Expanding and Improving the EAS-E Suite Platform for Exposure Modeling

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There are ethical and regulatory requirements for the safe and sustainable production and use of chemicals by society. The scientific assessment of chemical exposure and safety to human and environmental health is hindered by measurement data gaps and the limited availability of evaluated models and tools, particularly for exposure estimation. Furthermore, there is often limited time and expertise for obtaining the data required to apply models and tools to support chemical safety assessment, e.g., chemical properties, use information, exposure rates. Moreover, many tools currently used in the regulatory domain are outdated. The Exposure And Safety Estimation (EAS-E) Suite platform, (*pronounced* "EASY Suite") is a freely accessible on-line application (www.eas-e-suite.com) developed by ARC Arnot Research and Consulting (ARC) to address many of these challenges.

EAS-E Suite is comprised of:

1. Evaluated empirical (measured) data of chemical information required for assessments (e.g., physical-chemical properties, reaction half-lives);
2. Quantitative Structure-Activity Relationships (QSARs) and other models to predict chemical information required for assessments;
3. Mass balance models for simulating (i) chemical emissions throughout their life-cycle, (ii) chemical fate and transport and persistence in natural and manufactured (e.g., indoor) environments, (iii) toxicokinetics in humans, rodents, and ecological receptors as well as in vitro bioassays, (iv) exposures and bioaccumulation to a broad range of organisms, including humans, and (v) related risk estimates.

This research advances methods for exposure and risk estimation for various decision contexts (i.e., consumers, workers and ecological) and facilitates the application and evaluation of New Approach Methods (NAMs) by providing access of these scientific research and development advancements to multiple stakeholders (i.e., ACC members, competent authorities). The research project is separated into four general work packages:

1. Improve chemical property and use data in EAS-E Suite;
2. Expand near-field human exposure and safety estimation capacity including occupational, consumer and general population exposure scenarios in EAS-E Suite;
3. Improve far-field human exposure and ecological health assessment in EAS-E Suite;
4. Knowledge transfer (outreach, training webinars and workshops).

Implications: This research will enhance and expand capacity for applying, evaluating, and comparing data and tools to support chemical safety and sustainability.

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