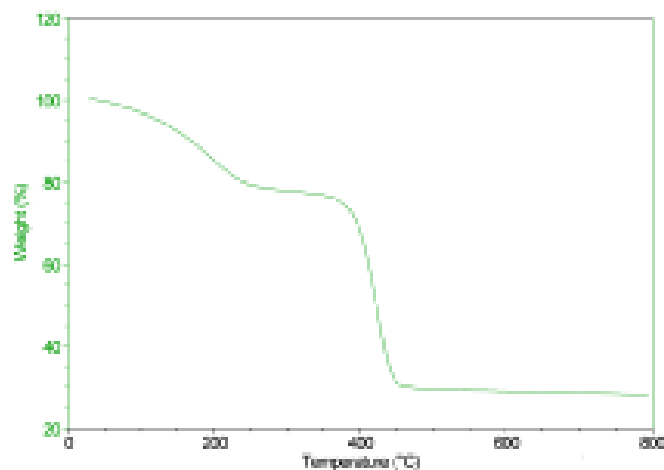# Supporting Information:

"Directed Formation of Silica by a Non-Polypeptide Block Copolymer Enzyme Mimic"

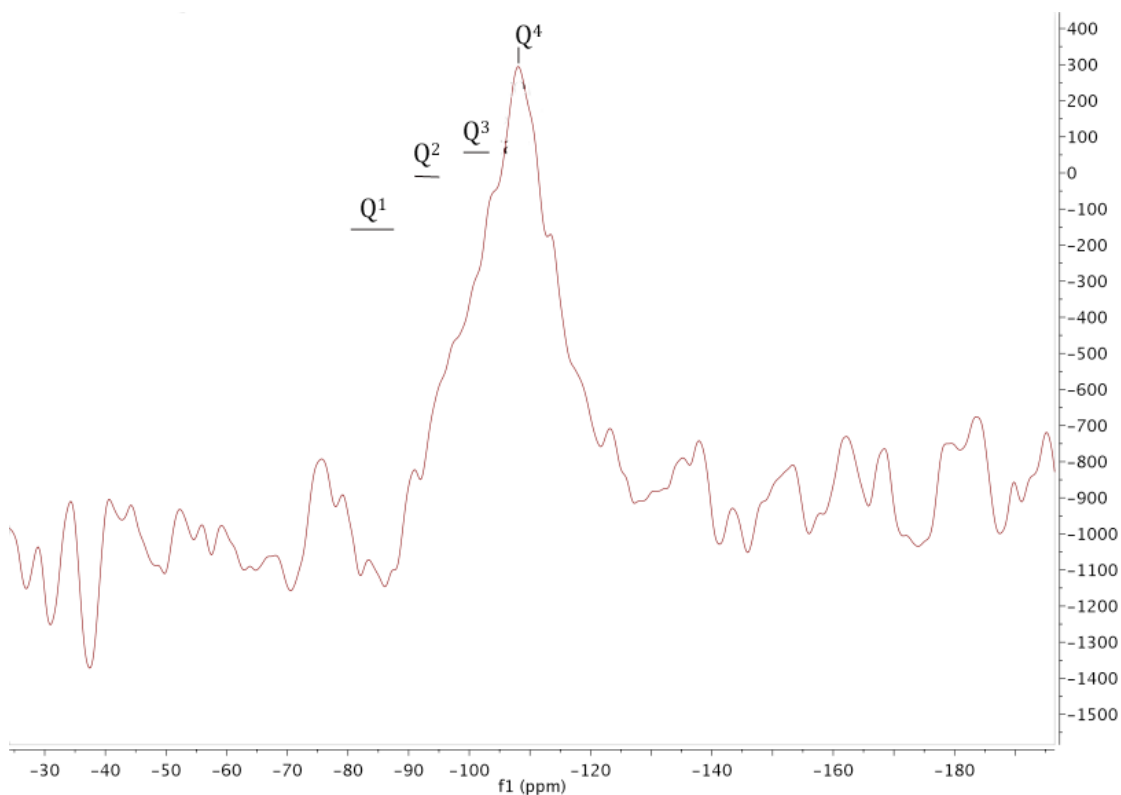Chetan C. Hire, Andrew J. Oyer, Gina E. Macek, Jennifer L. Bento, and Douglas H. Adamson

