Supporting Information

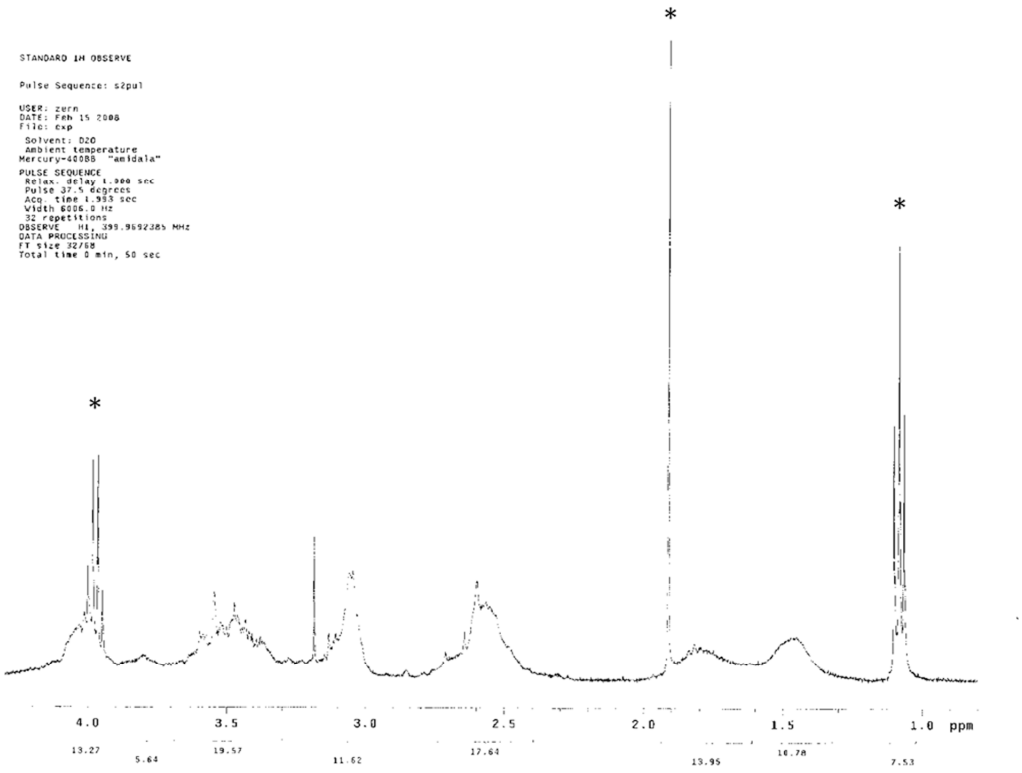


Figure S1. The NMR spectrum revealed a change in chemical shift from approximately 3.2 ppm in the diglycidyl ester to approximately 4.0 ppm in PAGS (supporting information). This shift corresponds to the opening of the epoxy ring in the diglycidyl ester. * The sharp proton signals are from residual solvent, ethyl acetate.

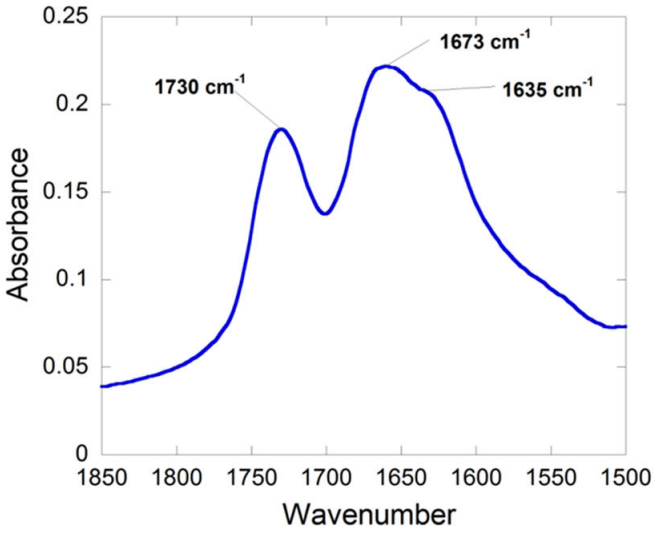


Figure S2. The FTIR spectrum of PAGS showed an intense absorbance at 1730 cm^{-1} indicating the formation of esters, and a strong absorption at 1673 cm^{-1} with a shoulder at 1635 cm^{-1} suggesting the presence of guanidinium groups.[1]

