The Shanghai Clinical Center for Endocrine and Metabolic Diseases

A National Clinical Research Center for Metabolic Diseases

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The Shanghai Clinical Center for Endocrine and Metabolic Diseases

A Wealth of Research from China for the World

The Shanghai Clinical Center for Endocrine and Metabolic Diseases (CCEMD) at Ruijin Hospital in the heart of downtown Shanghai is a large complex housing both the Shanghai Institute of Endocrine and Metabolic Diseases and the Department of Endocrine and Metabolic Diseases. CCEMD supports 100 staff, including a faculty of 30. A total of 149 doctoral degrees and 270 postgraduate degrees have been awarded at the center since 1979.

"CCEMD has the best research talent in China right now," says Professor Guang Ning, the center’s director. "Our vision is to become the leading endocrine and metabolic disease center in the Asia Pacific region; our mission is to take care of people’s health with our hearts." Ning joined the Department of Endocrine and Metabolic Diseases as chief resident in 1994 and has been the director of CCEMD since 2007. He is an executive committee member of the International Society of Endocrinology, has published more than 180 scientific papers in peer-reviewed journals, and created the Journal of Diabetes.

Professor Ning’s strong leadership style is characterized by openness and engagement. He strives to create a working environment where, he says, "we are all happy to come to work every day, and at the end of the day we don’t want to leave."

The best medical students across China compete fiercely for a place at CCEMD, where they are afforded access to some of the most knowledgeable minds in the field and the opportunity to be part of cutting-edge research. Every year, a select few are chosen to study abroad in the United States, Europe, Japan, or Australia.

Key Research Areas

CCEMD is pioneering both basic and translational science, housing research teams dedicated to studying endocrine tumors, diabetes, and obesity, among other areas.

Endocrine System Research

Established in the 1960s, the adrenal gland disease study group reported the very first primary aldosteronism (PA) patient in China. Today, the center holds the largest collection of adrenal tumors in China and leads a nationwide cross-sectional survey on the prevalence of PA in resistant hypertension patients in China. In addition to PA, the adrenal gland disease study group has been focusing on pheochromocytomas, Cushing syndrome, endocrine-related hypertension, and hypokalemia.

The thyroid research team, meanwhile, studies the most common diseases affecting the thyroid. Specific areas of investigation include elucidating genetic and environmental factors and immunopathways involved in autoimmune thyroid disease, identifying molecular biomarkers for improving the diagnosis and prognosis of thyroid tumors, and ultimately discovering new therapies for treating thyroid diseases.

Diabetes

"The prevalence of metabolic diseases such as diabetes is growing very fast in China," says Ning. "We must look for the best ways to prevent and treat diabetes, both so it is effective and so that the cost of treatment can be lowered and rolled out across China."

CCEMD research groups are conducting major studies on the molecular mechanism of pancreatic beta cell expansion and compensation in response to different stimuli to find a remedy for beta cell loss in type 1 and type 2 diabetes.

Other areas of great interest include the molecular mechanisms underlying metabolic disorders in the liver, in particular the function of nuclear receptors and adipocytes in the pathogenesis of nonalcoholic fatty liver disease and insulin resistance.

Traditional Chinese medicine (TCM) has long been used in diabetes treatment in China, and the center has been driving TCM experiments since the 1980s. CCEMD scientists have found evidence supporting the benefits of ingredients such as berberine, Panax ginseng, and androgapholide for treating diabetes and are creating a storage bank of TCM molecular ingredients and exploring ways to incorporate these into treatment regimens.

Obesity

With obesity rising dramatically in China, CCEMD is exploring novel causal genes, molecular mechanisms, prevention, and therapies. In 2009, the Genetics of Obesity in Chinese Youth (GOCI) study was established with the goal of exploring the pathogens and genetic susceptibility of patients with obesity. This cohort study has enrolled over 1,000 patients with obesity and 1,000 control subjects, and is registered on the U.S. ClinicalTrials.gov website.

The center was the first of its kind to investigate the causal role of obesity in cardiovascular disease using the principle of Mendelian randomization, a way of ensuring that the observed difference in the outcome is because of the genetic variant being studied. CCEMD researchers are using whole-exome sequencing to identify novel rare genetic variants in the human genome as well as metagenomics to investigate our "other genome" — the collective genome of the microorganisms inhabiting our body, known as the microbiome.

The obesity study group also conducts basic studies that examine the molecular mechanisms underlying obesity and energy balance, including which genes regulate adipocyte (fat cell) differentiation, and investigate how bariatric (weight loss) surgery alters the microbiome and neural pathways.

They believe that a better understanding of these processes will pave the way for developing new drugs to combat the obesity epidemic.

Prevalence of Diabetes Among Adults in China

According to the 2011 China National Diabetes Prevention and Control Program, the prevalence of diabetes in China is around 11% among adults aged 20-79. This figure is expected to rise to 14% by 2030. The National Diabetes Prevalence Survey (NDPS) conducted by the CCEMD in 2010 found that the prevalence of diabetes among adults over the age of 18 was 11.6%.

The NDPS also found that the prevalence of diabetes was higher among men than women (12.1% vs. 11.1%) and increased with age. The prevalence of diabetes was also higher in urban areas than in rural areas (12.7% vs. 9.6%).

Patient Statistics

- 280,000 out-patient consultations
- 6,600 patient follow-up visits
- 12 specialized disease clinics every week
- 5,210 in-patient consultations
- 19 clinical trials

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Journal of Diabetes (JDB) devotes itself to diabetes research, therapeutics, and education. It aims to involve researchers and practitioners in a dialogue between East and West via all aspects of epidemiology, etiology, pathogenesis, management, complications and prevention of diabetes, including the molecular, biochemical, and physiological aspects of diabetes. The journal has established a specific “Asia Track” to further this endeavor by bringing to the international community articles which focus on aspects of diabetes of particular relevance to Asia. The Editorial team is international with a unique mix of Asian and Western participation.

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