

Realization of a safe, secured, and comfortable town by removing a slight amount of hazardous substances hiding in living environments

Realization of a pandemic-free society by graphene FET sensors with quickly detectable human infectious viruses

Project Leader : Kazuhiko Matsumoto, Specially appointed Professor,
Institute of Scientific & Industrial Research, Osaka University

R&D Team : Kyoto Prefectural University of Medicine, Kagawa University, Chubu University



Summary : In order to quickly identify the type of human infective virus to improve the lifesaving rate, we realize a highly sensitive on site detection system that can instantly and immediately determine multiple types of viruses. Graphene field-effect transistors with ultra-sensitive characteristics are integrated and arrayed, and using a bio-inkjet printer, individual transistors are modified with multiple types of antibodies and sugar chains to which viruses selectively bind. Using these technologies, we will build an on site system that can determine the type of virus, its subtype, and human infectivity within a few tens of minutes just after collecting the virus sample. In order to dramatically improve the infection protection rate in society, we will develop a simple detection system that can detect viruses directly from saliva with high sensitivity so that anyone can easily detect viruses at home every day, and create a safe living space. Furthermore, we will develop a basic technology that can detect the presence or absence of a virus in the living space from the exhaled breath or the atmosphere.

With these results, it becomes possible to immediately measure the presence and type of human infectious virus, determine its risk as soon as possible, and prevent a pandemic due to the spread of infection.

