



Inhibiting pathogen transport and infection using compositions and antibodies capable of trapping pathogens in mucus.



Sub-neutralization doses of antibodies to neutralizing epitopes of pathogens can be effective at inhibiting infection. Further, use of antibodies to non-neutralizing epitopes of pathogens can also be effective at inhibiting infection. Having an antibody that selectively binds a conserved epitope of a target pathogen preserves efficacy of the antibody against new strains of the pathogen.

Benefits

Target pathogens can be viruses or bacteria. Viral pathogens include some common viruses such as influenza, HSV, HPV, viral hepatitis, HIV, molluscum contagiosum virus (MCV), SARS, respiratory syncytial virus (RSV), parainfluenza, adenovirus, human rhinovirus, and norovirus. Bacterial pathogens include *Salmonella*, chlamydia, gonorrhoea, chancroid, granuloma inguinale, syphilis, and *E. Coli*. In some embodiments, the composition specifically binds sperm, providing potential utility as birth control.

Determining a sub-neutralization dose effective in trapping target pathogens in mucus allows for a dosage lower than that which would be needed to achieve effective neutralization, thereby reducing the risk for multidrug resistance.



For More Information

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The Technology

It was previously assumed that neutralization was the primary mechanism of protection at mucosal surfaces. Antibodies that are found in mucus are slowed only slightly by weak, transient adhesive interactions with the mucus. The rapid diffusion of these mucosal antibodies accumulate rapidly on pathogen surfaces; when a plurality of antibodies have accumulated, the adhesive interactions between the antibodies and mucus are sufficient to trap the bound pathogen in the mucus and prevent infection. While infection is not entirely eliminated in all cases, the chance of infection moving through mucus and beyond the mucus membrane is reduced from 1%-100%.

A purified antibody, having a unique glycosylation pattern/unique oligosaccharide component designed to enhance trapping potency of the antibody once a plurality has bound the target pathogen, without hindering unbound antibodies from diffusing readily through the mucus to bind target pathogens. As well, a device for administering the antibody and/or an antimicrobial has been developed. Each "kit" can specifically bind to a different epitope of the target pathogen, or can include multiple antibodies and/or compositions containing such antibodies.

Pharmaceutical compositions of the antibodies can be formulated for administration not limited to topical, oral, anal, or vaginal administration. Usage of these sub-neutralization doses of antibodies reduces the risk of an infection spreading, while also reducing the risk of antibiotic-resistant or multidrug resistant strains.

Opportunity

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