Vitamin D regulated iNKT cell development

The objective of this project is to define the role that vitamin D plays in the iNKT cell development and function. Various cells of the immune system express the vitamin D receptor (VDR) and active form vitamin D ($1,25(OH)_2D_3$) has been shown to be an important regulator of T cell function. The VDR KO mice have decreased number of iNKT cells and the resident iNKT cells are hyporesponsive. iNKT cells have been shown to be important regulators of autoimmune disease, cancer and some infections. The hypothesis is that the presence of adequate vitamin D is required for normal development and function of iNKT cells. When vitamin D is low, iNKT cell development is disturbed. The specific aim is: to investigate the exact time point when vitamin D affects iNKT cell development using timed pregnancies and mice that cannot produce $1,25(OH)_2D_3$ (Cyp27B1 KO). A better understanding of the role that vitamin D and $1,25(OH)_2D_3$ play in iNKT cell development is essential for the development of new therapies for diseases regulated by iNKT cells.