

## **Control of organogenesis and cell differentiation in vertebrates**

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In early development of animals, the prototype of formation is completed during the period from fertilization to the larval stage. Regular gene expressions and visceral formation, as well as other important phenomena involved in the features of embryonic uniformity, occur as an embryonic development program progresses. The degree of understanding of these phenomena in the terms of molecular language is a major problem in both developmental and cell biology.

Animals have the mechanism for repair following injury. Humans also have this ability, although it is rather limited. Many researchers have attempted to regenerate and utilize the functions of organs and tissues that have become dysfunctional by introducing organs and tissues from outside the body. Artificial internal organs are an example. Especially, marked advances have been made recently in studies in the new field of regenerative medicine, including cell therapy using human ES cells, iPS cells and somatic stem cells. Furthermore, drug development studies using iPS cells have also become a major area of interest. Along with a look at the goings-on in the field of regenerative medicine inside and outside Japan, I would like to talk about the current status and problems in this field of study.