ANIMAL MODELS OF DIABETIC COMPLICATIONS (AMDCC)
http://www.amdcc.org

Description of project

- The AMDCC is a cross-disciplinary consortium designed to develop innovative mouse models that closely mimic the human complications of diabetes for the purpose of studying disease pathogenesis, prevention, and treatment.
- Complications to be examined include diabetic kidney disease, micro- and macrovascular disease, neuropathy, cardiomyopathy, and bladder function.
- The AMDCC started with 8 animal generation/validation sites and a bioinformatics center – 3 additional phenotyping core facilities have been added to increase the expertise in diabetic neuropathy, retinopathy and uropathy.
- The AMDCC defines standards to validate each diabetic complication for its similarity to human disease.
- The AMDCC generates mice using 3 different approaches: knock-in/knock-out of candidate genes, random mutagensis, and genome tagging methods.
- The AMDCC tests the role of candidate genes or chromosomal regions that emerge from genetic studies of human diabetic complications.
- The AMDCC uses the identified animal models for various aspects of basic, developmental, or translational research, including testing strategies for prevention, early detection, therapy, or diagnostic imaging.

Accomplishments

- The AMDCC has defined standards to validate cardiovascular, renal, nerve, and bladder diabetic complications – the standards are written for mouse or pig, but can apply to any animal.
- The AMDCC has developed standardized phenotyping assays – including HPLC creatinine, mouse GFR, atherosclerosis, LV catherization, aortic banding and aortic transplantation.
- The Bioinformatics website has built an ever growing mouse laboratory notebook – an interoperable mouse phenotype database, with statistical and graphical modules that consolidate experiments across laboratories.
- The AMDCC has identified a number of promising new animal models for diabetic complications of atherosclerosis, nephropathy, and neuropathy.

Future directions

- The AMDCC will focus its efforts on fully phenotyping/characterizing the best animal models identified for each diabetic complication.
- Standardized protocols will continue to be developed and utilized by the established AMDCC phenotyping core facilities.
- The AMDCC will continue to add functionality to its bioinformatics website.
- Additional efforts will be made to publicize the AMDCC and its Bioinformatics website.

Materials to be made available to researchers

As animal models are developed and validated, NIH will freely disseminate the mouse models and information related to them to the greater scientific community.

Participants

Sponsors: National Institute of Diabetes and Digestive and Kidney Diseases
National Heart, Lung, and Blood Institute

Participating Institutions

Albert Einstein College of Medicine
Brigham and Womens Hospital
Columbia University
Duke University Medical Center
Jackson Laboratory
JDRF
Johns Hopkins University
Medical College of Georgia
Mount Sinai School of Medicine
NCI
NHLBI
NIDDK
Northwestern University
Oregon Health Sciences University
Rockefeller University
Stanford University
The Cleveland Clinic Foundation
Thomas Jefferson University
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