

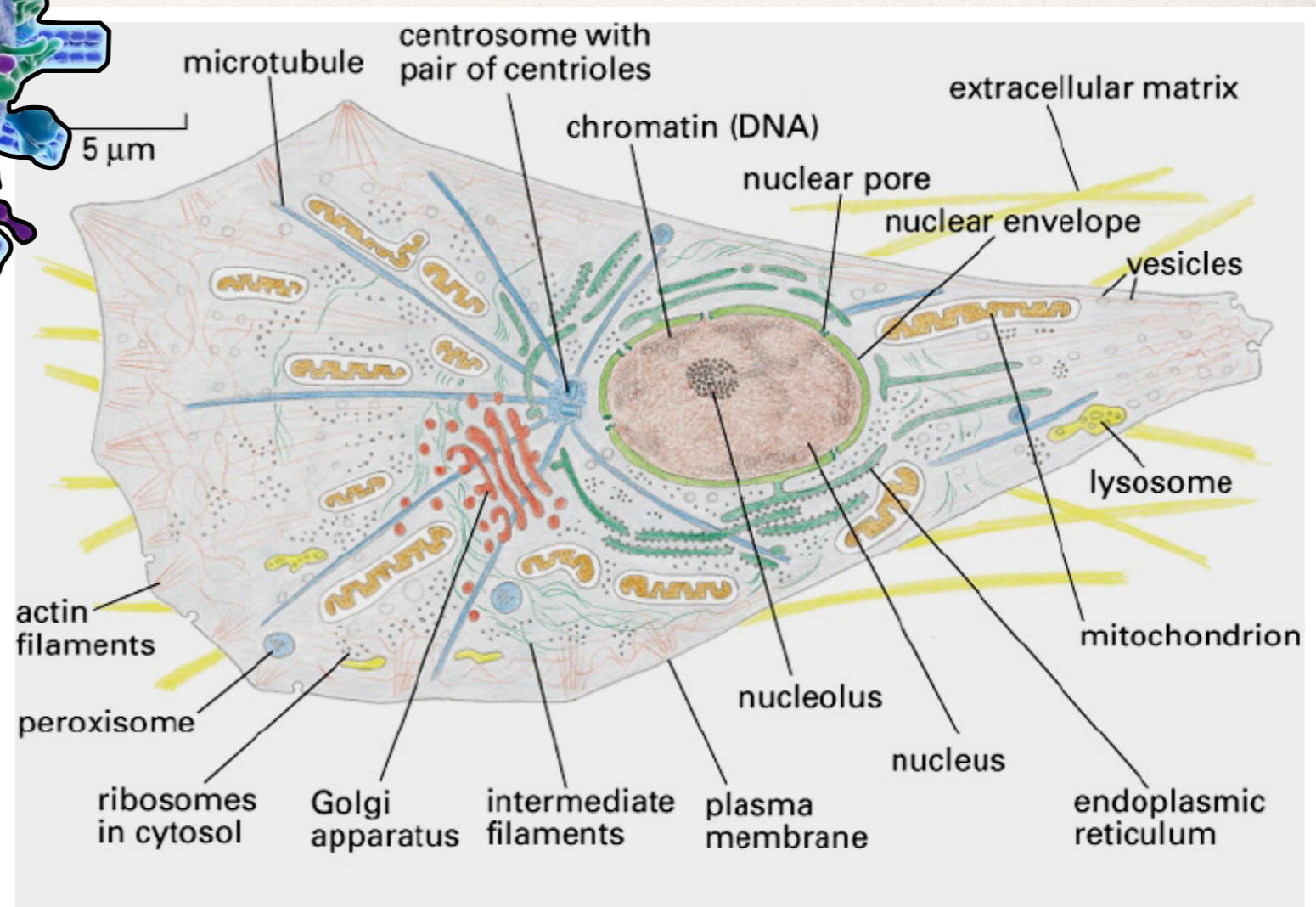
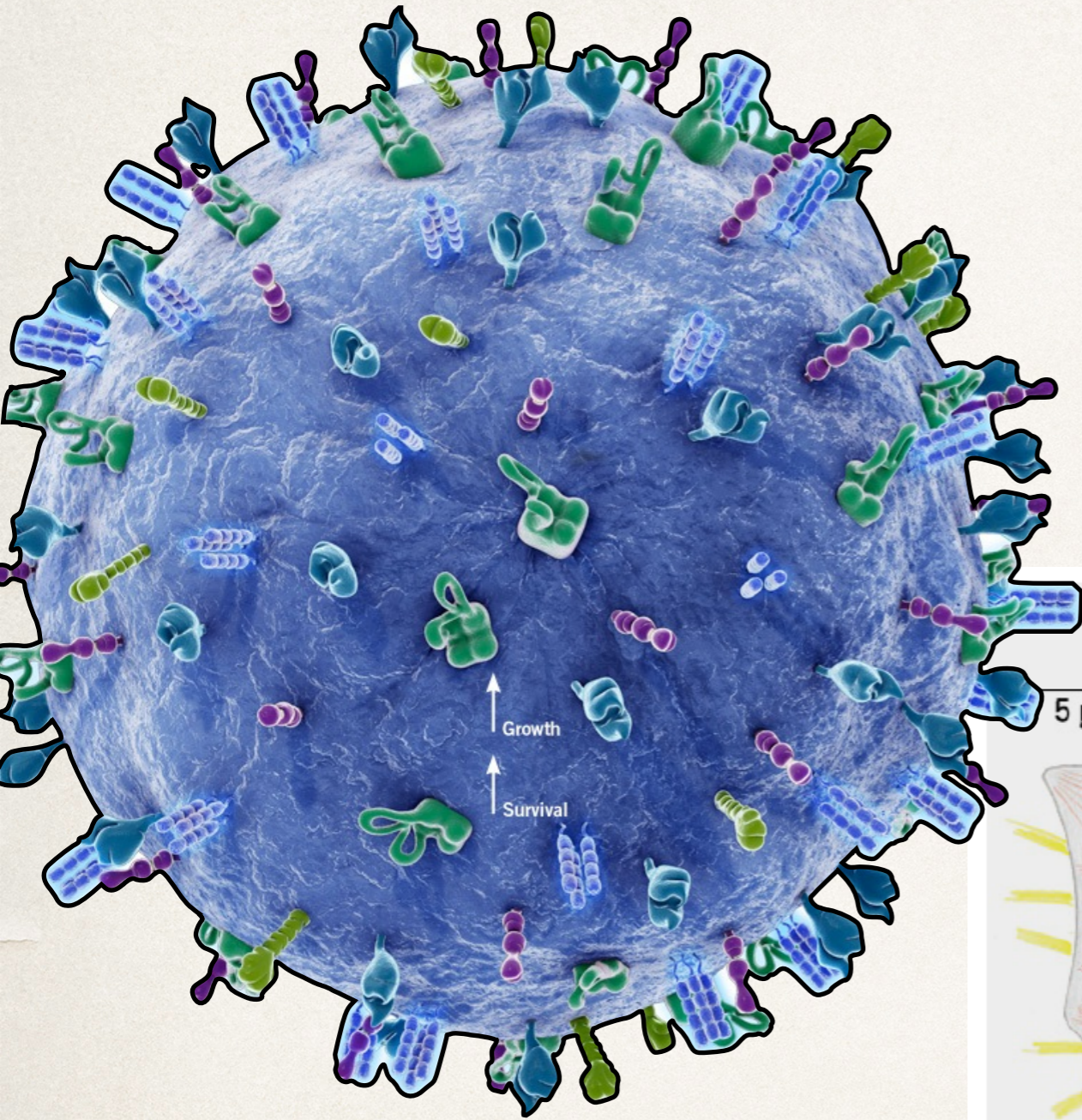
# Chemistry of the Cell Membrane:

