

More than just type 1 or type 2: DiMelli study points to different forms of diabetes

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The DiMelli (Diabetes Mellitus Incidence Cohort Registry) study examines the frequency and characteristics of diabetes phenotypes in children and young adults below the age of 20. The study was commissioned to investigate the increasing incidence of diabetes mellitus, particularly in childhood and early adulthood.

The project is funded by the German Center for Diabetes Research (DZD). Bioprobe measurements were performed centrally by the Central Medical Laboratory (LMZ) at the Helmholtz Zentrum München (HMGU) so as to guarantee the high quality and comparability of laboratory parameters. The study is based on the DiMelli Bavarian Diabetes Register, the only register of its kind in Germany, which collects data on biological parameters in the blood of newly diagnosed diabetics as well as their phenotypic characteristics, i.e. their physical symptoms and features. A questionnaire is used to identify the characteristics of the form of the disease occurring in the patient in question such as body weight and weight changes as well as [blood sugar levels](#), residual [insulin production](#) and other biomarkers.

The team of scientists headed by Professor Anette-Gabriele Ziegler, Dr. Katharina Warncke and Dr. Andreas Beyerlein from the Institute of Diabetes Research (IDF) at the Helmholtz Zentrum München, the Diabetes Research Group at the Technical University of Munich (TUM), the Children's Hospital in Munich-Schwabing and the Department of Pediatrics at the Klinikum rechts der Isar, Technical University of Munich, have now evaluated the initial data from the DiMelli study.

Between April 2009 and June 2012, 630 people were included in the register. Of that number, 522 exhibited two or more diabetes-specific antibodies while 64 participants in the study displayed one antibody. In 44 of the participants no antibodies were found. The existence of antibodies characterizes autoimmune [type 1 diabetes](#),

whereas [type 2 diabetes](#) occurs without any specific immunological reaction. Although the participants with and without diabetes-specific autoantibodies displayed different characteristics in terms of body weight, weight loss and residual insulin production function, as expected, the phenotypic features could not be clearly assigned to specific disease types. This means that the formation of autoantibodies does not go hand-in-hand with a clearly separable combination of other blood values and clinical characteristics.

The authors thus conclude that the latest scientific findings no longer support such a rigid classification of diabetes. Rather there appears to be a continuum of forms and a mixture of diabetes [phenotypes](#). "In order to be able to introduce the right steps in treatment and to offer patients accurate information about their disease, it is essential to refine the criteria for differentiating and diagnosing the different forms of diabetes," Professor Ziegler explains. "Further studies are now required to shed light on the long-term development of the phenotypes, the distribution of different types of [diabetes](#) and the way in which their features present themselves in adult patients."

More information: Warncke, K. et al. (2013): Does Diabetes Appear in Distinct Phenotypes in Young People? Results of the Diabetes Mellitus Incidence Cohort Registry (DiMelli), *PLOS ONE*, [DOI: 10.1371/journal.pone.0074339.s002](https://doi.org/10.1371/journal.pone.0074339.s002)

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