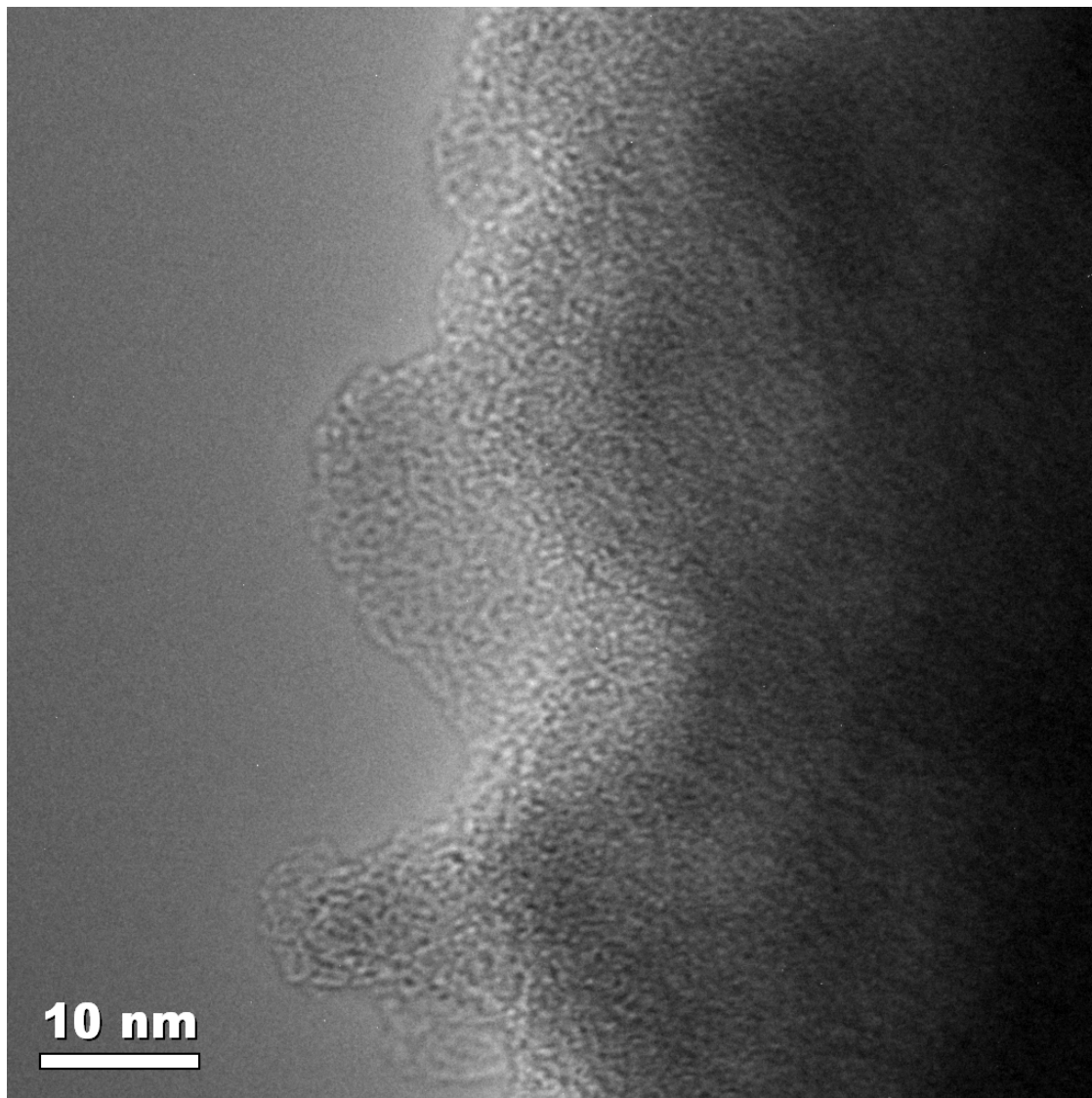Polymer characterization included both GPC and NMR. Examples of each are included below.

SI 1.

Thermal Gravimetric Analysis was obtained using a TA Instruments 2950.

SI 2.

