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学 位 論 文 要 旨

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専攻分野 口腔顎顔面外科学分野	身分 大学院生	氏名 村瀬 友里香
<p>論 文 題 名 Role of CCN2 in Amino Acid Metabolism of Chondrocytes (CCN2の軟骨細胞アミノ酸代謝における役割)</p>		
<p>論文内容の要旨 (2000字程度)</p> <p>CCN2/connective tissue growth factor (CTGF) is a multifunctional molecule that promotes harmonized development and regeneration of cartilage through its matricellular interaction with a variety of extracellular biomolecules. Thus, deficiency in CCN2 supply profoundly affects a variety of cellular activities including basic metabolism. A previous study showed that the expression of a number of ribosomal protein genes was markedly enhanced in <i>Ccn2</i>-null chondrocytes. Therefore, in this study, we analyzed the impact of CCN2 on amino acid and protein metabolism in chondrocytes. Comparative metabolome analysis of the amino acids in <i>Ccn2</i>-null and wild type mouse chondrocytes revealed stable decreases in the cellular levels of all of the essential amino acids. Unexpectedly, uptake of such amino acids was rather enhanced in <i>Ccn2</i>-null chondrocytes, and the addition of exogenous CCN2 to human chondrocytic cells resulted in decreased amino acid uptake. However, as expected, amino acid consumption by protein synthesis was also accelerated in <i>Ccn2</i>-null chondrocytes. Furthermore, we newly found that expression of 2 genes encoding 2 glycolytic enzymes, as well as the previously reported <i>Eno1</i> gene, was repressed in those cells. Considering the impaired glycolysis and retained mitochondrial membrane potential in <i>Ccn2</i>-null chondrocytes, these findings suggest that <i>Ccn2</i> deficiency induces amino acid</p>		

論文内容の要旨（2000字程度）

shortage in chondrocytes by accelerated amino acid consumption through protein synthesis and acquisition of aerobic energy. Interestingly, CCN2 was found to capture such free amino acids *in vitro*. Under physiological conditions, CCN2 may be regulating the levels of free amino acids in the extracellular matrix of cartilage.