MemMagic

Lipidic Bicelle Screening Kit for Membrane Proteins

Why use MemMagic:

- Allows the simple incorporation of proteins into bicelle discs for crystallization experiments in a lipidic environment.
- User friendly - handles like a detergent.
- Behaves like a lipid - even at 4ºC .
- Easily dispensed by hand or by standard robotics allowing rapid set up.
- Extended storage periods compared to pre-made LCP.
- Proven method - multiple published structures in protein crystallography.
- Versatile - also useful for NMR structural studies and functional assay development.

The **MemMagic®** Bicelle Screen Kit is based on the use of bicelles as an alternative method for the crystallization of membrane proteins in a lipidic environment.
Membrane proteins can be readily reconstituted into bicelles and are maintained in a native-like bilayer environment, which can be manipulated with almost the same ease as for detergent solubilized membrane proteins.
The bicelle discs can be described as patches of lipid bilayers with detergent molecules lining the apolar edges of each bilayer (Fig 1 a). Formed by the mixture of a phosphatidylcholine lipid such as DMPC and a detergent such as CHAPSO, bicelles present a compromise between a rigid lipidic medium and an artificial detergent medium while offering beneficial aspects from both.
Recently, a significant number of membrane proteins have been successfully crystallized using the bicelle method, including Bacteriorhodopsin, ß2 Adrenergic receptor/Fab, Voltage-Dependent Anion Channel, Xanthorhodopsin, Rhomboid Protease, Voltage-Gated Sodium Channel, Leucine Transporter (LeuT) and ATP Synthase C10 ring.

