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Tunable surface properties from bioinspired polymers WENDY VAN ZOELEN, ADRIANNE ROSALES, HANNAH MURNEN, University of California, Berkeley, RONALD ZUCKERMANN, Lawrence Berkeley National Laboratory, RACHEL SEGALMAN, University of California, Berkeley — Anti-fouling properties can be derived from patterned or "ambiguous" surfaces displaying multiple surface properties. Biological polymers with precisely controlled chain shapes and self-assembled structures are attractive materials for these applications, in which tunability is of great importance. We have investigated the surface properties of polypeptoids, a class of non-natural biomimetic polymers based on an N-substituted glycine backbone, that combine many of the advantageous properties of bulk polymers with those of synthetically produced proteins. Polypeptoids are of particular interest as they can be made in a sequence controlled fashion with functionalities already known to impart fouling-resistance (ethers, zwitterions, hydrophobicity, and nanoscale patterning). We demonstrate their surface stability and processibility from the standpoint of coating performance and also discuss controlled self-assembly of these materials. Used strategies include mediation of crystallization by incorporating chain defects and specific interactions.

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