

Approaches to Neural Stem Cells or Cancer Cells based on Natural Products

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The compounds that accelerate of differentiation of neural stem cells (NSCs) are important because such small molecules would be candidates for *regenerative medicine* of neural diseases. We have started to search active compounds from natural resources and synthetic compounds based on natural products. Three research cores have been set; 1) compounds, 2) protein-based assays, 3) cell-based assays.

We developed the efficient synthetic method of chromone and flavonoid derivatives bearing diverse heterocyclic units. Several compounds accelerate of differentiation of NSC. As the protein-based assays, we have developed the *rapid* discovering method for natural products by using protein immobilized magnetic beads, and the screening method for Hes1 (a bHLH factor which controls transcription of genes in NSCs) dimer inhibitors using protein immobilized microplate. For the cell-based assays, a reporter gene assay for activator or inhibitor of Hes1 expression was constructed. By using these original assays, active natural compounds and synthetic compounds based natural compounds were discovered. By these three cores, we also approached to cancer cells. The potent hedgehog or Wnt signaling inhibitors were found from natural products.

