

Near-infrared photoimmunotherapy for the treatment of malignant gliomas
悪性神経膠腫に対する近赤外線光線免疫療法

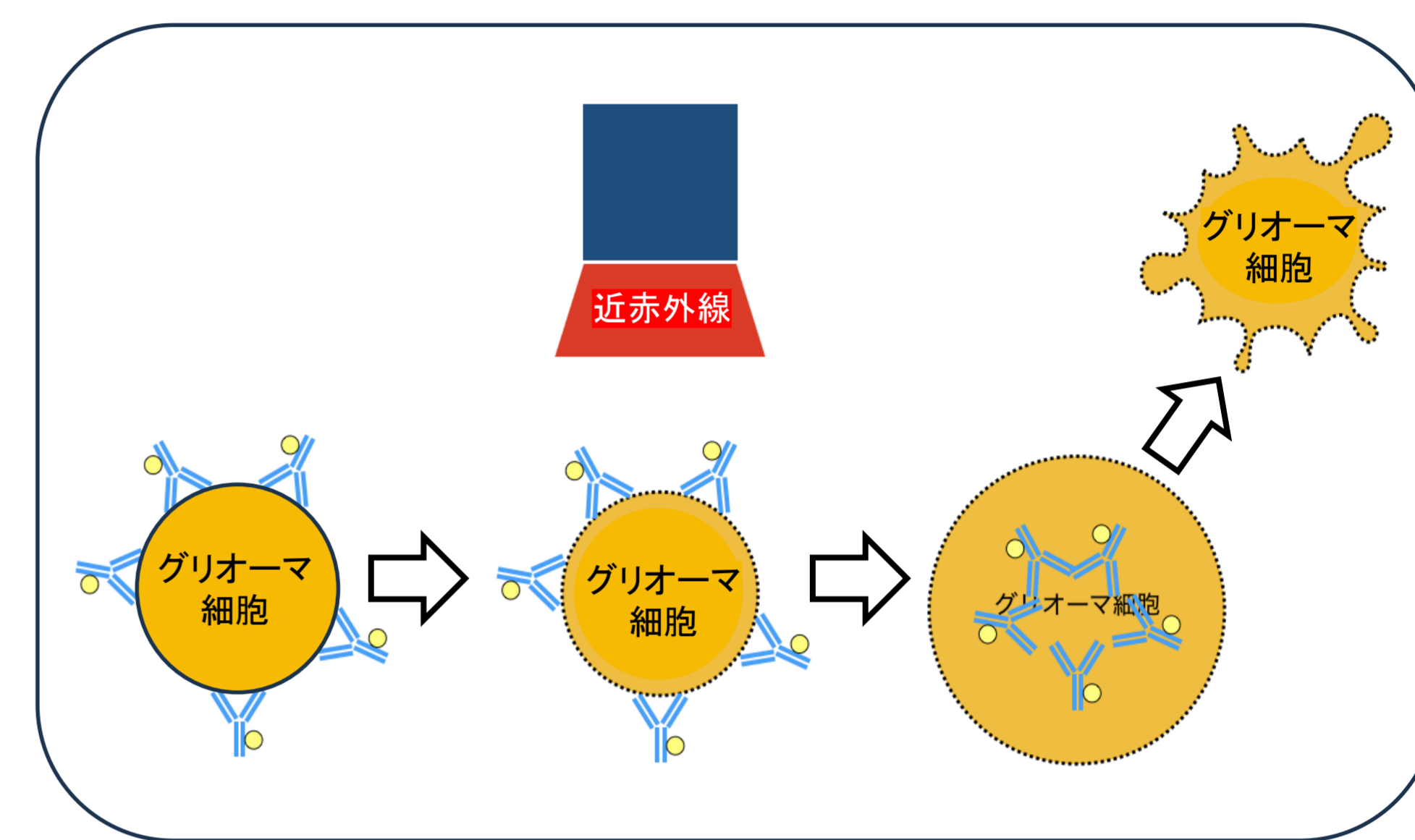
【キーワード】

Malignant glioma	Near-infrared photoimmunotherapy	Podoplanin	Local therapy	IR-700
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■ Summary

Near-infrared photoimmunotherapy (NIR-PIT) is a new method of cancer treatment unlike chemoradiotherapy or photodynamic therapy (PDT). Cetuximab-NIR-PIT has already been approved in Japan for head and neck cancer, but NIR-PIT for brain tumors is still in the preclinical phase.

