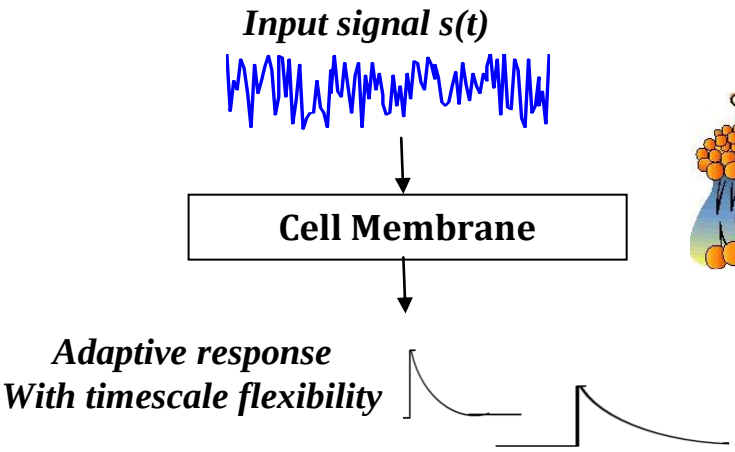
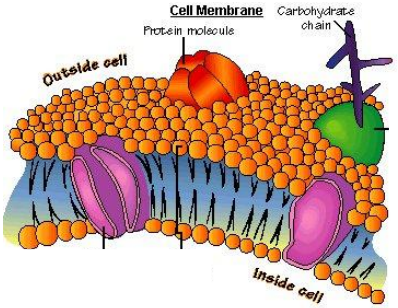
# Timescale flexibility in biological signal-processing




Biological signal processing is a fascinating area of research where we use the tools of signal processing to understand the action of biological systems.
However biological systems are often special and different from the standard ones analyzed in classic signal processing. One important property they have is **timescale flexibility**: they respond with different relaxation times to different input signals. However, we still do not have a good understanding what benefit it brings them.

This project will investigate a simple model for proteins in a cell membrane responding to signals. The model was developed in our lab, and in spite of its simplicity it exhibits **timescale flexibility**. This provides a unique opportunity to study this problem quantitatively in the context of a simple model.

The project will entail:
* Implementing the model computationally.
* synthesizing an array of time-dependent input signals, characterized by different temporal properties, from simple white-noise signals to intermittent chaotic signals.
* Studying the response properties of the model to these input signals.
* Trying to answer the scientific open question: how can one understand, maybe through the formulation of an optimization principle, the evolutionary advantage of timescale flexibility in biological systems?

One semester, with optional extension

*Contact*
Naama Brenner, (04-829) 3578 nbrenner@tx.technion.ac.il