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Inhibiting effects of common trivalent metal ions on transmembrane-type 2 matrix metalloproteinase

Li Ren[a,b], Dahai Yu[c], Yanyan Wang[d], Liqiao Shen[c], Jinrui Zhang[e], Ye Wang[c], Xuexun Fang[e*].*

a. College of Food Science and Engineering, Jilin University, 5333 Xi'an Street, Changchun, Jilin 130062, P. R. China.

b. State Key Laboratory of Inorganic Synthesis and Preparative Chemistry, Jilin University, 2699 Qianjin Street, Changchun 130012, P. R. China.

c. Key Laboratory for Molecular Enzymology and Engineering of Ministry of Education, College of Life Science, Jilin University, 2699 Qianjin Street, Changchun 130012, P. R. China.

d. School of Biological Engineering, Dalian Polytechnic University, Dalian 116034, P. R. China.

**Corresponding author: Ye Wang and Xuexun Fang*

Ye Wang: Tel.: +86-0431-85155249; Fax: +86-0431-85155200; E-mail address: wangye0106@jlu.edu.cn.

Xuexun Fang: Tel.: +86-0431-85155249; Fax: +86-0431-85155200; E-mail address: fangxx@jlu.edu.cn.

Abstract

Transmembrane-type 2 matrix metalloproteinase (MT2-MMP) degrades connective extracellular matrix between cells and enables tumor cells to migrate and metastasize, making this substance a potential therapeutic target in various diseases. In this work, the interactions between MT2-MMP and common trivalent metal ions, including aluminum (Al^{3+}) and ferrum (Fe^{3+}) ions, were investigated. Enzymatic detection revealed that Al^{3+} and Fe^{3+} strongly inhibited the MT2-MMP. Fluorescence spectrography elucidated a static quenching interaction between the negatively charged amino acids on MT2-MMP and the inhibitory trivalent metal ions, indicating that a stable complex was formed between MT2-MMP and metal ions. In addition,