THE 'MICROBIOLOGY OF THE BUILT ENVIRONMENT (MOBE)' PROGRAM – RECENT ACTIVITIES IN EUROPE

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YHTEENVETO

'Microbiology of the Built Environment (MoBE)" (suom. "Rakennetun ympäristön mikrobiologia") on USA:laisen Alfred P. Sloan –säätiön rahoittama laaja tutkimusohjelma. Ohjelman painopiste on sisäympäristössä esiintyvien mikrobiyhteisöjen ja niihin vaikuttavien tekijöiden kuvaamisessa sekä tutkimusmenetelmien kehittämisessä. Hankkeessa on viime vuosina rahoitettu pohjoisamerikkalaisen tutkimuksen lisäksi poikkeuksellisesti myös eurooppalaista - mukaanlukien suomalaista - tutkimusyhteistyötä. Tässä seminaariesityksessä ja -artikkelissa esitetään yhteenvedot a) Hollannin Eindhovenissa kesällä 2015 järjestetyn Healthy Buildings Europe–seminaarin MoBE-aktiviteetien sekä b) Kuopiossa syyskuussa 2015 pidetyn asiantuntijatyöpajan " "Indoor microbes in good and bad – understanding a paradox" (suom. "Sisäympäristön mikrobit hyvässä ja pahassa – paradoksin ymmärtäminen") esityksistä ja johtopäätöksistä.

INTRODUCTION

The Microbiology of the Built Environment has been established as one major program area within the Alfred P. Sloan Foundation, a non-profit funding organization in the U.S. that has provided extensive financial support to research activities within this thematic area over the past years (http://www.sloan.org/major-program-areas/basic-research/mobe/). While funding has been primarily seeded into a national network of scientists and institutions in the U.S. the foundation has recently funded two activities that have been taking place in Europe. One was a Symposium on the 'Microbiology of the Indoor Environment' that was held in Eindhoven, NL, in cooperation with the Healthy Buildings 2015-Europe Conference, May 21-22. The other was a workshop titled 'Indoor Microbes in good and bad – understanding a paradox' that was held in Kuopio, Finland, September 08-10-2015. In the following we summarize and highlight outcomes of these activities.

SYMPOSIUM 'MICROBIOLOGY OF THE INDOOR ENVIRONMENT' AT THE HEALTH BUILDINGS EUROPE CONFERENCE IN EINDHOVEN, NL, 2015

This symposium was organized with the aim to facilitate dialogue on indoor microbial research between scientists and practitioners in the field. The Healthy Buildings conferences of the International Society for Indoor Air Quality and Climate (ISIAQ) follow historically a translational approach of indoor environmental research and thus this conference was identified as a key opportunity to bring together scientists of the MOBE

program and practitioners in Europe and worldwide. The symposium consisted of a plenary lecture and two technical sessions (viewable under http://isiaq.org/hb2015_europe_sloan_symposium.php), and an interactive workshop embedded in the Healthy Buildings 2015-Europe conference followed by the Annex Workshop to capture, expand and to prioritize potentially important future indoor environment research themes.

The symposium presented and addressed barriers to the practical use of the latest revolution in molecular microbial methods, first and foremost next generation sequencing, to characterize indoor environments. There was general consensus that while these recent applied microbiology developments have had notable scientific impact, these advances have not successfully translated into tools or approaches available for practitioners. Much of the microbial work supporting building investigations is done using traditional, culture-based methods and microscopy still today, which underlines the reluctance for using advanced molecular methods outside the science applications. This may be due to both, limitations of the novel molecular methods, (e.g. the lack of reference data), and strengths of the traditional methods (e.g. the quality of cultivation to differentiate which microbes are 'alive' from which ones are not). From a practitioners point of view it is crucial to provide answer to the clients' question "Is my building safe?". Lack of reference data and lack of 'history' of interpreting data from molecular methods prohibits their common use in the field. As a synthesis of some of the major themes, Levin et al. /1/ listed:

- Buildings are systems and interstitial spaces (inside walls, floors, etc.) are important
- The role of moisture in adverse building outcomes is clear – should we care about anything else?
- Microbial methods: are there broad/simple approaches that offer as much value as molecular methods?
- Molecular methods need to converge towards quantitative interpretation (including locally applicable reference data) and dead/alive differentiation.

