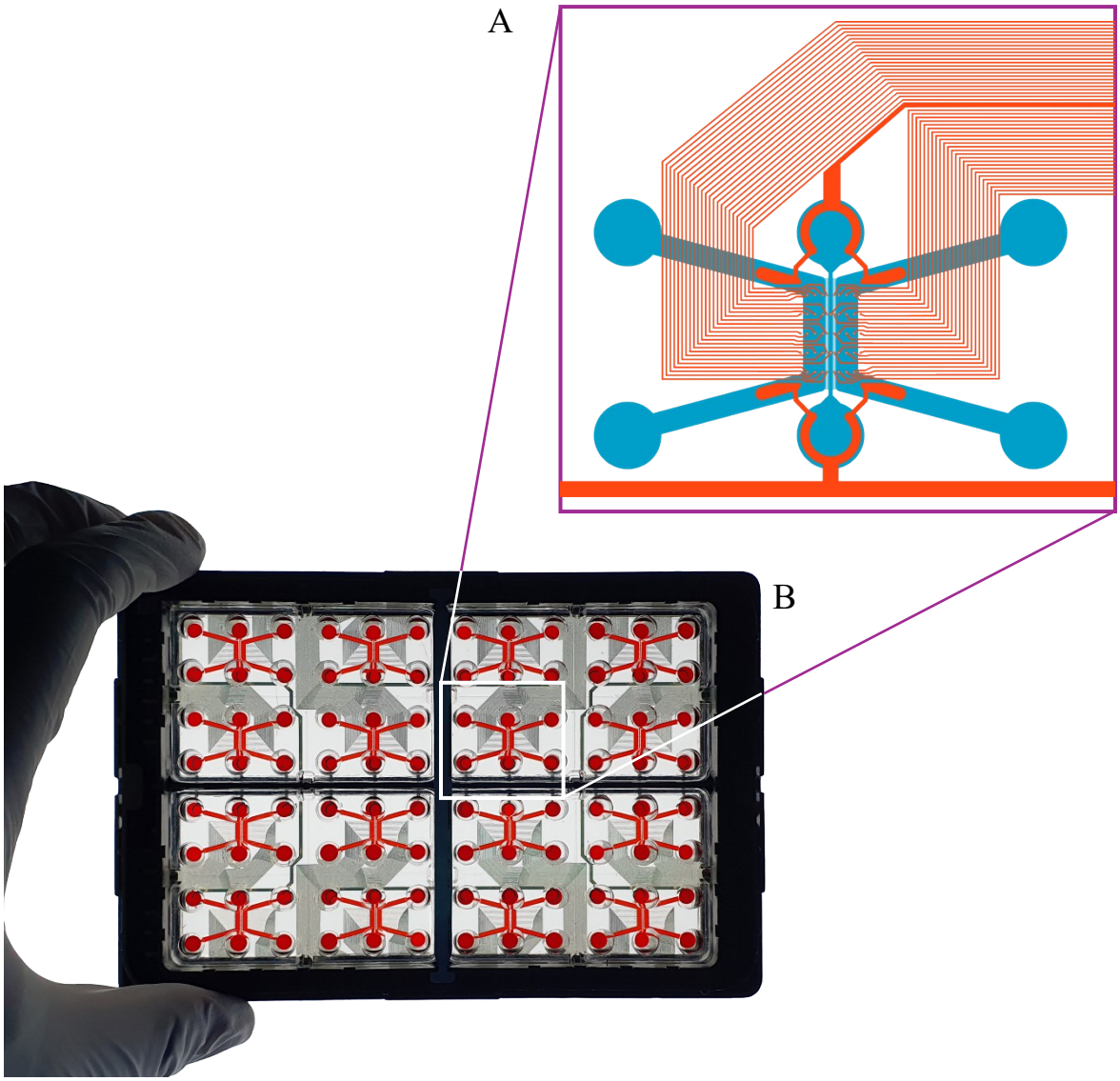
Supplementary Information (SI) for Lab on a Chip.