## How does it affect us ?



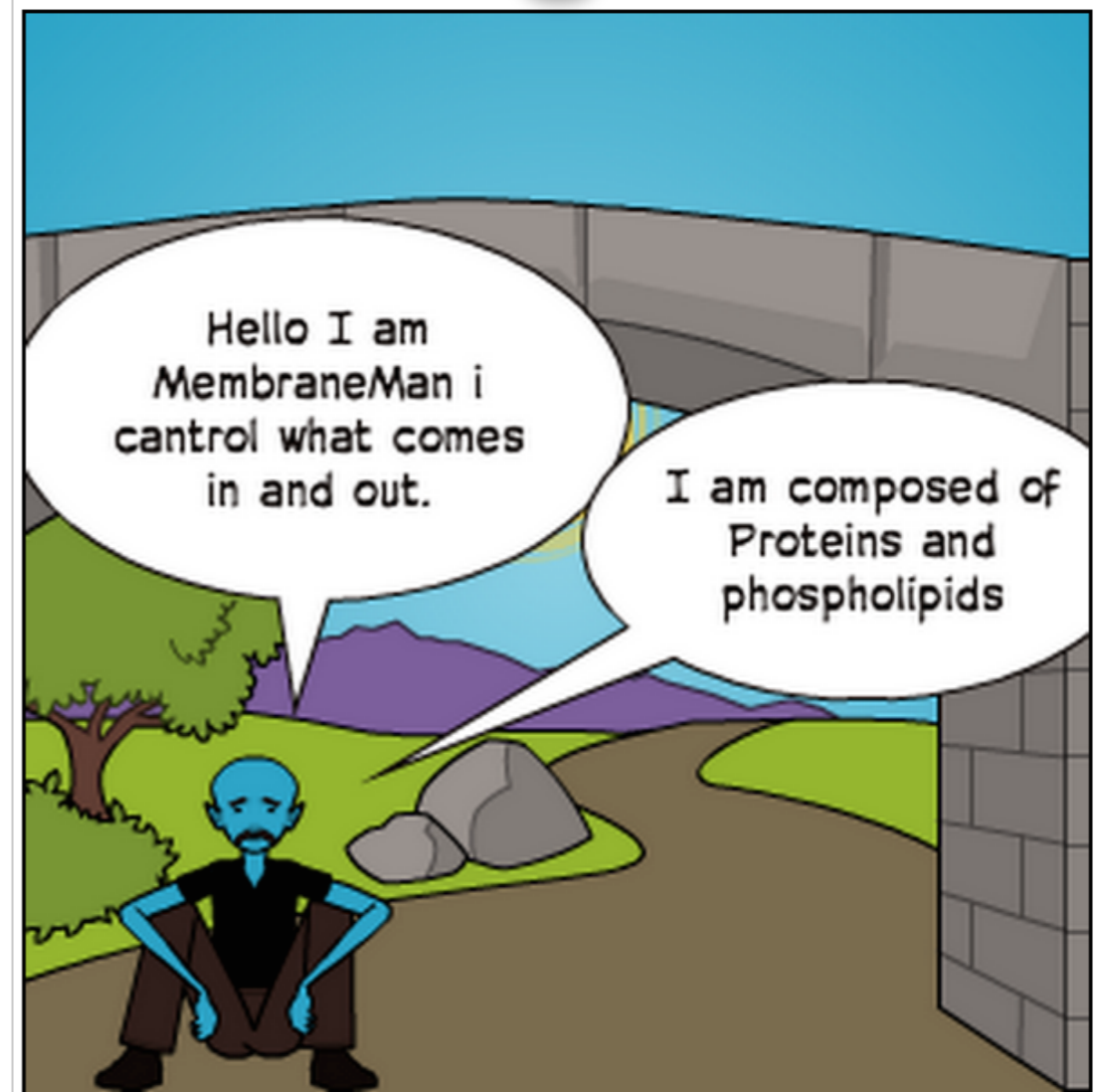
Durba Sengupta  
National Chemical Laboratory  
<https://biophyschem.wordpress.com/>

# What is the Cell Membrane ?



# Why are Membranes Important?

- Information
- Nutrients
- Cues -light, taste, touch
- Viruses
- Pharmaceutical drugs
  
- Antimicrobial agents
- Drug delivery

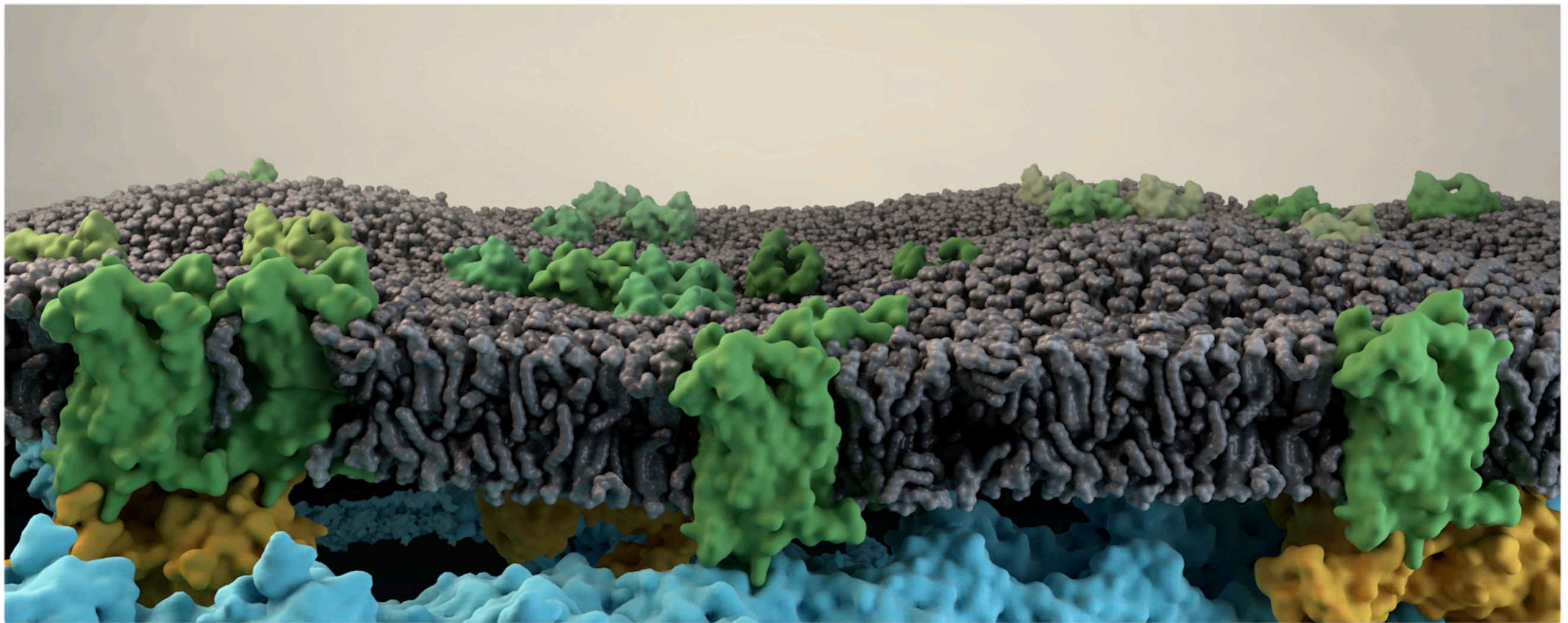


# Therapeutics

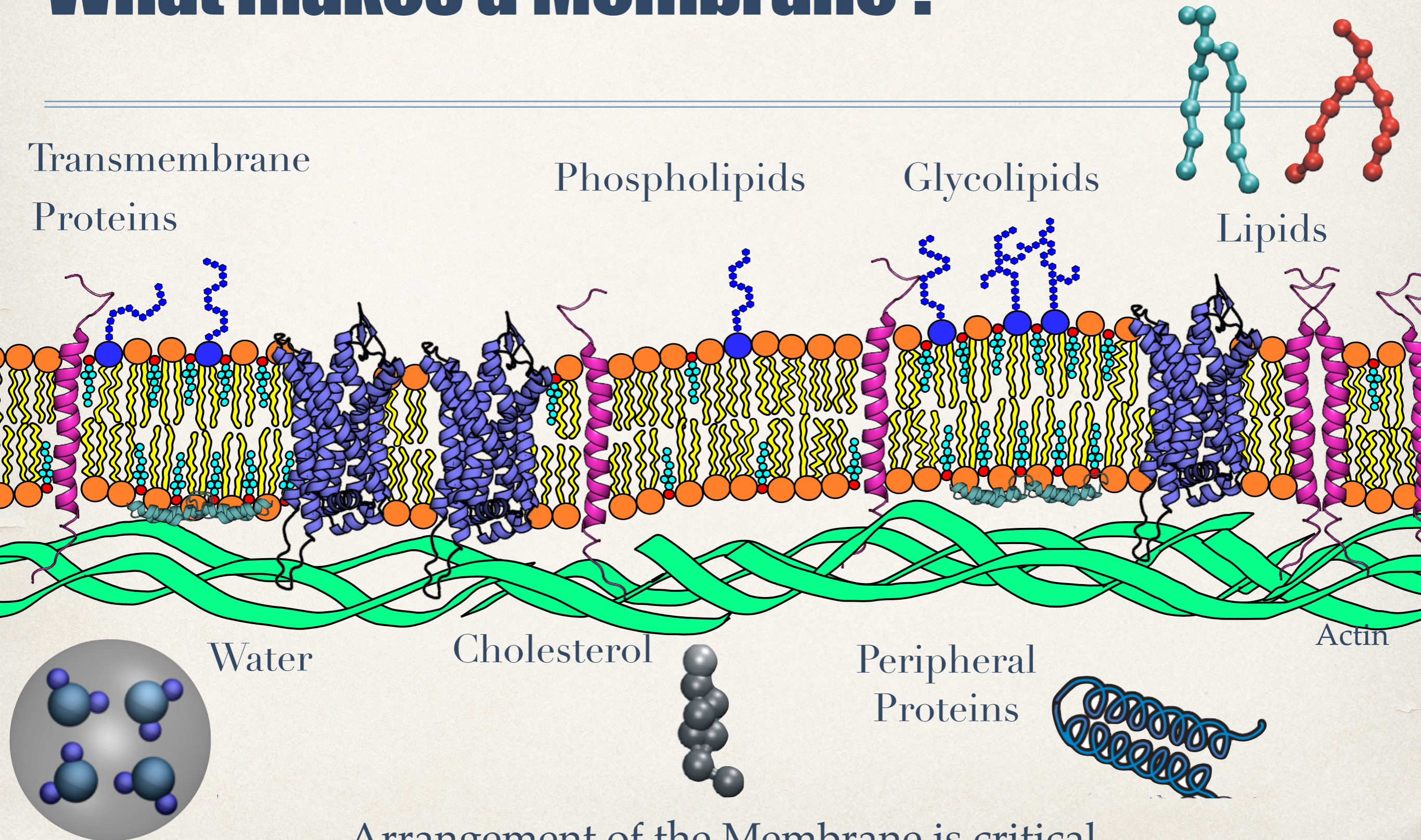
- More than half of all Pharmaceutical Drugs!
- Asthma
- Local Anaesthetic
- Cardiovascular/heart
- Diabetes
- Headache