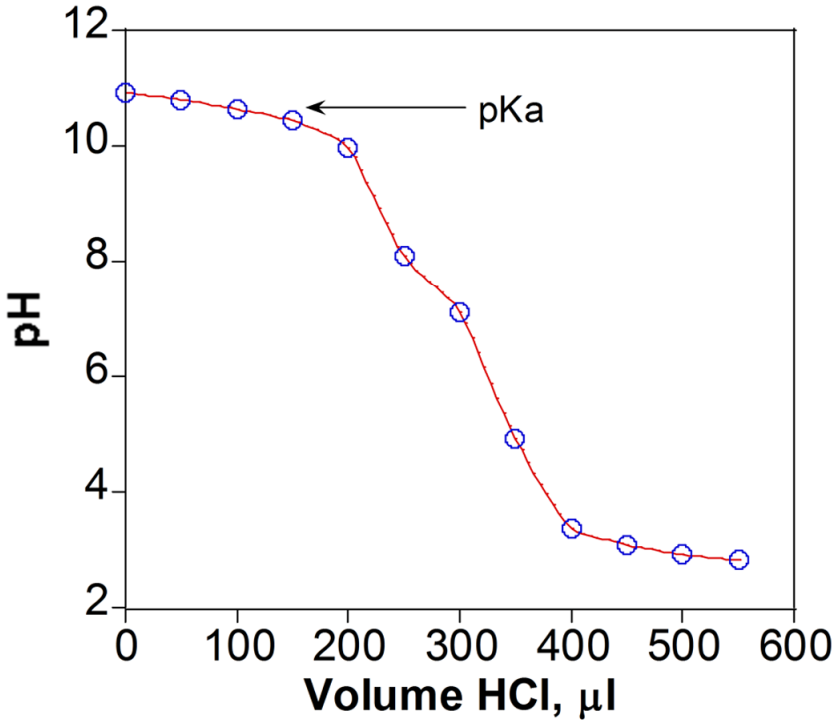


Figure S3. Titration curve indicated that PAGS pKa was approximately 10.5.