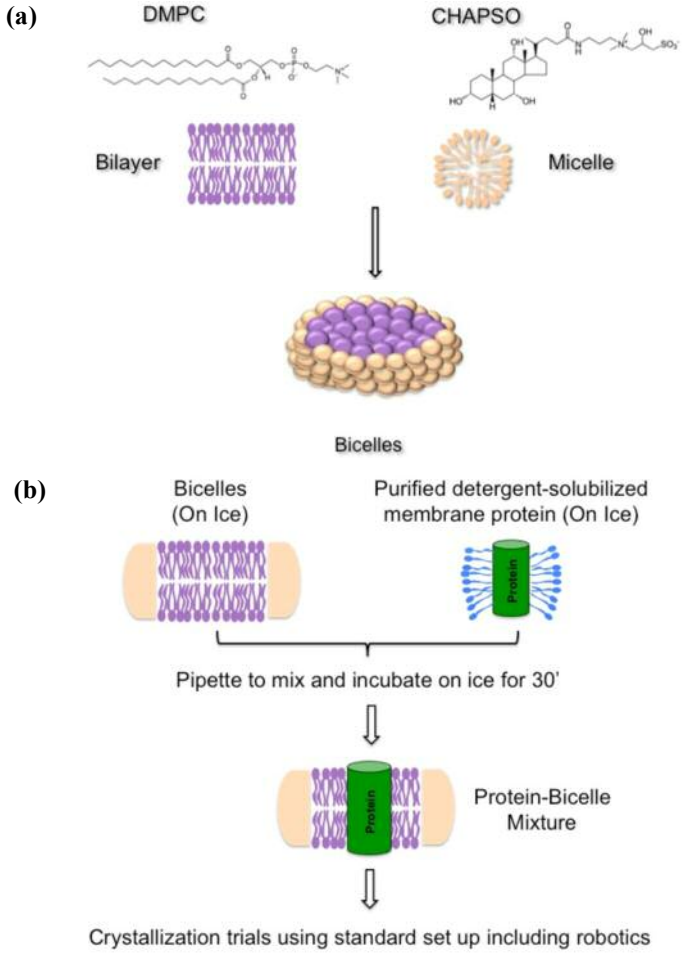


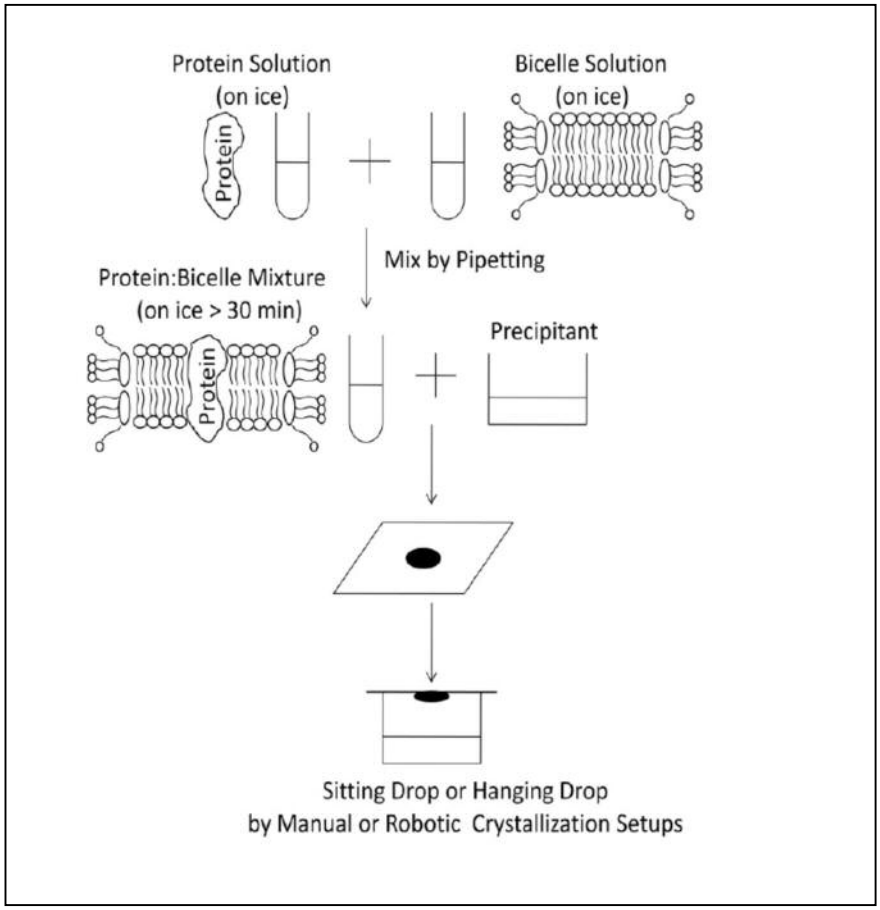
Fig. 1 (a) Bicelles are formed by mixing a phosphatidylcholine lipid such as DMPC with a detergent such as CHAPSO (the detergent which shields the hydrophobic edges of the bilayer). **(b)** Use of Bicelles (MemMagic) in crystallization. Figure adapted from Ujwal & Bowie (2011).

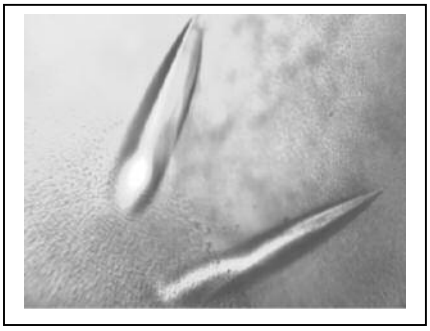
Get some crystallization magic today:
Each kit contains four bicelle solutions of 40%, 35%, 30%, 25% DMPC:CHAPSO (2.8:1)

MD1-81 = 4 x 100 µL kit
MD1-82 = 4 x 250 µL kit

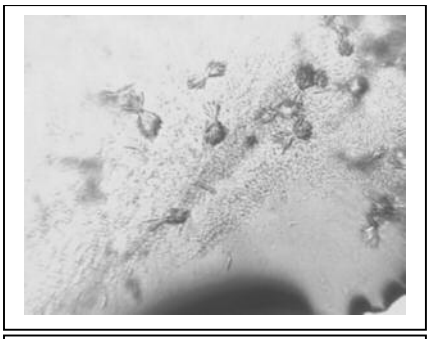
MemMagic® Quick Protocol

- Thaw frozen bicelles completely at room temperature until a clear gel-like phase is observed.
- Place the clear gel on ice to transform it to liquid form. The bicelle solution may become cloudy when placed on ice
- Vortex 2-3 seconds to mix and immediately place it back on ice to maintain its liquid form.
- Add the bicelle solution to the protein (preferably protein concentration >10mg/ml) in a 1:4 (bicelle:protein) ratio (*e.g.* 10 µl bicelle + 40 µl protein) while keeping everything on ice. Only make enough protein/bicelle mixture for a single day experiment. Do not store protein/bicelle mixture for next day or future use.
- Mix by pipetting the contents up and down until the solution appears homogenous (do not vortex).
- Incubate the protein/bicelle mixture on ice for minimum 30 min before setting up crystallization trials.
- Do not incubate crystallization trays at or below 4°C.





Crystals grown using MemMagic®



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