

Laboratory of Environmental Safety Science

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There are various types of chemical substances in the environment. To manage them, concentration standards are set mainly for each type of chemical substance. However, can we say that this is enough? Considering that there are tens of thousands of chemical substances in the environment, while only a few dozen chemical substances have concentration standards, we have to say that the current regulation of individual substance concentrations is insufficient. Therefore, we need an indicator that can capture chemical substances by their properties and evaluate them comprehensively.



In our laboratory, we focus on the toxicity to DNA (the first stage of carcinogenesis) as one of the comprehensive indicators, and test the toxicity of air, exhaust gas, tap water, wastewater, etc. To collect these samples, we go out to the field in various regions as well as in the laboratory. And ultimately, we aim to estimate the cancer risk from the obtained toxicity intensity. This will enable us to evaluate the safety of air and drinking water in terms of the total cancer risk, rather than the concentration of individual substances.

On the other hand, the concentration of chemical substances in the environment and in wastewater and exhaust gases can easily fluctuate greatly depending on various conditions, such as source situation, wind direction, water flow, and coexisting materials. Therefore, it is often more efficient and accurate to measure the environmental situation by using low-cost and simple measurement methods many times than by using a high-performance measurement instrument a few times. In our laboratory, we are developing new methods that can measure chemical substances (groups) quickly and easily.