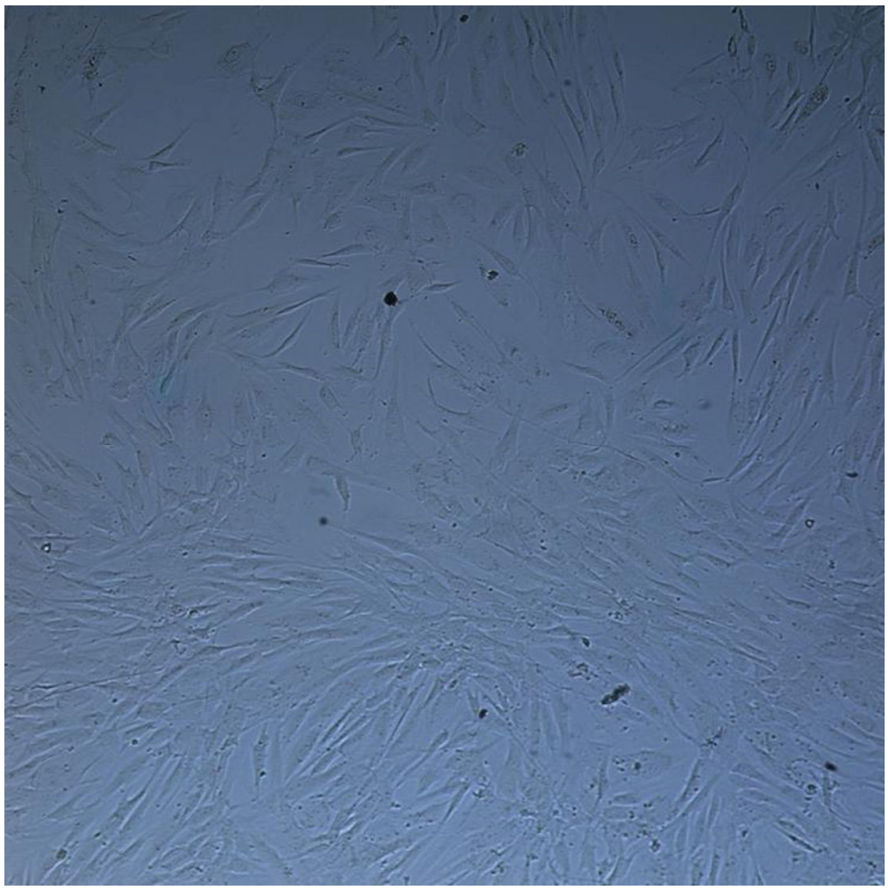


Figure S4. Phase contrast microgram of SMCs incubated with 10 mg/ml of PAGS for 24 h exhibited normal cell morphology.

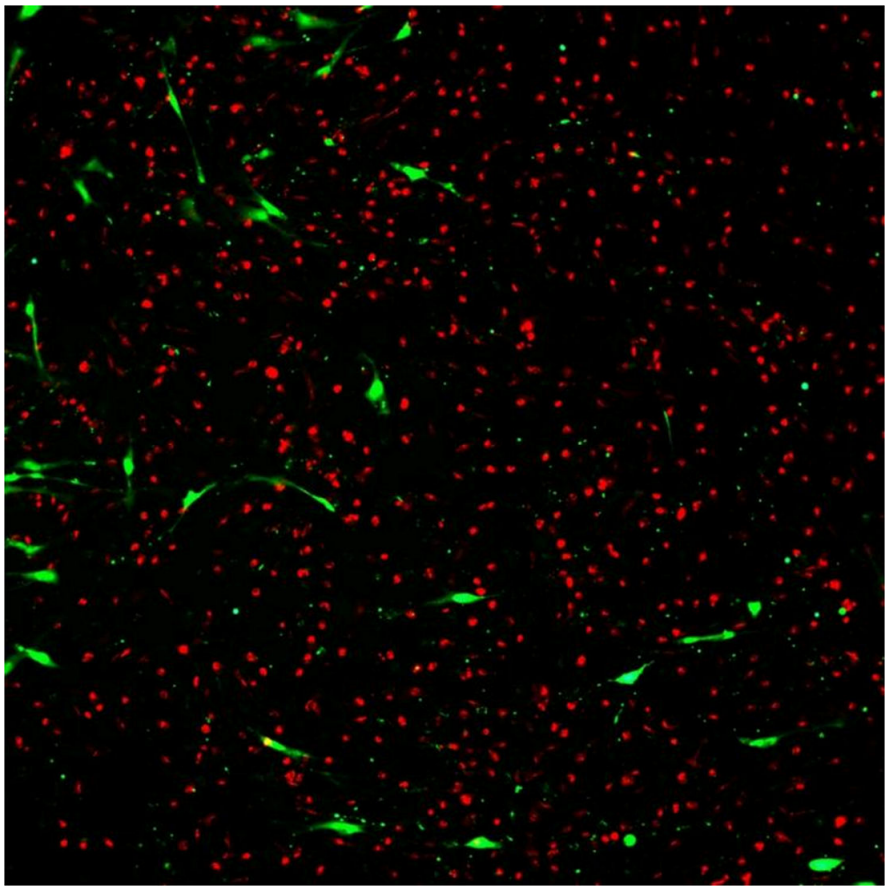


Figure S5. Fluorescent (100x) micrograph of cells incubated with as low as 0.05 mg/ml PEI for 24 h showed a drastic increase in dead cells. Live cells are green (calcein AM) and dead cells are red (ethidium homodimer-1).

