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Microanalysis of proteoglycan sulfation in the growth plate

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The *diastrophic dysplasia sulfate transporter (DTDST* or *SLC26A)* family of disorders include phenotypes with different clinical outcomes from mild to letal. The gene encodes a widely distributed sulfate/chloride antiporter of the cell membrane whose function is crucial for the uptake of inorganic sulfate, which is needed for proteoglycan sulfation. Proteoglycans (PG) are a family of macromolecules characterized by one or more polysaccharide chains, called glycosaminoglycans (GAG), covalently linked to a core protein.

We have already demonstrated undersulfation of GAG chains in articular cartilage from patients compared to the controls and in a diastrophic dysplasia (dtd) mouse model available in our laboratory. However sulfation of the cartilage growth plate has never been measured due to the low amount of tissue available and the difficulties in isolating this small area. The aim of this work was to measure PG sulfation of the growth plate on mutant and wild-type mice. The growth plate was obtained from sections of the tibia of 2 weeks old mice by microdissection and disaccharides released from PG after enzymatic digestion were labeled with 2-aminoacridone (AMAC) and analysed by FACE (fluorophore assisted carbohydrate electrophoresis). Our results demonstrate a significant undersulfation of dtd growth plate compared to wild-type animals confirming previous data on articular cartilage.

In the future we plan to study growth plate PG sulfation in mice at different ages and in the different zones of the growth plate to elucidate the role of sulfation on proper development and differentiation of the tissue.

Works that will be presented at the XXIst meeting of the European Connective Tissue Society (FECTS), Marseille,)-13 July 2008:

References

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2. Fabio Pecora[1], Antonella Forlino[1], Benedetta Gualeni[1], Anna Lupi[1], Marcella Facchini[1], Roberta Gioia[1], Sofia Giorgetti[1,2], Loredana Marchese[1,2], Ruggero Tenni[1], Giuseppe Cetta[1] and Antonio Rossi[1]. Two dimensional gel electrophoresis of murine articular cartilage.[1]Department of Biochemistry, University of Pavia; [2]Laboratori di Biotecnologie, IRCCS Policlinico S. Matteo, Pavia, Italy.