

Supporting information

Biofunctionalized 3D Nanopillar Arrays Fostering Cell Guidance and Promoting Synapse Stability and Neuronal Activity in Networks

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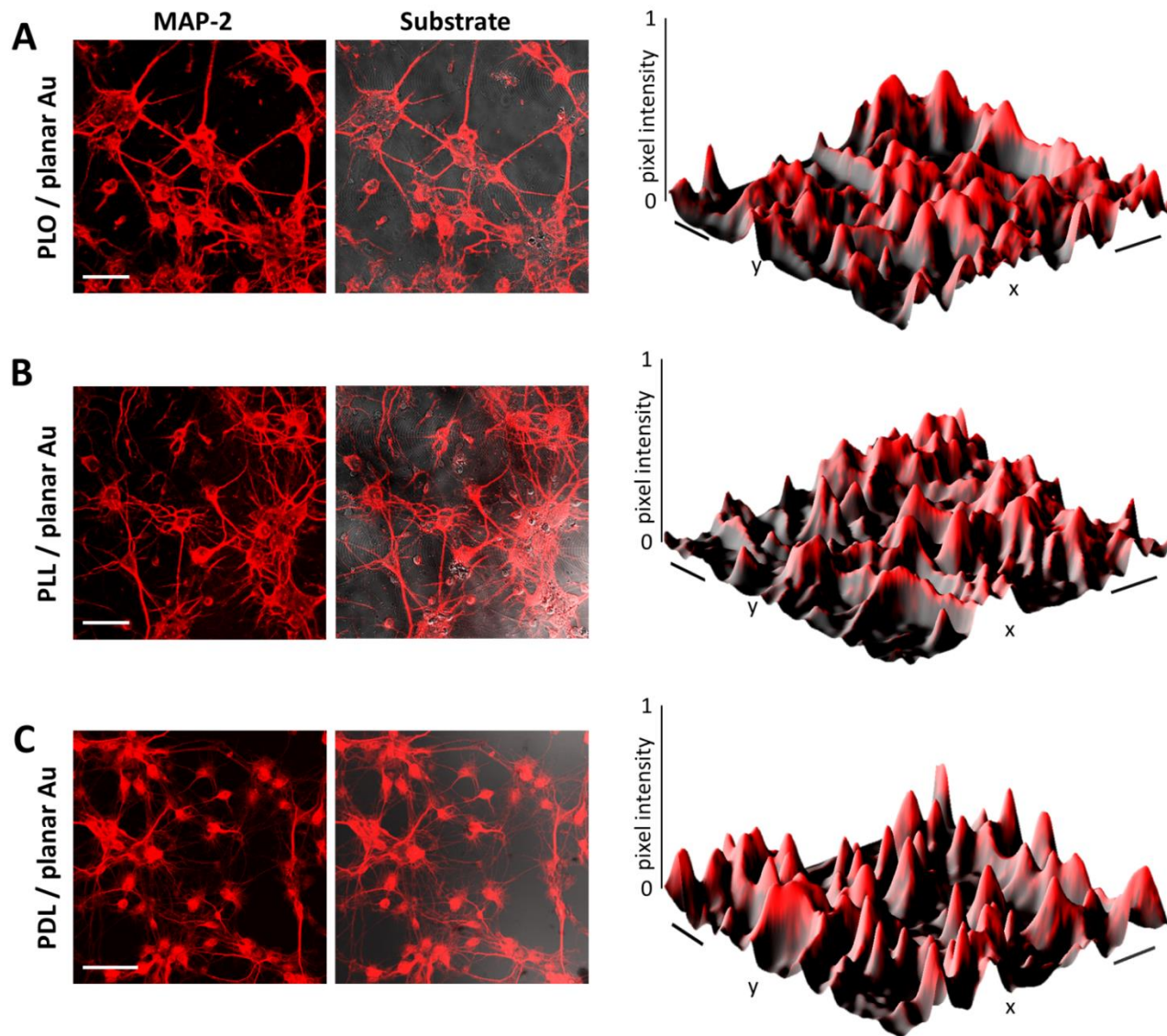


Figure S1. Fluorescence images displaying neuronal morphological arrangement on planar Au surface pre-coated with biochemical adhesion molecules. (A) Hippocampal neurons grown on planar Au coated with PLO and stained with MAP-2. The Intensity profile of neuronal MAP-2 fluorescence signal detected in neurons shows a random morphological arrangement. (B) As in (A) but for random neuronal morphological arrangement and intensity profile of neurons grown on PLL/planar Au. (C) As in (A,B) but for random neuronal morphological arrangement and intensity profile of neurons grown on PDL/planar Au. Scale bars represent 50 μm for all images on the *left* and (40 μm x 40 μm) for the intensity profiles on the *right*.

