Evaluation of Habilitation thesis of Ing. Darina Dvořáková, Ph.D.

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With interest I have read the habilitation thesis of Ing. Darina Dvořáková, Ph.D. with the topic "Biomonitoring: Tool for the Assessment of Human Exposure to Environmental Contaminants".

Dr. Dvořáková has co-authored 21 peer-reviewed papers, together with a large number of conference papers, other short papers, papers in the Czech language, and she has presented a large number of papers at international symposia. She has been active in the European program Human Biomonitoring for the EU (HBM4EU) and is heavily involved in the design of the follow-up program PARC. She has played an active role in the design of a quality assurance program for HBM4EU.

The thesis starts with an overview of the objectives of the work. These are focused on novel analytical approaches for the simultaneous determination of various groups of environmental contaminants and their exposure markers (metabolites) in human biological matrices with an emphasis on the validation of sample preparation methods. A multi-method for five groups of POPs was developed, which shortened the total time required to analyse these compounds substantially. Special attention was given to the PFAS group and hydroxy metabolites of the PAHs. A novel method for the phthalate metabolite di-iso-nonyl cyclohexane-1,2-dicarboxylate (DINCH) was developed, which is strong feature of this work. The human matrices serum, breast milk and urine were all studied.

The scientific papers are all of high quality. They have been published in journals with high impact factors. It would have been interested to see the number of citations included in this thesis. All papers are well-written with proper references used. They cover different fields, in particular analytical chemistry and human biomonitoring.

The amount of work done for this habilitation thesis and beyond is impressive. The results were all published in journals with high impact factors. The papers also show the international large network that was built during the work. It is clear that in the papers shown in the appendices a large share of the total work was carried out by Dr. Dvořáková. I have the impression that in the other papers, especially in the list of oral presentation, where she is not always mentioned as first author, her contribution was smaller in some cases. It would have been nice to have had a better description of her own share in that work.

There are, unfortunately, serious language issues, which is especially true for the first part of the thesis (until page 40). Most problems are in an incorrect use of articles, use of plural forms, erratic translations and illogic sentence constructions. I suggest that Dr. Dvořáková follows a course to improve this, because it may really hinder her future work. In some cases, the language used caused confusion about the meaning of a statement made.

I would also have hoped for a bit more vision in the entire document. On page 11 the objectives are very quickly turned into tasks, whereas formulation of sub-objectives would have been preferred. Obviously, analytical chemical methods are often considered as 'tasks' that contribute to the overall aim of the work rather than as a mission on its own. Nevertheless, in the Conclusions on page 37 a bit more vision on where the analytical methodology is developing to in the future would have been welcome. Similarly, some more ideas on the outcome of the measurements and interpretation of the results with a wider view on for example what would be the possible effects of the contaminant concentrations found would have been good. I mention these points in the hope that they will guide Dr. Dvořáková in her further development as professor, moving away from 'merely carrying out the

work' to 'a more visionary approach'. The thesis presented here gives confidence that Dr. Dvořáková will follow that road in her future work.

Therefore, I recommend Dr. Dvořáková's habilitation thesis for the defense.