nanomaterials

Supplementary Materials: Polysaccharide-Based Bioink Formulation for 3D Bioprinting of an In Vitro Model of the Human Dermis

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1. Model of the scaffold and photographs of printed ink and bioink formulations.

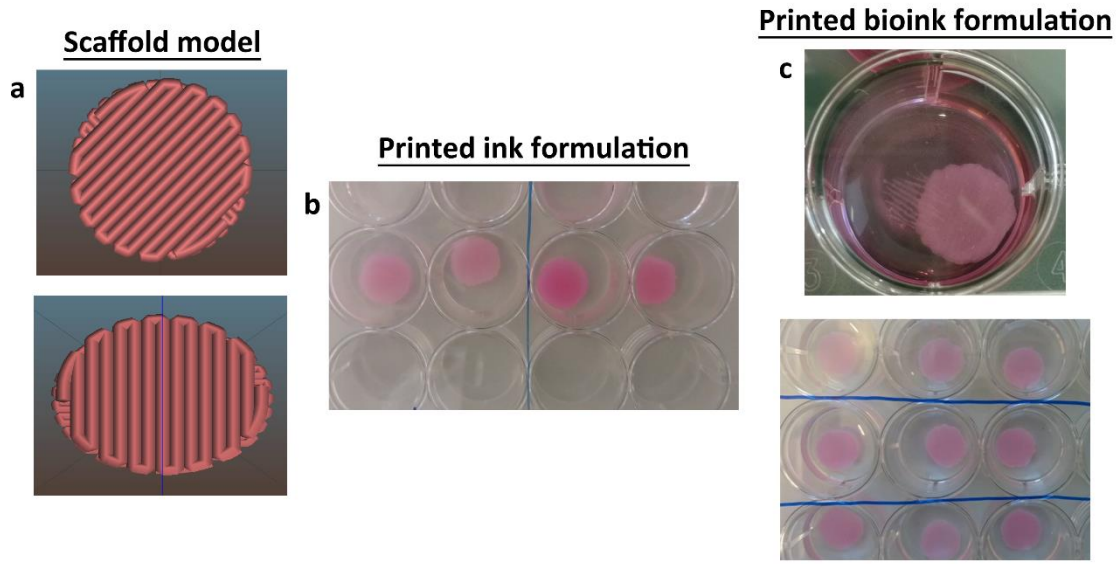

Figure S1. a) Model of the 3D printed scaffold, **b**) printed bioink formulation in a P12 well plate, and **c**) printed bioink formulation.

