SEQUENCING OF NOD MOUSE

Description of Project

- The NOD (Non-Obese Diabetic) mouse is the preferred animal model for investigation into the etiopathogenesis of type 1 diabetes mellitus and other autoimmune disorders in humans. The NOD mouse spontaneously develops type 1 diabetes after its insulin-producing beta cells are destroyed during an autoimmune process similar to the process that occurs in humans.
- Sequencing the regions of the NOD mouse genome relevant to type 1 diabetes is crucial to better understanding the role that genetic susceptibility plays in the pathogenesis of type 1 diabetes. A full genomic sequence will facilitate identification and characterization of potential immunogenic proteins responsible for initiation and progression of autoimmune destruction of islets and potential targets in therapy.
- These genomic sequences will allow comparisons to determine if SNPs or other genomic variations are associated with diabetes in the mouse and comparison to related molecules in the human.

Accomplishments

- In Fiscal Year 2003, The Wellcome Trust Sanger Institute, Cambridge, United Kingdom completed the BAC end sequencing of the first NOD mouse BAC clone library, available on The Sanger Institute website using the ENSEMBL database, at http://www.ensembl.org/Mus_musculus/

Future directions

- Data analysis underway to compare NOD sequence to the most up-to-date map of the C57Bl/6 normal mouse.
- Sequence of a second library underway to fill in any gaps in the original library; the second library will be distributed to North American investigators that request clones.
- Scientific advisory board to provide guidance on the regions of the NOD mouse genome to be fine sequenced. The board provided guidance on the BAC end sequencing to include an additional mouse strain, such as the 129 strain, to facilitate the identification of SNPs.

Material to be made available to researchers

- All data from the BAC end sequencing of each library and all mouse strains will be placed in a public repository accessible to the research community.

Participants

Sponsors: National Institute of Allergy and Infectious Diseases
National Institute of Diabetes and Digestive and Kidney Diseases
Juvenile Diabetes Research Foundation International

Participating Institution

Wellcome Trust Sanger Institute