SOCIETY FOR IMMUNE POLYMORPHISM

SPRING-SUMMER 2023 PRESIDENT'S NEWSLETTER

Hello Society for Immune Polymorphism (SIP) members!

Each quarter, I publish a President's Newsletter to provide you with updates on Society activities, new developments, and other items of interest. This newsletter summarizes activities since March of 2023. Newsletters are available on the Society website at https://immunepolymorphismsociety.org/news/.

For new members, the Society for Immune Polymorphism is an international association of researchers, data scientists and clinicians dedicated to understanding the genetic and functional variation of the vertebrate immune system and its role in health, disease, and evolutionary biology. The SIP provides a forum for basic science, clinical, industrial and educational applications related to immune polymorphism, with the goal of sharing and disseminating research findings, integrating data resources, and developing secure open-source, cloud-based technologies to advance the analysis, collection, exchange and storage of immune-related genomic data.

BOARD OF DIRECTORS UPDATE

Since March, the SIP has incorporated as a scientific non-profit organization based in the US, developed a road map of events and activities for the next year, drafted a social media policy, and expanded the Board of Directors. Please welcome Dr. Paul Norman, PhD to the SIP Board of Directors!

Dr. Norman joined the SIP Board in May of 2023. He is an Associate Professor in Biomedical Informatics at the University of Colorado, Anschutz Medical Campus in the US. His laboratory researches the evolution, immunogenetics and functional immune diversity of indigenous groups worldwide, including modern African hunter-gatherers, Australians and Pacific Islanders, ancient humans, and multiple non-human species, with a focus on the co-evolution of the HLA and KIR molecules. Dr. Norman recently edited a special issue of the journal Immunogenetics focusing on the immunogenetics of infectious disease. He serves on the board as a member of the Finance Committee.

With Dr. Norman's addition, the Board now consists of 11 members. We still have one open seat, so please contact me if you would like to learn more about serving on the board.

RECENT SOCIETY ACTIVITIES

Earlier this year, the SIP worked with the European Federation for Immunogenetics' (EFI) Local Organizing Committee to develop a special session for the 36th European Immunogenetics and Histocompatibility Conference, held in Nantes, France from April 26th to 29th. This special session, titled, "*Advances in Clinical Immunogenomics*" was held on Friday April 28th and featured three fantastic speakers.

Dr. Ami Bhatt, MD from Stanford University, presented "From Precision Microbial Genomics to Precision Medicine". She summarized her talk as follows:

"More than 1,000 species of bacteria, archaea, viruses and fungi live in the human gut. Far from being passive passengers, these organisms strongly interact with one another and with their host's metabolism and immune system. Compelling early experiments have demonstrated associations between the intestinal microbiome composition and obesity, cardiovascular diseases, and certain cancer chemotherapies' efficacy. Yet teasing apart the mechanisms by which microbes impact host health has been challenging. In this presentation, I spoke about three recent developments in our lab: (1) I introduced the importance of absolute quantification in microbiome research, and our efforts toward that (Maghini et al., Nature Biotechnology, 2023). (2) I gave an overview of a new

computational workflow called "Phanta", which enables simultaneous taxonomic profiling of eukaryotes, bacteria and viruses in a human gut metagenomic sample (Pinto et al., Nature Biotechnology, 2023). (3) And finally, I shared exciting new unpublished work on our discovery of intragenic inversion as a previously unappreciated mechanism of generating genetic diversity in microbial genes. This occurs through programmed, enzyme-mediated flipping of DNA."

Dr. Becca Asquith, PhD, from Imperial College London, presented, "KIRs, T cell dynamics, control of chronic virus infection and autoimmunity". She summarized her talk as follows:
"Killer immunoglobulin like receptors (KIRs) are known to be important for modifying the innate natural killer (NK) cell response. We have been working on a different question: do KIRs play a role in modulating adaptive T cell mediated immunity? We have shown that KIRs affect CD8+ T cell mediated control of chronic virus infection (HIV-1, HCV and HTLV-1) (Boelen et al., Science Immunology 2018), we have also shown they affect the T cell associated risk of type 1 diabetes (unpublished). Most recently we have shown that KIRs have a profound impact on CD8 T cell lifespan in humans in vivo (Zhang et al., J Clin Invest 2023). Given the central role of T cells in immunity, this work suggests that KIRs could have a widespread and important impact on human health via their impact on T cells."