Supplementary figures :

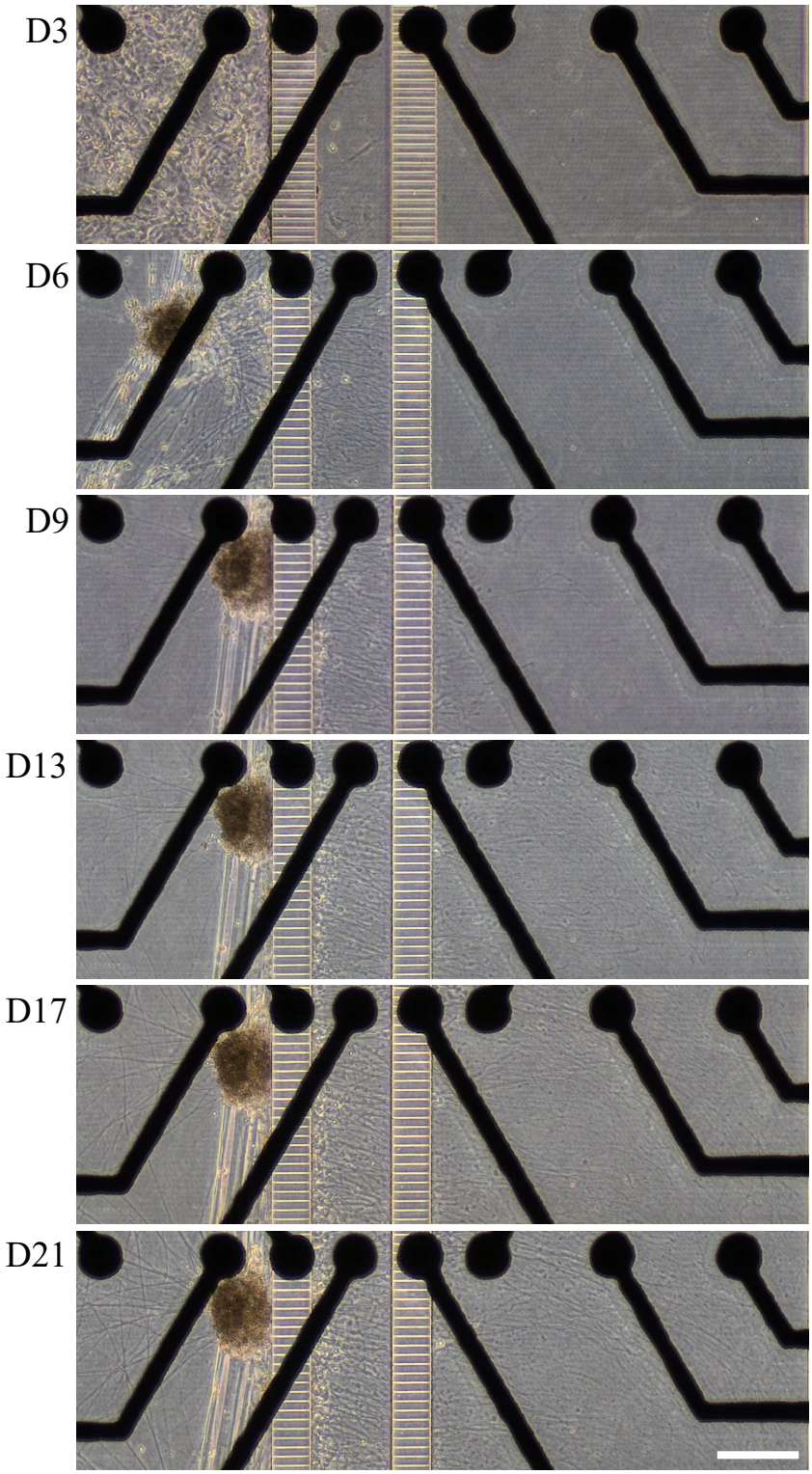
An In Vitro Organ-on-Chip Model for Studying Neuron-Keratinocyte Interactions In Sensory Response Through Electrophysiology



Supplementary Figure 1:

A) Schematic of the DuaLink MEA microfluidic device with electrode layout (red) and channel architecture (blue).

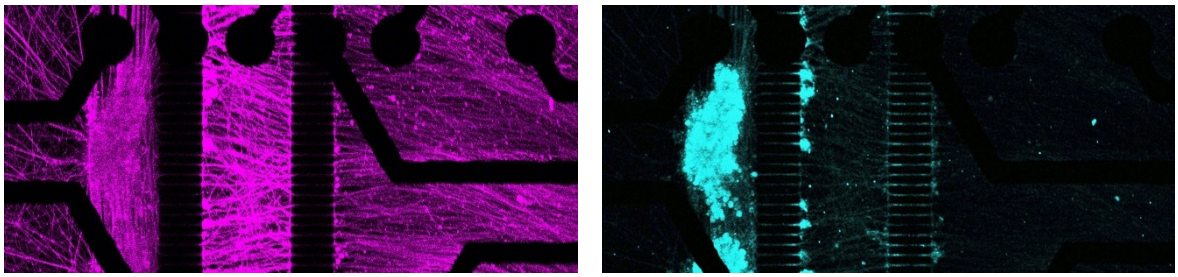
B) Image of a 16-device MEA plate used for simultaneous recordings of multiple samples.



