The Lorry I. Lokey Interdisciplinary Center for Life Sciences and Engineering
NETWORK BIOLOGY RESEARCH LABORATORIES

Actin self-organization in hydra regeneration

Background

In tissue morphogenesis a group of cells, which lacks any prior order, self organizes into a well-defined organ system. Mechanical forces, generated by actin stress fibers, participate in tissue morphogenesis from the level of individual cells to whole organism patterning.

Hydra, a small predatory fresh water animal (Fig 1), can regenerate from a condensed aggregate, which is formed by a mixture of completely dissociated cells. Due to hydra remarkable regeneration capabilities, it is used as a relatively simple model system to study the role of mechanics in tissue morphogenesis.

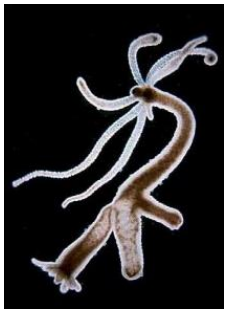

Figure 1: Hydra

Project description

Develop a tool to automatically characterize and quantify actin stress fibers formation and organization throughout hydra regeneration process.

This will be done by image analysis of fluorescently labelled actin images such as in Fig 2.

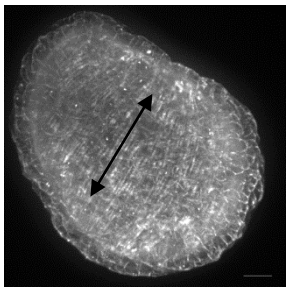

Figure 2: An image of a hydra fragment during the regeneration process, in which the actin is fluorescently labelled. It can be seen that actin fibers are organized and oriented in the direction of the arrow. Scale bar: 100μm

Requirements:

Excellent programing skills in Matlab

Background in image analysis

Interest in biological systems and biophysics

Contact:

Dikla Raz-Ben Aroush, diklar@ph.technion.ac.il