

Department of Internal Medicine

Division of Diabetes, Metabolism and Endocrinology

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General Summary

We see over 15,000 patients a month in our department, and the patients are increasing every years. Mainly we see diabetic patients (including 10% of Type1 diabetes), but our patients have multiple of disease like thyroid grand, pituitary gland and gonad.

Physicians should practice not only contribute to make advances of diabetes and endocrinology, but provide best healthcare to our patients which consists of research evidence, clinical expertise, and patients' preferences. To accomplish this goal, we encourage the members of our staff to do quality basic and clinical research. And we accept many students japan and abroad far more than our college. Futhermore, we educate foundation house officers and specialist trainees about positive conference presentation.

Research Activities

Diabetes complications

1. Molecular mechanisms governing intracellular signal transduction focusing on cell types relevant to diabetic complications
2. Roles of small GTP-binding protein Rho and Rho-kinase in renal, retinal, neuronal, and endothelial biology
3. Isoform-specific roles of Rho-kinase in pathogenesis of diabetes. Approaches to this study range from in vitro to in vivo using gene-targeting approaches in mice

Epidemiology

1. Clinical trials of the treatment with diabetic patients using continuous glucose monitoring (CGM) and Flash Glucose Monitoring FGM)
2. A nationwide epidemiologic study of mortality in approximately 3,500 patients with type 1 diabetes was started in 1986 and has continued to provide much information about the prognosis of Japanese children with type 1 diabetes
3. A population-based study of childhood obesity and insulin resistance as well as diabetes in elderly and genetic factors has also continued in Niigata Prefecture
4. Epidemiological study using data consisted of more than 6,000 individuals with diabetes from 4 Jikei University hospitals

*Molecular biology for pancreatic islets**Basic research*

Insulin insufficiency and insulin resistance are main cause of diabetes but yet to be elucidated. In addition to this, dysregulated glucagon secretion and function are considered as important as insulin, namely “bi-hormonal disorder”. Although glucagon secretion is suppressed by insulin, dysregulated glucagon secretion is seen in diabetic patient.

Recently, insulin resistance in pancreatic alpha cell was proposed which results in dysregulated glucagon secretion leading to diabetes.

Serendipically, we found that serine/threonine kinase protein kinase c (PKC) delta is involved in alpha cells glucagon secretion. Thus, the aim of this study is to elucidate the mechanism of PKCdelta-dependent glucagon secretion in insulin resistant alpha cells. Ongoing projects are as following.

1. Insulin resistance for glucagon secretion is studied in glucagon-secreting alpha TC1 cell line
2. Involvement of PKCdelta is studied by chemically and genetically inhibition PKCdelta in alpha TC1 cell line
3. To elucidate the molecular mechanism of PKCdelta in vivo, we are establishing alpha cell specific PKCdelta knockout mice (α PKC δ KO)
4. Establishment (confirmation) of alpha cell insulin resistance in vivo
5. Physiological and histological characterization of α PKC δ KO in wild type and diabetic mice

*Endocrinology**Basic research*

1. The role of 12-lipoxygenase on diabetic cardiomyopathy
2. The role of BRS (baroreflex sensibility) on diabetic macroangiopathy especially effects of glycemic variability and blood pressure variability
3. Effect of SGLT-2 inhibitor in diabetic model rats
4. Effect of aldosterone in macula lutea degeneration

Clinical research

1. Effect of SGLT-2 inhibitor in diabetic patients
2. The role of BRS (baroreflex sensibility) on diabetic patients
3. The durability of basal insulin affects day-to-day glycemic variability assessed by continuous glucose monitoring in type 2 diabetes patients
4. Investitation of HbA1c variability in type 2 diabetic patients. (JDDM)
5. Achievement of HbA1c and Blood pressure and LDL-C goal of type diabetic patients (JDDM)

Publications

Tajima N, Nishimura R, Izumi K, Hayashino Y, Origasa H, Noda M, Ueki K. A large-scale, observational study to investigate the current status of diabetes complications and their prevention

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