OpenRiskNet: an open e-infrastructure to support data sharing, knowledge integration and in silico analysis and modelling in risk assessment

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OpenRiskNet is
• a virtual research environment for predictive toxicology and chemical and nanomaterial risk assessment,
• harmonizing and facilitating interoperability of software,
• easily deployable to single computers, public and in-house cloud solutions,
• addressing the needs of industry and academic researchers, risk assessors, regulators and informed public.

Introduction

Case studies

Case-study-driven development is used to
• test and evaluate the solutions provided,
• demonstrate the ability to satisfy stakeholder groups requirements,
• present real-world applications,
• guide the prioritization of data sources and tools.

A workflow for the safety assessment of chemicals without animal testing developed within the SEURAT-1 project (Berggren et al., 2017) was selected to guide the definition of 7 case studies. This workflow constructs a hypothesis based on existing data, computational modelling, biokinetic considerations, and then, targeted non-animal testing.

Service-oriented science, containerization, deployment

Uses modern and established tools and frameworks supported by industry
• Offers an agile and scalable environment to use, and a straightforward platform to extend
• Allows language-agnostic integration of diverse software
• Reduces extra work for integration
• Reduces risk and improve sustainability

API design concept and semantic interoperability

OpenRiskNet will make the interfaces smarter by adding a semantic interoperability layer. By querying this layer, a service will provide
• scientific background of the service (link to the publication, manuals, tutorials and other training materials)
• technical background (links to source code, installation instructions, license information and deployment options)
• capabilities of the service (type and amount of generated output including the options and parameters)
• requirement on input data types and formats and options on the output format.

The semantic layer is realized as a combination of OpenAPI definitions with JSON-LD data serialization to bridge the worlds of API development and the semantic web.

References and more information


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