

Reference: 06/PC

**Project: Production and characterisation of avian influenza H1 to H18 recombinant haemagglutinin proteins in Drosophila S2 cells for the development of rapid diagnostic tests**

**Supervisor: Pengxiang Chang      Co-Supervisor: Munir Iqbal**

**Research Group: Avian influenza virus group**

**Project Summary:**

Influenza A virus is classified based on the antigenic difference in the surface glycoproteins haemagglutinin (HA) and neuraminidase (NA). Currently, there are 18 types of HA (H1-H18), of which H17 and H18 type influenza viruses are only found in bats. The haemagglutination-inhibition (HI) assay is a classical laboratory procedure to determine the antibody response of the host post influenza virus infection. However, influenza virus for the HI assay requires class II or even higher grade biological safety cabinet. Therefore, a substitution of influenza virus, which can be handled outside of the hood, is urgently needed. Here, we propose to express the recombinant HA protein in S2 cells so that it can be handled out of the safety cabinet. In addition to the HI assay, these HA proteins produced can be widely used as control for the ELISA and lateral flow device we are currently working on. Furthermore, the recombinant HA proteins will be a great resource to share with our collaborators.

**Details:**

We propose to express the recombinant HA of H1-H18 in Drosophila S2 cells for the development of rapid diagnostic tests. We have established ExpreS2 recombinant protein expression and purification platform. The detailed work will be as follows:

1. Synthesis of H1-H18 HA and sub-cloning into ExpreS2 expression plasmid
2. Establishment of S2 cell line stably expressing HA protein by antibiotic selection
3. Collection and purification of recombinant HA proteins
4. Characterisation of HA proteins

**References for Suggested Reading:**

- Secretory expression of all 16 subtypes of the hemagglutinin 1 protein of influenza A virus in insect cells. <https://www.ncbi.nlm.nih.gov/pubmed/21827791>