Measuring Drug Interactions with Artificial Membranes

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Background

We have developed an approach to mount lipid bilayers on substrates. This allows the probing of the properties of these layers using traditional physical chemistry or surface science approaches. Using this approach we have been able to probe drug-membrane interaction as a function of membrane fluidity and also watch in the transition of a membrane due to its interaction with drugs.

Outcomes

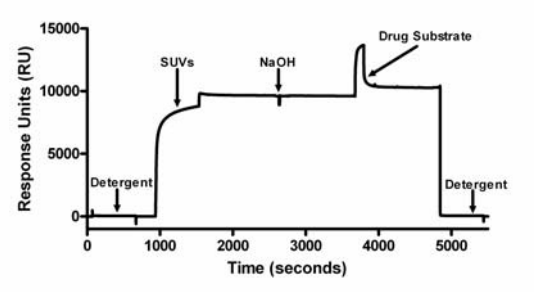
Better understanding of drug-membrane interactions

Better Understanding of the role of proteins in drug interactions with cells

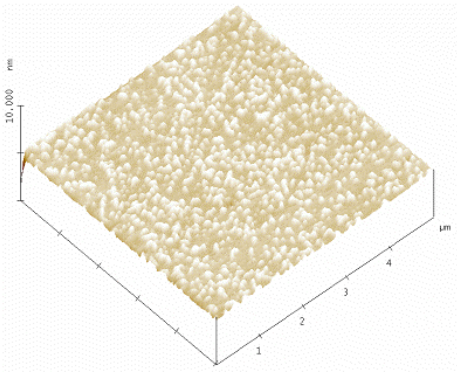
Progress to Date:

We have followed the extent of interaction of various cationic amphiphilic drugs (CADs) with supported phospholipid vesicles measured using surface plasmon resonance (SPR) as a function of both drug concentration and membrane fluidity. We report a two stage interaction which to our knowledge has not been reported previously and gives a significant insight into how these drugs interact with phospholipid bilayers.

Additionally we have used atomic force microscopy (AFM) to examine the static layers and then follow the dynamics events of the layers due to changes in temperature or interactions with drugs.



Typical SPR Response Curve



AFM Image of a Bilayer

Things to Do

Real membranes contain several different lipids as well as various proteins. We are currently working on building these structures.

Contact

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