2. Live/Dead assay of the 3D bioprinted hSF-laden scaffolds.

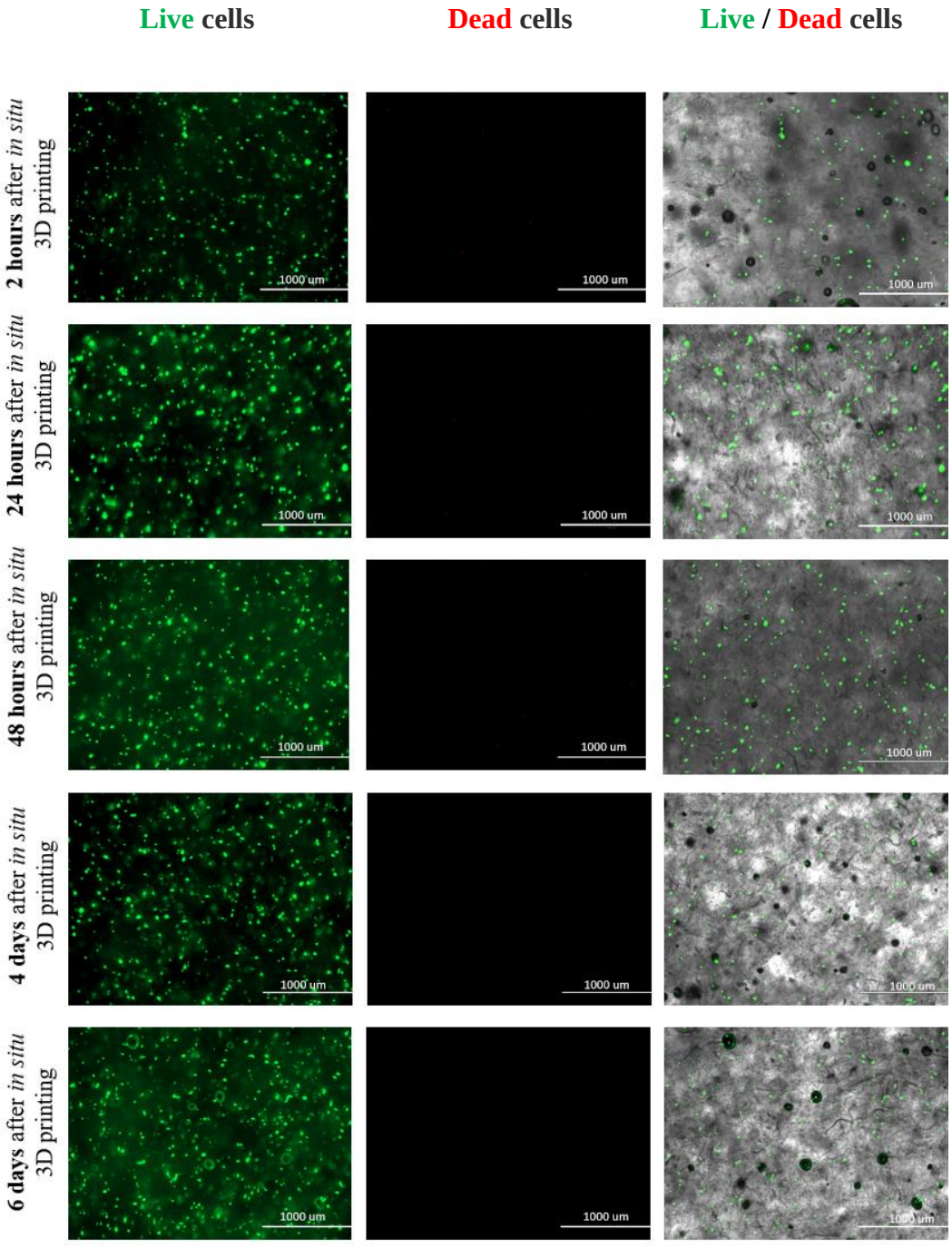

Figure S2. Live/Dead assay of the 3D bioprinted hSF-laden scaffolds at given time points.

