

# The Japanese Teratology Society (JTS): Its 50-year history and prospects for new development

JMAJ 54(6): 406–408, 2011

Hiroki OTANI\*<sup>1</sup>

## The Foundation and Development of JTS

Since the first meeting in Tokyo in August 1961, annual meetings and scientific meetings of the Japanese Teratology Society (JTS) have been held regularly without interruption, and the 50th Anniversary Meeting was held in Awajishima (in Hyogo Prefecture) in July 2010 (**Fig. 1**).

The issue of congenital anomalies, defects present at birth, became a great social problem that generated about 10,000 patients worldwide due to the thalidomide incident of 1960–1961. Because of this incident, the need for academic research was well and widely recognized, and relevant academic societies were set up in both Japan and the USA in the same year. The JTS was established based on a very forward-looking idea at that time that the congenital anomaly issue requires an interdisciplinary approach encompassing the areas of basic medicine and clinical medicine. Thus, the JTS is an interdisciplinary society in which basic medical researchers specializing in anatomy, pathology, pharmacology, hygiene, etc., and clinical medical researchers and doctors in the fields of pediatrics, obstetrics & gynecology, surgery, orthopedics, ophthalmology, etc., collaborate. This society was admitted to the Japanese Association of Medical Sciences in 1968 as the 61st member society. The JTS's journal, which was first issued only in Japanese, developed into an English-language-only journal, "Congenital Anomalies," in 1982 (**Fig. 2**). This journal was steadily enhanced as an international publication, and was included in the Science Citation Index Expanded with Impact Factor acquisition

in 2010. As of June 2011, JTS had 785 members.

## International Collaboration in Research on Congenital Anomalies

Aiming at international collaboration in this field of research, four academic societies, namely, the JTS, the Teratology Society in the USA, the European Teratology Society, and the Australian Teratology Society formed a coalition to set up the International Federation of Teratology Societies (IFTS) in 1983. Although the IFTS held joint academic meetings and symposia every 3–4 years by rotating the supervising organizer, its activities were suspended in 2006 for various reasons. However, international collaboration among these societies has continued in the forms of developing glossaries of technical terms, holding international symposia, etc.

## Academic and Social Contributions of the JTS

When the JTS was founded, much remained unclear as to the cause of human congenital anomalies. In particular, with the exception of only a few, it was not recognized by researchers that medications and other environmental factors can cause developmental anomalies in humans. The thalidomide incident and the subsequent Minamata disease incident aroused serious concern as to the influences of environmental chemicals on fetuses, and the relationship between the environment and congenital anomalies became a major theme of research. In this field, JTS mem-

\*1 Chief of Directors, Japanese Teratology Society, Kyoto, Japan (jts@ac-square.co.jp).

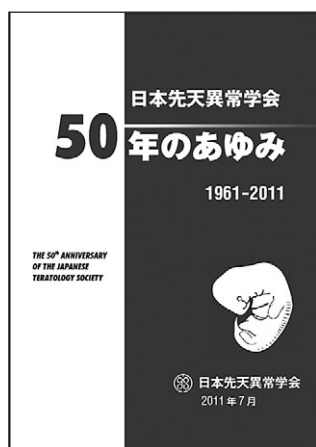


Fig. 1 “50 Nen no Ayumi”—The 50th Anniversary Issue of the Japanese Teratology Society (July 2011)

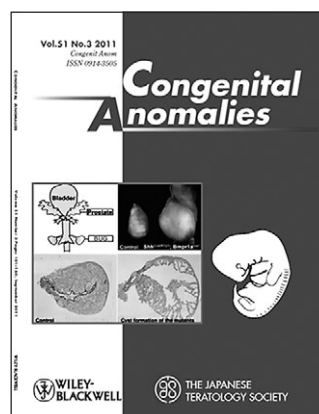


Fig. 2 *Congenital Anomalies* Vol. 51, No. 3 (September 2011)—The official English journal of the Japanese Teratology Society

bers played an extremely significant role. Through these processes, reproductive and developmental toxicity tests became mandatory for the development of medicines and environmental chemicals. Many JTS members have also been playing central roles in the formulation of relevant guidelines and in governmental regulatory reviews of reproductive and developmental toxicities of new drugs. The Japanese guidelines for reproductive and developmental toxicity tests for drugs are the most comprehensive among comparable guidelines in the industrialized countries, serving as a model for other countries. Many of the concepts in Japanese guidelines were incorporated into the development of standard international guidelines (International Harmonization).

On the other hand, since analysis of gene sequences became possible in the 1970s, molecular biology has been the main approach applied in genetic studies. Since completion of the human genome sequence analysis, previously unknown gene functions have been clarified one after another by experimental studies using genetically-modified animals. Mechanisms of normal and abnormal development became a major target of molecular biology studies, and as a result, the molecular bases of various congenital anomalies were elucidated. Clinically, there were also major changes in diagnostic and therapeutic approaches to patients with congenital anomalies. Along with the remarkable development of medical biology, the content of research papers and presentations

at academic meetings of the JTS also changed substantially. Thus, it can be said that the history of the JTS truly parallels academic research progress in the field of medical biology.

### Toward the Next 50 Years of the JTS

A major characteristic of the JTS is its interdisciplinary nature. Congenital anomalies have complex causes and pathogeneses, and treatment and therapeutic education aimed at congenital anomalies inevitably requires cooperation among specialists from a number of different fields. It is also true that the importance of the roles of researchers in reproductive and developmental toxicity and those engaged in toxicity testing will never change. To overcome the difficult challenges presented by congenital anomalies, it is very important for the JTS to develop as a discussion venue for researchers gathering from multiple disciplines, while facilitating the studies in their own areas of specialties. In order to promote the development of the JTS to make further contributions to society for another 50 years, a multidisciplinary group of professionals involved in congenital anomaly research are now formulating a specific cooperative system that links or extends beyond various areas of specialization. At the same time it is also important to accurately and flexibly respond to major innovative changes in social situations and remarkable progress, which take place not only in the field of

congenital anomaly research itself but also in many other related fields of study.

There are still issues regarding the causes of congenital anomalies. One question is how the vast amount of evidence at the molecular level obtained from studies in the so-called “omics” fields, i.e. genomics and proteomics, should be connected to the results of close observation of pathologic conditions and abnormalities in actual clinical cases and animal experiments or to epidemiological findings. How to clarify the complicated relationship between genetic and environmental factors is also a problem, and this issue further deepens every time another new finding is obtained. The JTS has the potential, or is at least in a position that is required to make efforts to serve as a bridge between multiple disciplines addressing these issues. It is also necessary to continuously provide information and support from the interdisciplinary viewpoint concerning

the influences of radioactive materials released from the accident at the Fukushima Daiichi Nuclear Power Plant and biohazardous chemicals discharged from houses and other buildings that collapsed due to the earthquake and tsunami disasters. The JTS must promote the development of congenital anomaly studies as a comprehensive science of embryos and fetuses. These studies include not only those related with organogenesis such as thalidomide-induced malformations, but also those that aim at elucidation and prevention of the mechanisms responsible for formation of disease predispositions for postnatal organ-based diseases such as diabetes and hypertension in the histogenesis stage during the latter half of the prenatal period. The JTS should also enlighten related professionals and citizens to deepen their understanding of the prenatal period as a segment in the succession of life stages.