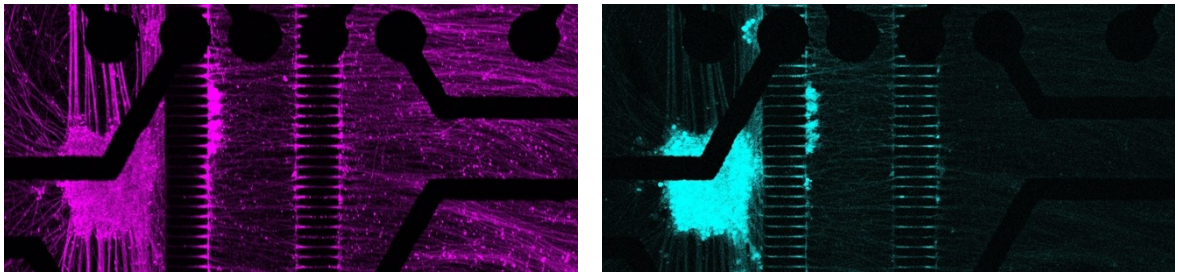
Supplementary Figure 2:

Transmitted light images of human iPSC-derived sensory neurons cultured in microfluidic devices over 21 days.

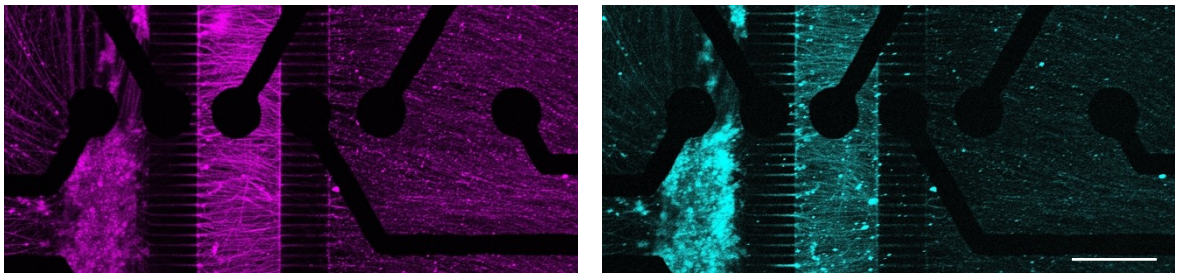
Scale bar: 200 µm.