# What does the Cell Membrane Comprise of?

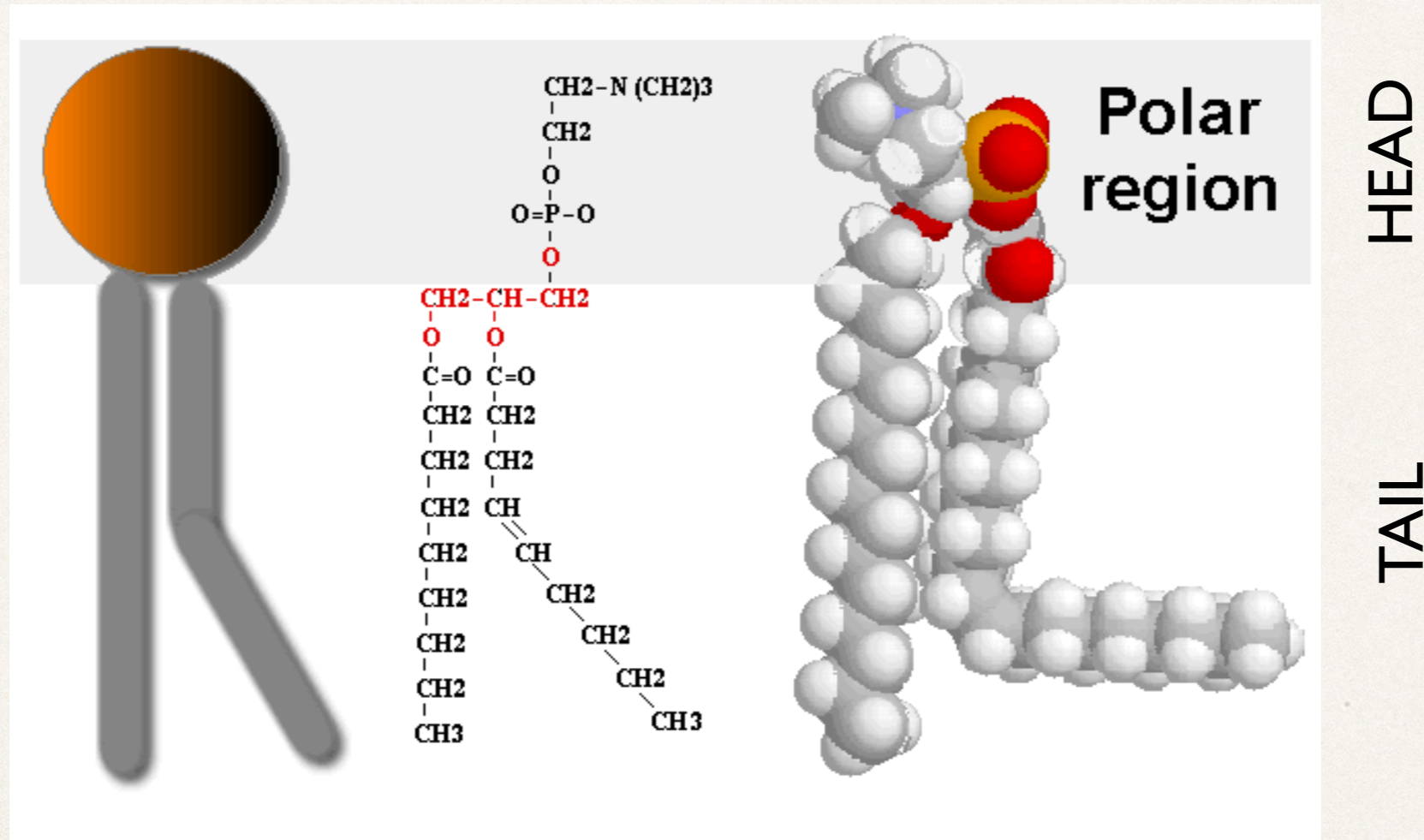


# What makes a Membrane ?



Arrangement of the Membrane is critical

# Heads Out, Tails in



- What is hydrophobicity?

- Oil in Water ?

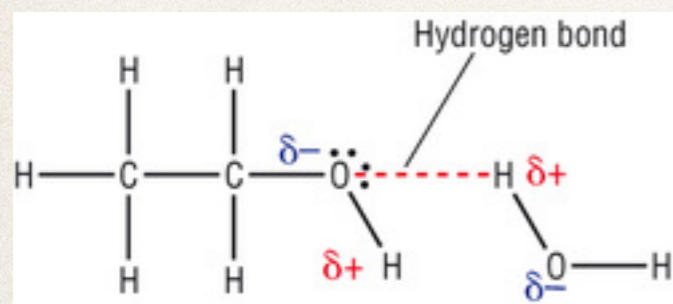
- Detergent

- Lipid = Detergent + Oil

# Testing for Membranes: Food Biochemistry

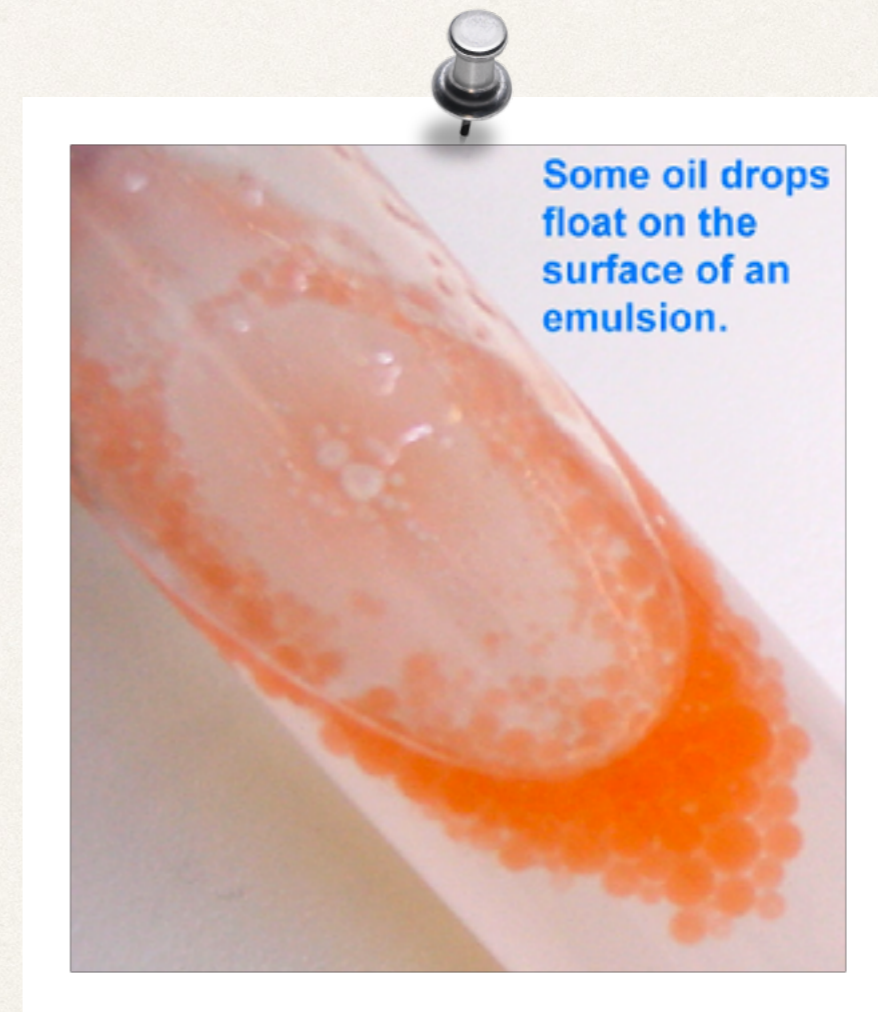
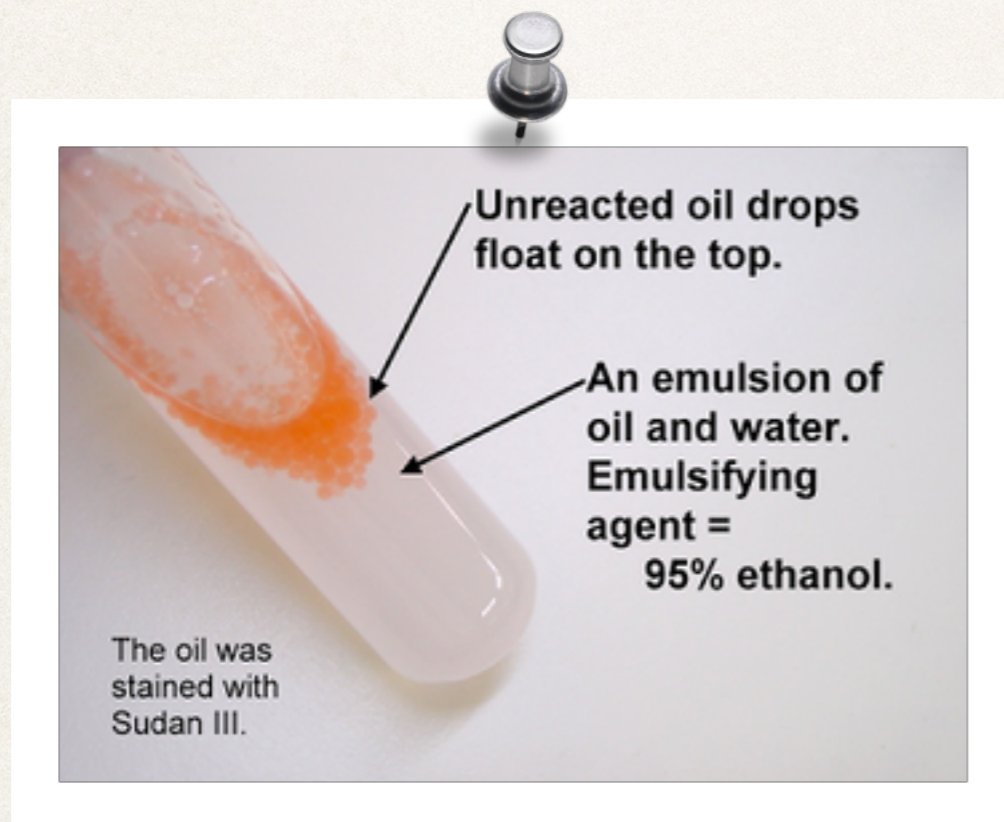
## ● EXPERIMENT

