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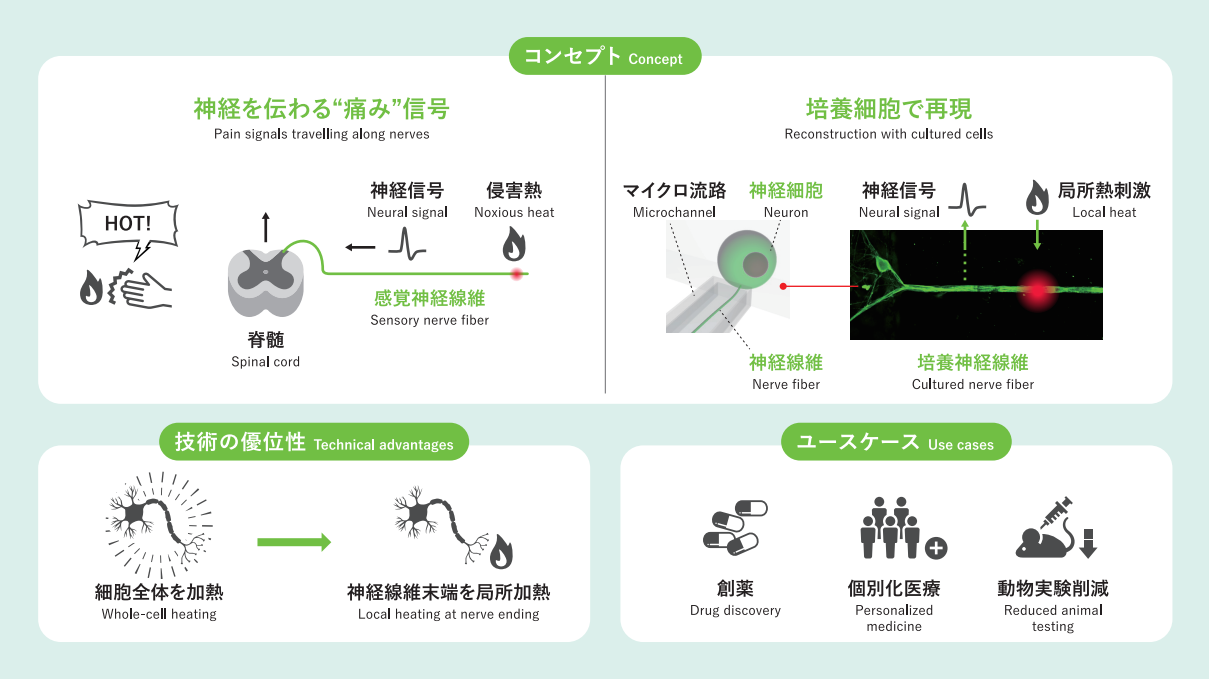
#Health & Well-being#Elderly Support

Decoding Pain with Nerve-on-a-Chip

Human sensory nerve-on-chip shows how pain signals arise and spread

Technical Challenges & Goals

In vitro pain research often stimulates whole cultures, failing to recreate local signal generation and propagation in vivo. Our chip mimics peripheral nerves and captures the “entry point” of pain as electrical signals. Human iPSC neurons may reveal pain sensitivity differences and support personalized medicine.



Key Technologies

Core Technologies

- Microchannels too narrow for cells guide only nerve fibers to grow in straight lines
- A chip locally heats guided nerve fibers in milliseconds and records signals along the same fiber

Key Differentiators

- Conventional slow whole-dish heating vs. local 1-ms heating of a ~100 µm nerve-fiber segment
- World’s first recording of neural signals arising and propagating along the same nerve fiber

Use Cases

Healthcare

Human iPSC-derived sensory neurons enable evaluation of pain sensitivity and drug responses, supporting advanced analgesic development, personalized medicine, and the reduction in or replacement of animal testing.

Exhibitors

Basic Research Laboratories, NTT, Inc. ; NTT Bio-Medical Informatics Research Center, NTT, Inc.

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https://onlinelibrary.wiley.com/doi/full/10.1002/smll.73577

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