WORKSHOP ON 'INDOOR MICROBES IN GOOD AND BAD – UNDERSTANDING A PARADOX' IN KUOPIO, FI, 2015

The goal of this workshop was to provide the basis and support for a scientific exchange that would link the MOBE community in the U.S. and Canada with research groups in Finland and neighboring countries that have extensive experience in this research topic. The workshop discussed the positive and negative health effects of indoor microbial exposures known today based on epidemiological and toxicological work, aiming at identifying knowledge gaps in this 'paradox' role of indoor microbes, and where the recent advances in indoor microbial assessments could merge in to achieve key progress. This 2.5-day workshop held in Kuopio and organized by the University of Cincinnati and the University of Eastern Finland convened 50 experts from Europe, the U.S. and Canada. A number of research exchanges between Finland and the U.S were one outcome of this workshop. The main discussion points that crystallized during this workshop will be presented at SIS 2016.

REFERENCES

1. Levin H, Täubel M, Hernandez M. (2015) Summary of Sloan symposium: healthy buildings 2015-Europe. Microbiome 3(1):68. doi: 10.1186/s40168-015-0115-4.

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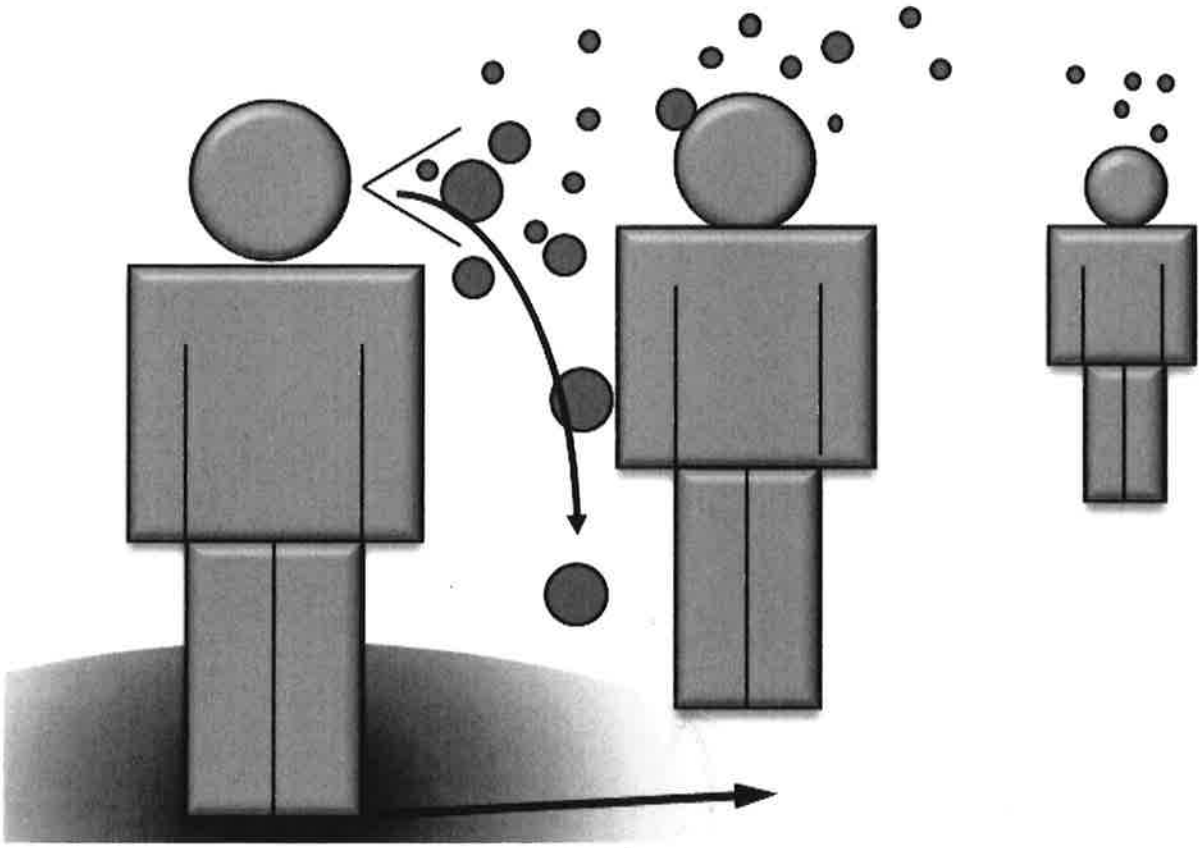

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