

## A Brief Note on Hemagglutinin and Influenza Virus

Damsky Soria\*

Department of Medicine, Amur State University, Amur Oblast, Russia

### DESCRIPTION

Hemagglutinin (HA) performs a crucial function within the first step of Influenza Virus (IFV) contamination as it initiates the binding of the virus to the sialylgalactose linkages of the receptors at the host cells. Here that a HA-binding peptide immobilized on a stable help to bind to HA and IFV. Hemagglutinin is a set of normal glycoproteins that purpose red blood cells (erythrocytes) to agglutinate, or clump together. These materials are determined in plants, invertebrates and gram positive microorganisms. Among the best characterized hemagglutinins are those who arise as antigens (overseas proteins that stimulate the manufacturing of antibodies) on viruses within the own circle of relatives Orthomyxoviridae, which incorporates the influenza viruses, and the own circle of relatives Paramyxoviridae, which incorporates some of pathogenic viruses, along with those who purpose measles. Outbreaks of influenza because of influenza A viruses have endured to arise in birds and mammals along with humans. Each year, seasonal influenza virus infects as much as one hundred million human beings worldwide, inflicting critical contamination in three to five million human beings and 250,000–500,000 deaths. Previous study at the antigenic version of influenza viruses have indicated that they have been persevering with to go through evolutionary changes. All of the subtypes of influenza A virus had been detected within the wild water avian reservoir.

### Hemagglutinin glycoprotein structure

Influenza A virus, a member of the Orthomyxoviridae own circle of relatives, has a round length of approximately one hundred nm in diameter. It is composed of a lipid bilayer that's derived from the host plasma membrane, enveloping the Ribonucleo Protein (RNP) complicated together with 8 single-stranded RNA (ssRNA) segments in complicated with polymerase proteins (PB1, PB2 and PA) and Nucleoprotein (NP). The 8 ssRNA segments encode 12 viral proteins. The envelope-related

proteins, Hemagglutinin (HA) and Neuraminidase (NA) are inserted into the lipid bilayer as spikes. M1 matrix protein is concerned in nuclear export and exists underneath the lipid bilayer. M2 proton ion channel is embedded with-in the lipid bilayer and is concerned in pH maintenance. Avian influenza viruses are maintained some of the herbal host birds however on uncommon activities pass species to contaminate exceptional animal hosts. In humans, who have no immunity, such an influenza virus of animal starting place can cause a pandemic, commonly ensuring in tremendous contamination, a massive deaths, disruption of social existence and monetary losses.

The presence of hemagglutinin on influenza viruses permits the viruses to bind to sialic acid at the surfaces of cells in host animals. This binding allows host contamination, thereby contributing to the virulence of the viruses. A comparable mechanism is assumed to make a contribution to the infectious nature of measles virus. Viral hemagglutinin stimulates the manufacturing of antibodies via way of means of the host's immune system. These antibodies bind to a part of the hemagglutinin antigen referred to as an epitope, thereby tagging the virus for immune destruction. In the case of influenza viruses, mutations withinside the genes encoding hemagglutinin can supply upward push to new epitopes that allow the viruses to get away antibody recognition. These mutations can also additionally end result from antigenic drift or antigenic shift. These could supply upward push to influenza viruses able to inflicting epidemics or pandemics. There are sixteen types of hemagglutinin, certain H1 through H16, related to influenza A viruses. Together with diverse types of a viral antigenic protein referred to as neuraminidase, hemagglutinin is used to differentiate among subtypes of Influenza A viruses (example: H1N1, H5N1). Antibodies to viruses that own hemagglutinin antigens may be detected through a hemagglutinin-inhibition test. If someone is sporting such antibodies the agglutination of red blood cells may be prevented.

**Correspondence to:** Damsky Soria, Department of Medicine, Amur State University, Amur Oblast, Russia, E-mail: soria@Dam.edu.ru

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