

New research on type 2 diabetes could benefit young adults with the condition

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New research on Type 2 diabetes by Trinity College Dublin researchers could benefit young adults (aged 18-25 years) with the condition. The research led by Professor John Nolan of Trinity College Dublin and St James's Hospital, Dublin, has just been published online in the leading international journal, *Diabetes Care*.

The study findings demonstrate new mechanisms in [muscle cells](#) that may explain severe insulin resistance which is the body's decreased ability to respond to the effects of insulin, and a reduced response to [aerobic exercise](#) in young obese patients with [Type 2 diabetes](#). These important findings will contribute in the longterm to the development of more specific treatments for young people with Type 2 diabetes.

Type 2 diabetes is the most common form of diabetes. It occurs because the body produces too little insulin and is unable to properly use the insulin that is secreted. It usually occurs in older people although it is becoming more common among younger people, partly due to lifestyle factors such as diet, lack of physical activity and obesity. The highest rates occur in countries with modern lifestyles. Type 2 diabetes accounts for approximately 85%-90% of all cases of diabetes in European countries.

Commenting on the significance of the research, Professor John Nolan of the Department of Clinical Medicine, TCD, who led the Metabolic Research Group, said: "Type 2 diabetes is presenting in much younger people, usually because of early onset obesity and a strong family

background of diabetes. These studies provide us with important new insights into the way diabetes develops and progresses in these young patients. In this study, we have shown that obese young patients with Type 2 diabetes, in contrast to equally obese young people without diabetes, have abnormal function of key [mitochondrial genes](#) and proteins. Mitochondria are the energy centres in cells and these abnormalities contribute to insulin resistance and a severely blunted response to physical exercise. Aerobic exercise is very effective in preventing and treating Type 2 diabetes in middle aged and older people."

"Type 2 diabetes is the major chronic disease of modern societies", continued Professor Nolan, "and threatens the health of populations, most dramatically in Asia and developing countries. Designing specific treatments for Type 2 diabetes in young people depends on a more exact understanding of the cellular mechanisms of this disease. Our studies of muscle mitochondrial function have allowed us to focus intervention studies on these important new mechanisms."

The research was carried out by the Metabolic Research Unit at Trinity College Dublin based at St James's Hospital. These studies are part of an ongoing research programme by Professor Nolan's team into the causes and treatment of Type 2 diabetes and severe [insulin resistance](#) in young people. The investigations were done in collaboration with Professor Antonio Zorzano at the Institute for Research in Biomedicine, Barcelona. The studies were funded by grants from the European Foundation for the Study of Diabetes and from the EU Commission as well as grants from the Ministerio de Educación y Cultura in Spain.

Provided by Trinity College Dublin

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