

Biomimetic Materials for Protein Storage and Transport (ANL-IN-05-037)

Enabling storage of proteins in their native state

The Invention

Argonne has invented a unique, first of its kind method for storing proteins in their native state for assay, application and delivery to sites outside of initial extraction and storage facilities.

Membrane proteins represent an important class of proteins and comprise the vast majority of drug targets being studied. In contrast to soluble proteins, however, it is difficult to produce sizeable quantities in natively folded, functional and relatively pure form.

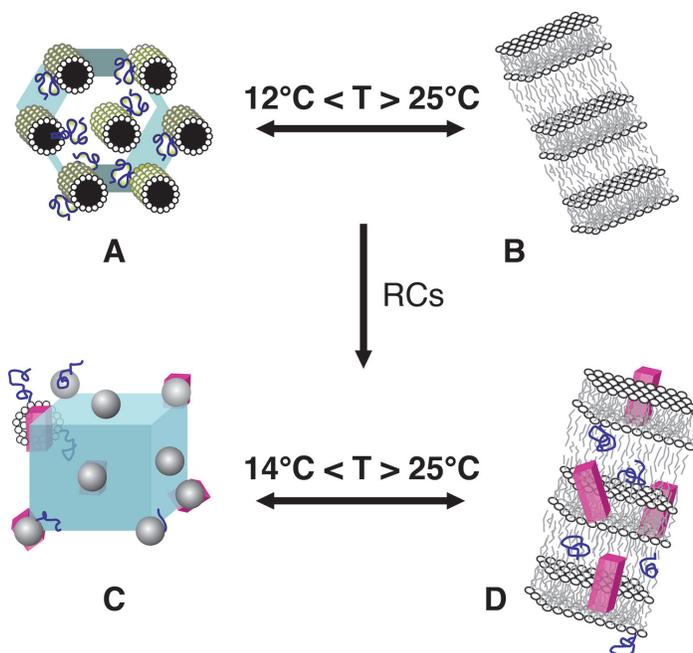
Argonne's invention preserves both soluble and membrane proteins in their native state, making further characterization of their structures and functions possible. The method facilitates storage of the protein and enables *in situ* characterization of the proteins. The invention also provides a biocompatible medium that provides a cellular mimetic environment for the encapsulation and organization of a wide range of proteins and complexes.

Benefits

- ▶ Allows isolation and maintenance of protein in its native state
- ▶ Provides a means for extracting protein from its native environment via a thermo reversible phase transition
- ▶ Allows indefinite storage of embedded protein
- ▶ Provides a vehicle to extract, store, transport and reuse membrane proteins
- ▶ Allows insertion and recovery of protein in storage

Applications and Industries

- ▶ Biological laboratories
- ▶ Pharmaceutical companies
- ▶ Diagnostics
- ▶ Protein therapeutics
- ▶ Research and development



A-D are schematic representations of the topology of polymer-grafted lipid-based complex fluid showing the effects of various temperatures and the presence of guest protein molecules; (A) In the cold, normal hexagonal phase; (B) above the phase transition, expanded lamellar structure; (C) doped with reaction centers (RCs) below the phase transition, proposed cubic micellar phase; (D) doped with RCs above the phase transition, expanded lamellar structure.

Developmental Stage

Reduced to practice

Availability

Available for licensing

Argonne Invention Number

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Patent Information

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