Solid state NMR of silica formed by bio-mimetic block copolymer. The silicon-29 (29Si) solid-state magic angle spinning (MAS) nuclear magnetic resonance spectra was acquired using a Bruker Ascend 400WB spectrometer operating at 79.42 MHz. A 29Si NMR MAS spectrum was obtained using a single 45° rf pulse (3.5 µs) separated by 120 s recycle delays. The spectral width was 30 kHz, and a total of 3000 scans were acquired. The spinning rate was 5 kHz at room temperature using a 4 mm rotor.
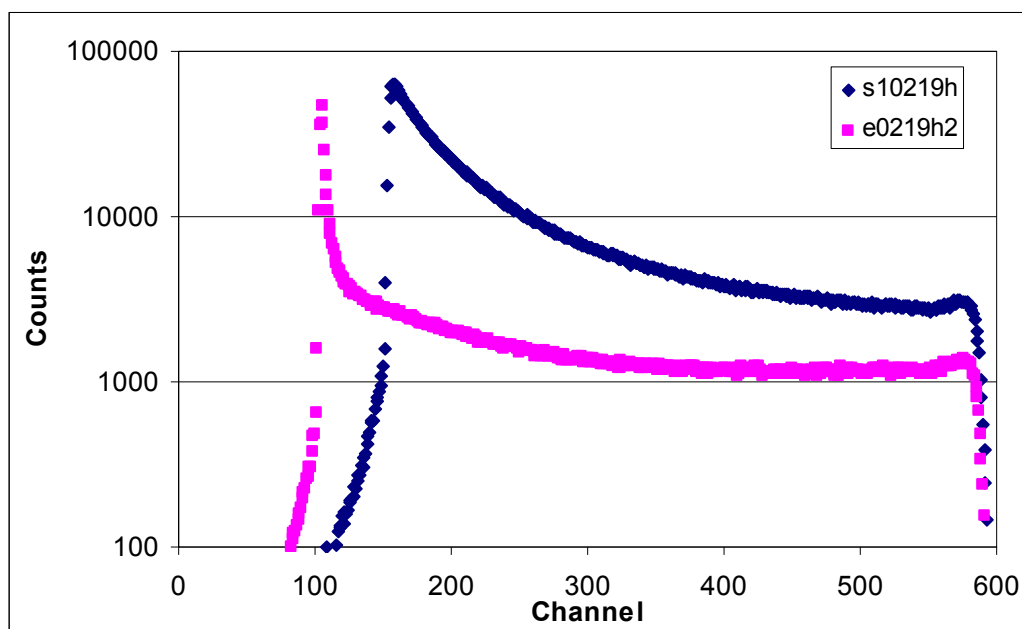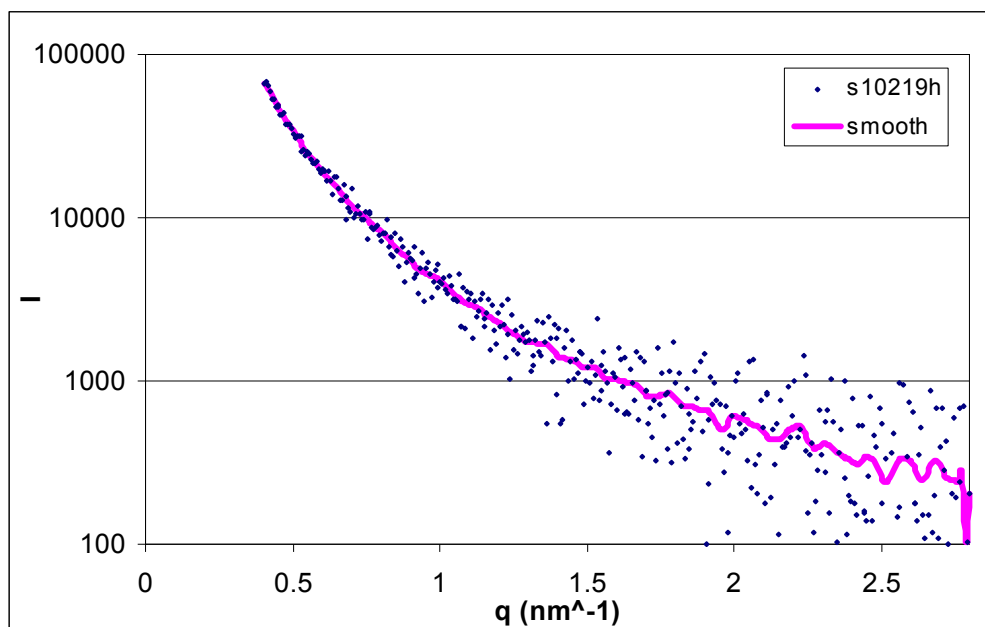
SI 3.

