Analysis Of Adenylate Cyclase 6 In K562 Cell Chemical Induced Megakaryocyte Differentiation

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ABSTRACT

Chronic myeloid leukemia (CML) is a hematopoietic stem cell disorder. Hematopoietic stem cell can replenish functional blood cell, like erythrocyte (red blood cell), platelet, leukocyte, plasma cell, lymphocyte, and macrophage. Patients suffer their lost in functional blood cell and the ratio of non-function cell increased. K562 cell was isolated from the pleural effusion of the leukemia patient and was used as a model cell line to study the relationship between the blood cell differentiation and signal transduction. In this report, three different inducers, huangqi (Astragalus membranaceus) extract, chemicals Hemin and HMBA were used to induce K562 cell differentiation and several cluster of differentiation (CD) marker were used to identify the cell linage. Two megakaryocyte markers were up-regulated in these treatments. The CD61, a late marker, was highly expressed in HMBA treated cell and CD41, an earlier marker, was identified in huangqi treated cell. In former report, the Gi2 and Gs was induced by the HMBA administration. Since both G proteins affect their downstream effector adenylate cyclases (ADCYs), the ADCYs that could be participated in the pathway were examined by RT-PCR. The ADCY1 and ADCY6 were up-regulated in the HMBA-induced K562 cell. The ADCY1 is expressed mainly in the brain and the ubiquitous ADCY6 were cloned. The ADCY6 transfected cells were treated with three inducers, the data showed that all induced increased CD61 expression and huangqi and Hemin induced CD41 expression. The ADCY6 transfected cells increased CD61 expression. The results imply that the signal from inducers and ADCY6 may participate the megakaryocyte differentiation. The study sugested that K562 cells can change the signal pathway through the ADCY isoforms to alter cell differentiation. That may be used as the reference of the gene therapy of leukemia.

Keywords : K562 cell、HMBA、Megakaryocyte、Heterotrimeric G-protein、Adenylate cyclases

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