DIABETES

O-GlcNAcylation—a new diagnostic tool for type 2 diabetes mellitus?

The extent of protein modification by O-linked β -N-acetylglucosamine (O-GlcNAcylation) shows potential as a tool for the diagnosis of type 2 diabetes mellitus (T2DM), suggest South African researchers.

Early and efficient detection of prediabetes and T2DM is urgently needed, but currently available diagnostic tests have limitations and some patients remain undiagnosed until complications develop.

Springhorn *et al.* aimed to develop a new diagnostic test for earlier detection of T2DM based on O-GlcNAcylation of leukocyte proteins. “Under hyperglycaemic conditions, total O-GlcNAcylation of target proteins is increased,” explains senior author Faadiel Essop of Stellenbosch University.

The researchers classified 74 individuals as having diabetes mellitus, prediabetes or no diabetes on the basis of fasting blood glucose and HbA_{1c} levels. The degree of O-GlcNAcylation in leukocyte samples isolated from the participants was measured by flow cytometry.

Leukocyte O-GlcNAcylation was increased in participants with diabetes mellitus versus control participants. Interestingly, the degree of O-GlcNAcylation differed for leukocyte subpopulations, with granulocytes showing increased O-GlcNAcylation compared with lymphocytes. Granulocyte O-GlcNAcylation enabled differentiation between control individuals and those with prediabetes. In addition, lymphocyte O-GlcNAcylation enabled differentiation between individuals with prediabetes and those with diabetes mellitus.

The team now plan to identify specific leukocyte proteins that are O-GlcNAcylated and test their diagnostic utility.

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Original article Springhorn, C. *et al.* Exploring leukocyte O-GlcNAcylation as a novel diagnostic tool for the earlier detection of type 2 diabetes mellitus. *J. Clin. Endocrinol. Metab.* doi:10.1210/jc.2012-2229