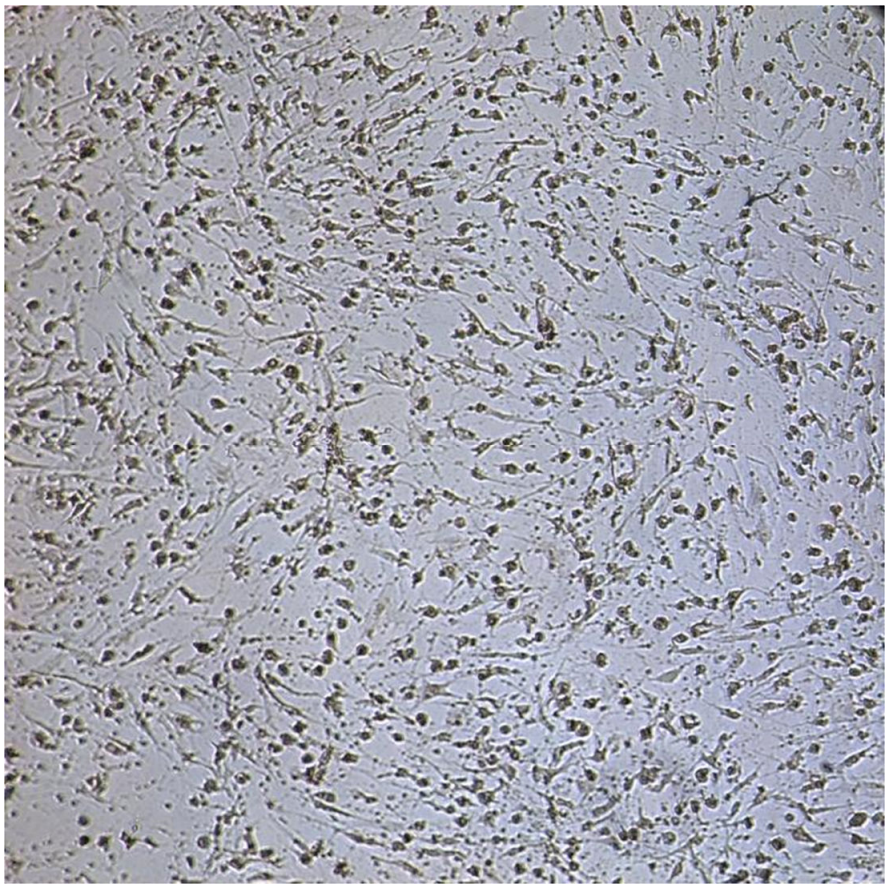
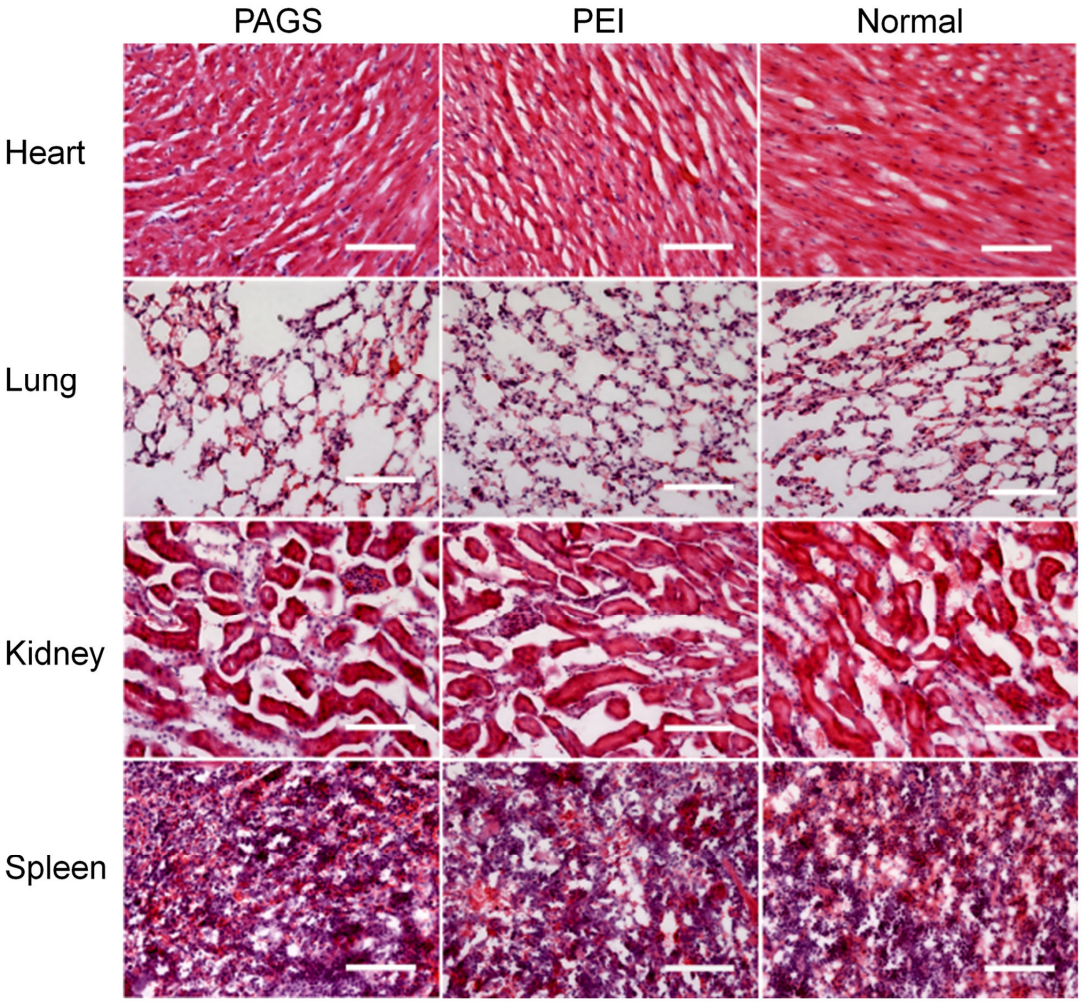


