

Title of Research:

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Development and practical verification of novel comprehensive monitoring system for multiple contamination of environmental pollutants in Mekong River basin

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Summary of Research:

Due to the rapid industrialization and population concentration, serious environmental pollution has been caused by multiple contaminations of pollutants, such as agricultural chemicals, endocrine disruptors, heavy metals, and antibiotics for the international river basin of Southeast Asia, like Mekong River basin. These environmental pollutions lead to the potential for serious health damage in ASEAN countries and for high-cost and careful inspection for imported foods from the corresponding area in Japan. To avoid these risks, it is important to construct a monitoring system of food and environmental samples for multiple contaminations of environmental pollutants. The aim of our project is to develop a novel comprehensive monitoring system for multiple contaminations as an appropriate technology for ASEAN countries. For this purpose, we plan to tackle the following topics; 1. Gathering of information and investigation of situation of pollution in Mekong River basin, 2. Development of bioassay system for detecting four group pollutants (agricultural chemicals, endocrine disruptors, heavy metals, and antibiotics), 3. Verification of the validity and conformity of bioassay for preliminary analysis applicable to Mekong River basin and ASEAN countries, 4. Improvement and establishment of the bioassay system, 5. Investigation on how appropriate for ASEAN countries the bioassay system is. In the present term, we have tackled a construction of biosensors for sulfonamides and antibiotics that inhibit bacterial protein synthesis. We proposed a new principle for each biosensor and performed proof-of-concept experiments.

Timeline:

March 1, 2015-

Topics:

The New LRI Research Meeting (Tokyo, August 2015; Poster presentation)

Publications: