

Bioinspired organic electronics with self-organizing organic semiconductor-peptide hybrids

Initiative: Integration molekularer Komponenten in funktionale makroskopische Systeme (beendet, nur noch Fortsetzungsanträge)

Bewilligung: 08.07.2010

Laufzeit: 3 Jahre

Aim of this proposal from three research groups is to create an integrated approach using nanostructured materials based on self-assembling organic semiconductor-peptide hybrids for the generation of macroscopic materials that will be applied in organic solar cells and field effect transistors. The research, for which the expertise of all three research groups is crucial will encompass: a) Synthesis of helical peptides covalently and non-covalently functionalized with pi-conjugated thiophene- and phenylene-based moieties with outstanding (optoelectronic and transport properties; the "bio-block" should serve as a matrix and at the same time govern the self-assembly of the hybrid. b) Investigation of self-assembly processes of the biogenic materials in solution, on surfaces and in the bulk; they will control, tune and optimize the desired functions of the organic semiconductors. c) Processing and integration of the novel self-organizing nanostructured hybrid materials into macroscopic organic electronic devices with functions ranging from solar cells (energy conversion) to field-effect transistors (transport).

Projektbeteiligte

Prof. Dr. Peter Bäuerle

Universität Ulm
Institut für Organische Chemie II
und Neue Materialien
Gebäude 026, 4. Niveau
Ulm

Prof. Dr. Klaus Müllen

Max-Planck-Institut für Polymerforschung
Mainz
Department Müllen
Arbeitskreis Synthetische Chemie
Mainz

Prof. Dr. Helma Wennemers

Eidgenössische Technische Hochschule

Zürich

Department Chemie und Angewandte Biowissenschaften

Laboratorium für Organische Chemie

D-CHAB, HCI H313

Zürich

Schweiz