NIR-PIT involves attaching a cancer cell surface specific antibody / photosensitizer IR-700 complex to cancer cells and selectively killing off cancer cells by near infrared radiation. This is a potential breakthrough treatment for malignant gliomas.

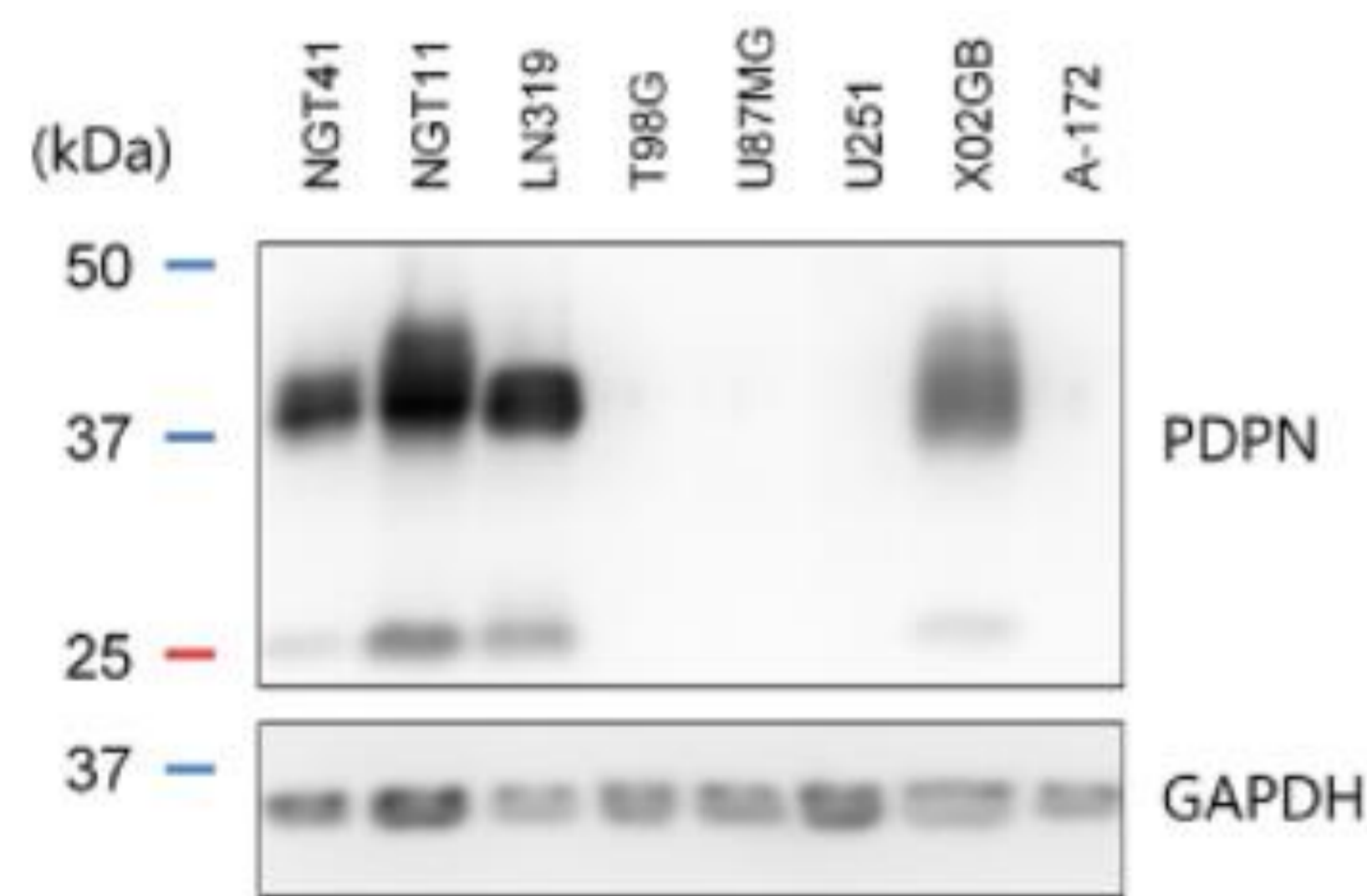


NIR-PITの原理

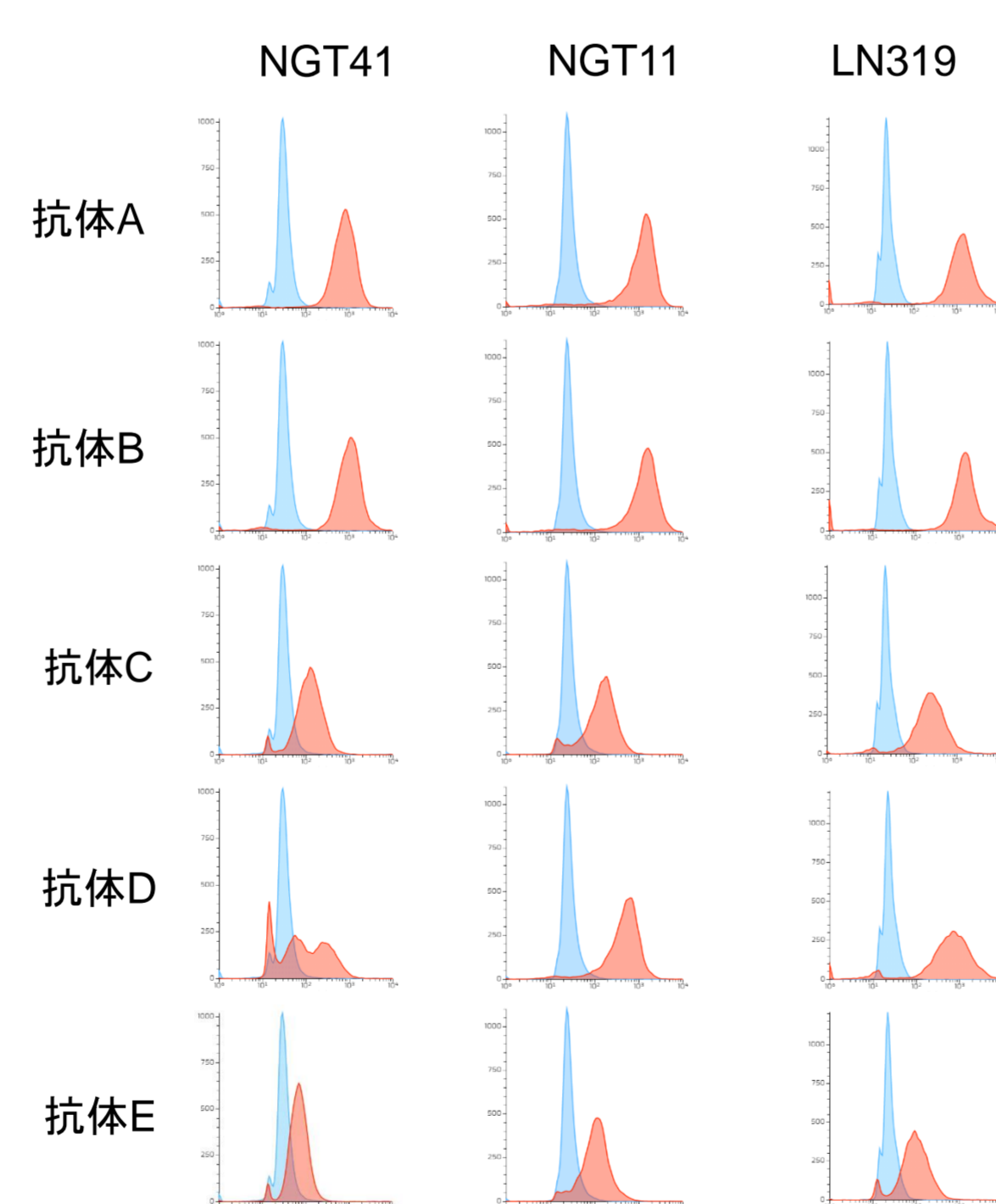
■ Subject Details/Topic

- Podoplanin is a surface antigen highly expressed in IDH-wildtype malignant gliomas, but not normal brain. (Watanabe, Natsumeda et al, *World Neurosurgery*, 2019)
- Co-investigator Prof. Y. Kato (Tohoku U.) has developed many podoplanin antibodies and obtained patents.
- Co-investigator Prof. T. Suzuki (Niigata U.) is developing lasers for *in vitro* as well as *in vivo* studies.
- PDPN-NIR-PIT effectively killed PDPN(+) glioblastoma cells but not PDPN(-) cells.