Lipids soluble in Ethanol,  
but not in water





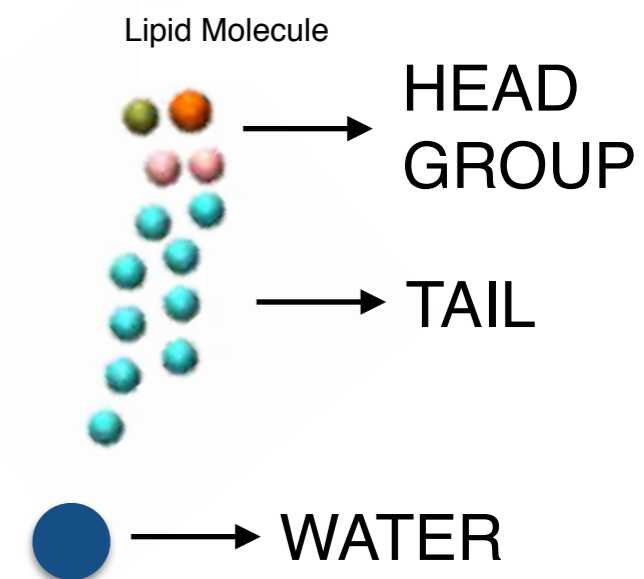
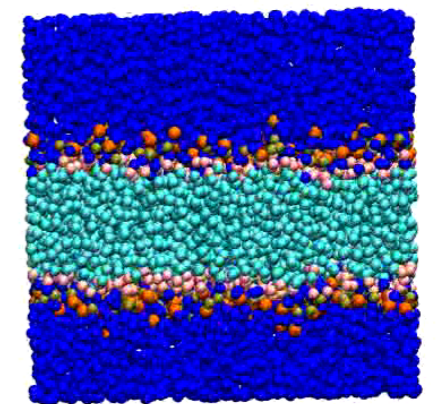
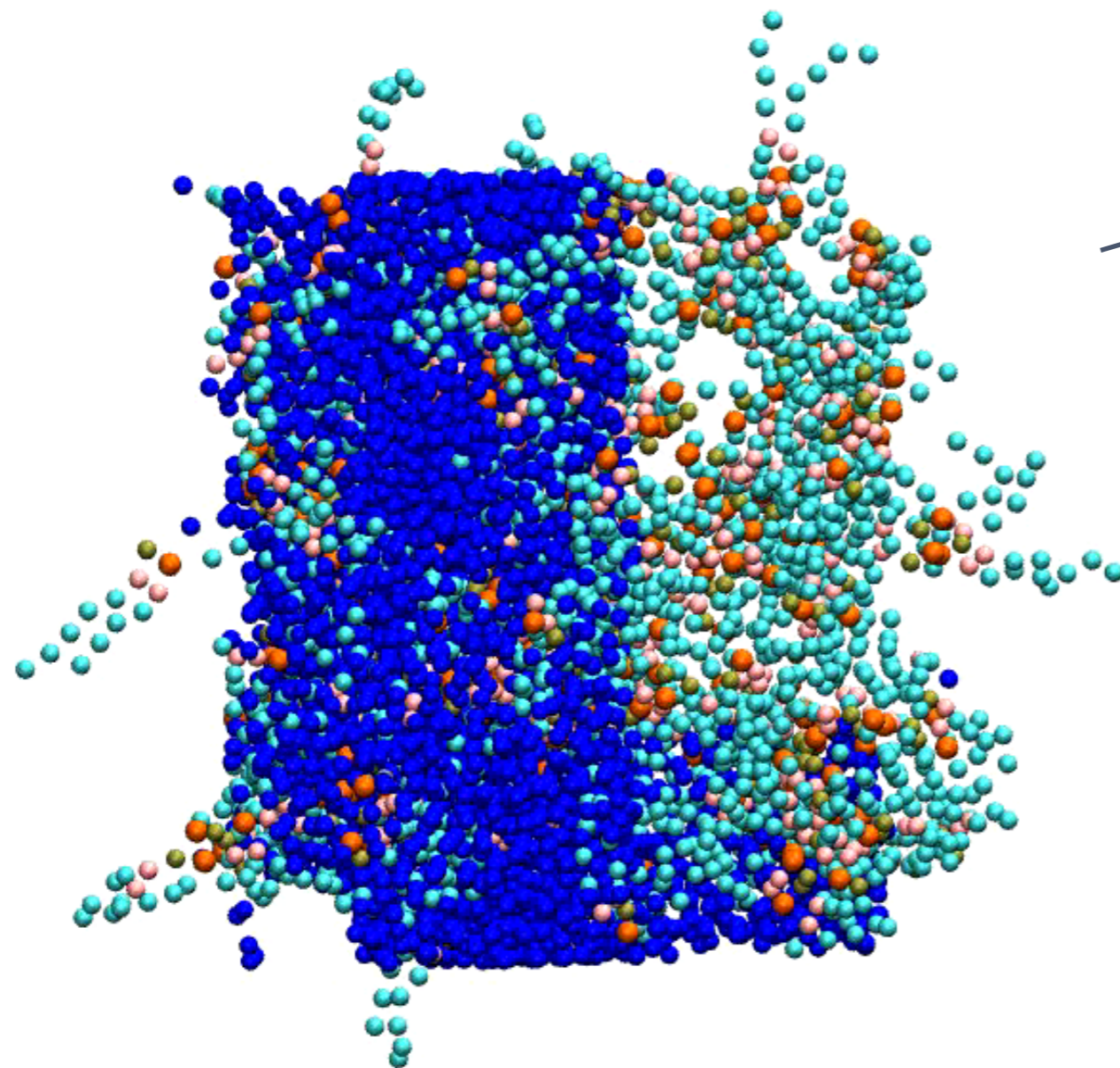
# Sudan Dye Test: Food Biochemistry



<http://biology-igcse.weebly.com/-food-test-3---emulsion-ethanol-test-for-fats.html>

