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Directed Spontaneous Assembly of Membrane Protein with Amphiphilic Block Copolymers

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Description: This invention describes a method for using membrane proteins (MPs) in synthetic systems for biosensor design, high-throughput drug-screening, catalysis or energy harvesting. Current efforts in the art face a challenge that practical applications involving liposomes have been continually hindered by their lack of stability. This invention used polymersome membranes as structural materials to support MP functions in lieu of biologically-derived lipid bilayers. A series of amphiphilic block copolymers with systematically varied membrane-forming blocks were designed. Investigation of the design found that charge-interaction directed assembly paradigm is applicable to the polymersome system to induce the formation of 3-D hierarchically ordered proteopolymersome membranes spontaneously, even when the membrane block is in entangled or glassy states

Potential Areas of Application

- Biosensor design
- High-throughput drug-screening
- Catalysis

Main Advantages of this Invention

- Doesn't use unstable liposomes
- Spontaneously ordered
- Membrane could be in entangled or glassy states

Intellectual Property Status: Provisional Patent filed May 31, 2011

Opportunity: We are seeking an exclusive or non-exclusive licensee for marketing, manufacturing, and sale of this technology.

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