Published online: April 8, 2020

Ogra PL, Walker WA, Lönnerdal B (eds): Milk, Mucosal Immunity and the Microbiome: Impact on the Neonate. Nestlé Nutr Inst Workshop Ser. Basel, Karger, 2020, vol 94, pp X–XI (DOI:10.1159/000505245)

Foreword

There have been considerable advances in science to understand the varied mixture of bioactive components in human milk that influence the immune status of infants not only by providing protection, but also by facilitating development, tolerance, and an appropriate inflammatory response.

Human milk is the communication vehicle between the maternal immune system and the infant, a system actively directing and educating the immune, metabolic, and microfloral systems within the infant. The physiological and protective functions of several immune components in human milk have been studied not only in infants, further evidence has also been obtained from what is known in other species and in vitro models.

The 94th Nestlé Nutrition Institute (NNI) Workshop entitled *Milk, Mucosal Immunity and the Microbiome: Impact on the Neonate*, which took place in Lausanne in September 23–25, 2019, reviewed the latest data on immune development in infants and the role of milk factors. The program was focusing on the current knowledge of how both the “classical” immune and nonimmune ingredients found in human milk support maturation of the immune system, facilitate development of tolerance, and regulate inflammatory responses of infants.

World experts in human milk research and nutrition, i.e., *Pearay L. Ogra* (Professor Emeritus Jacobs School of Medicine and Biomedical Sciences, University at Buffalo, NY, USA); *W. Allan Walker* (Conrad Taff Professor of Nutrition [Emeritus], Professor of Pediatrics, Harvard Medical School); and *Bo Lönnerdal* (Distinguished Professor Emeritus, Department of Nutrition and

Internal Medicine, University of California, Davis, CA, USA), have contributed to the Workshop program.

The 94th NNI Workshop was designed with the goal to provide a comprehensive overview on the latest human milk research and its potential in modulating mucosal immunity, the microbiome, and its impact on the neonate. The program was comprised of three sessions. Session I, led by Prof. Pearay L. Ogra, reviewed data on the immunology of milk and lactation. The flow of the topics brought us from a historical perspective to the latest scientific findings in order to understand the complex immunobiology of mammalian milk. Session II, directed by Prof. W. Allan Walker, discussed the microbiology of human milk and lactation in detail, with a focus on premature infants and necrotizing enterocolitis. The objective of the third and last session, shepherded by Prof. Bo Lönnerdal, was to shed light on the protective factors in human milk, e.g., human milk oligosaccharides, bioactive milk fat components, and lactoferrin, and their role in influencing the neonate's immune system.

The program brought important new insights but also raised unanswered questions. We are only beginning to understand the complex milk composition, functions of different bioactive components, and the most important role of each in human development.

The 94th NNI Workshop and its book are dedicated to an extraordinary personality: Prof. *Lars A. Hanson* (MD, PhD), who is considered the founder of modern milk immunology by the human milk research community. We believe that this publication and online material will be a great scientific support to all people seeking a deeper understanding of human milk and its immunological properties and enlarge the knowledge of those who have already specialized in human milk research.

We would like to thank the three chairpersons Pearay L. Ogra, W. Allan Walker, and Bo Lönnerdal who designed the scientific program.

Our special thanks also go to all speakers and scientific experts in the audience who contributed to the content of the workshop and scientific discussions.

Finally, we thank Maria Elena Munoz and the NNI team for making this workshop possible.

Dr. Natalia Wagemans
Global Head, Nestlé Nutrition Institute
Vevey, Switzerland