Will level of a factor regulating blood cell production increase after the loss of dopaminergic neuron in crayfish?

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Parkinson disease is a chronic neurodegenerative disease in which dopaminergic neurons are destroyed and this will affect the moving of the patient. Millions of people are affected by the Parkinson disease in the world and most of them are over 60 years old, which will seriously impact the living quality of the old people. Many reports have been researching on the disease and people are constantly finding new factors that will affect the symptoms of Parkinson's disease. Recently, a protein called Bv8/Prokineticin 2 has been discovered to be involved in the Parkinson's disease. This protein was found to be increased in the brain of patients with Parkinson's disease and in mice injected with a compound destroying dopaminergic neurons. The prokineticin 2 was also shown to reduce neuronal death, which is the most affected neuron in the Parkinson's disease.

A protein which is similar to Bv8/Prokineticin 2 is also present in the crayfish. In the crayfish, it is called astakine 1. The astakine 1 has been reported with functions in the production of blood cell and the growth of the neuron cells. Therefore, we hypothesized that there might be some relationship between the astakine 1 and dopaminergic neuron loss in the crayfish. We then used a compound (6OHDA), which is widely used to induce the Parkinson-symptoms, to induce dopaminergic neuron loss in crayfish. After 6OHDA injection, levels of astakine 1 in crayfish brain and blood cells were examined by the western blot. In addition, number of blood cells was determined and movement of crayfish was observed.

The results show that there was a large variation in the astakine 1 level between individual crayfish both before and after injection. Therefore, the conclusion cannot be made on the effect of 6OHDA-induced dopaminergic neuron loss on astakine 1 level at the moment, more experiment need to be done in the future. In addition to astakine 1 level, we found that there was no change in blood cell number after injection. Interestingly, the 6OHDA tended to decrease walking speed of the crayfish. However, more experiments need to be done to confirm this result and more crayfish are needed to be able to perform statistical analysis.

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