ELECTRONIC SUPPLEMENTARY INFORMATION

Production of monoclonal antibodies in microfluidic devices

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Table S1. Values of variance analysis F statistics of the cell numbers by quadrants in the cisterns of the microdevices ($p<0.05$)

Variation origin	Sum of the squares	Degrees of freedom	Average squares	F	Probability	Critical value for F
Between groups	1001421.976	23	43540.08591	0.562321 2	0.938751195	1.680280894
Within groups	5574903.047	72	77429.20899			
Total	6576325.023	95				

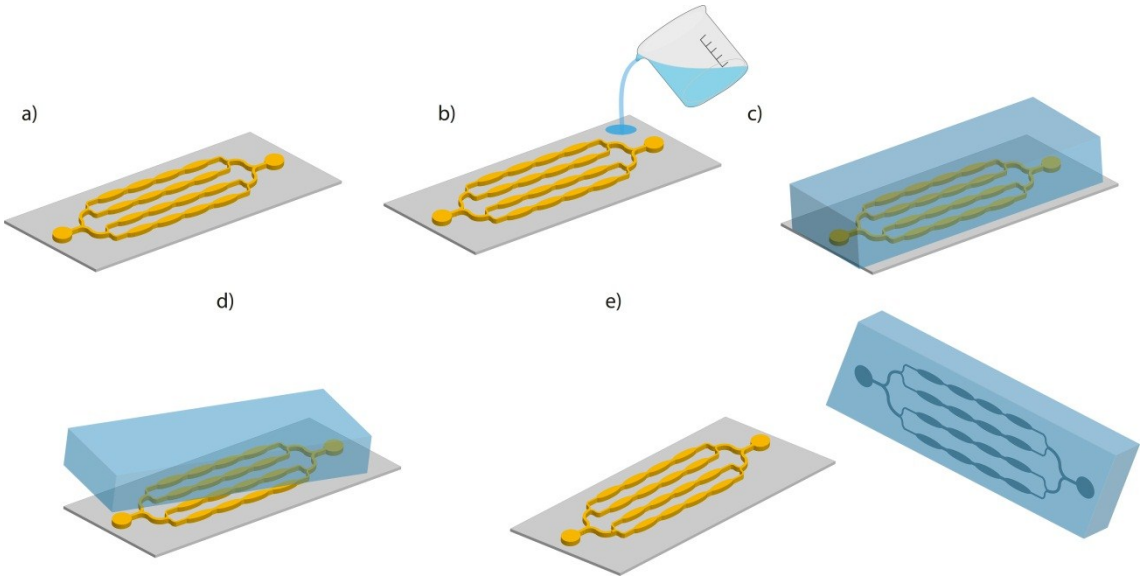

Figure S1. Molding microchannels in PDMS a) SU-8 master on silicon wafer, b) pouring PDMS onto SU-8 master, c) curing PDMS, d) peeling off the PDMS chip from the master and e) microchannels have been etched.

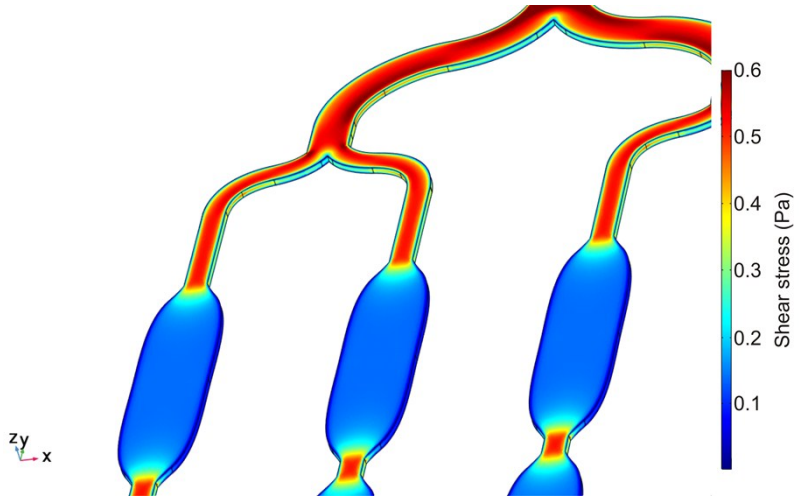

Figure S2: Surface shear stress (Pa) in the microchannels at the flow rate 3.28 $mm^3\ s^{-1}$ from a 3D simulation (Comsol 5.2a).

The calculated shear stress (**Figure 1**) shows values in the range of 0.1 to 0.6 Pa. Areas of reduced shear stress (blue areas) in the cisterns and higher values of shear stress (red areas) are shown here, and they overlap with the flow velocity simulation. These values are within the observed in the physiological environment where the shear stress is in the range of 0.014 Pa to 1.1 Pa[1]. Additionally, Brás *et. al.* 2017[2] report that the CHO cells are highly tolerant to

mechanical strain in microfluidic devices, showing morphological damage at shear stress greater than ~250 Pa. Since the values of shear stress in our microdevice are much lower, we expect that it will not affect significantly the production of recombinant proteins in our system.

