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Supplementary Material

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Supplementary Figure 1. Efficient genome editing with bolus delivery of Cas9:sgRNA lipofectamine complexes to the U2OS.EGFP cells seeded on 24-well tissue culture plates. (A) Fluorescent images of U2OS.EGFP that were untreated or treated with Cas9:sgRNA lipofectamine complexes or exposed to transfection reagent, lipofectamine CRISPRMAX, only. (B) Quantification of DAPI counts per field of view. Kruskal-Wallis, Dunn's Post-hoc test, N.S. : $p > 0.0629$. (C) Quantification of EGFP cleavage efficiency based on fluorescent images. Kruskal-Wallis, Dunn's Post-hoc test, N.S. : Not significant ($p > 0.999$), **** : $p < 0.0001$. (D) Gel electrophoresis of DNA products after processing with Genomic Cleavage Detection (GCD) kit. (E) Graph to reflect length of GCD cleavage product.

Supplementary Figure 2. General workflow for adsorption of Cas9:sgRNA lipofectamine complexes on scaffolds.

pDOPA-coated scaffolds soaked in culture media

Supplementary Figure 3. Schematic of workflow to understand the mechanisms of Cas9:sgRNA-lipofectamine complexes delivery from the scaffold.

Supplementary Figure 4. 3-D reconstruction of U2OS.EGFP cells on pDOPA + LAM coated fibers with complexes. (A) 3-D reconstructed image of U2OS.EGFP cells taken under confocal microscope. Image slices were captured at 40x, at an interval of 0.83 μm , and an image z-stack of 10 μm was used for this image reconstruction. (B) Magnified 3-D reconstructed image of U2OS.EGFP cells to illustrate the expression of EGFP within the cell. Cell marked with white asterisk shows the lack of EGFP expression within the cell. (C) Maximum projected image of U2OS.EGFP cells on fibers. Maximum projection was done on an image z-stack of 10 μm whereby

image slices were captured at 40x and an interval of 0.83 μm . Cell marked with white asterisk corresponds to the annotated cell in (B).

Supplementary Figure 5. Surface charge measurement of 4 h dopamine coated PCL scaffolds after incubation in deionized water at different time points. For surface charge measurement, electrospun fibrous mesh was prepared according to protocol established in our previous work [1]. Briefly, PCL fibers were electrospun onto a piece of aluminum foil. Fibrous mesh was wetted with 70% ethanol and washed with water before cutting into 1 cm x 2 cm dimension and coated with 0.5 mg/ml of Dopamine for 4 h [2]. Surface potential measurements were performed with Anton Paar SurPASS 3 equipped with pH and conductivity electrodes and autotitrator according to manufacturer's protocol. Specifically, a pair of coated fibrous mesh was mounted onto the adjustable gap cell with an industrial-grade tape. pH and conductivity electrodes were calibrated with standard solutions before sample measurements. For each pair of samples, the gap between the mesh was adjusted to in between 100-120 μm . 0.001 M KCl was used as the electrolyte for surface potential measurements. Fibrous meshes were either immediately measured after

polydopamine coating or were incubated in deionized water for 4 days or 7 days before measurements were conducted.

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