Figure S6. Phase contrast microgram of SMCs incubated with PEI at 0.05 mg/ml for 24 h exhibited abnormal cell morphology and a high percentage of dead cells.


PAGS
PEI
Normal
Heart
Lung
Kidney
Spleen
Day 1 post-injection

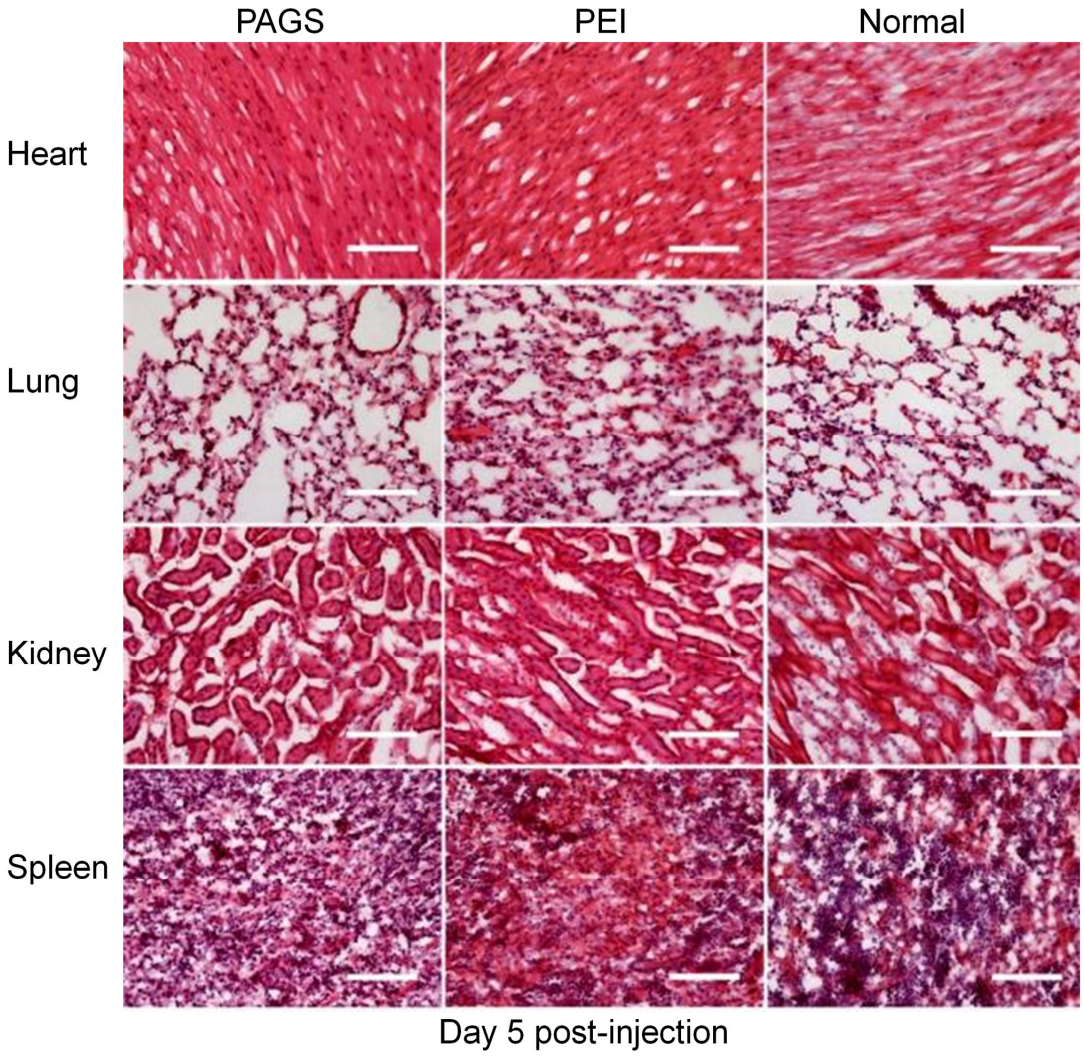


Figure S7. H&E staining of heart, lung, kidney, and spleen showed normal histological architecture for both PAGS (8 mg injection) and PEI (0.2 mg injection) groups. All images are of 200x magnification, scale bar = 100 μm.

Experimental:

Chemicals and Instrument

Succinic acid and 1,4-butandiol diglycidyl ether (TCI, Tokyo, Japan), L-arginine ethyl ester dihydrochloride (Research Organics, Cleveland, OH), D-arginine (EMD Chemicals, Gibbstown, NJ), heparin (MW: 12 kD), meta-chloroperoxybenzoic acid (mCPBA) and acetyl chloride (Acros Organics, Morris Plains, NJ), and other chemicals (Alfa Aesar, Medford, MA) were used without purification, except for mCPBA which was lyophilized for overnight to remove water. Flash chromatography was performed on Fraction Collector C-660 equipped with a UV photometer C-635 (Buchi, Flawil, Switzerland). ^{1}H NMR and FTIR spectra were recorded by Mercury 400 NMR (Varian, PaloAlto, CA) and