

Use of gut flora as a natural vaccine against autoimmunity

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Although it is known that resident gut flora contribute to immune system function and homeostasis, their role in the progression of the autoimmune disease Type 1 Diabetes (T1D) is poorly understood. Comparison of stool samples isolated from Bio Breeding (BB) rats, a classic model of T1D, shows that distinct bacterial populations reside in spontaneous diabetes-prone (BBDP) and diabetes resistant (BBDR) animals. We have previously shown that the oral transfer of *Lactobacillus johnsonii* N6.2 (LjN6.2) from BBDR to BBDP rodents conferred T1D resistance to BBDP rodents, whereas *Lactobacillus reuteri* TD1 (LrTD1) did not. In this study, we show that diabetes resistance in LjN6.2 fed BBDP rodents was correlated to a Th17 cell bias within the mesenteric lymph nodes (mLN). The Th17 bias was not observed in the non-gut draining axillary lymph nodes, suggesting that the Th17 bias was because of immune system interactions with LjN6.2 within the mLN. LjN6.2 interactions with the immune system were observed in the spleens of diabetes resistant, LjN6.2 fed BBDP rats as they also possessed a Th17 bias in comparison to control or LrTD1 fed rats. Using C57BL/6 mouse in vitro assays, we show that LjN6.2 directly mediated enhanced Th17 differentiation of lymphocytes in the presence of TCR stimulation, which required antigen presenting cells. Finally, we show that footpad vaccination of NOD mice with LjN6.2 pulsed dendritic cells was sufficient to mediate a Th17 bias in vivo. Together, these data suggest an interesting paradigm whereby T1D induction can be circumvented by gut flora-mediated Th17 differentiation.

Biography

Joseph Larkin, III completed his Ph.D in 2000 from the University of Florida and conducted postdoctoral studies at the University of Pennsylvania and the Wistar Institute. He is currently an Assistant Professor at the University of Florida. He has published more than 20 papers in reputed journals, was a member of the American Association of Immunologists Minority Affairs Committee, and currently serves on the editorial board of several distinguished journals.

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