Dr. Effie W. Petersdorf, MD, from Fred Hutch, presented, "Immunogenetics of Hematopoietic Cell Transplantation". Her very engaging talk described new understanding of NGK2D, MICA and MICB polymorphisms in the context of hematopoietic cell transplantation outcomes, and translation of these new research findings for clinical care (*Petersdorf et al., Blood Adv. 2023*).

This session was very well attended, with each speaker's presentation followed by engaging discussions. The SIP is honored to be viewed as an EFI sister-organization, and looks forward to many such collaborations in the future.

We held a SIP meeting at the EFI meeting. We discussed strategies for growing the society, establishing relationships with other societies, akin to the collaborative relationships we have with EFI and the American Society of Histocompatibility and Immunogenetics (ASHI), and started planning for a two-day, in-person SIP Symposium in Europe in 2024.

UPCOMING SOCIETY ACTIVITIES
Four SIP activities are currently planned for the second half of 2023.

Frontiers in Immunology Issue: "New Perspectives in Immune Polymorphism", a Frontiers in Immunology issue, will showcase the role of HLA, KIR and LILR polymorphism in immune regulation, and illustrate how integrated analysis of these gene systems advances human health and immune therapies. The submission portal will open in July, with a link on the SIP Projects page. Contact Dr. Charles Seik-Soon Khor, PhD with questions about this issue.

ASHI 2023: The Society is organizing Plenary Session II at the 49th American Society of Histocompatibility and Immunogenetic Meeting, in San Antonio, TX. The session, "MHC Genomics – How Evolutionary Diversity of the MHC May Have Clinical Relevance" will be held on October 18th from 10:30AM to Noon, and will feature:

- Dr. David Sayer, PhD, from One Lambda/ThermoFisher, presenting, "MHC Block Structure and Ancestral Haplotypes".
- Dr. Jason Chen-Shan Chin, PhD, from GeneDx, presenting, "Human Pangenomic Graph Analysis for the MHC".
- Dr. Satu Koskela, PhD, from Finnish Red Cross Blood Service, presenting, "MHC Genomic Diversity and HCT Donor Selection".

SIP Webinar: The society will hold a 1-hour webinar titled, "Best Practices for Manuscript Peer-Review" in November of 2023. This webinar is primarily intended for graduate students and post-doctoral trainees, but anyone interested in learning about the peer-review process is welcome to attend. Many SIP members have experience as manuscript authors and reviewers, as well as journal editors, and the aim of this webinar is to share that experience with attendees, with the goal of making the peer-review process effective for authors, reviewers and editors. Details will be shared in September.
Inaugural SIP Membership Meeting: The society will be hold its first Membership Meeting in December of 2023. This will be a remote, one-hour meeting open to SIP members. The initial business meeting will last 15 minutes, followed by a pair of 15 minute scientific talks, and a 15 minute panel discussion. Details will be shared in September.

STAY CONNECTED
Mr. Martin Maiers, Chair of SIP's Web and Social Media Committees, maintains the SIP website, and the Society's presence on LinkedIn and Twitter. You can stay current with SIP news by following the society on both. In addition, archived versions of the President's Newsletter are available on the SIP News page.

I am looking forward to working with you over the rest of 2023, and meeting you at SIP events!

Steve Mack, Society for Immune Polymorphism President and Board Chair

P.S. Here are some recently published papers that may be of interest to SIP members:

- Nguyen, et al. 2023 Investigation of the functional role of UNC93B1 in Nile tilapia (Oreochromis niloticus): mRNA expression, subcellular localization, and physical interaction with fish-specific TLRs. Fish Shellfish Immunol. 2023 Jun 15;108902.
- Fu, et al. 2023 Divergent allele advantage in the MHC and amphibian emerging infectious disease. Infect Genet Evol. 2023 Jul;111:105429.
- Sun, et al. 2023 Universal open MHC-I molecules for rapid peptide loading and enhanced complex stability across HLA allotypes. PNAS. 2023 Jun 20;120(25):e2304055120
- Nayak, et al. 2023 Evidence for selective sweeps in the MHC gene repertoire of various cattle breeds. Anim Biotechnol. 2023 Apr 11;1-7.
- Elnaggar, et al. 2022. Comparative analysis of the specificity of monoclonal antibodies developed against the bottlenose dolphin, Tursiops truncatus, TNF-α, IL1-β, IL-6, IL-8, IL-10 with monoclonal antibodies made against ovine IFN-γ bovine IL-17A and IL-1β revealed they recognize epitopes conserved on dolphin and bovine orthologues. Vet Immunol Immunopathol. 2022 Aug;250:110456.