β3T /BRN3A



β3T /Islet1

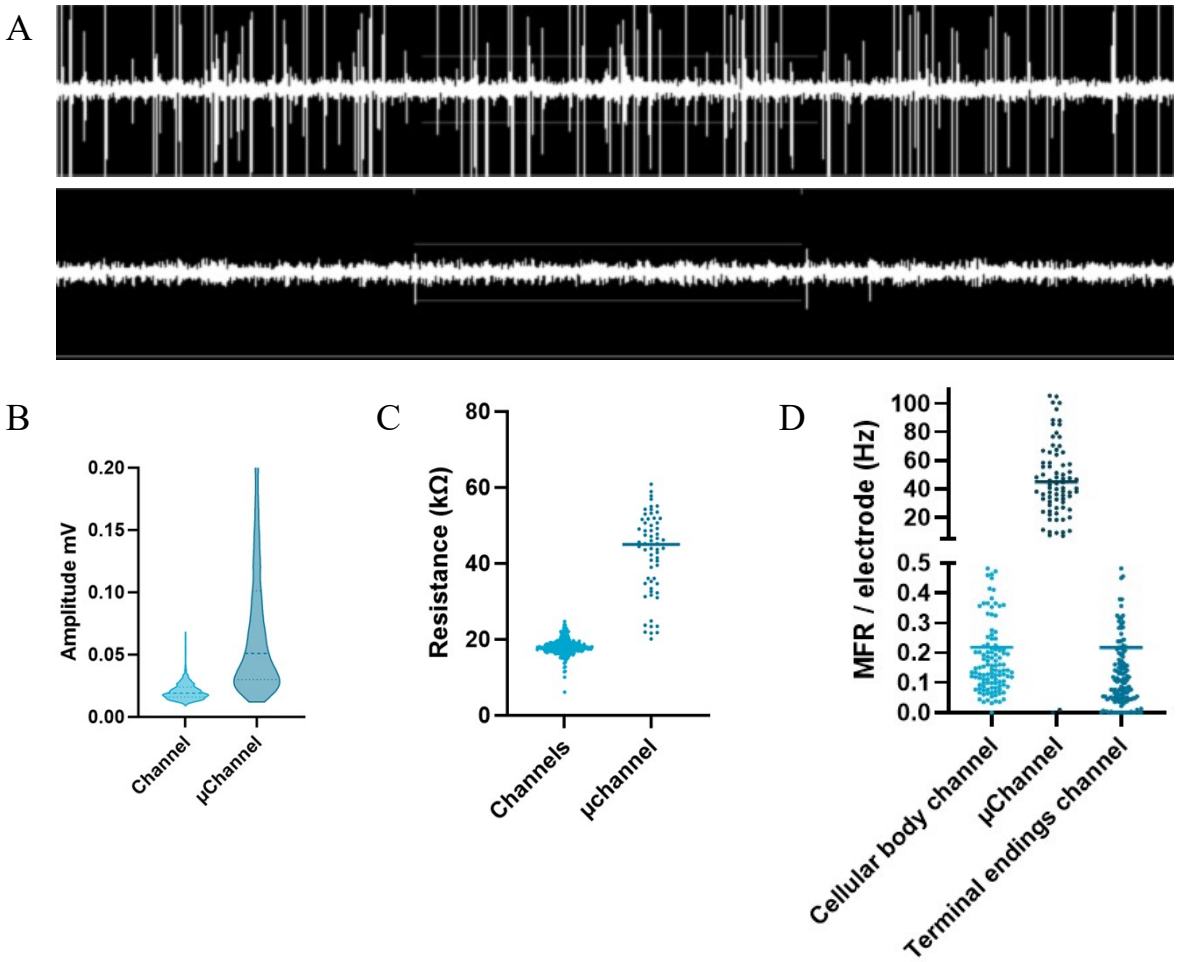


TrkA/SYNAPTO

Supplementary Figure 3:

Immunofluorescence staining of sensory neurons. BRN3A, Islet1, and synaptophysin (cyan), co-stained with either βIII-tubulin (magenta) or TrkA (magenta).

Scale bar: 200 µm.



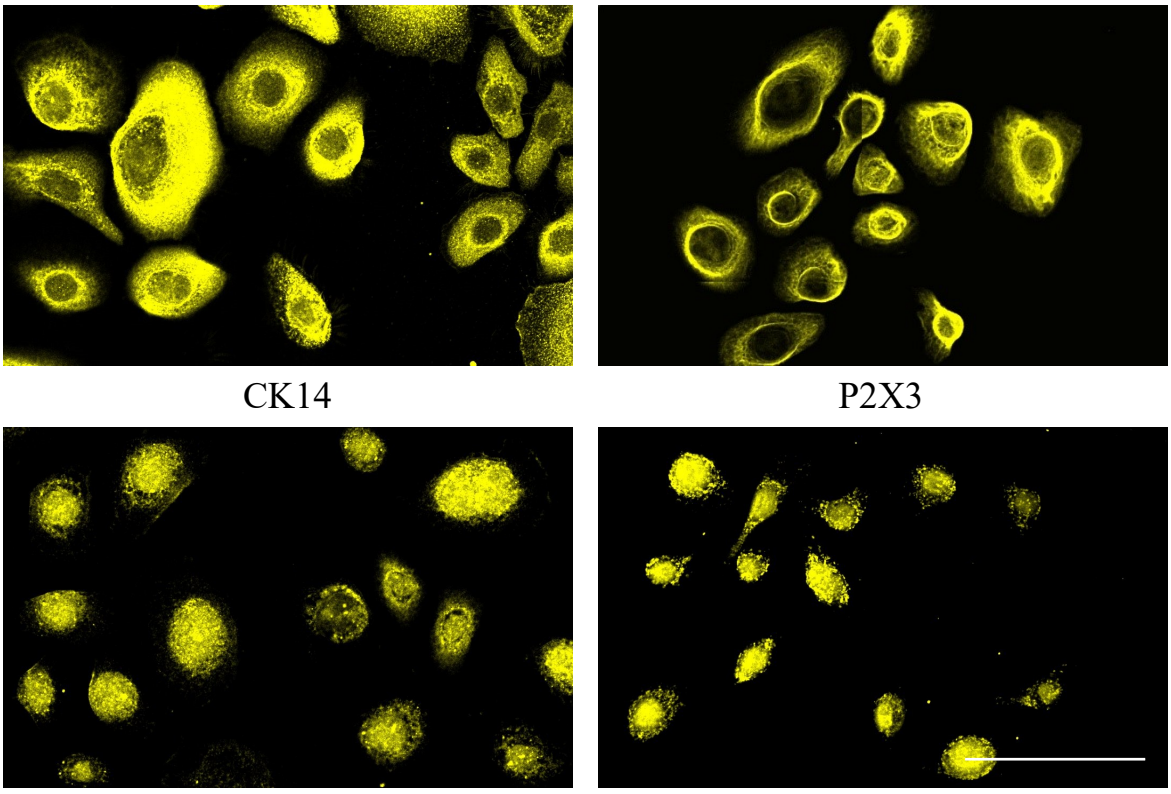
Supplementary Figure 4:

