# Raman spectroscopic tissue detection for minimallyinvasive and precise medicine


| Principal Investigator | Life and Medical Photonics Division, Institute for Open and Transdisciplinary Research Initiatives, Osaka University |
|---|---|
| | **Associate Professor Yasuaki KUMAMOTO** |


## Project Outline

Raman spectroscopy allows cell and tissue analysis and discrimination by irradiating them with laser light and measuring Raman scattering light generated from the samples, requiring no treatment prior to measurement. However, Raman scattering light is weak and spatial analysis takes a long time, and hence Raman spectroscopy is not used in medical applications. In this research, we will develop a spectroscopic analysis method that enable rapid Raman mapping of biological tissue. The developed method employs single exposure for measuring the entire area of interest. Since the laser light is applied only to the area to be inspected, it is possible to reduce the risk of tissue damage by laser irradiation. It is also possible to avoid the deterioration in measurement accuracy due to the light coming from non-inspection areas.

We aim to realize a medical device that can avoid tissue damage that can occur during surgery, avoid leaving diseased tissue behind, and shorten the operation time. This will contribute to resolving medical issues, such as improving the postoperative QOL of patients, and reducing the mental and physical burden on doctors.

The current development stage lies in the range between basic research and non-clinical testing. We filed two Japan patents in January 2022 and July 2023 a Raman mapping method/device and a Raman probe method/device, respectively. One PCT patent is also applied in January 2023.

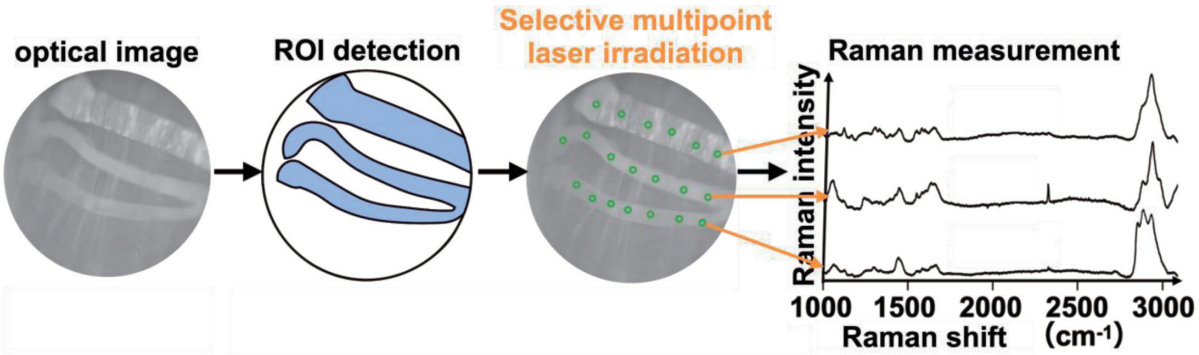


Figure 1 : A schematic representing the developed Raman mapping technique.

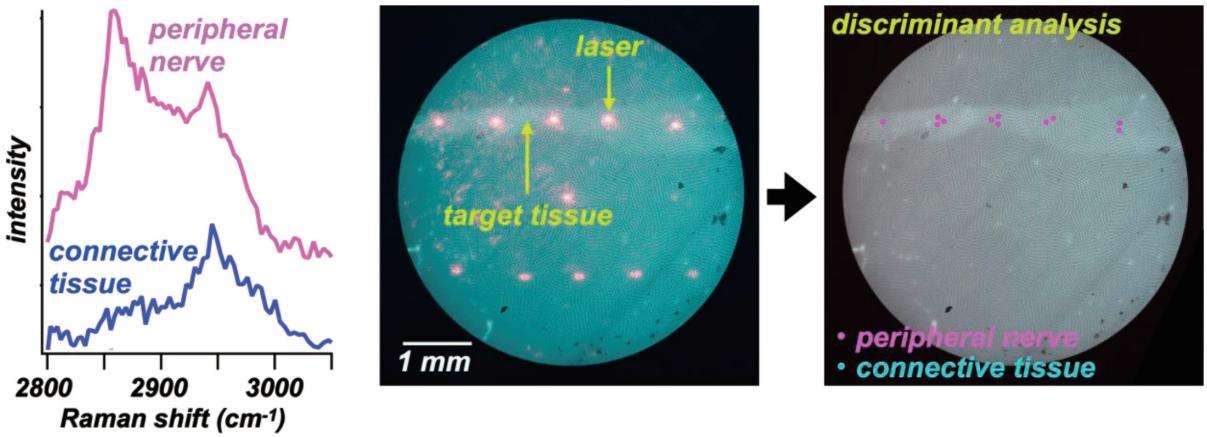


Figure 2 : Nerve detection result by the developing Raman apparatus