**Synthesis of bioHEMA monomer**

To a 50 mL round bottom flask was added Biotin (2.0 g, 8.19 mmol, 1 eqv.) and 20 mL DMSO. The biotin was then allowed dissolve overnight in the dark. To this solution was then added DMAP (4.0 g, 33.7 mmol, 4 eqv.), and HEMA (4.2 g, 33.7 mmol, 4 eqv). After the DMAP had completely dissolved DIC (5.07 mL, 33.7 mmol, 4 eqv.) was added. The solution was then septa sealed and allowed to react for 18 hours in the dark. After this time the solution filtered and then precipitated (1 to 20) into cold (3 °C) 150 mM HEPES buffer pH 8.4. The filtrate was then washed thoroughly with deionized water and then dried under high vacuum. 500 mHz \(^1\)H NMR in DMSO D\(_6\): \(\delta\) ppm 1.25-1.68 (SCH\(_2\)CH\(_2\)CH\(_2\), m, 6H), 1.88 (CH\(_3\), s, 3H), 2.31 (CH\(_2\)CO\(_2\), t, 2H), 2.55 (SCH\(_2\), d, 1H), 2.82 (SCH\(_2\), dd, 1H), 3.08 (CHCH(CH\(_2\))S, m, 1H), 4.13 (CHCH(CH\(_2\))S, m, 1H), 4.29 (OCH\(_2\)CH\(_2\)O and NHCH(CH\(_2\))S, s/m , 5H), 5.7 (CH\(_2\)CCH\(_3\) trans, s, 1H), 6.03 (CH\(_2\)CCH\(_3\) cis, s, 1H), 6.35 and 6.43 (CONHCH, s, 1H).