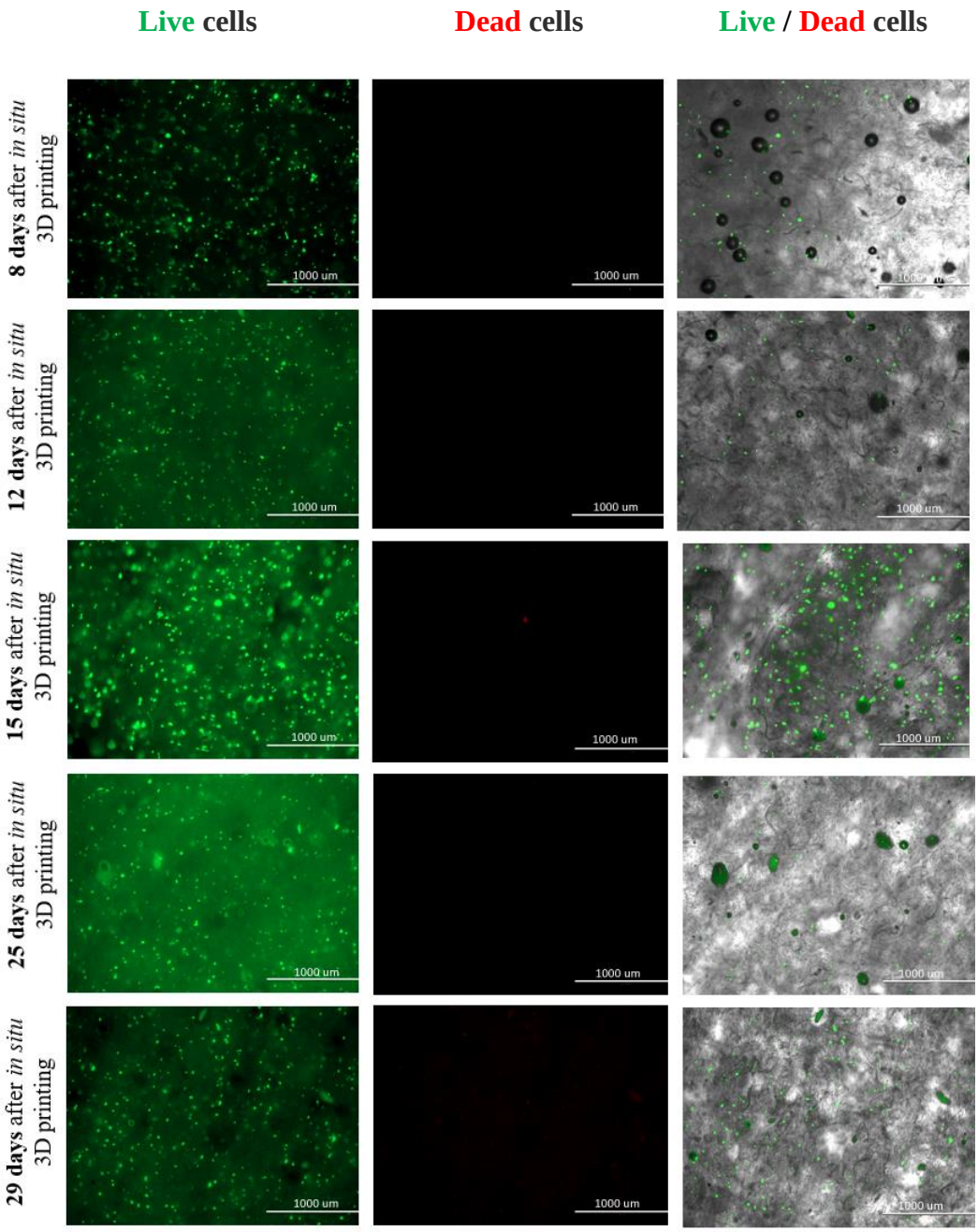

Figure S3. Live/Dead assay of the 3D bioprinted hSF-laden scaffolds at given time points (continued).