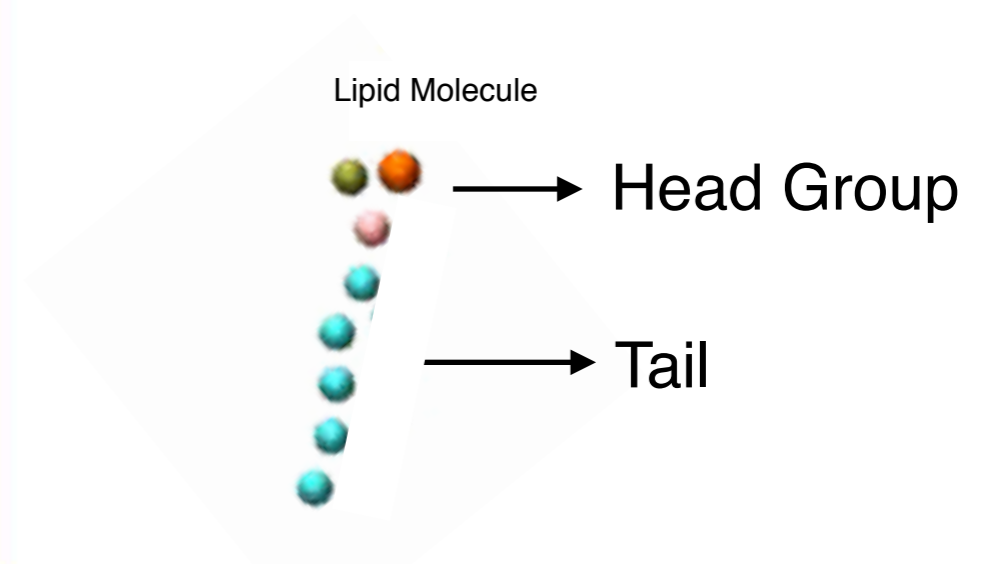
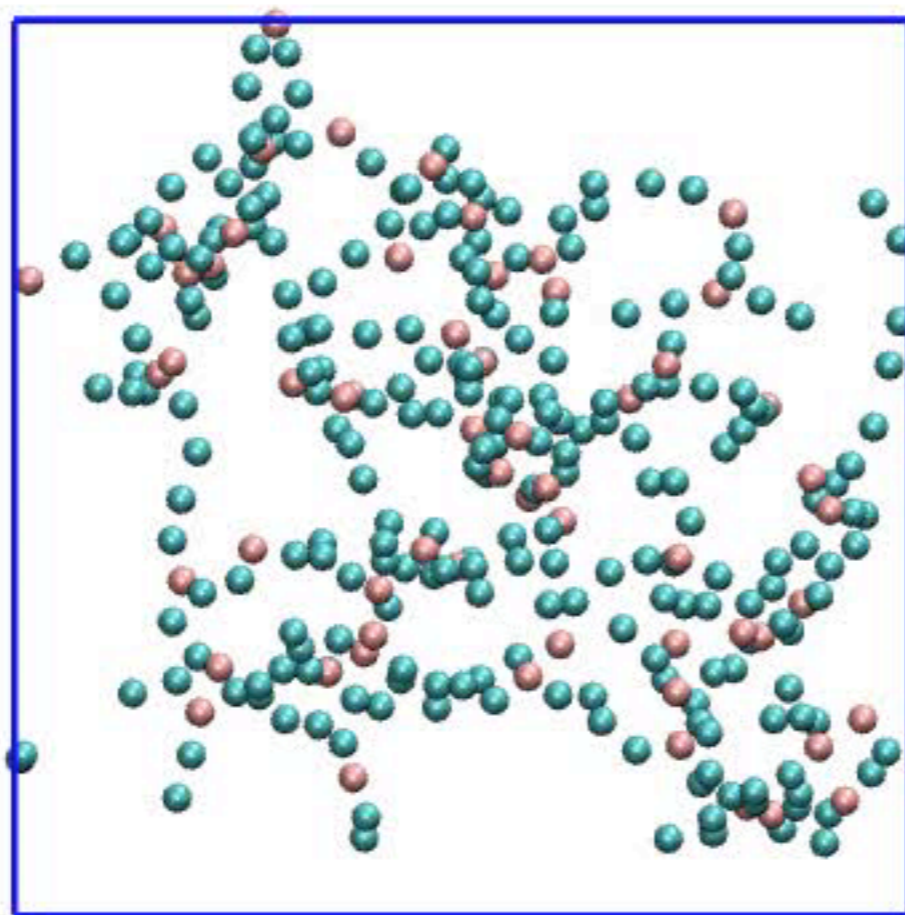
# How do Membranes form?

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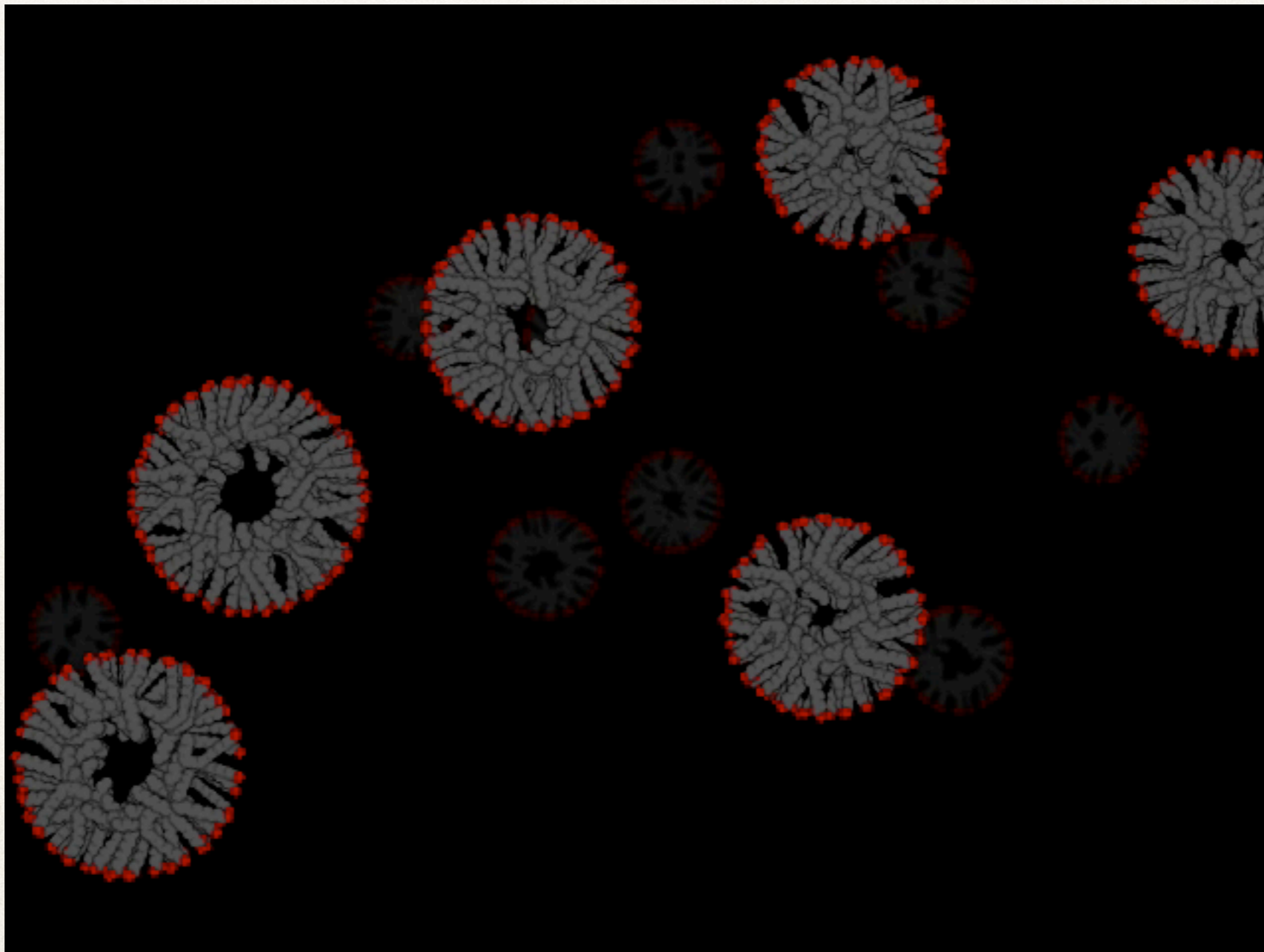
# Micelles and Bilayers

