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Supporting Information

Impact of hydrogel nanoparticle size and functionalization on in vivo behavior for lung imaging and therapeutics

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Running Title: Lung delivery of functionalized hydrogel particles

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Synthesis of N-acryloyltyramine. Tyramine (0.5 g, 3.64 mmol, 1 eq.) dissolved in N,N-dimethylformamide (15 mL) was added to a dried flask purged with dry nitrogen. Triethylamine (0.41 g, 4.01 mmol, 1.1 eq.) was added, and the flask was placed in an ice-water bath. Acryloyl chloride (0.31 g, 3.46 mmol, 0.95 eq.) was mixed with N,N-dimethylformamide (10 mL), and added dropwise to the tyramine solution. After 5 min, the flask was removed from the bath and was allowed to stir for an additional 1 h at rt. The reaction mixture was passed through a 0.2 μm PTFE syringe filter to remove the precipitate, and the solvent was removed by rotary evaporation. The resulting clear, brown residue was dissolved in ethyl acetate (90 mL) and washed with PBS (3 x 30 mL). The organic layer was dried over $MgSO_4$, filtered, and the solvent was evaporated. The crude product was further purified by silica gel chromatography using a gradient from 3:1 to 1:3 hexane:ethyl acetate as the eluent. The product (0.42 g, 2.20 mmol, 63% yield) obtained was a white solid. Spectroscopic data was consistent with that previously reported by Bentolila, *et al.*[1]

LITERATURE CITED

1. Bentolila, A.; Vlodavsky, I.; Ishai-Michaeli, R.; Kovalchuk, O.; Haloun, C.; Domb, A. J., Poly(N-acryl amino acids): a new class of biologically active polyanions. *J. Med. Chem.* **2000,** 43, (13), 2591-600.