Department of Microbiology & Immunology Programme Seminar Series… *August 2019*

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12pm – 1pm

NUS, Blk MD4
Level 2 Seminar
Room @ 5 Science
Drive 2, S117545

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Do Universal Influenza Vaccines Increase The Risk Of Autoimmunity?

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Abstract

A universal influenza vaccine could save millions of lives in the event of a deadly pandemic. It is not clear why antibodies specific for conserved regions of influenza viruses are so rare. One possibility is that these antibodies have a higher potential to cross-react to self-proteins, and therefore B cells that generate these antibodies are deleted through tolerance mechanisms. In support of this, infections and vaccinations with the 2009 H1N1 pandemic strain induced more antibodies that were cross-reactive against multiple influenza strains than were induced by previous seasonal strains. However, they were also associated with a higher risk of autoimmune disorders, including narcolepsy and Guillain-Barré syndrome. Therefore, we examined whether cross-reactive influenza antibodies had a higher potential to be autoreactive than antibodies specific for one subtype of influenza. We previously demonstrated that H3N2-vaccinated mice treated with a low dose of rapamycin had more cross-reactive influenza antibodies and were better protected against subsequent lethal infections of multiple subtypes. Thus, we utilized rapamycin to increase the frequency of influenza cross-reactive antibodies, and tested whether these antibodies were more reactive to self-proteins than strain-specific antibodies. We found that mice with increased levels of cross-reactive influenza antibodies also had more IgM antibodies specific for self-antigens. Although the increase in autoreactive IgM antibodies was transient, it correlated with increased susceptibility to disease in mouse models of multiple sclerosis and Guillian-Barre Syndrome. Together, our results suggest that influenza cross-reactive antibodies have the potential to be autoreactive. These data have important implications for developing universal influenza vaccines designed to generate durable influenza cross-reactive antibodies.

Dr. Maureen McGargill is presently an Associate Member in the department of Immunology and an adjunct Associate Professor at University of Tennessee, Health Science Center. She received her Bachelor of Science degree in Biology from Creighton University, Omaha, Nebraska and her PhD in Immunology from the University of Minnesota, under the direction of Dr. Kristin Hogquist. She completed her postdoctoral fellowship in Immunology at the University of California, San Diego in the laboratory of Dr. Stephen Hedrick. Dr. McGargill's research focuses on regulation of the immune system. In particular, she is investigating the immune mechanisms that are needed to create a universal influenza vaccine. Additionally, her team studies factors that mediate survival of autoreactive T cells, which will aid in developing improved therapies to treat autoimmune diseases such as multiple sclerosis and type I diabetes. Finally, her team is examining how the immune system influences the formation of cartilage tumors, known as osteochondromas, which are the most common type of bone tumor.