

Glycobiology Conference 2017: Determinant of receptor-preference switch in influenza hemagglutinin - Qinghua Wang - Baylor College of Medicine

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Hemagglutinin (HA) is one of the two major glycoproteins on the surface of influenza virus. One main function of HA is to selectively bind to sialic-acid receptors on host cells to trigger viral entry by endocytosis. There are two types of sialic-acid receptors that HA recognize: $\alpha(2, 3)$ -linked avian-like receptors and $\alpha(2, 6)$ -linked humans-like receptors. Frequently, a small number of substitutions in HA would endorse a switch in receptorbinding specificity from avian-like to human-like receptors, thus allowing cross-species transmission. In biology, hemagglutinin or haemagglutinin are glycoproteins which cause red blood cells (RBCs) to agglutinate or clump together. (Note that agglutination is one among three steps within the more complex process of coagulation.) The method of the RBC's agglutinating is named hemagglutination or haemagglutination. Antibodies and lectins are commonly known hemagglutinins. Hemagglutination are often wont to identify RBC surface antigens (with known antibodies) or to screen for antibodies (with RBCs with known surface antigens). Using anti-A and anti-B antibodies that bind specifically to either the A or to the B blood type surface antigens on RBCs it's possible to check alittle sample of blood and determine the ABO blood type (or blood type) of a private . The bedside card method of blood type ing relies on visual agglutination to work out a person's blood group. The cardboard board has dried blood type antibody reagents fixed onto its surface and a drop of the individual's blood is placed on each area on the card. The presence or absence of visual agglutination enables a fast and

convenient method of determining the ABO and Rhesus status of the individual. Flu viruses travel through the air in droplets when someone with the infection coughs, sneezes or talks. you'll inhale the droplets directly, otherwise you can devour the germs from an object — like a telephone or keypad — then transfer them to your eyes, nose or mouth. People with the virus are likely contagious from the day approximately before symptoms first appear until about five days after symptoms begin. Children and other people with weakened immune systems could also be contagious for a rather longer time. Influenza viruses are constantly changing, with new strains appearing regularly. If you've had influenza within the past, your body has already made antibodies to fight that specific strain of the virus. If future influenza viruses are almost like those you've encountered before, either by having the disease or by getting vaccinated, those antibodies may prevent infection or lessen its severity. But antibodies against flu viruses you've encountered within the past can't protect you from new influenza strains which will be very different immunologically from what you had before. The Centers for Disease Control and Prevention (CDC) recommends annual flu vaccination for everybody age 6 months or older. Each year's seasonal flu vaccine contains protection from the three or four influenza viruses that are expected to be the foremost common during that year's flu season. This year, the vaccine are going to be available as an injection and as a nasal spray. In recent years, there was concern that the nasal spray vaccine wasn't effective enough against certain sorts of flu. However, the nasal spray vaccine is predicted to be effective within the

2019-2020 season. The nasal spray still isn't recommended for a few groups, like pregnant women, children between 2 and 4 years old with asthma or wheezing, and organelles other people who have compromised immune systems. Most sorts of flu vaccines contain a little amount of egg protein. If you've got a light egg allergy — you get hives only from eating eggs, for instance — you'll receive the flu shot with none additional precautions. If you've got a severe egg allergy, you ought to be vaccinated during a medical setting and be supervised by a doctor who is in a position to acknowledge and manage severe allergic conditions. Another key difference between influenza A and B? While influenza B viruses are typically less common than influenza A viruses, influenza B infections are often more severe in children, and may cause complications that need hospitalization or death. Symptoms usually appear from one to four days after exposure to the virus, and that they last five to seven days. For people who've had a flu shot, the symptoms may last a shorter amount of your time, or be less severe. For people, the symptoms may last longer. Even when symptoms resolve, you'll still feel fatigued. These are available from drug stores. In severe cases, a doctor may prescribe a course of antiviral drugs. Oseltamivir (Tamiflu) and zanamivir (Relenza) are drugs that doctors may use to treat A or B influenza. The simplest overall flu medicine would be NyQuil and DayQuil severe combo caplets. This combo pack contains ingredients that focus on multiple symptoms of fever, pain, and cough. The DayQuil capsule contains a strong expectorant ingredient which will relax your mucus to decrease cough and congestion. Call your doctor if your temperature is 103 F (39.4 C) or higher. Seek immediate medical attention if any of those signs or symptoms accompanies a fever: Severe headache. Unusual rash, especially if the rash rapidly worsens. A replacement study shows that Gatorade was as effective as Pedialyte at rehydrating and easing diarrhea in children with viral gastroenteritis. Sometimes called the "stomach flu," viral gastroenteritis is caused by an

epidemic which will trigger diarrhea and/or vomiting and typically improves by itself within every week. If you're vomiting, try these tips: Take an opportunity from solid food, albeit you are feeling like eating. Stay hydrated by sucking on ice chips or frozen fruit pops. Try drinking sips of water, weak tea, and clear soft drinks without carbonation, noncaffeinated sports drinks, or broth. Once you vomit, stomach acids are coming in touch together with your teeth and coating them, he says. "If you sweep timely, you're just rubbing that acid everywhere the hard outer shell of your teeth." Instead, swish with water, a diluted mouth rinse or a mix of water and 1 tsp. bicarbonate of soda to assist wash the acid away. However, the set of residues required for such a receptor-binding specificity switch differs among various subtypes of influenza type A virus. In my talk, I will discuss the results of our most recent study in understanding the underlying principles of this process.

Biography

Qinghua Wang has her expertise in Structural Biology with a focus on mechanistic studies of actin-mediated signal transduction. She has pioneered a novel double-mutant strategy that for the first time allowed the capture of stable actin nuclei for structural studies. By applying this novel strategy, she has elucidated the molecular mechanisms of mammalian tandem-actin-binding nucleators.

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