Life Science Forum of Tsinghua University in 2013

Oct 19, 2013

1 Keynote, Xuetao Cao

1.1 Two different classes of scientist

- The leading scientists
- The exploring scientists

2 Wu Wei Lab

2.1 Wnt signaling pathway

Build the reporting system of interaction between beta-catenin and TCF, by fluorescence protein fusion method. Beta-catenin protein is bound with half of GFP and TCF protein is bound with the other half of GFP. Happening the interaction between beta-catenin and TCF, the GFP will be detected using fluorescence microscope.

Using IP method to demonstrate that the cyclic anchor of beta-catenin on TCF.

2.2 Cell cycle

Relation between cell cycle and Wnt signaling pathway. Wnt signaling is very important in S-G2 phase.

3 Meng Anming Lab

The anterior lateral line system is a sensing system of fish. Wnt signaling pathway is important in the leading region, and Fgf signal is essential in the following region.

TGF-beta is responsible for cell differentiation and cell proliferation.

4 Pan Junmin Lab

Cilia / Flagella is responsible for movement of bacteria. Deficiency of Cilia / Flagella will cause a lot of disease.

5 Du Lijun Lab

Berberine is a chemical in plant, and possibly support blood vesicle protecting.

6 Zhou Bin Lab

Huntington Disease results from a copper toxicity and PolyQ. Using Drosophila as a model, the role of two copper transporter has been identified for causing Huntington Disease. P463 Drosophila is a model as a Huntington Disease.

The oligomer sate of the Httexon protein may be responsible for the disease happening. Mutation of the protein from copper binding can prevent the fly from Huntington Disease when fed with copper.

Copper may bind to Httexon and causing it to aggregate to oligomer state.

7 Wang Hongwei Lab

The project focuses on the distinct substrate recruitment pathway. The exosome is involved in RNA maturation. Exosome contains two parts, core domain and Rpn44. Two routes may involved in RNA degradation, through exosome route and direct access route.

After EM, 2D and 3D analysis can be done. Different conformation can be observed between exosome with no RNA and with long strand RNA.

8 Gong Haipeng Lab

They study the formate transporter in FocA. When importing, FocA using active proton symport mechanism.

9 Wang Xinquan Lab

MERS has a fatality of about 50 percent, which is a limited human to human infectious disease.

10 Wu Jiawei Lab

Allosteric AMPK regulation is essential for metabolic homeostasis. Gamma subunit is responsible for allosteric regulation.

This most important question is that how AMPK can sense the difference between ATP and ADP.

11 Yang Maojun Lab

Nickel and cobalt is very important for human being. Import of nickel and cobalt is mainly facilitated by an ECF transporter.

A new method called XANE can be used to detect the environment around the metal ion.

12 Chen Guoqiang Lab

This project focus on a drug on a potential drug agains Alzheimer's Disease. There is an assumption problem of glucose in the brain of an AD patient. HB is a ketone that can prevent the brain. Using the ether form of HB, HBME, may can efficiently prevent from neuron degradation. HBME provides energy and inhibit cell death in deprivation of glucose.

13 Deng Haiteng Lab

It is a proteomics lab. UNG1 is enzyme to cut DNA and initiate DNA repair.

14 Liu Dong Lab

The deprivation of phosphate will great damage the growth of the plant. When the soil lacking phosphate, the plant will secrete some acid to turn the organic phosphate to inorganic phosphate.

Hsp7 exhibits much shorter root and more root hairs than WT in the Pi starvation condition. Hsp7 mutant will secrete lots of acid.

15 Guan Jisong Lab

This lab focuses on memory study.

16 Zhang Rongqin Lab

They use *Pinctada fucata* as model. Matrix protein contains 5 percentage in shells. In vitro expression of pfN44, the protein can be get. PfN44 and the mineral are incubated together, and crystal can be obverses, indicated the association of the protein and the mineral. Beside, with the existence of magnesium ion, pfN44 can inhibit aragonite formation.