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VIC IUIS Travel Bursary Report:
Keystone Symposia's Immunity to Veterinary Pathogens: Informing Vaccine Development
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I am tremendously grateful for the opportunity to attend Keystone Symposia's Immunity to Veterinary Pathogens: Informing Vaccine Development conference, made possible in part through the travel bursary provided by the Veterinary Immunology Committee (VIC) of the International Union of Immunological Societies (IUIS). In addition to a poster presentation, it was a privilege to present my short talk, "*Increased percentages of functional NK cells in pigs with Severe Combined Immunodeficiency (SCID) caused by natural mutations in the Artemis gene,"* to such an interested audience, and receive such valuable feedback. Although my primary background is in genetics, my thesis research has introduced me to the exciting world of immunology. The exposure to such quality immunological insight provided by the expert speakers and organizers of the conference has contributed greatly to the advancement of my knowledge and appreciation of immunology, as well as to the experimental design and possibilities of my own research.

I found great value in the variety of talks presented. Not only was excellent work presented about the latest findings of classical immune cell function and interactions in veterinary species (T-cells, B-cells, macrophages, dendritic cells, and more), but the conference also provided a unique up-date on many crucial animal disease models. I hope to work in the future with an influenza model and gained helpful background knowledge about current literature, viral mechanism, and experimental considerations when working with the virus. Response to vaccine, viral shedding, lesion development and severity, and genetic diversity of the virus were especially of interest.

Also emphasizing genetic diversity were a series of thought-provoking talks regarding MHC across several species, as well as across several objectives. From haplotype sequencing and use with Equine Herpes Virus and reproductive immunology, to epitope prediction pipelines for Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) vaccine development, the resources detailing MHC continue to expand at an impressive rate.

Since I am currently working on a SCID pig project with an emphasis on natural killer cells, there were numerous talks about functional differences within NK cell subsets that were of great interest. Many offered questions and insight I have not considered previously. The analysis for migration, tissue infiltration, cytokine production, and cytotoxicity differences within very defined marker groups of NK cells in multiple species is greatly expanding what we know about these innate lymphocytes. In addition to the very informative characterization of NK cells, the work presented concerning their interactions with dendritic cells for co-localization, activation and interconnection with other immune components (MHC expression, T-regs, lymph node migration, etc.) was fascinating. These collected works are making exciting progress toward better defining the mechanism and specific roles of NK cells in immune response and interaction between adaptive and innate immunology.

Just as the understanding of natural killer cells continues to grow, the conference offered perceptive presentations about more rare immune cell types such as the plasmacytoid dendritic cells and NKT cells; even across multiple species. Working in the swine model, the development of new resources (such as marker antibodies) to look at some of these characterizations in the pig is offering new and exciting opportunities.

The impact of the information shared at this meeting was significant across many animal model platforms. There were important animal models for human disease, developing as biomedical models to improve patient care and therapy methods. There were genetic models designed to create reference genomes and early sequence maps for some species. There were models offering valuable insight into commercially devastating diseases. As a whole, it left me with the fierce appreciation of the progress being made in prediction, discovery, control, and response to vaccine work across a plethora of species, defects, and diseases.

As a student and developing scientist, the advice and suggestions made personally by so many knowledgeable scientists through discussions and the poster sessions gave me many meaningful considerations for analyzing and improving my current research. It was great to meet other PhD students from around the world with such varied fields of study and learn about the next generation of researchers. It was also immensely insightful to sit down with the organizers of this conference and learn about their career development paths.

It was so inspiring to make so many meaningful connections with such respected individuals and share such a great passion for science!

Sincerely,
Ellis Powell