**Subcellular compartmentation of ascorbate and epigenetics**

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The main goal of our work was to prove the epigenetic effects of ascorbate in two different model systems, scurvy caused by general lack of ascorbate and arterial tortuosity syndrome accompanied by a local (mainly nuclear) ascorbate deficiency. We successfully set up a new and – regarding mammalian cells - unique method to study intracellular distribution of ascorbate: transmission electron microscopy was used following ascorbate antibody and immunogold staining. The method let us obtain direct information regarding the ascorbate distribution in intracellular compartments both in control fibroblast and fibroblast isolated from patients having arterial tortuosity syndrome. In the latter, ascorbate deficiency was mainly localized to the nucleus, therefore we examined the epigenetic consequences of it. We found that ascorbate treatment increased hydroxymethylcytosine level and the ratio of 5-hydroxymethylcytosine/methylcytosine only in control cells. We have already started the selection of genes and gene regions for the region-specific PCR analysis. Mainly genes of proteins, which need ascorbate as a cofactor for their functions, were selected.