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# Magnesium Deficiency: Not Always a Nutritional Problem

*Apr. 4, 2011* — Researchers and scientists of the Charité -- Universitätsmedizin Berlin, in cooperation with the Max Delbrück Center for Molecular Medicine, and colleagues from the Netherlands, Belgium, Switzerland and the Czech Republic have succeeded in identifying a genetic cause of magnesium deficiency.



The study from Dr. Dominik Müller of the Department of Pediatric Nephrology, ascertained changes in a gene which is involved in the regulation of magnesium processes. This research, which is published in the current issue of the *American Journal of Human Genetics*, opens the way for possible future medicinal treatment of genetically caused magnesium deficiencies.

A magnesium deficiency, with symptoms ranging from fatigue and muscle weakness to severe seizures and heart rhythm disturbances, may also be associated with diabetes and high blood pressure. Up until now it has been mostly explained by dietary insufficiencies.

Dr. Müller and his team have now shown that an altered gene may be the cause for this deficiency. Changes in a gene (Cnnm2), entail changes in the human blueprint and thus in the structure and function of protein sequence. In this case, the change affects a protein that is anchored in the membrane of kidney cells and intestinal cells and is responsible for the absorption of magnesium in the blood stream. Since this process no longer works in the defective protein, the magnesium is not put into the blood stream but excreted through the intestine and the urine, and therefore forfeited.

Dr. Mueller commented on his research results as follows: "Our results provide us with a number of new insights into magnesium metabolism in the body. In the end, following further research and development, we see the possibility to deal with such deficiencies medicinally."



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The above story is based on materials provided by **Charité - Universitätsmedizin Berlin**.

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**Journal Reference**:

1. Marchel Stuiver, Sergio Lainez, Constanze Will, Sara Terryn, Dorothee Günzel, Huguette Debaix, Kerstin Sommer, Kathrin Kopplin, Julia Thumfart, Nicole B. Kampik. **CNNM2, Encoding a Basolateral Protein Required for Renal Mg2 Handling, Is Mutated in Dominant Hypomagnesemia**. *The American Journal of Human Genetics*, 2011; 88 (3): 333 DOI: 10.1016/j.ajhg.2011.02.005



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