Human Practice

We intend to tell the public the development of synthetic biology. Through communicating with various people, we thought that we should bring the following two points into our project.

(1) Simple explanation for the importance of genetic programming

(2) Application of synthetic biology that is familiar to the public

Considering these points, we created the story of “Ninja,” which is famous all over the world. By describing fascinating life of Ninja with E. coli, our project can attract a lot of people. When we design a genetic circuits of Ninja, our project will help general people understand programming of genetic network in synthetic biology.

1. Ninja State Switching

Signal-dependent state change circuit

When we design a genetic circuits of Ninja, our project will help general people understand hormones depending on the soil environment. In the second-life, E. ninja starts farming in a peaceful village.

Crosstalk Circumvention

The key part related to crosstalk, we succeeded in crosstalk circumvention by network engineering (Fig. 1-b).

An improved phosphate sensor

We combined the phoA promoter from E. coli [3] and the GFP part to construct the improved part (BBa_K1139201) (Fig. 3-c).

3. Farming

An improved phosphate sensor

We combined the phoA promoter from E. coli [3] and the GFP part to construct the improved part (BBa_K1139201) (Fig. 3-c).

Flow Mimic state

When E. civilian emits C12HSL and E. ninja receives these molecules, the C12HSL-LasR complex activates Plux. Then LacI starts to be expressed and represses PPl.

2. M13 Shuriken

E. ninja throws “shuriken” to attack E. samurai in response to the signal from E. samurai.

Part collection

We constructed a model system for inducible phage release by induction of g2p expression [2]. We would be able to transmit desired DNA to the desired place by using our parts.

Inducible M13 phage

Main Achievements

1. Circumvention of crosstalk between two intercellular molecules (BBa_K1139110 new part)

2. Part collection of M13 phage (BBa_K1139019, BBa_K1139020, BBa_K1139021)

3. Phosphate dependent expression regulation (BBa_K1139201 improved part)

Attribution

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