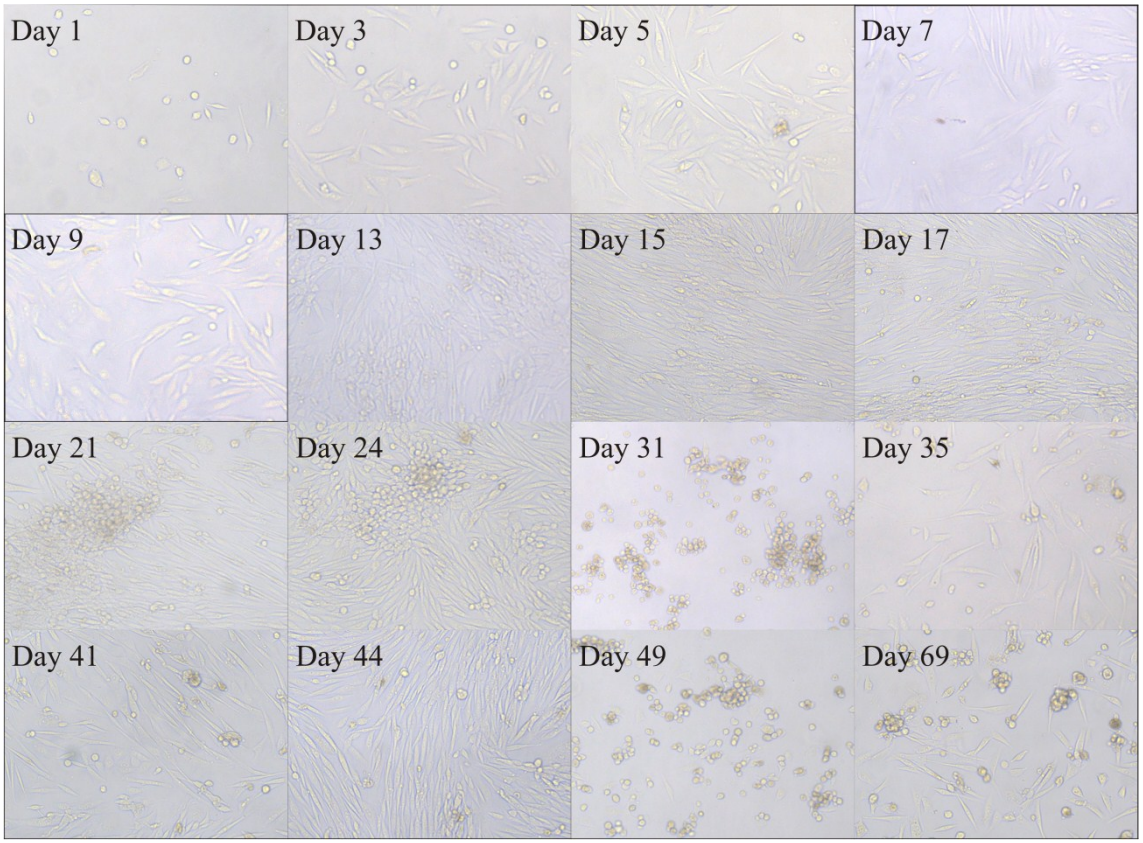

Figure S3. Bright field miscroscopy images (10X magnification) of the growth and proliferation of CHO-K1 cells in poly-D-lysine coated microchannels

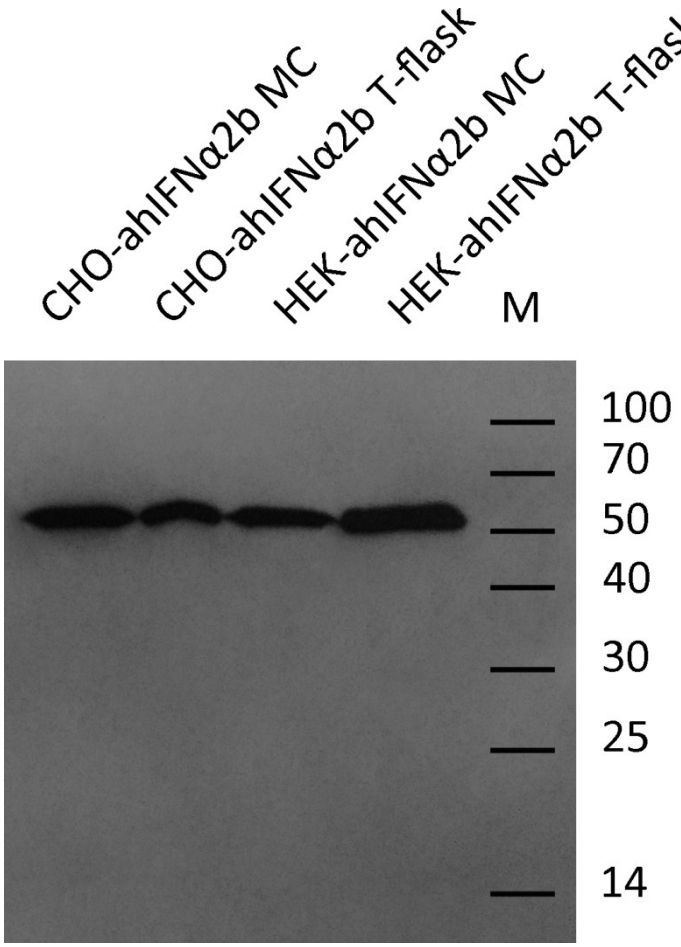

Figure S4. Western blot analyses of anti-hIFN-α2b MAb produced in the microdevice culture (MC) or in T-flasks culture (T-Flask). scFv-Fc apparent molecular mass: 52.8 kDa. M: Blue Plus® II protein marker (Transgen Biotech, China).

References

1 L. Avraham-Chakim, D. Elad, U. Zaretsky, Y. Kloog, A. Jaffa and D. Grisaru, PLoS One, 2013, 8, 0–8.

2 E. J. S. Brás, V. Chu, M. R. Aires-Barros, J. P. Conde and P. Fernandes, J. Chem. Technol. Biotechnol., 2017, 92, 334–341.