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Water not shown but present

# From bilayers to Proto-Cells: Origin of Life

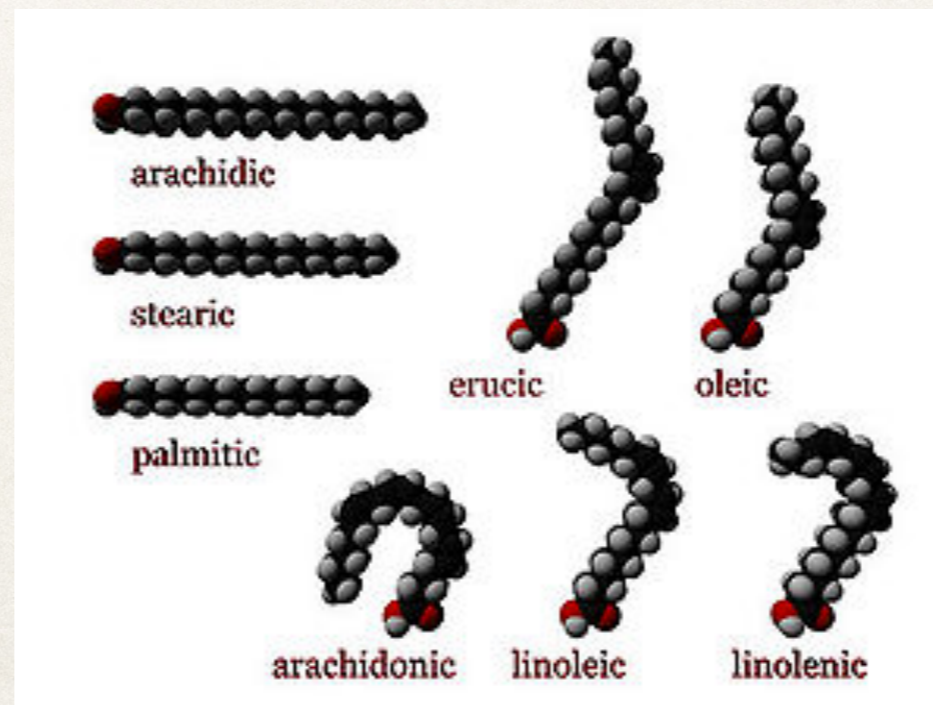
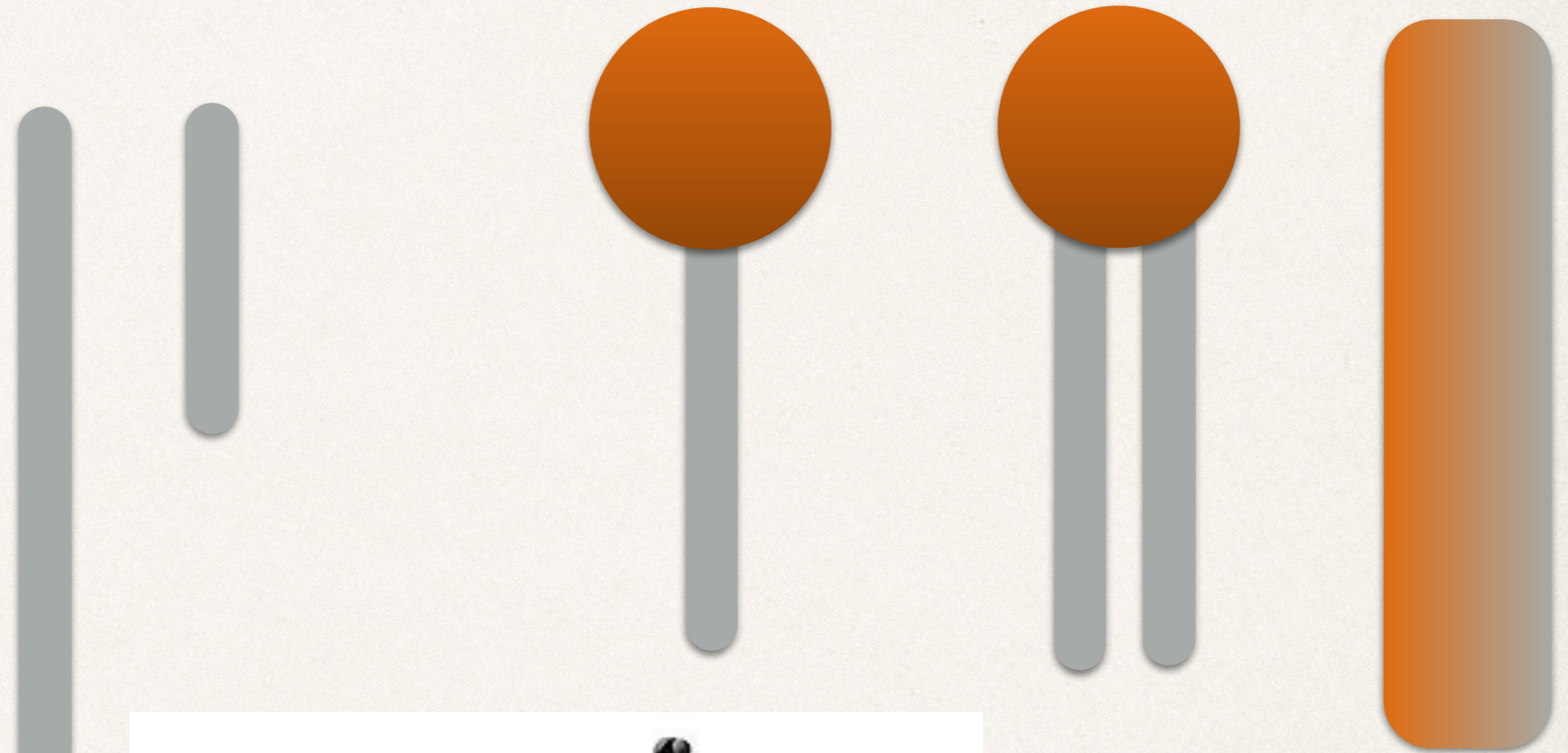


