

Selective Detection of Human & Bird Influenza Virus by Sugar Chain Modified Graphene FET

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Abstract

The bird influenza virus and human influenza virus are selectively detected using the sugar chain modified graphene FET. The bird influenza virus itself is not dangerous and does not infect to the human. However, once the bird flu gets into the body of animals, such as pig, the bird flu changes the structure and gets the human adaptability. So, we should know whether the virus has the human adaptability or not.

The influenza virus attached to the sugar chain of the throat of the human and of the colon of the pig. The structure of each sugar chain is almost similar between them, but the end of the structures is different, i.e., for the human sugar chain, sialic sugar chain is connected to the α 2-6 galactose, and for the bird sugar chain, sialic sugar chain is connected to the α 2-3 galactose. The bird and human influenza virus detect this difference and connect selectively. However, once the bird influenza virus gets the human adaptability, it can connect both the bird sugar chain and the human sugar chain also. In order to know whether the influenza virus has the human adaptability or not, the selective detection of bird & human influenza virus is indispensable.

In order to selectively detect the influenza virus, two types of the graphene FET, one is modified by the human type sugar chain, the other is modified by the bird's sugar chain, are prepared as shown in Fig.1. The measurement system is shown in Fig.2. For the purpose of the safety, the pseudoinfluenza virus, such as Lectin was used.

Figure 3 shows the selective detection of the pseudoinfluenza virus. SSA is the Lectin for the pseudoinfluenza virus, the MAM for the pseudobird influenza virus, and BSA is completely non-target protein. In Fig.3, the pseudoinfluenza virus can be selectively caught by the human-type sugar chain and modified the current of the graphene FET, that means the selective detection of the pseudoinfluenza virus. Fig. 4 shows the selective detection of pseudobird influenza virus by the bird-type sugar chain modified graphene FET.

Thus, we have succeeded in the selective detection of human type and bird type influenza virus by the sugar chain modified graphene FET.

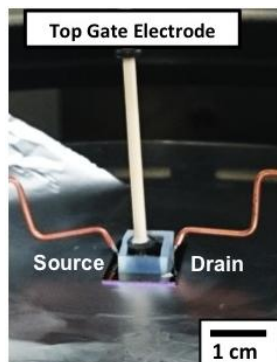
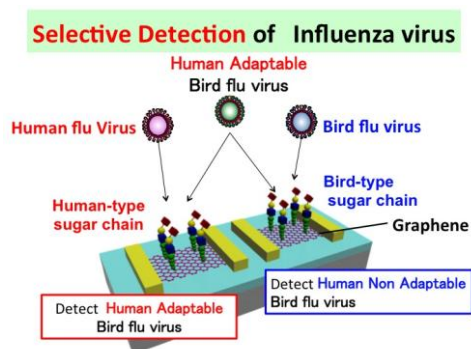


Fig.1, Sugar chain modified graphene FET for the selective detection of Bird Flu and Human Flu.

Fig.2, Measurement system.

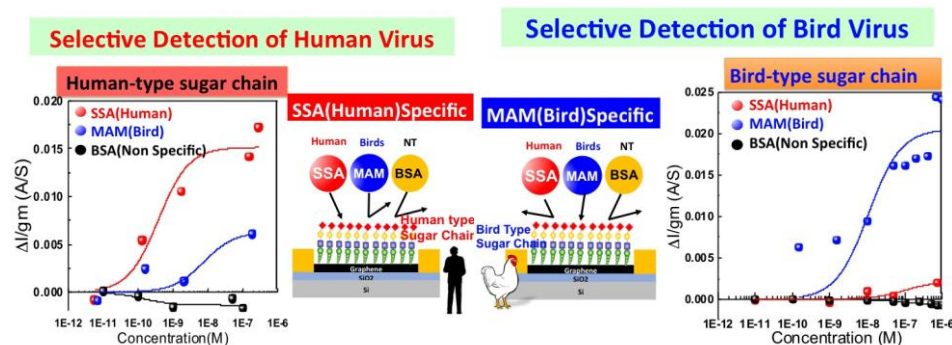


Fig.3, Selective detection of Pseudo Human Flu virus by human sugar chain.

Fig.4, Selective detection of Pseudo Bird Flu virus by bird sugar chain.