Nicolet IR-100 spectrometer (Thermo Scientific, Waltham, MA), respectively. The molecular weight of the polymers was determined by gel permeability chromatography (GPC) with GPCMax VE 2001 (Viscotek, Houston, TX) equipped with a refractive index detector and a right angle light scattering detector. A SDV 10,000Å column (PSS-USA, Warwick, RI) and dimethylforamide (DMF) were used as solid and mobile phase, respectively. A poly(2-vinylpyridinium bromide) standard, PSS-pvpq3k (PSS-USA, Warwick,

RI), was chosen for calibration and molecular weight calculation. PEI was purchased from Alfa Aesar. Bright-field and fluorescent images were observed by Eclipse TE2000-U (Nikon, Melville, NY) equipped with X-cite® 120 fluorescence illumination system (EXFO, Ontario, Canada) and 64 megapixel Spot Flex digital camera (Diagnostic Instruments, Sterling Heights, MI). Particle size and zeta potential measurements were performed on a Zetasizer Nano Z (Malvern Instruments, Ltd. Westborough, MA). Scanning electron microscopy (SEM) was performed on a Leo 1530 SEM (10 kV, 3 nm spot size).

Reference:

[1] M. S. Braiman, D. M. Briercheck, K. M. Kriger, *J. Phys. Chem. B* **1999**, 103, 4744-50.