

*Supplementary Information*

**Hybrid skin chips for toxicological evaluation of chemical drugs  
and cosmetic compounds**

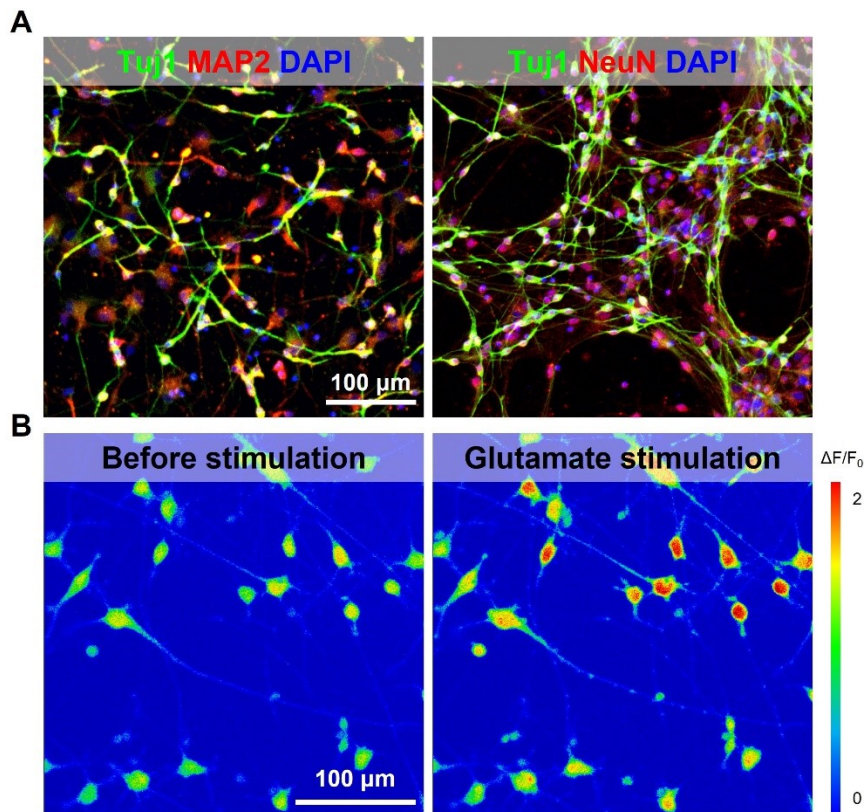
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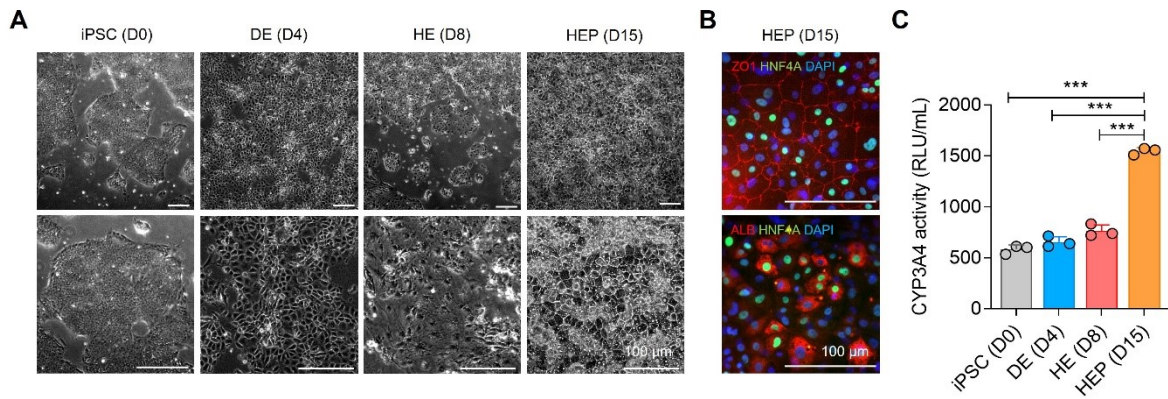
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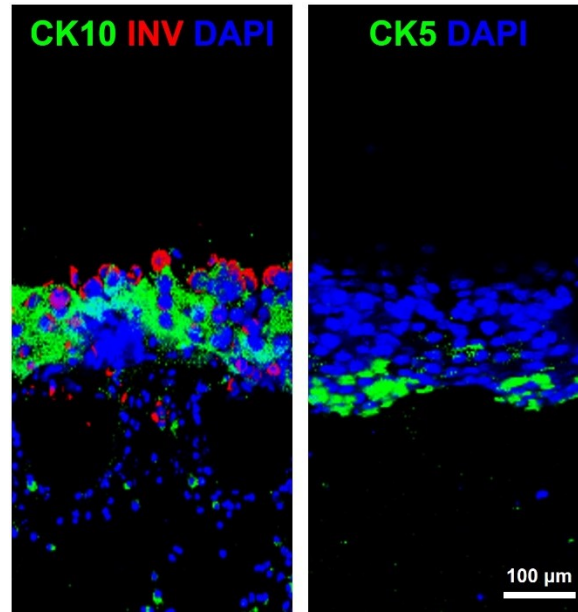
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**Supplementary Figure S1.** Characterization of human neural stem cell (hNSC)-derived neuronal cells 12 days in the culture for differentiation. (A) Immunostaining images of differentiated neuronal cells for neuronal markers (Tuj1, MAP2, and NeuN). (B) Calcium imaging analysis to check electrophysiological functionality of the neuronal cells derived from hNSCs. The neuronal cells showed increased calcium influx upon exposure to neurotransmitter (glutamate).



**Supplementary Figure S2.** Characterization of human induced pluripotent stem cell-derived hepatocyte-like cells (hiPSC-HEPs). (A) Microscopic observation to check the morphological change of the hiPSC-derived cells during hepatic differentiation. (B) Immunostaining images of the hiPSC-HEPs for several hepatic markers (day 15). (C) Measurement of CYP3A4 activity of the hiPSC-HEPs to check their hepatic functionality (\*\*\*) ( $p < 0.001$  versus HEP (D15) group).



**Supplementary Figure S3.** Immunostaining images of the constructed skin layer for basal layer marker (CK5), epidermal layer marker (CK10), and cornified layer marker involucrin (INV).