Foreword: *Immunogenetics* special issue 2017

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Since its inception, the scientific journal *Immunogenetics* has been publishing a large number of papers dedicated to the immunobiology of MHC genes and gene products. In the first decades, the focus was mainly on the characterisation of MHC gene products and their role in transplantation, both in humans and in rodent models. In later years, attention shifted towards understanding the biological role of the MHC genes in a variety of biological processes such as autoimmune and infectious diseases, as well as in reproductive biology. In a relatively short time, however, the methods of characterisation have changed dramatically. In the early days, serology was the technique of choice, to be bypassed by the introduction of various biochemical and molecular methods. At the present time, a massive amount of information is able to be gathered in a relatively short period by new technologies such as next-gen sequencing. One other feature has changed as well. The number of species being studied has exploded. This is an aspect of comparative genetics that has taught us a great deal about the evolution of the MHC multigene family and its ligands, and is greatly appreciated by the readers of *Immunogenetics*. After the discovery of the two lineages of T-cell receptors, particular MHC class I epitopes were found to be ligands for KIR receptors on NK cells. This opened a complete new avenue of research. The editors are pleased to announce that this year's special issue of *Immunogenetics* is devoted to the role of MHC/KIR genes in health and disease, and

we are proud to present reviews provided by a selected group of authorities in the field.

The first contribution to set the stage introduces the key players as well as their main known functions (Kelly and Trowsdale 2017). As we have learned from the AIDS pandemic, MHC and KIR genes each play an important role in controlling either susceptibility or resistance to infectious disease. As regards AIDS, the current state of knowledge in the field of immunogenetics has been reviewed for humans (Carrington and Naranbhai 2017) and chimpanzees (de Groot et al. 2017), as well as for rhesus macaques (Silver and Watkins 2017). It is intriguing to observe that in these different primate species, the ability to control disease may be linked to specificities that share features with HLA-B27 or -B57 allotypes. In their turn, fish and amphibians, such as frogs, have turned out to represent valuable model systems, helping us to understand how some representatives of these species are dealing with challenges presented by infectious disease (Wilson 2017) (Fu and Waldman 2017).

One of the main tasks of NK cells is to scan for the absence of MHC class I at the cell surface. It is known that pathogens—but also the MHC expression pathways in cancer—may be manipulated. One of the contributions in this special issue is devoted to transmissible tumours, which are ravaging the contemporary populations of Tasmanian Devils (Caldwell and Siddle 2017). By the same token, a detailed understanding of the biological role of KIR genes may help us to battle cancer and to develop tailor-made therapies (Malmberg et al. 2017). The recognition of ‘self and non-self’ plays an important role in the first stages of life. The genetic make-up of the parents, and in particular of the mother and child, plays an important role in the biology of pregnancy (Colucci 2017). In a similar context, whether KIR receptors in

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humans recognise self or altered-self HLA-C structures is reviewed by another research team (Hilton and Parham 2017). We can also read that not only the classical (HLA-A, -B, and -C) but also the non-classical MHC gene products such as HLA-E, -F, and -G genes may play a significant role in reproductive biology (Persson et al. 2017). Several MHC genes are associated with a high risk of developing autoimmune diseases or a food intolerance. One contribution highlights the impact of processed MHC epitopes on the severity of arthritis (Kampstra and Toes 2017), whereas another paper highlights the impact of host genetics and interaction with food components in concert with post-translational modifications (Sollid 2017). Another intriguing phenomenon has emerged from studies involving the side effects of particular types of medicine, which may cause problems for patients with the ‘wrong’ type of host genetics. The role of HLA genes in pharmacogenomics is highlighted by an Australian team (McCluskey et al. 2017). Last but not least, the discovery of the MHC was propelled by transplantation research. It is fascinating to see that we are now beginning to understand that allo-HLA reactivity during a transplantation may be triggered by infectious pathogens that are shaping our immune repertoire (D’Orsogna et al. 2017).

The goal of this issue is to provide a comprehensive overview of the current state of the art relating to MHC/KIR genes in health and disease. On behalf of my co-editors, I would like to thank all contributors for their tremendous input. We also sincerely hope that our readers will enjoy this special issue of *Immunogenetics*.

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