

Abstract Submitted
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Laminated, Nontwisting Beta-Sheet Fibrils Constructed via Peptide Self-Assembly MATTHEW S. LAMM, University of Delaware - Department of Materials Science and Engineering, KARTHIKAN RAJAGOPAL, University of Delaware - Department of Chemistry and Biochemistry, JOEL P. SCHNEIDER, University of Delaware - Department of Chemistry and Biochemistry, DARRIN J. POCHAN, University of Delaware - Department of Materials Science and Engineering — A de novo designed peptide has been characterized that self-assembles into beta-sheet fibrils exhibiting a nontwisted, laminated morphology. The laminated morphology is constituted by 2.5nm wide filaments that laterally associate to form flat fibril laminates exceeding 100nm in width and microns in length. The height of each fibril is determined by the length of exactly one peptide monomer in an extended beta-strand conformation, approximately 7nm. Once formed, these fibrils are highly stable over a range of temperatures and pH and exhibit characteristics similar to those of amyloid fibrils. Kinetic parameters of pH and temperature can be used to affect the rate of beta-sheet formation and, consequently, the degree of lamination. Finally, the importance of peptide sequence on the resultant fibril morphology is demonstrated via rational peptide design and discussed in the context of current theories of fibril twisting.

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