



Paul N. Epstein, M.D.

Professor

Department of Pediatrics
Department of Pharmacology &
Toxicology
School of Medicine

Research Activities:

Dr. Epstein's primary interests are in the causes and complications of diabetes. Dr. Epstein and his research group particularly focus on the complications of diabetic cardiomyopathy and nephropathy. They also investigate the loss of beta cell function that occurs with autoimmune reactions and disrupted sleep cycles.

Dr. Epstein was the first to demonstrate that blood glucose is maintained by a single reaction in the pancreatic beta cell. He has developed the most accurate model of diabetes for study of diabetic nephropathy in rodents. Dr. Epstein has shown that antioxidants can protect the heart from the chronic impairment produced by diabetes. He has also demonstrated that a specific cardiac metabolite controls cardiac insulin sensitivity. Other results from his laboratory demonstrate that antioxidant protection of one type of kidney cell, the podocyte, prevents albuminuria in diabetic

Grants Funded:

Role: Principal Investigator

Title: Podocytes and Oxidative Stress in Diabetic Kidney

Funding Agency: NIH/NIDDK

Direct Costs Funded: \$250,000

Role: Principal-Investigator

Title: Prolonged Diabetic Damage to Cardiac Mitochondria

Funding Agency: NIH

Direct Costs Funded: \$244,000

Role: Principal-Investigator

Title: Podocyte Specific Antioxidant Protection in Diabetic Nephropathy

Funding Agency: Juvenile Diabetes Research Foundation

Direct Costs Funded: \$60,000

Role: Principal-Investigator

Title: Antioxidant Transgenes In Diabetic Cardiomyopathy

Funding Agency: NIH/NHLBI

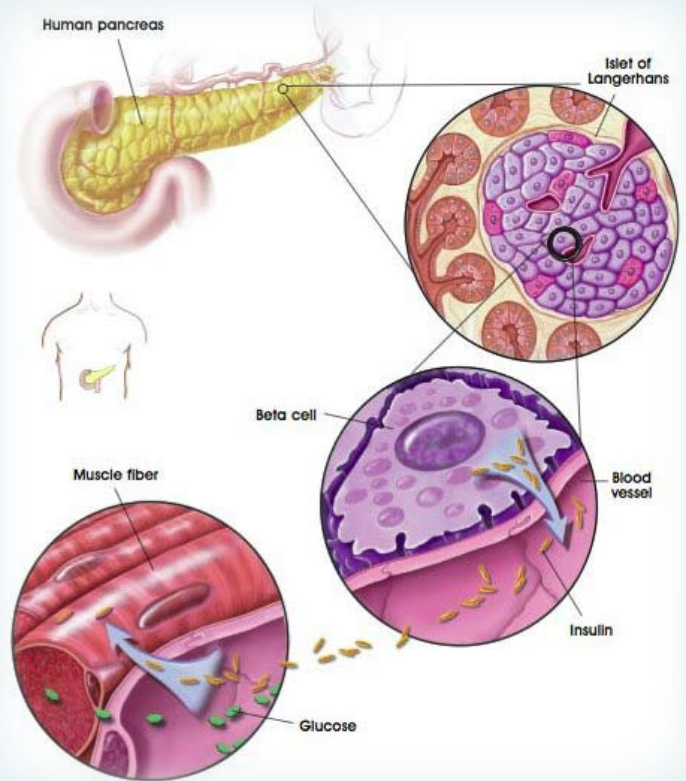
Direct Costs Funded: \$200,000

Role: Principal-Investigator

Title: Altered Glucose Homeostasis by Sleep Impairment

Funding Agency: NIH/NHLBI

Direct Costs Funded: \$225,000



Role: Collaborator

Title: B-cells in Pups of Mild and Severe STZ Diabetic Mothers; Antioxidant Protection

Funding Agency: NIH

Direct Costs Funded: \$200,000

Role: Collaborator

Title: Training Program in Transplantation

Funding Agency: NIH/NHLBI

Direct Costs Funded: \$823,577

Role: Collaborator

Title: UofL Environmental Health Sciences Training Program

Funding Agency: NIH/NIEHS

Peer-reviewed Publications:

Ai, J.; Epstein, P. N.; Gozal, D.; Yang, B.; Wurster, R.; Cheng, Z. J. Morphology and topography of nucleus ambiguus projections to cardiac ganglia in rats and mice. *Neuroscience* 149:845-860; 2007.