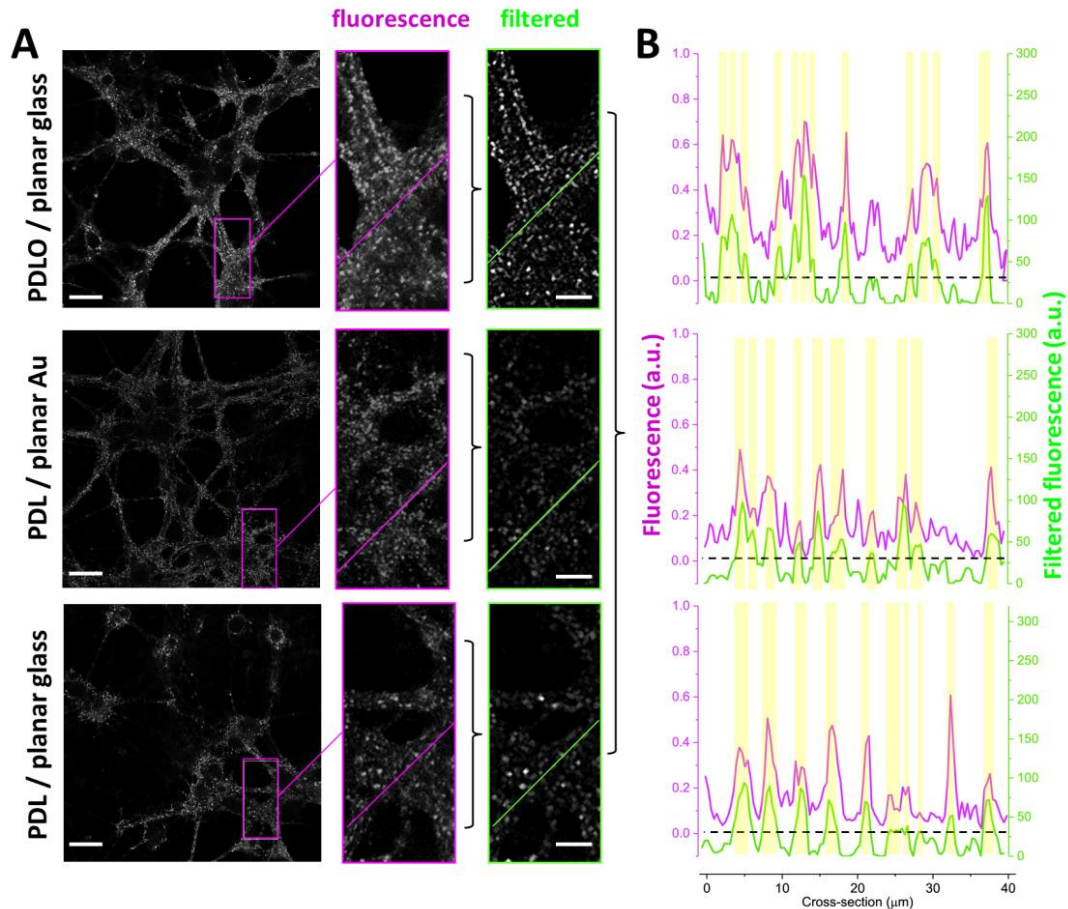


Figure S2. Quantification of combinatorial effects of nanotopographical and biochemical cues on synaptic maturation and stability. (A) Confocal micrographs displaying neuronal PSD-95 expression on planar surfaces of glass and Au functionalized with PDLO and PDL. All scale bars represent 30 μm in images on the *left* and 10 μm in images on the *right*. (B) Quantification of PSD-95 protein expression is performed by processing the images with the granulometric filter method. Magenta and green cross-sections indicate the fluorescence and the corresponding filtered intensities, respectively. The starting and the ending positions of the cross sections are read from the *left* (0 μm) to the *right* (40 μm). The position of the PSD-95 puncta was defined above an arbitrary offset on the filtered fluorescence scale, that is, 30 indicated by black dotted lines.

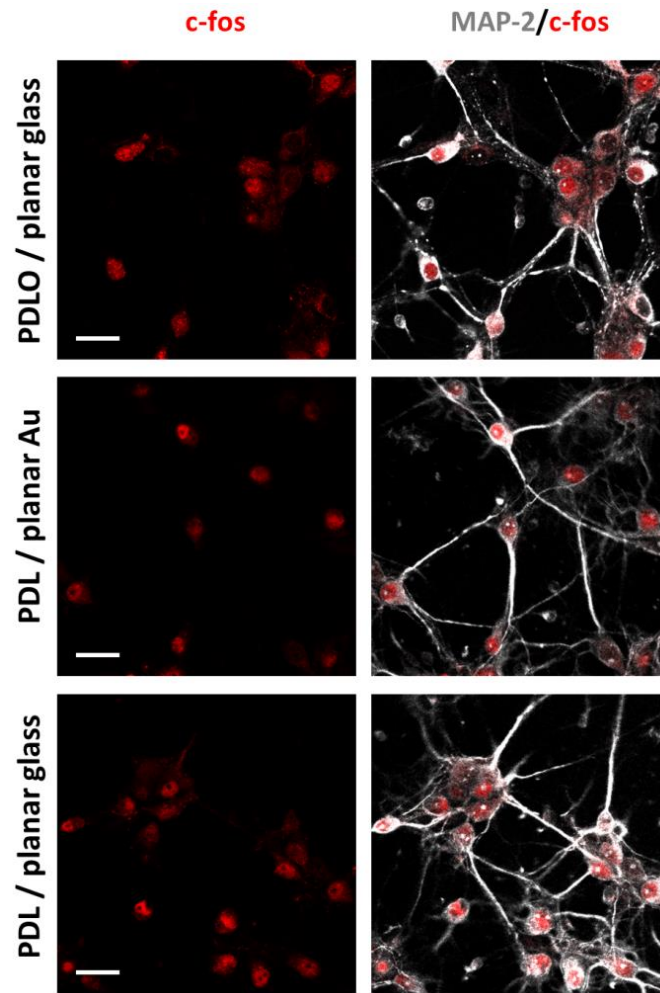


Figure S3. Quantification of combinatorial effects of nanotopographical and biochemical cues on cellular activity. Confocal micrographs showing the c-fos and MAP-2 immunofluorescence of neurons grown on planar glass and Au surface functionalized with PDLO and PDL. Scale bars represent 30 μm .