3. Viability of the simple bilayer *in vitro* skin model.

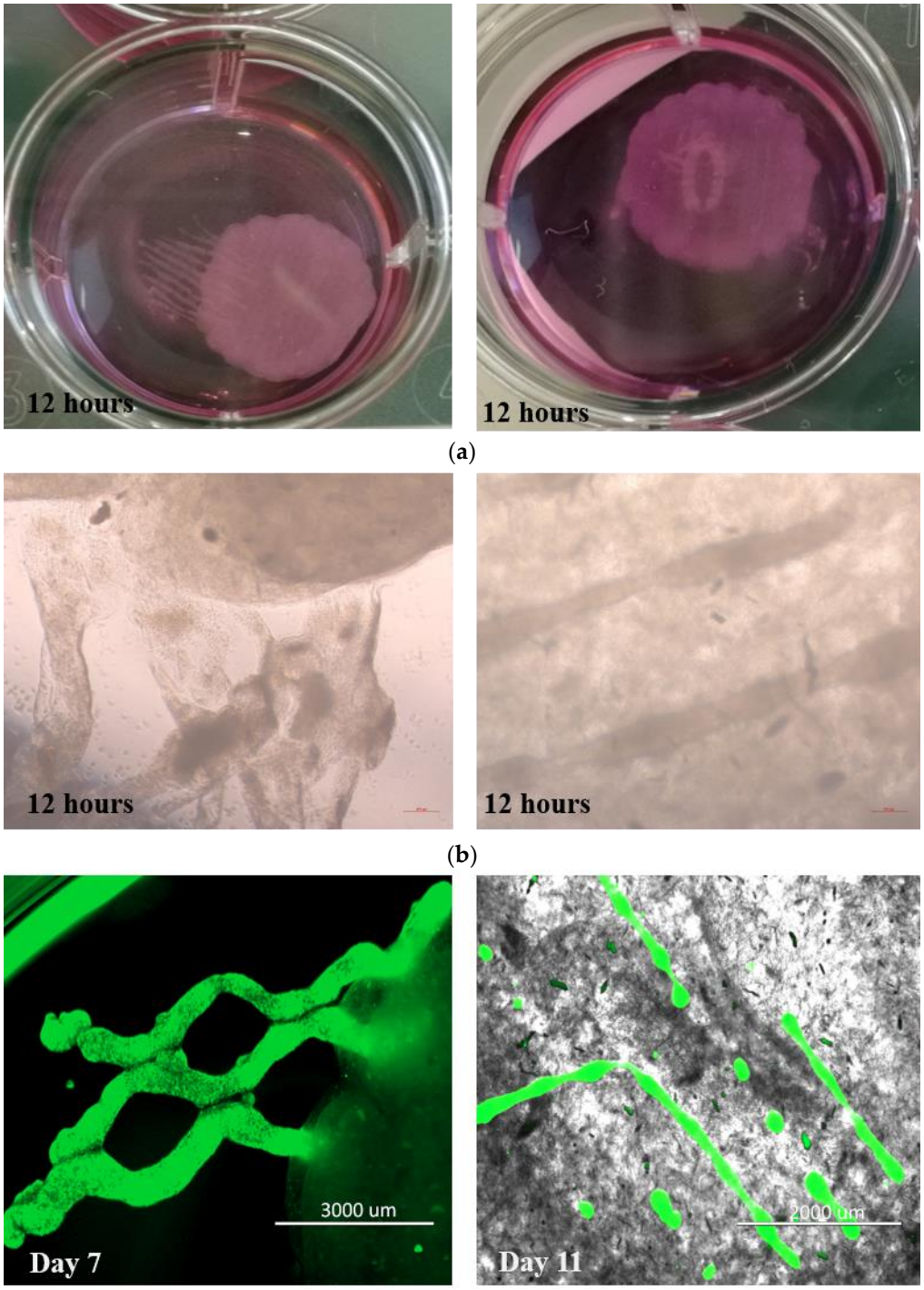

Figure S4. Viability of the simple *in vitro* skin model: (**a**) the photographs of 3D bioprinted hSF-laden scaffolds seeded with HACAT cell line (formed monolayer can be clearly seen); (**b**) the micrographs of grown HACAT cells on 3D bioprinted hSF-laden scaffolds; (**c**) Live/Dead assay performed on the simple bilayer *in vitro* skin model (epidermis/HACAT monolayer, dermis/hSF-laden scaffold).

4. Scanning electron microscopy (SEM) method description.

The sample morphology was analysed using Field Emission Scanning Electron Microscopy (FESEM, Carl Zeiss FE-SEM SUPRA 35 VP electron microscope, Zeiss, Germany). Prior to measurements, all samples were lyophilized and individually placed on aluminium SEM sample holders using double-side conductive carbon tape. The samples were sputtered using a Benchtop Turbo sputtering device (Dentum Vacuum, Moorestown, NJ, USA) with a thin layer of palladium. The SEM images were recorded with an accelerating voltage of 1keV at an approximately 4.5 mm working distance.