**Do you want to know more about  
the cell membrane ?**

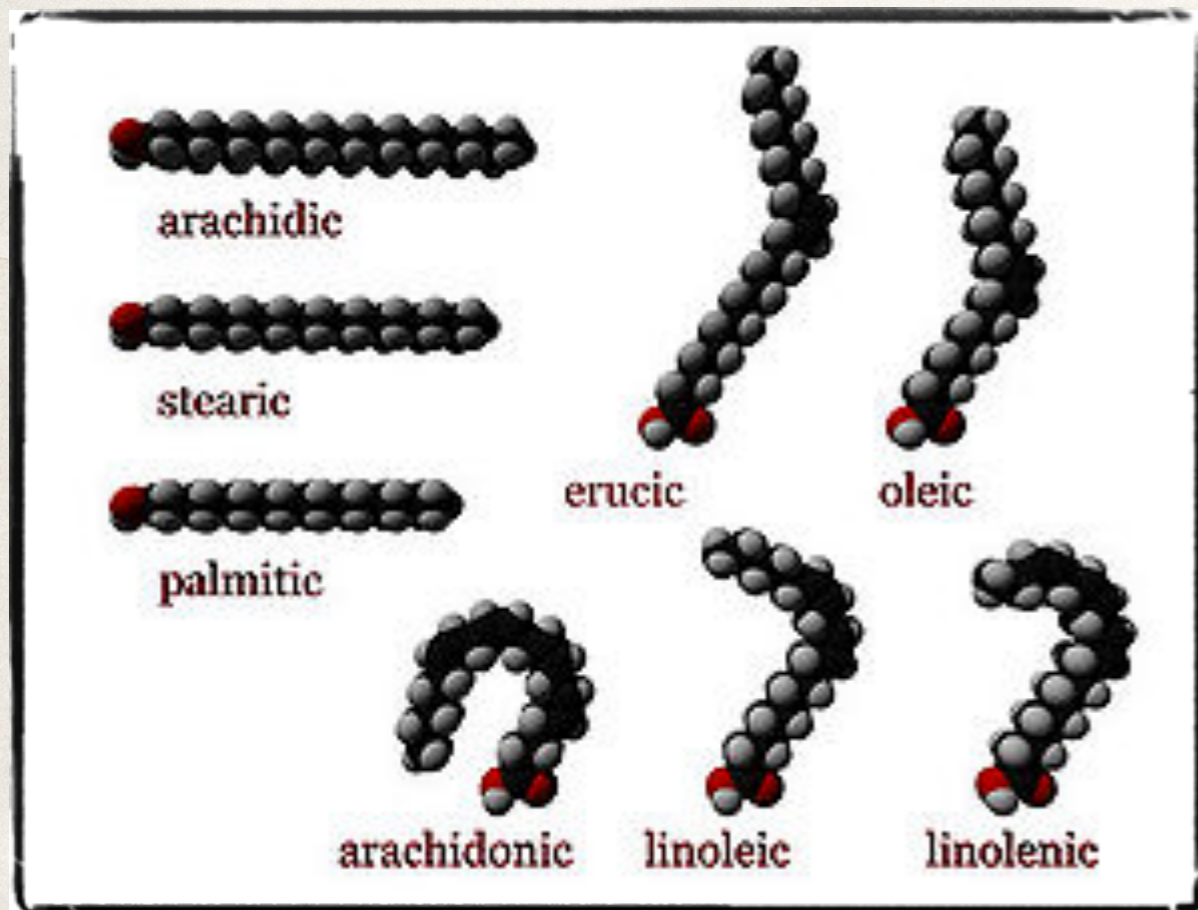
**What about similar molecules ?**

# Similar molecules

- Oils
- Detergents
- Fats
- Amphiphile



# Oils and Fats



- Peanut Oil
- Coconut Oil
- Trans fats
- Omega 3 Fatty Acid

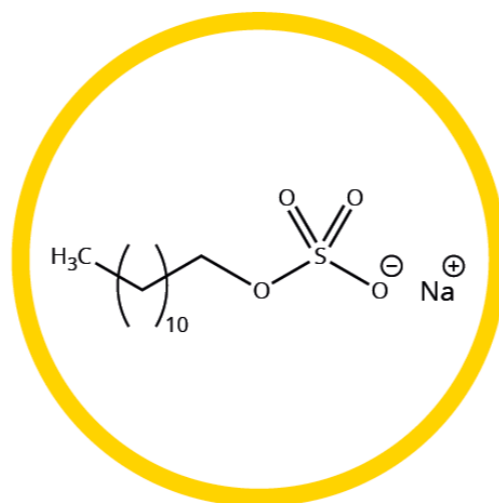


# EVERYDAY COMPOUNDS: SODIUM LAURYL SULFATE

SODIUM LAURYL SULFATE IS A SURFACTANT FOUND IN MANY CLEANING & HYGIENE PRODUCTS, INCLUDING TOOTHPASTE, SHAMPOO, SHAVING CREAM & BUBBLE BATHS

DETERGENT

TOOTHPASTE



**SODIUM  
LAURYL SULFATE**  
*Sodium dodecyl sulfate*  
White powder  
 $\text{CH}_3(\text{CH}_2)_{11}\text{OSO}_3\text{Na}$



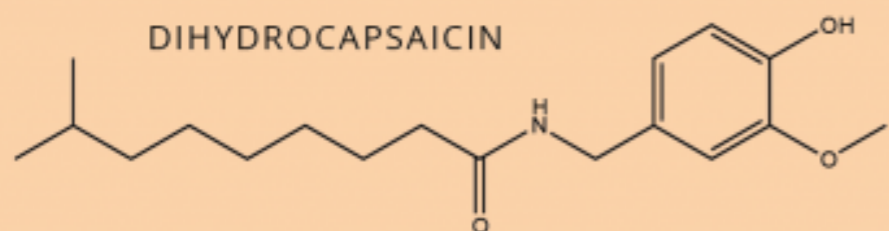
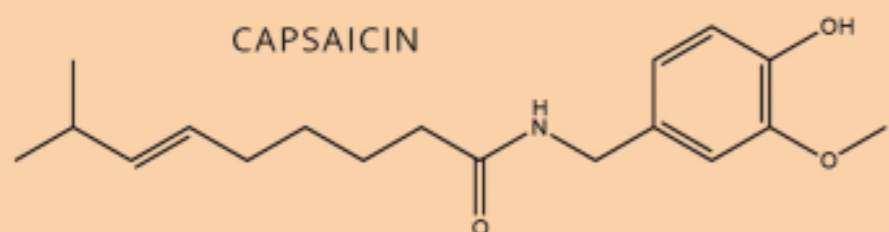
PESTICIDE

POLLUTANT



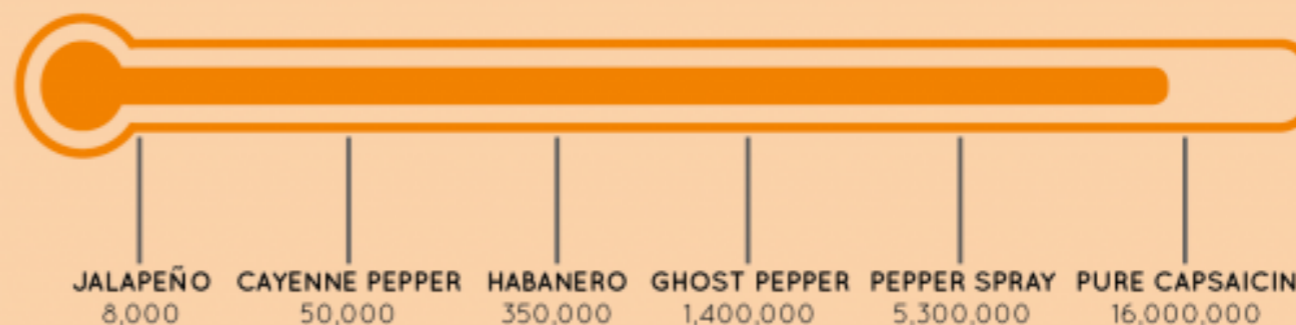
# THE CHEMISTRY OF A CHILLI

## CAPSAICINOIDS



**WHAT WILL DISSOLVE  
CAPSAICIN ?**

## THE SCOVILLE HEAT INDEX



The Scoville scale is a taste detection based method for rating the heat of chilli peppers. A measured amount of pepper extract has sugar added to it incrementally until the heat is undetectable through taste. Though it is an imprecise method, it has been estimated that 1 unit corresponds to 18 $\mu$ M.

# Standing on the Shoulders of Giants ...

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**THANK YOU**

