Microfluidic & Behavioral Experiments

Month of Grope and Practicing: February-May

The microfluidic chips and our experimental plans were tested during this time. We practiced our skills for microfluidic technology and improved our plans during this time.

Month of Experiments: May-October

After many times' attempts during the February to May, we decided our final plans and do our experiments in these months.

1/5-15/5: the N2 *C. elegans* were sent into the fixing plate using "infundibular method". The flow velocity was 200uL/min totally. The *C. elegans* can be fixed into the channels.

15/5-31/5: the N2 *C. elegans* (after synchronization) were sent into the Gaussian plate using "infundibular method". The flow velocity was 200uL/min while sending the *C. elegans* and 50uL/min when the *C. elegans* were in the chip. There was little bubble in the chip, but the distribution of the *C. elegans* was not Gaussian distribution.

1/6-18/6: we just kept the *C. elegans* and designed the future experiments.

18/6-18/7: kept the *C. elegans* and did the Gaussian plate.

18/7-31/7: we kept the *C. elegans* and did the fixing plate.

1/8-8/20: we got the Odr10::CoChR::GEM-GECO::mCherry *C. elegans*. We did the Gaussian Plate and the immobilization plate.

8/20-9/10: we kept the *C. elegans*.

9/23: we injected the Odr10::CoChR::GEM-GECO::mCherry worms with ATR into the immobilization chip. After about 2 hours the Odr10::CoChR::GEM-GECO::mCherry worms were inactive, then we used lights with different wavelengths and intensities to stimulate them. We found only 480 nm from the projector could active them.

9/24: we did the same experiments as the 9/23 on wild types, we found that the worms could not be active by the light with 480 nm from projector.

9/25: we injected the Odr10::CoChR::GEM-GECO::mCherry C. elegans with ATR into the immobilization chip and fixed the worms. Then we gave the worms the light of 488nm, and we saw the mCherry.

10/6: we can induce the Odr10::CoChR::GEM-GECO::mCherry worms to draw a cycle on the NGM plate.

10/21-10/22: we used different concentrations of the alcohol to train the

Odr10::CoChR::GEM-GECO::mCherry worms. Then we used the alcohol to induce the worms to get close to the alcohol.

10/22-10/30: We did the same experiments as the 10/21-10/22 and did the 3 controls to prove that the Odr10::CoChR::GEM-GECO::mCherry worms were really trained by the alcohol.