Abstract

Inherited metabolic disorders (IMD) form a diverse group of several hundred different diseases with a relatively high cumulative incidence (stated up to 1:600). They are associated with accumulation of the substrates and lack of the products in specific metabolic pathways, which is caused by deficiency of the enzyme or its activator, or dysfunction of the transport protein. However, the underlying cause is at the DNA level. The grounds for different phenotype manifestation in patients with the same genotype are often not known.

During my work at the Institute of Inherited Metabolic Disorders, I designed several new methods for the research of IMD and applied them in the patients and their families. I created procedures for the isolation of lysosomal membranes that are used for the research of lysosomal storage disorders and general properties of lysosomes. Next, I introduced several novel assays for determination of the X-inactivation ratio, which led to a significant increase of informative women. Nowadays, we use these methods in heterozygous women with X-linked diseases in order to study the influence of X-inactivation on the manifestation of the diseases. The cases of a girl with mucopolysaccharidosis type II, a girl with OTC deficiency and a family with the mutation in *HPRT1* gene are described here in more details.