Abstract Submitted
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**Design of artificial proteins to incorporate non-biological cofactors**[1] TING XU, University of Pennsylvania, SHIXIN YE, JOE STRZALKA, SOPHIA WU, ANDREY TRONIN, MICHAEL THERIEN, J. KENT BLASIE, University of Pennsylvania — The design of artificial proteins with synthetic non-biological cofactors could lead to peptide based systems with novel properties not exhibited by biological systems. Extended pi-electron systems were designed to exhibit selected NLO responses and light-induced electron transport. Amphiphilic 4-helix bundle peptides have been designed to selectively incorporate electron donor-acceptor prosthetic groups within both the hydrophilic and hydrophobic domains. The binding between a series of non-biological metalloporphyrin cofactors and the designed amphiphilic 4-helix bundles was studied. Incorporation of the non-biological cofactors into the 4-helix bundle did not change the secondary structure of the proteins. The binding selectivity depends on hydrophobicity and steric hindrance of the cofactors. Artificial proteins monolayer, both the apo- and holo-form, can be oriented vectorially at the air/water interface. This development may potentially lead to 'bio-inspired' materials with novel electron transfer properties.

[1]DOE/MS&E, NSF/MRSEC and NIH/CNBT

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