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Abstract

NKG2D-mediated control of Enterohepatic *Helicobacter*

Multiple studies demonstrate an effect of the gut microbiota on immune cell function both inside and outside the intestine, as well as a reciprocal effect of the immune system on the composition of the intestinal microbiota. Interaction with the intestinal microbiota is essential for the development and maintenance of proper immune self/non-self discrimination. Intestinal microbiome dysbiosis is implicated in the pathogenesis of multiple diseases, including metabolic disorders and autoimmunity. Cumulative data demonstrate an association between the composition of the microbiome and autoimmune diabetes susceptibility in both rodents and humans. This has led to the hypothesis that treating microbiome dysbiosis could prevent or delay the disease. However, little is known concerning the identity of relevant tolerance- or disease- inducing microbes, the specific immune alterations induced by these microbes, or the essential immune components involved in maintaining proper symbiosis. These are critical questions that must be answered before therapeutic efforts aimed at restoring symbiosis in patients can be attempted. I will describe our data that demonstrate a role for the NKG2D immune receptor in shaping the composition of the intestinal microbiota in a way that alters autoimmune diabetes development. These data implicate NKG2D-mediated control of enterohepatic

Helicobacter in this process, suggesting further study into the possible role of this bacterial genus in autoimmune diabetes development is warranted.

Bio-Summary

Mary Markiewicz, PhD, is an Assistant Professor in the Department of Microbiology, Molecular Genetics & Immunology at the University of Kansas Medical Center, a member of the University of Kansas Cancer Center, and the Scientific Director of the University of Kansas Medical Center Flow Cytometry Core. She is a cellular immunologist with a strong interest in both tumor immunology and type 1 diabetes research. Dr. Markiewicz received her PhD in Immunology from the University of Chicago, where she performed tumor immunology studies. Dr. Markiewicz then moved to the Department of Pathology and Immunology at the Washington University School of Medicine in St. Louis and began her studies on the NKG2D immune receptor with a Postdoctoral Fellowship from the American Cancer Society. After completing her postdoctoral training, she became a Research Assistant Professor in the Department of Pathology and Immunology at Washington University School of Medicine. During this time, propelled by funding from a Junior Faculty Award from the American Diabetes Association, she began her studies investigating the role of NKG2D in autoimmune diabetes. With funding from the Molecular Regulation of Cell Development and Differentiation COBRE, Dr. Markiewicz joined the KUMC faculty in 2014. Dr. Markiewicz has also continued studies into the role of NKG2D signaling in cancer immunotherapy strategies with funding from the V Foundation and the University of Kansas Cancer Center.