TEM image of silica sphere fragment indicating amorphous silica. The images were obtained by use of a JEOL 2010 FasTEM.
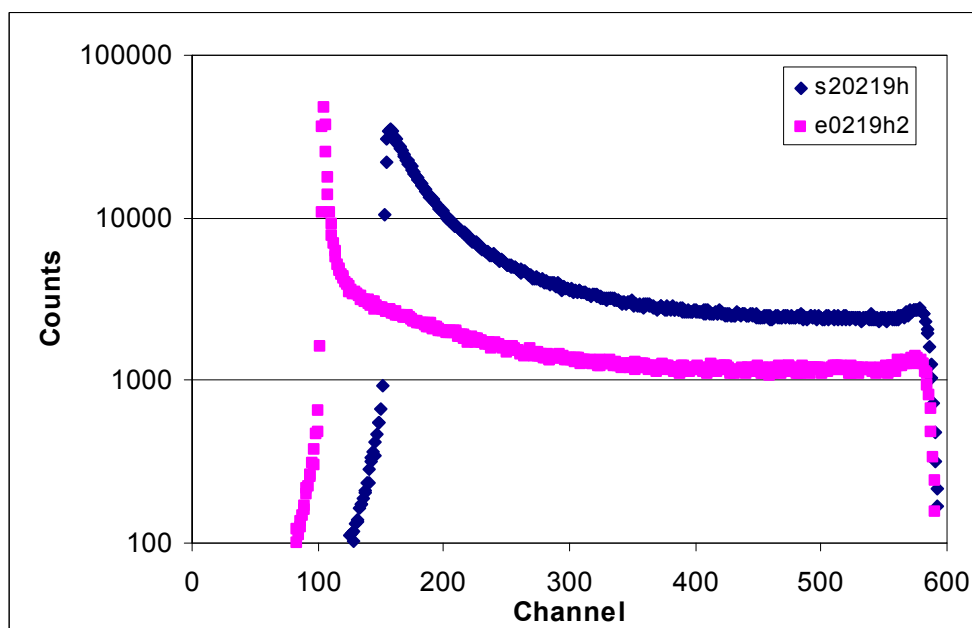
SI 4

SAXS analysis was performed in the laboratory of Prof. Rick Register at Princeton University. The in house system consists of a PANalytical PW3830 (sealed tube) x-ray generator employing a long fine focus Cu x-ray tube. To this is coupled a Kratky camera made by Anton-Paar, Graz, Austria. The camera is connected to a one-dimensional position-sensitive detector (Braun OED-50M) which is then connected to a PC multichannel analyzer (Tennelec Nucleus PCA-II). The figures below are the results of analysis of silica precipitate shown to be spheres of approximately 100 nm in size by TEM. Due to strong scattering, it was not possible to obtain data below about $q=0.4$ nm^{-1}. No evidence of internal microstructure was observed, although the possibility exists that it is masked by strong particle scattering.
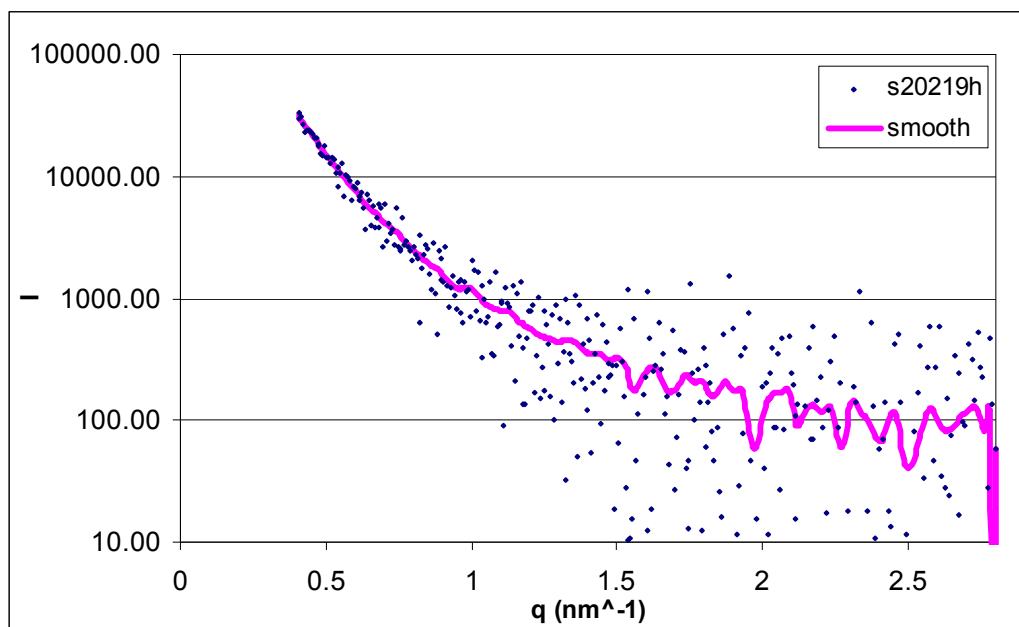

