

Comparative Analysis of Fetal Ferret Pancreas Development. RL Branscomb, (M.D., SOM), JF Engelhardt, and L Sussel, Barbara Davis Center for Diabetes, Aurora, CO.

Cystic fibrosis (CF) is a progressive, multisystemic disease that affects more than 30,000 individuals in the US. Cystic fibrosis-related diabetes (CFRD) is the most significant co-morbidity, impacting >50% of adult patients. Studies in young children with CF indicate that defects in islet function is an early clinical feature of CF, but the cause of this dysfunction remains controversial. To begin to understand the potential origins of CFRD, it would be optimal to model CFRD in an animal model; however, CFRD is not well-modeled in mice. Alternatively, CFRD occurs spontaneously in the ferret model of CF, suggesting this would be a useful model to characterize whether there is a developmental origin of pancreas dysfunction in CF patients. Because the development of the fetal ferret pancreas has not yet been characterized, the purpose of this project is twofold: 1) to characterize wild type ferret pancreas development as a baseline for comparison with a CF ferret model, and 2) determine whether pancreatic developmental defects contribute to CFRD in adults. Fetal ferret tissues were embedded and sectioned, and immunohistochemistry was employed to identify key markers of development. In this study we demonstrate that the ferret, mouse, and human pancreas appear similar in early development, but as development progresses, ferret pancreatic islet formation appears more similar to humans. Future studies will use similar analyses to determine whether CF ferrets display altered pancreatic islet development.