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Editorial

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The 2019 DOHaD World Congress “*Investing in a healthy future for all – Research, Education, Policy*” brought together close to 1000 delegates from over 50 countries to share in four days of exceptional science, robust and meaningful discussions, and the opportunity to network with others in the DOHaD community in the beautiful city of Melbourne, Australia.

In addition to the cornerstone DOHaD topics, which included the burden of obesity and chronic disease, long-term consequences of being born small, and the intergenerational cycles of poor health, the Congress program had a strong focus on emerging areas of DOHaD science. These included environmental toxins and pollutants, the impacts of climate change, DOHaD and Indigenous populations, maternal stress and impacts on child mental health, the role of the microbiome in DOHaD, the long-term consequences of preterm birth and design, and delivery, of complex interventions. In addition, the Congress acknowledged the growing recognition of the need to engage and educate our children and adolescents, and to empower them to affect change in their communities. Sharing the work that has already been done in this area and emphasizing the critical role of education and engagement in breaking intergenerational cycles of poor physical and mental health was a key feature of the Congress program. The 2019 DOHaD Congress also featured many new additions to the Program. These included the first ever Public Engagement Event at a DOHaD Congress and the first ever Trainee-focused Workshop.

The 2019 DOHaD World Congress provided an opportunity to recognize the outstanding achievements of individual DOHaD researchers. The David Barker Medal is the society's highest honour and is awarded biannually to a scientist who has made an outstanding contribution to the scientific development and broader leadership of the DOHaD field. In 2019, the David Barker Medal was awarded to Prof Kent Thornburg from Oregon Health Sciences University. The Nick Hales Medal is awarded to a young and emerging investigator who has made an outstanding scientific contribution to the DOHaD field. The 2019 winner of the Nick Hales Medal was Dr Gabriella Conti from the Department of Economics at University College London.

The 2019 Congress also featured the first ever Trainee Awards Session. Six of the most outstanding trainee members were selected, on the basis of their abstract, to present in a dedicated Symposium. The inaugural Trainee Symposium awardees were:

Dr Maria Magnus, Centre for Fertility and Health, Norwegian Institute of Public Health, Oslo, Norway

Siobhan Tu'akoi, Liggins Institute, University of Auckland, New Zealand

Dr. Rongbin Xu, Monash University, Melbourne, Australia

Ms. Macarena Lepez, Medical Sciences, Pontificia Universidad Católica de Chile

Dr Elie Antoun, Research Fellow in Bioinformatics, School of Human Development and Health, University of Southampton, UK

Evelyn Loo, Singapore Institute for Clinical Sciences, A*STAR

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In this Special Issue of the J DOHaD, we are delighted to be able to relive some of the cutting-edge science of the 2019 DOHaD World Congress, through invited articles from award winners

and selected Congress presenters. The articles in this issue cover a broad range of DOHaD topics, which perfectly highlights the breadth of science featured at the Congress.

A review article by Trainee Award winner Evelyn Loo and colleagues at A*STAR, Singapore¹ provides a synthesis of current evidence relating to the consequences of environmental dust exposure on the microbiome and the relationship this has to the risk of non-communicable diseases, including obesity, diabetes, and allergy. The article examines the effects of a range of pollutants on physiology, immune regulation, inflammation, and cellular metabolism, and compares the physiological consequences of dust exposure during pregnancy, early infancy, childhood, and adulthood in both clinical and animal studies. The review raises important questions regarding the impact of air quality in the modern urban environment on the microbiome and downstream risk of non-communicable diseases, and how this impact varies according to factors like geographical location, timing of onset, duration of exposure, and pollutant composition.

The issue also features two articles by Trainee Award winner Siobhan Tu'akoi and her colleagues at the University of Auckland. The first² reports the results of a systematic review that aimed to capture the distribution of DOHaD population studies across different countries and regions. The key finding of this paper was that the vast majority of DOHaD population studies to date have been performed in high-income countries, with virtually none undertaken in low-income countries. This highlights an important gap in DOHaD research, and the need to undertake more studies in lower-income regions whose populations are likely to benefit to a greater extent from the outcomes. The second paper³ reports the process of implementing and evaluating a strategy for educating communities in the Cook Islands about DOHaD and its implications. The study highlights the critical role of community engagement in building an understanding and appreciation of the importance of early life nutrition for long-term health, and strongly captures the "education" element of the 2019 World Congress.

The article by Trainee Award winner, Dr. Rongbin Xu, presents the results of his research focused on risk factors for myopia in girls in relation to the timing of menarche.⁴ The findings suggest that there are differential risk factors for myopia in girls before compared to after menarche. These results are important to inform strategies to achieve optimal eye health and vision in teenage girls, which in turn plays an important role in their quality of life.

Plenary speaker, Professor Huixia Yang and colleagues from Peking University⁵ report the findings of their study aimed at establishing the role of changes in the gut microbiota during pregnancy in the development of gestational diabetes (GDM). In a clinical study, they identify significant differences in the gut microbiome composition of women with and without GDM.

Importantly, when the gut microbiome from women with GDM was transferred to germ-free mice, these mice developed hyperglycemia and evidence of glucose intolerance. This novel finding supports the existence of a causal relationship between shifts in the gut microbiome during pregnancy and the development of GDM, which has the potential to identify new intervention strategies.

The final article in this Special Issue, by Strømmer and colleagues from the University of Southampton,⁶ discusses the critical and emerging area of behavior change interventions and was based on the plenary presentation by Prof Mary Barker. The authors explore the potential reasons for the failure of the vast majority of existing behavior change interventions to achieve a substantial improvement in outcomes. The article then draws on the extensive experience of the research team to explore potential strategies for addressing these issues, and thus achieving significant and sustained changes in behaviors that result in improved health outcomes.

While the pandemic has meant that we need to wait a little longer than originally planned for the next World Congress, we know that John Challis, Janice Bailey, and the rest of the organizing committee have already done a huge amount of work, and we have no doubt that the 2022 DOHaD World Congress in Vancouver, Canada, will be a meeting to remember. We look forward to seeing you all there.

Until then, stay well, stay safe!

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