Our survey

We surveyed the current situation of Japanese public view on GM, Drosophila and incurable diseases, and obtained the following answers.

-Questionnaires on GM
  Q. What do you imagine from GM?
  A. Top three are DNA (16%) , Clone (15%) , GM foods (14%) .
  Q. If it is labeled, do you buy non-GM foods?
  A. 55% of people tend to buy “non-GM foods” although many people imagined “GM foods” from GM, they have bad feeling on them.

-Questionnaires on Drosophila
  Q. What kind of feeling do you have on fly?
  A. Top three answers are Dirty (34.9%) , Harmful insect (20%) , Unpleasant buzzing (19%) .

-Questionnaires on incurable diseases
  Q. Which one do you think the most incurable disease?
  A. Top 17 choices are Leukemia (473) , Cancer (332) and Parkinson’s disease (296).

The survey proved that a lot of people think leukemia as a typical incurable disease.

4 Parts

We have designed and constructed these Biobrick parts.

- Bba_E0240
  - RBS
  - GFP
  - Term
  - Term

- Bba_K579000
  - NO ATG GFP
  - Bba
  - MEF
  - GFP
  - OK!

- N5!

We improved Bba_E0240 and constructed a plasmid carrying GFP gene without a start codon and registered as a new part (Bba_K579000).

This Biobrick part was designed to fuse GFP to C-terminal regions of any proteins. This part produces the fusion protein by being combined with protein domain, and the produced protein can be visible by expression of GFP. In our projects, we use this plasmid to fuse GFP to dMLF, DIAP2, API2-MALT1 and others to monitor expression of these proteins in E. coli and Drosophila.

- About GFP parts and establishment of the transgenic flies
  We expect the GFP parts can be applied to monitoring blood cells of a leukemia model in Drosophila. We have already confirmed its expression in E. coli, and later we are establishing transgenic flies carrying the GFP transgenes. We will be able to monitor increasing number of blood cells, and also change in their shapes in the transgenic flies. We will be able to monitor increasing number of blood cells, and also change in their shapes in the transgenic flies. The transgenic flies would be useful for genetic screen of novel diagnosis markers of MALT lymphoma and for high throughput screen of candidate drugs for therapy of MALT lymphoma.

5 Results and Application

-GFP-part
  We have carried out the additional experiments to prove that the GFP-part is truly functional. We fused the Maltose binding protein(MBP) and GFP-part by cloning the GFP-part into the pMal-c vector. The transformed bacteria showed GFP signals under the black light and thus we have successfully proved that the GFP-part is truly functional at least in E. coli.

-WdMLF
  Firstly life cycle of Drosophila is only 10 days. Of course it is longer than life cycle of E. coli, but it is much shorter than mouse and human. Secondly, 70% of human genes are shared with Drosophila. So it is suitable to make human disease model.

-In addition there is no ethical restriction in making experiments.

3 Why Leukemia?

Nucleophosmin Chromosomes
MMLF1 Chromosome I
Fusion protein

AP12
MALT1
AP12-MALT1

Insulin pathway is also conserved in Drosophila.

t(3;5)(q25.1;q34) is the frequent chromosomal aberration in myeloid leukemia, producing NPM-hMLF1 fusion protein. Homologue of the hMLF1 exists in Drosophila. The transgenic flies overexpressing Drosophila MLF (dMLF) has been established and successfully used to study in vivo function of dMLF and also screen genes that genetically interact with dMLF.

API2-MALT1

t(11;18)(q21;q21) is the most frequent chromosomal aberration in MALT lymphoma, which produces API2-MALT1 fusion protein causing lymphoma. We are microinjecting API2-MALT1 fusion gene into Drosophila embryos to establish transgenic lines. Once the transgenic lines are established, we will be able to express API2-MALT1 fusion protein in any tissues and any time during development by using GAL4-UAS targeted expression system. The established fly would be useful to develop a novel tool for diagnosis and therapy of MALT lymphoma.

1 Why Mr.D?

There are three advantages in using Mr. D.

Firstly, life cycle of Drosophila is only 10 days. Of course it is longer than life cycle of E. coli, but it is much shorter than mouse and human.

Secondly, 70% of human genes are shared with Drosophila. So it is suitable to make human disease model.

In addition there is no ethical restriction in making experiments.

-About GFP parts and establishment of the transgenic flies
  We expect the GFP parts can be applied to monitoring blood cells of a leukemia model in Drosophila. We have already confirmed its expression in E. coli, and later we are establishing transgenic flies carrying the GFP transgenes. We will be able to monitor increasing number of blood cells, and also change in their shapes in the Drosophila leukemia model. The transgenic flies would be useful for genetic screen of novel diagnosis markers of MALT lymphoma and for high throughput screen of candidate drugs for therapy of MALT lymphoma.

2 Our survey

We surveyed the current situation of Japanese public view on GM, Drosophila and incurable diseases, and obtained the following answers.

-Questionnaires on GM
  Q. What do you imagine from GM?
  A. Top three are DNA (16%) , Clone (15%) , GM foods (14%) .
  Q. If it is labeled, do you buy non-GM foods?
  A. 55% of people tend to buy “non-GM foods” although many people imagined “GM foods” from GM, they have bad feeling on them.

-Questionnaires on Drosophila
  Q. What kind of feeling do you have on fly?
  A. Top three answers are Dirty (34.9%) , Harmful insect (20%) , Unpleasant buzzing (19%) .

-Questionnaires on incurable diseases
  Q. Which one do you think the most incurable disease?
  A. Top 17 choices are Leukemia (473) , Cancer (332) and Parkinson’s disease (296).

The survey proved that a lot of people think leukemia as a typical incurable disease.