

**Shinsuke Tanabe, Ph.D.**

**Professor of Environmental Chemistry, Center for Marine Environmental Studies (CMES), Ehime University**

Dr. Shinsuke Tanabe is an environmental chemist in the field of persistent toxic substances such as dioxins, PCBs, heavy metals, etc. He has authored 383 original scientific publications and 86 book chapters and articles, both in English and Japanese. Presently, he is the leader of the mega project on Global Center of Excellence Program sponsored by the Ministry of Education, Culture, Sports, Science and Technology, Japan. The establishment of the Environmental Specimen Bank at CMES, catering to the needs of many research institutions, is his exquisite idea. He has received many research awards in Japan and abroad, including the Okada Prize from the Oceanographical Society of Japan (1985), the Nissan Science Foundation Award (1999), the Citation Classic Award in Japan from ISI Thomson Scientific (2000), the Friendship Award for Collaborative Academic Activities from the Government of Vietnam (2003), the 2005 SETAC (Society of Environmental Toxicology and Chemistry) Founders Award, the Excellence of Review Award in Environmental Science and Technology (2007) and the 2007 SETAC/Menzie-Cura Environmental Educational Award, etc.

**Analysis on Spatial Distribution and Temporal Trends of Novel Persistent Toxic Substances Utilizing Environmental Specimen Bank, Ehime University**

When the novel environmental contaminants appear and tend to become a social problem, the specialists and administrators always pose queries such as “What is the possibility of wide-spread contamination?” and “When has the contamination started and how will it be in future?”. The Environmental Specimen Bank (*es*-BANK) in Ehime University has been established recently and stocked the frozen environmental and biological samples collected over the world since 1960 during our surveys abroad. These samples were utilized in many studies on the contamination monitoring and risk assessment of persistent organic pollutants (POPs) and the outcome of the studies contributed substantially in answering the above academic and social queries.

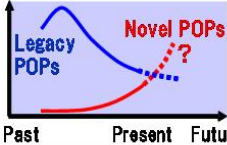
The highlights of past studies using the samples of our *es*-BANK made clear the spacial and temporal variations of POPs (Persistent Organic Pollutants) contamination on global terms. Some studies using mussels and human breast milk samples elucidated the presence of pollution sources of POPs pesticides (like DDT) in developing countries, and the chemicals (eg. organotins and PCBs) used as industrial purposes in developed nations. The finding on the significant source of the dioxin contamination from the open-dumping sites in developing countries was highly acknowledged by the world environmentalists as an excellent research. Furthermore, the fact that the recovery of POPs contamination in remote areas like polar regions is temporally very slow was recognized as an illustrative research clearly showing the effectiveness of stored samples in our *es*-BANK, which

were carried-out using the fat tissues of minke whales from the Antarctic Ocean and Baikal seals from the Lake Baikal, Russia.

By the way, some Asian developing countries with high economic growth rates are known for the occurrence of irresponsible waste dumping and recycling, and related environmental problems such as serious chemical pollution and human health effects. In relation to these industrial activities and problems, the environmental contamination by some POPs candidates (novel POPs) such as brominated flame retardants, perfluoroalkyl sulfonate substances and halogenated dioxins are of great concern on Asian developing countries. However, monitoring studies on the environmental contamination of these novel POPs are very scarce, while abundant data are available from developed nations. The present study aims at elucidating the status of environmental contamination, behavior and fate, bioaccumulation and historical trend of the above novel POPs in the biotic and abiotic samples from Asian developing countries by effectively utilizing the *es*-BANK, Ehime University.

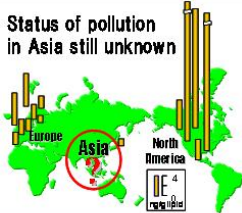
The outcome of environmental studies is dependent not only on excellent technology and human talents, but also on systematic sample collection, archives and stocks. The archived samples in *es*-BANK, Ehime University is like a spokesman speaking on environmental records, which is “Earth Watcher” and “Time Capsule” being able to make clear the status of contamination and toxic effects of hazardous pollutants on local, regional and global terms. Strategically using the facility and function of *es*-BANK, Ehime University, the present study strives to excel leading world class Asian studies on the environmental chemistry and ecotoxicology.

Novel POPs pollution increasing?




Past Present Future

Status of pollution in Asia still unknown



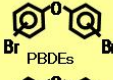
Irresponsible dumping of wastes




**Utilizing es-BANK in Ehime University**  
Status of Contamination and Temporal Trends of Novel POPs in Asian Developing Countries

- 1) Development of analytical methods
  - Brominated flame retardants (PBDEs - HBCDs)
  - Halogenated dioxins (PXDD/DFs)
  - Perfluoroalkyl sulfonate substances (PFOS, etc.)
  - Accuracy assurance (intercalibration, etc.)
- 2) Status of Contamination
  - Distribution and behavior in terrestrial and marine environment
- 3) Sources of pollution
  - Contamination profiles of waste dumping site, recycling facility, Urban air/soil, office/house dust, etc.
- 4) Specific bioaccumulation
  - Accumulation feature, gender difference, metabolism, biomagnification, etc.
- 5) Temporal trend
  - Patterns on regional and substance characteristics

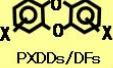
**Contribution to**  
Establish Database on Spatial and Temporal Trends in Developing Countries  
Exert Evidences for the Environmental Innovation and Technology Development




PBDEs



HBCDs



PXDDs/DFs



PFOS