DIFFERENTIATION INDUCTION FROM HUMAN PLURIPOTENT STEM CELLS INTO HYPOTHALAMIC NEURONS

ABSTRACT

There is provided a method for efficient differentiation induction from human pluripotent stem cells into hypothalamic neurons. Also, provided is a method for constructing, from human pluripotent stem cells, a cellular structure in which hypothalamic tissue and pituitary tissue are integrated. A cellular structure including hypothalamic tissue is obtained by a method including the steps of: culturing an aggregate of human pluripotent stem cells in suspension in a medium containing a low concentration of a bone morphogenetic protein signal transduction pathway activating substance and a low concentration of a substance acting on the Shh signaling pathway; and further culturing the cell aggregate obtained in the step in suspension in a medium containing a low concentration of a substance acting on the Shh signaling pathway. Also, a cellular structure including hypothalamic tissue and pituitary tissue is obtained by a method including the steps of: culturing an aggregate of human pluripotent stem cells in suspension in a medium containing a bone morphogenetic protein signal transduction pathway activating substance and a substance acting on the Shh signaling pathway; further culturing the cell aggregate formed in the step in suspension in a medium containing a bone morphogenetic protein signal transduction pathway activating substance and a substance acting on the Shh signaling pathway; and culturing the cell aggregate obtained in the step in suspension in a medium suitable for simultaneous induction of pituitary and hypothalamus.

[Figure 14]