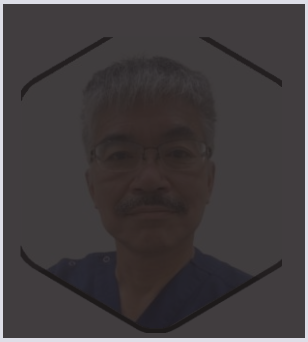
INVITED SPEAKERS



Professor Yoshito Kamijo
is a distinguished professor at Saitama Medi-cal University, where he serves in the Department of Clinical Toxicology. He has an extensive background in emergency medicine and clinical toxi-cology, having previously held professorships at Kitasato University and other departments within Saitama Medical University. His research in-terests are focused on toxicology, particularly in the areas of poisoning and its clinical management. Kamijo has contributed significantly to the field through numerous publications, addressing a wide range of toxico-logical issues such as the effects of various toxic substances, and the clin-ical outcomes of poisoning cases. His work often explores the physiologi-cal and biochemical impacts of toxins, as well as innovative treatment methods for poisoning. Kamijo's research is well-regarded for its depth and practical implications in emergency medicine and toxicology.

Marine Poisoning in Japan—Focusing on Pufferfish Poisoning

The venom of pufferfish was isolated in 1909 by Yoshizumi Tahara, a Japanese researcher, from the ovaries of pufferfish with a purity of 0.2% and named tetrodotoxin (TTX). In 1964, Kyosuke Tsuda, another Japanese researcher, published a complex three-dimensional chemical structure of TTX. TTX is characterized by having both positively and negatively charged sites in the molecule. The Ranvier's nodes of peripheral nerves have a high density of voltage-sensitive Na+ channels. A positively charged portion of TTX binds to the negatively charged outer pore of the voltage-sensitive Na+- channel. As a result, the outer pore is blocked, preventing Na+ influx, thus inhibiting action potential generation and excitatory conduction. In severe cases of pufferfish poisoning, general flaccid paralysis causing ventilatory failure occur 15 minutes to 24 hours after ingestion of a TTN-containing pufferfish.

TTN-containing pufferfish are the most dangerous marine organism in the world. Pufferfish poisoning occurs mainly in East and Southeast Asia, with the most reports coming from Japan. Deaths from pufferfish poisoning in Japan numbered as many as 100 annually at the beginning of the 20th century. Subsequently, it declined after laws were established regarding the preparation and distribution of pufferfish. According to the Ministry of Health, Labor and Welfare website, the frequency of pufferfish poisoning has been about 30 cases a year, including 50 poisoned patients and several deaths a year since the 21st century.

In Japan, the species of pufferfish that can be consumed, and the parts of the fish that can be used for food are determined. And, pufferfish cooks must be licensed. Most cases of pufferfish poisoning are caused by improper treatment of the fish by unlicensed cooks or amateurs. It is a business exclusive license, which means that no one other than a licensed person can perform the pufferfish cooking as a work. For example, Takifugu rubripes is the most delicious and popular pufferfish in Japan. The liver, ovary, and intestine of this pufferfish contain TTN. So, only skin, muscle, and milt are edible in Japan. The Japanese have long loved to eat pufferfish. The venomous and edible parts of each species of pufferfish have been identified. As a result, pufferfish is commonly eaten and consumed, but reports of pufferfish poisoning are very rare now. With a better understanding of the characteristics of pufferfish and the establishment of laws, pufferfish can be eaten.