Supplementary Material

Growth and labelling of cell wall components of the brown alga Ectocarpus in microfluidic chips

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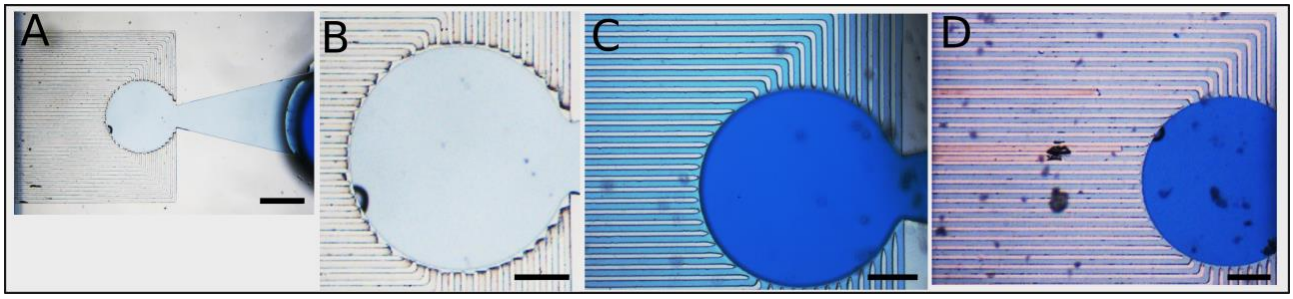
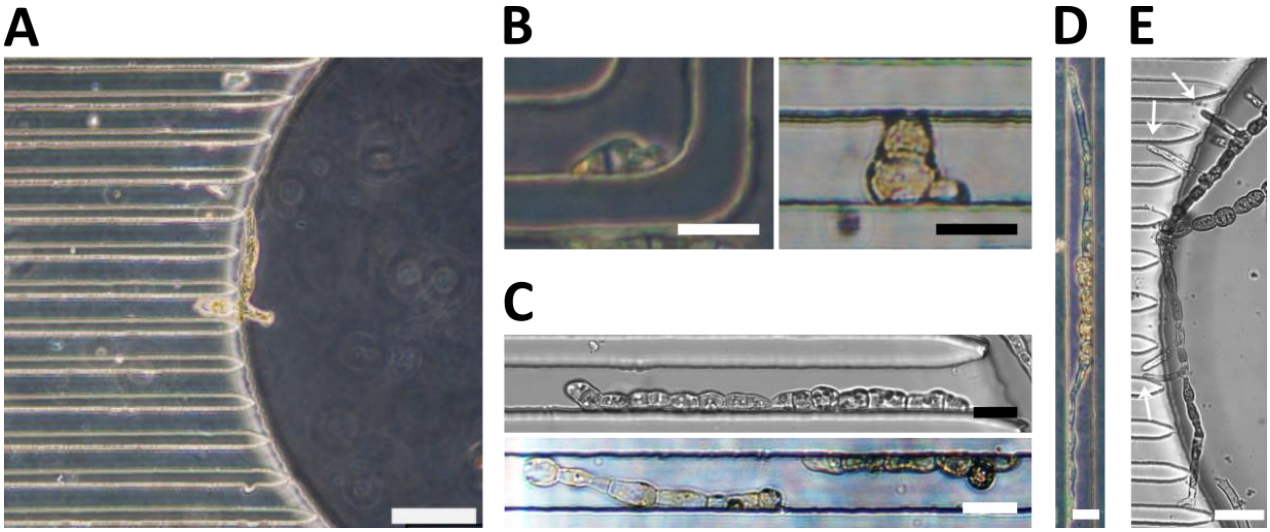
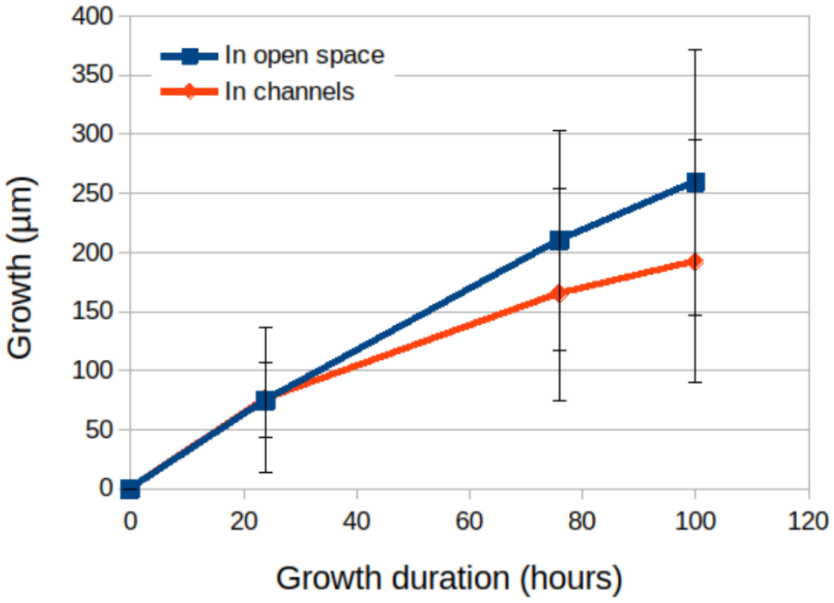


Supplementary Figure 1: Filling in the chips.
A solution of sea water with bromophenol blue was used to monitor the filling of the lab-on-chip device. (A) If pipetting pressure was too low, the solution did not fill the channels and remained in the chamber (the inlet is on the right of the photo). (B) Zoom-in on the channels entrance showing that the liquid did not get in. (C) Fully filled channels. (D) Partially filled channels where air remains trapped inside some channels. Scale bar: (A) = 500 µm, (B – D) = 200 µm.



Supplementary Figure 2: Pieces of *Ectocarpus* filaments stuck in the chamber and spore germination inside microchannels.
(A) A piece of fertile sporophytes blocked at the entrance of the channels. (B) Impaired spore germination inside microchannels: germination was delayed and occured perpendicularly to the main channel orientation. (C) Apical growth for spores germinated inside microchannels was impaired, with shorter and less anisotropic apical cells and a slower growth rate. (D) Despite germination inside microchannels, cell differentiation through cell rounding occurred in some filaments. (E) A piece of a non-fertile sporophyte from which branches (white arrows) emerge and grow into the channels. Scale bar: (A) = 100 µm, (B - D) = 25 µm, (E) = 50 µm. All images were taken from devices with 25 µm wide channels.



Supplementary Figure 3: Comparison of specimen growth behaviour for different environments.
A graph comparing the growth between Ectocarpus filaments in open space environments (blue) and filaments growing inside microfluidic channels (red). The lengths of the filaments were characterised after 24, 76, and 100 hours with the initial length at the start of the measurement being set to 0 to allow for direct comparison of the growth behaviour. No statistical significance has been found between the growth rate in the open space and the confined environment with 15 and 22 samples, respectively.