A) Representative MEA traces recorded from unstimulated iPSC-derived sensory neurons recorded with a microchannel electrode (top) and a channel electrode (bottom).

B) Quantification of spike amplitudes recorded over a 5-minute period in channels vs. microchannels.

C) Comparison of electrode resistance between channel and microchannel configurations.

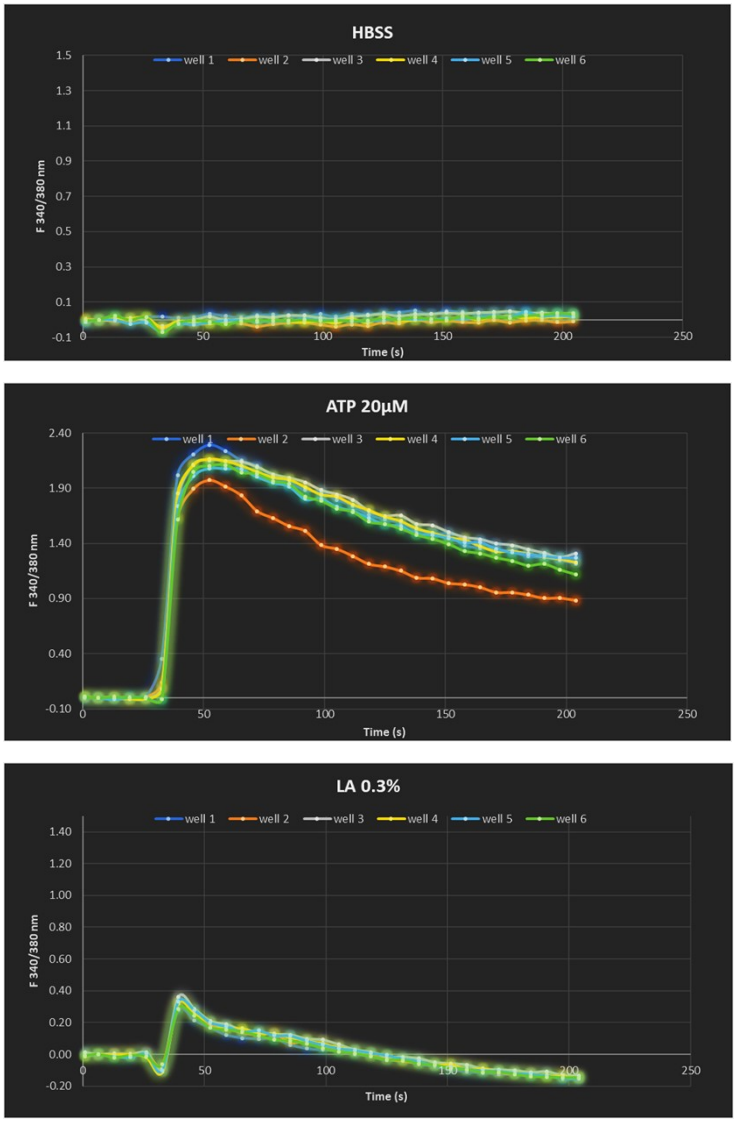
D) Comparison of mean firing rates recorded in channel vs. microchannel electrodes.



Supplementary Figure 5:

Immunofluorescence staining of primary human keratinocytes for cytokeratin 14 (CK14), P2X3, TRPA1 and TRPV1.

Scale bar: 100 µm.



Supplementary Figure 6:

Fura-2 fluorescence ratio (340/380 nm) in primary human keratinocytes following treatment with vehicle (negative control), ATP (20 µM), or lactic acid (0.3%).