

HABILITATION THESIS REVIEWER'S REPORT

Masaryk University

Applicant

Lisa Emily Melymuk, Ph.D.

Habilitation thesis

Tracking the chemical signal of modernity: linking policy, behaviour and environment to understand human exposure to chemical pollution

Reviewer

Peter Haglund, Professor

Reviewer's home unit, institution

Umeå University, Department of Chemistry, Sweden

Dr. Melymuk's habilitation thesis focuses on human exposure to organic contaminants. This include both direct exposure of humans in indoor environments and indirect exposure through dietary exposure. Her research work is focused on the development of new tools and multi-disciplinary strategies that are used to generate profound knowledge of major drivers of human exposure to chemicals of emerging concern (CECs).

The text of the habilitation thesis is based on a selection of 20 peer-reviewed publications, including 19 original research articles and one review; all in well-reputed journals. Dr. Melymuk was the first and/or corresponding author on 16 papers. The publications are listed in the thesis and are categorized according to the author's contribution to experimental work, mentoring, manuscript preparation, and research guidance. The full texts of each publication are given in the appendices. From the publication list and associated material, it is clear that Dr. Melymuk has an extensive national and international collaboration network and that she engages extensively in the training of junior researchers.

The thesis is based on a conceptual model for emission, transport, fate and human exposure, including key drivers of the exposure. From this model a framework has been developed for understanding those drivers. It is divided in three parts covering chemical policy, human behaviour and environmental factors as drivers of human exposure. Well selected and illustrative examples are given in each of these areas, mainly based on the Dr. Melymuks work. The ultimate goal of the exposure assessment work has been to contribute to the international risk evaluation and reduction process, to identify chemical risks, and provide data to support decisions and actions to reduce such risks.

Overall, this is a very good habilitation thesis.

Reviewer's questions for the habilitation thesis defence

1 – Most of the contaminants included in the selected studies are legacy persistent organic pollutants (POPs) whilst many of the CECs are polar or semi-polar and less persistent. Would

the framework and tools presented be equally suitable for such contaminants, or would it need to be adopted or modified?

2 – The conceptual model presented in Figure 1 include environmental contamination of the food chain, but not direct contamination of food or feed (e.g. by food contact materials or tainted feed ingredients). Are that type of food contamination of less importance or only besides the main topic of the thesis?

3 - The concept of regrettable substitution is not specifically discussed. Do you have any illustrative examples of regrettable substitution(s) among the chemicals you have been investigating? What can be done to avoid it in the future?

Conclusion

The habilitation thesis entitled “Tracking the chemical signal of modernity: linking policy, behaviour and environment to understand human exposure to chemical pollution” by Lisa Melymuk **fulfils** requirements expected of a habilitation thesis in the field of Environmental Health Sciences.

Date:

Signature:

Umeå, 26 February 2025