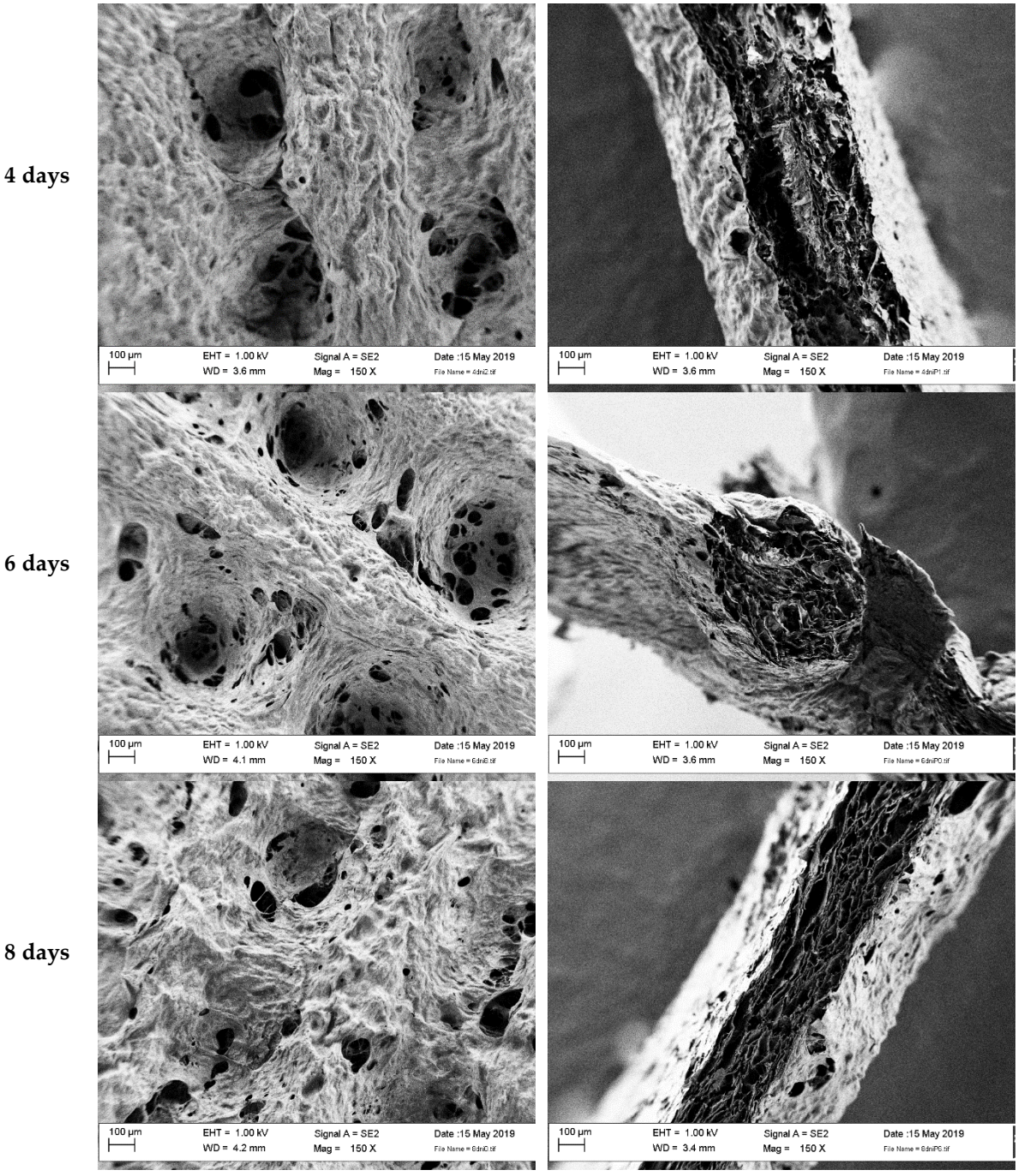

Figure S5. SEM micrographs showing the scaffold morphology (after 4, 6, and 8 days of cell growth): (**a**) the micrographs show the top views of the scaffolds; (**b**) the micrographs show the side views of the scaffolds. As can be seen, the general morphology of the scaffolds is preserved in both direction for the whole experiment duration.

