Jain et al. – SUPPLEMENTARY MATERIAL

Supplementary figure 1

A. Flow chart depicting the protocol for optimization of electroporation parameters on ITO glass pieces.

B. Custom-built electroporation setup used for the optimization protocol.

C. “Browning curve”. Electroporation parameter sets which cause browning on the ITO substrate. The browned ITO usually caused cells to rupture from the surface and therefore was avoided during optimization. The area below the curve was used during the optimization of electroporation parameters (voltage and pulse-width).

D. Image of a “browned” ITO coated glass piece.

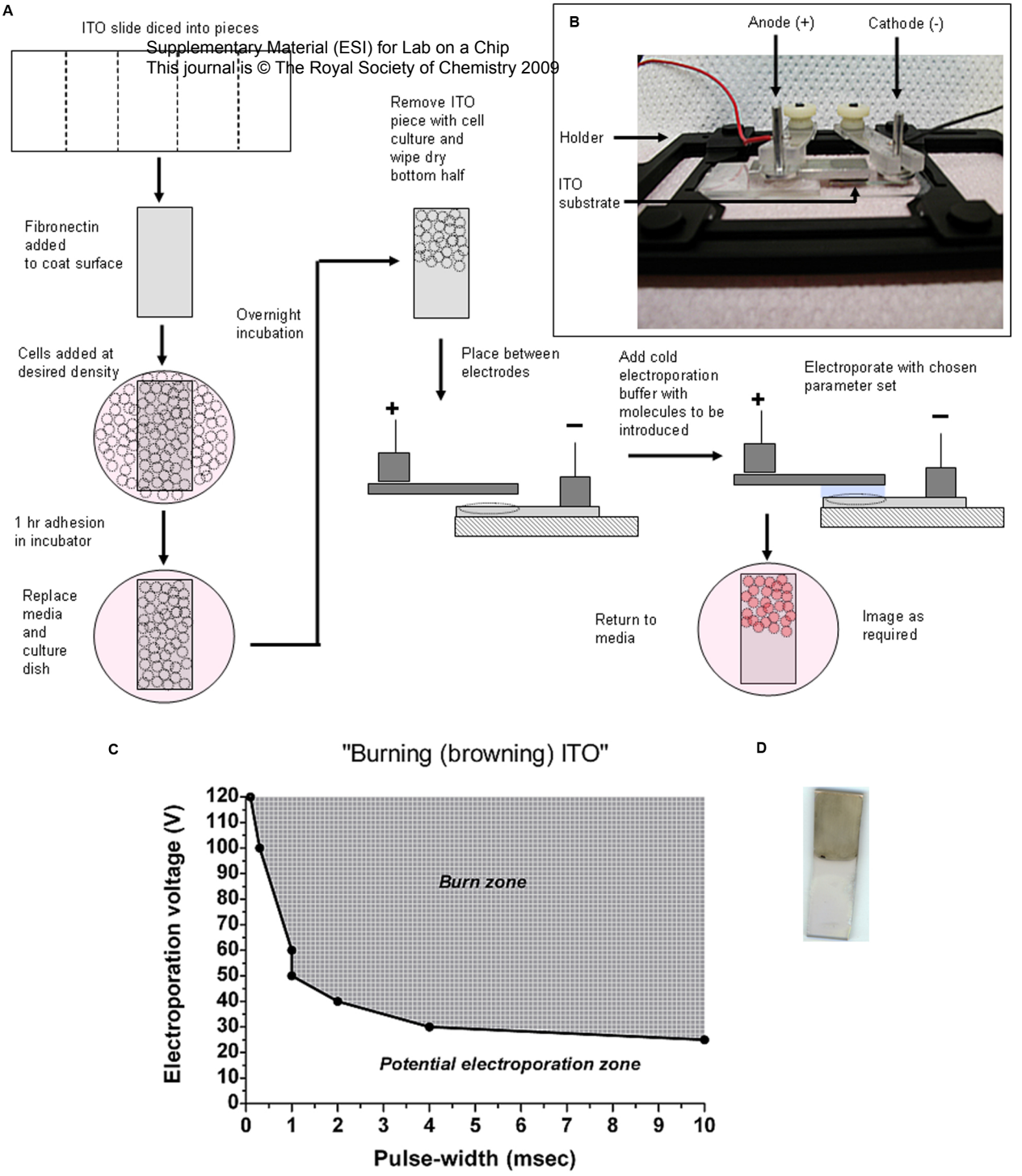
Supplementary figure 2

HeLa cells were seeded on ITO pieces and optimization of electroporation parameters was carried out by varying the voltage and pulse-width. Representative images are shown for three different electroporation parameter sets. All images taken post-electroporation (post-EP). Left column: Phase contrast image (2 hr post-EP). Center column: Transfection assay with Propidium Iodide (2 hr post-EP). Right column: Calcein live assay (1 day post-EP).

Additional note: *Strategy for optimizing electroporation parameters for various cell types*
Different cell types required different electroporation parameters. The main parameters used for optimizing electroporation were electric field, pulse width and number of pulses. Initial studies with HEK 293T cells (Fig. 1, 3 and 5) were obtained by testing out several combinations of these three parameters (mentioned in the methods section). The general strategy was to modify the electric field and/or pulse-width, keeping the number of pulses fixed, to minimize the parametric space. The number of pulses was kept constant at one pulse and the electric field and pulse-width optimized for HEK 293T cells. The same parameters did not give high electroporation efficiency for HeLa cells. Further experimentation with electric field/ pulse width combinations (keeping pulse number fixed at one pulse) gave higher electroporation efficiency while maintaining high

viability (Supplementary Fig. 2). However, when electroporation in primary mouse macrophages was attempted, changing the electric field or pulse width did not efficiently increase the transfection efficiency from the original parameters found for HEK 293T or HeLa cells. For the macrophages the number of pulses was then varied along with the two parameters to induce repetitive electroporation (Fig. 4) and achieve high electroporation efficiency.

Supplementary Fig. 1.



Supplementary Fig. 2.