and screening methodologies, for example by improving the scientific basis for setting safety factors. The new methods will take into account geographical, ecological, social and cultural differences across Europe.