S10219h = sample vial 2.1; channels below ~150 were masked by lead tape
E0219h2 = empty w/ 2 pieces of Kapton tape
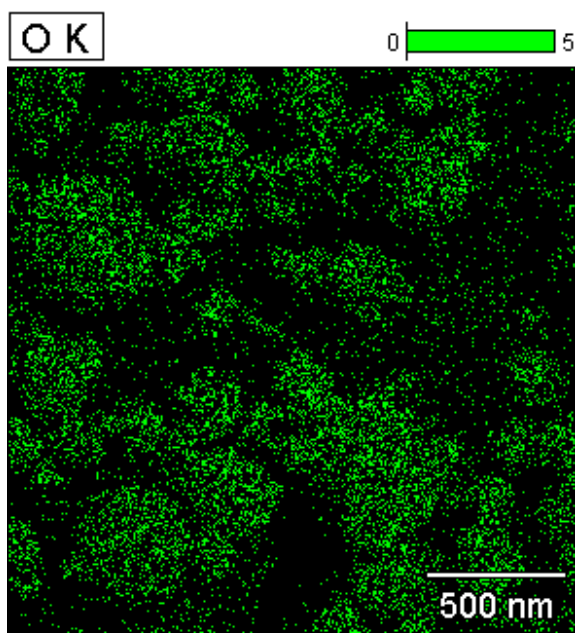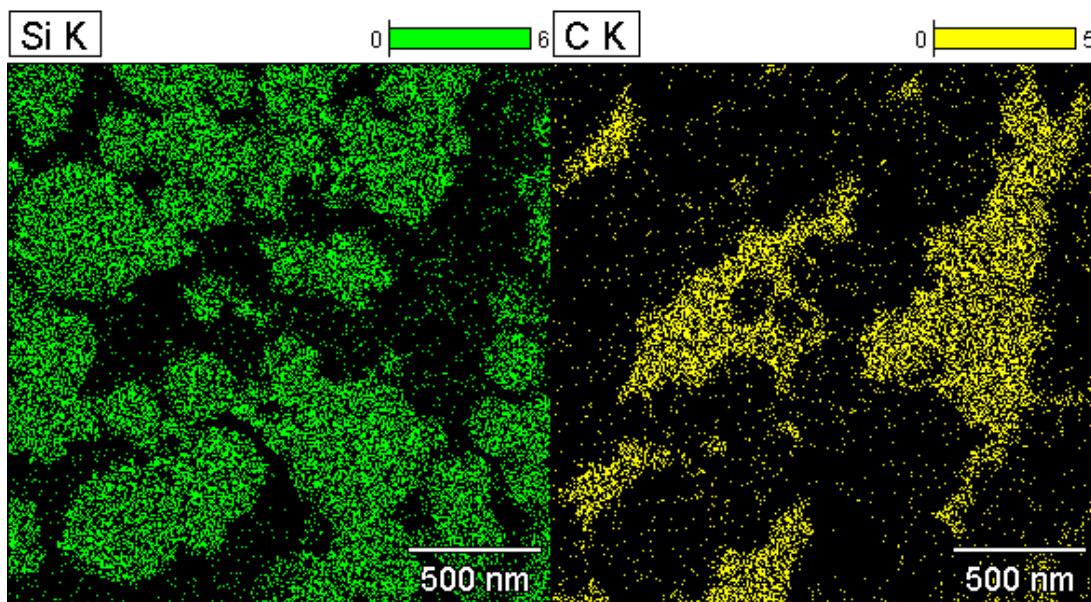
Blue points = non-smoothed data

S20219h = sample vial 2.1.2; channels below ~150 were masked by lead tape
E0219h2 = empty w/ 2 pieces of Kapton tape

Blue points = non-smoothed data

SI 5.

EDAX of typical silica precipitate from mimic polymer solution. Top left is silicon, top right is carbon from the carbon tape used to secure the samples, and the bottom image is of oxygen.