Donthi, R. V.; **Epstein, P. N.** Altering and analyzing glucose metabolism in perfused hearts of transgenic mice. *Methods Mol Med* 139:151-161; 2007.

Han, J.; Xu, J.; Long, Y. S.; **Epstein, P. N.**; Liu, Y. Q. Rat maternal diabetes impairs pancreatic beta-cell function in the offspring. *Am J Physiol Endocrinol Metab* 293:E228-236; 2007.

Song, Y.; Du, Y.; Prabhu, S. D.; **Epstein, P. N.** Diabetic Cardiomyopathy in OVE26 Mice Shows Mitochondrial ROS Production and Divergence Between In Vivo and In Vitro Contractility. *Rev.Diabet. Stud.* 4:159-168; 2007.

Zaruba, R. A.; **Epstein, P. N.**; Carr, P. A. Hyperglycemia alters enzyme activity and cell number in spinal sensory ganglia. *J Brachial.Plex. Peripher.Nerve Inj.* 2:11; 2007.

Gu, H.; **Epstein, P. N.**; Li, L.; Wurster, R. D.; Cheng, Z. J. Functional changes in baroreceptor afferent, central and efferent components of the baroreflex circuitry in type 1 diabetic mice (OVE26). *Neuroscience* 152:741-752; 2008.

Teiken, J. M.; Audettey, J. L.; Laturus, D. I.; Zheng, S.; **Epstein, P. N.**; Carlson, E. C. Podocyte loss in aging OVE26 diabetic mice. *Anat Rec (Hoboken)* 291:114-121; 2008.

Wang, Q.; Donthi, R. V.; Wang, J.; Lange, A. J.; Watson, L. J.; Jones, S. P.; **Epstein, P. N.** Cardiac phosphatase-deficient 6-phosphofructo-2-kinase/fructose-2,6-bisphosphatase increases glycolysis, hypertrophy, and myocyte resistance to hypoxia. *Am J Physiol Heart Circ Physiol* 294:H2889-2897; 2008.

Xu, J.; Han, J.; Long, Y. S.; **Epstein, P. N.**; Liu, Y. Q. The role of pyruvate carboxylase in insulin secretion and proliferation in rat pancreatic beta cells. *Diabetologia* 51:2022-2030; 2008.

Xu, J.; Han, J.; Long, Y. S.; Lock, J.; Weir, G. C.; **Epstein, P. N.**; Liu, Y. Q. Malic enzyme is present in mouse islets and modulates insulin secretion. *Diabetologia*; 51:2281-2289; 2008.

Zheng, S.; Carlson, E. C.; Yang, L.; Kralik, P. M.; Huang, Y.; **Epstein, P. N.** Podocyte-Specific Overexpression of the Antioxidant Metallothionein Reduces Diabetic Nephropathy. *J Am Soc Nephrol*; 19:2077-2085; 2008.

Yang, L.; Zheng, S.; **Epstein, P. N.** Metallothionein over-expression in podocytes reduces adriamycin nephrotoxicity. *Free Radical Research*; 2008 In Press.

David W. Powell, Clinton C Bertram, Timothy D. Cummins, Michelle T. Barati, Shirong Zheng, **Paul N. Epstein** and Jon B. Klein: Renal Tubulointerstitial Fibrosis in OVE26 Type 1 Diabetes Mice. In Press 2008.

Jianxing Xu, Yun-Shi Long, David Gozal and **Paul N. Epstein** Beta Cell Death and Proliferation after Intermittent Hypoxia: Role of Oxidative Stress. *Free Radical Biol Med* In Press 2008.

