Abstract Submitted
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Self-assembled peptide nanostructure-based polymeric electronic materials[1] SOMA KHANRA, SUCHI GUHA, University of Missiouri, Columbia, WENDEL ALVES, THIAGO CIPRIANO, Universidade Federal do ABC, Santo Andre- Sao Paulo, Brazil — Peptide-based nanostructures derived from natural amino acids are superior building blocks for organic semiconductor-based and bio-compatible devices as they can be used in a bottom-up process without the need for expensive lithography. Based on self-assembly and mimicking the strategies occurring in nature, peptide materials play a unique role in a new generation of hybrid materials for the electronics of the 21st century. In this work we functionalize diphenylalanine (FF)-containing polypeptides with conducting polymers, such as Poly (3-hexylthiophene) (P3HT) and polyfluorene (PF). The FF:polymer composites were synthesized by two methods: liquid-vapor and solid vapor phase. Electron microscopy images show micrometer size tubes with approximately 200 nm in diameter with homogeneous morphology. Photodiodes and light-emitting diode structures have been fabricated from FF:P3HT and FF:PF, respectively. We compare the electrical and optical properties of the FF:polymer composite devices with pristine polymer devices. Our results show that FF nanostructures with organic semiconductors could open up a new generation of bio-compatible materials in organic electronics.

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