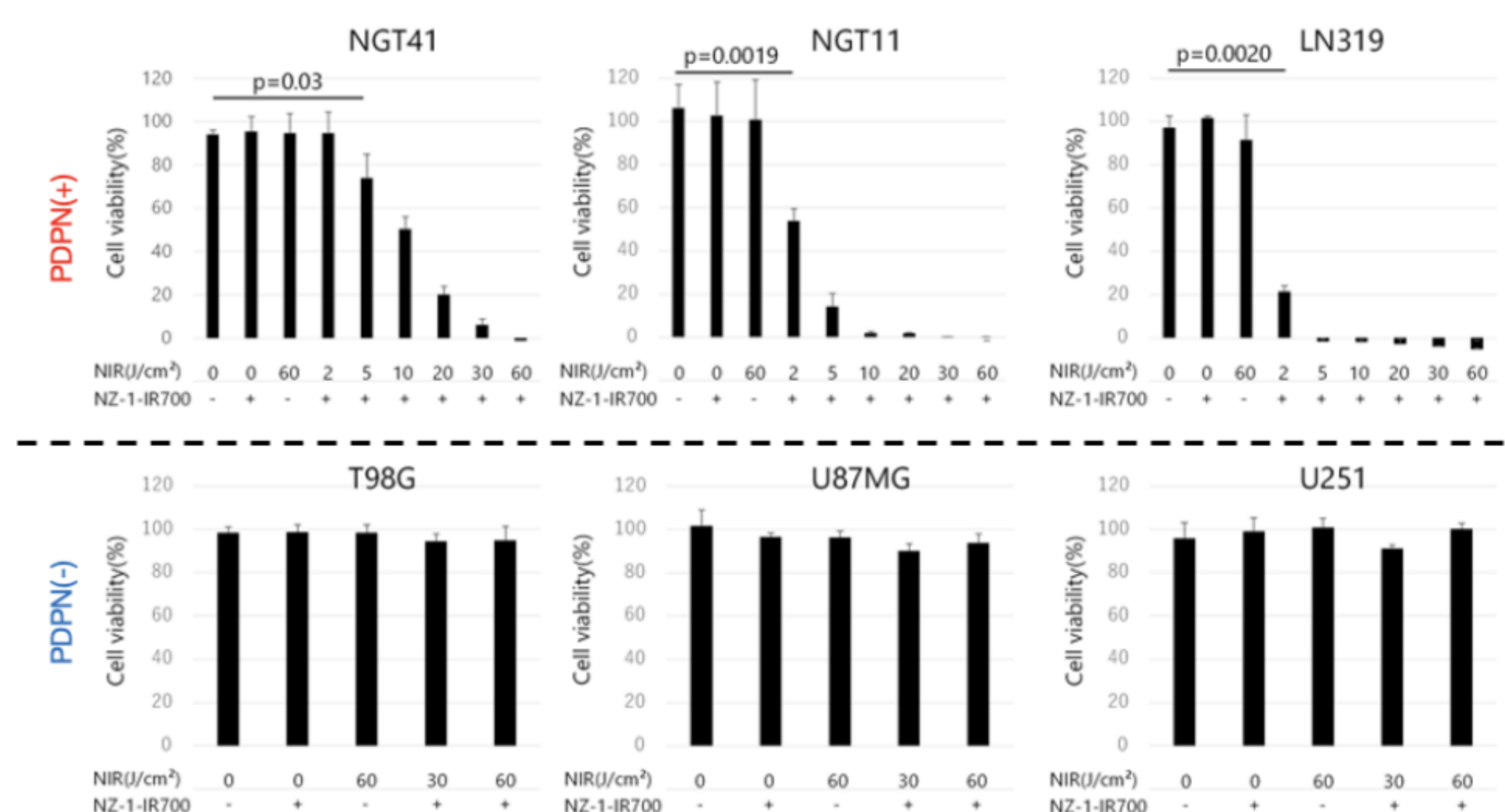
Western blot



Flow cytometry



Cell viability assay



- Professor Jiro Akimoto of Tokyo Medical U. has developed photodynamic therapy (PDT) for malignant brain tumors, which is already approved for use in Japan. By changing the wavelength of laser, we can apply this method to NIR-PIT targeting malignant gliomas and other brain tumors.
- Compared to PDT, NIR-PIT is more tumor cell specific, more cytotoxic, and can reach deeper depths.

■ We hope to collaborate with...

Medical companies pursuing clinical treatment of malignant brain tumors

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