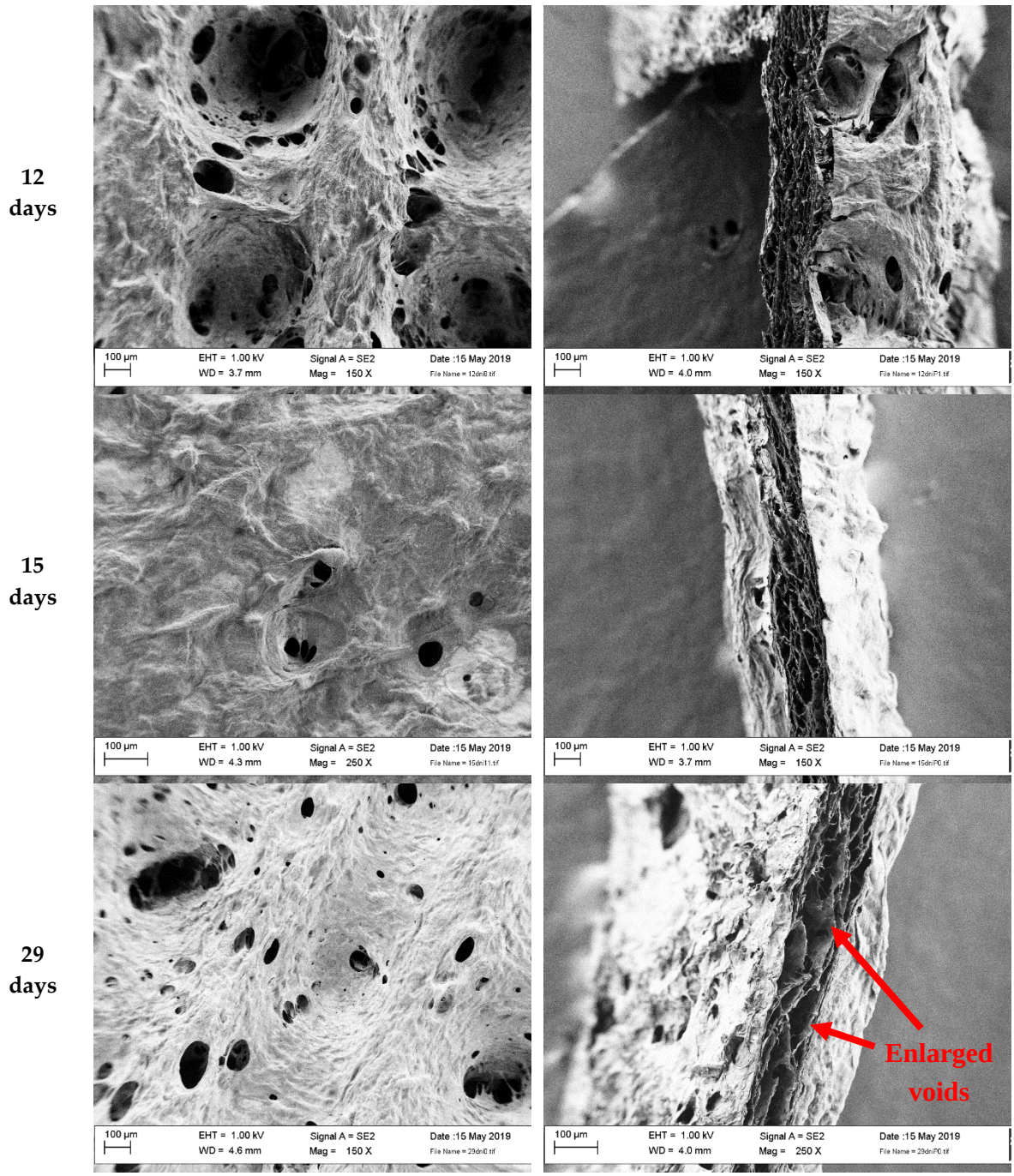

Figure S6. SEM micrographs showing the scaffold morphology (after 12, 15, and 29 days of cell growth): (**a**) the micrographs show the top views of the scaffolds; (**b**) the micrographs show the side views of the scaffolds (continued). The red arrows show an apparent enlargement of the internal spacings (voids) inside the scaffolds, which might contribute to promotion of cell migration and proliferation.

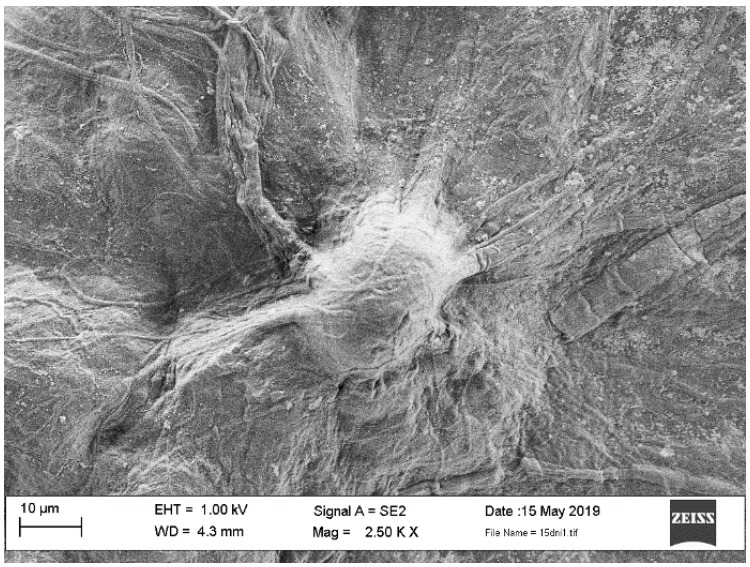

Figure S7. SEM micrograph showing a high magnification of a keratinocyte cell, attached to the base scaffold surface (taken on a scaffold after 15 days of cell growth).