Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

**Role of monomer sequence and backbone chemistry in polypeptoid copolymers for marine antifouling coatings**[1] ANASTASIA PATTERSON, Univ of California - Santa Barbara , BRANDON WENNING, Cornell University, GEORGIOS RIZIS, Univ of California - Santa Barbara, DAVID CALABRESE, Cornell University, JOHN FINLAY, SOFIA FRANCO, ANTHONY CLARE, Newcastle University, EDWARD KRAMER, Univ of California - Santa Barbara, CHRISTOPHER OBER, Cornell University, RACHEL SEGALMAN, Univ of California - Santa Barbara — The design rules elucidated in this work suggest that antifouling coatings bearing pendant peptoid side chains perform better overall in marine fouling tests than those with peptide side chains, with extremely low attachment of *N. incerta* and high removal of *U. linza.* This difference in performance is likely due to the lack of a hydrogen bond donor in the peptoid backbone. Furthermore, we show that the bulk polymer material of these hierarchical coatings (based on PEO or PDMS) plays a key role in determining both surface presentation and fouling release performance. We demonstrate these trends utilizing a modular coating based on a triblock copolymer consisting of polystyrene and a vinyl-containing midblock, to which sequence-defined pendant oligomers (peptides or peptoids with sequences of oligo-PEO and fluoroalkyl groups) are attached via thiol–ene "click" chemistry. Surface presentation was analyzed with X-ray photoelectron spectroscopy and captive bubble water contact angle, and antifouling performance was evaluated with attachment and removal bioassays of the marine macroalga *U. linza* and diatom *N. incerta.*

[1] NSF GRFP and ONR PECASE

Anastasia Patterson
Univ of California - Santa Barbara

Date submitted: 11 Nov 2016 Electronic form version 1.4