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ABSTRACT | Andrea Parisi

Title

Role of age-different immune response in the development of antigenic drifts

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Abstract

Human Influenza A is characterized by 16 different subtypes, defined by the antigenicity of the corresponding Hemmaglutinin protein which is recognized by the host immune system. The hemmaglutinine protein has five antigenic sites which can be recognized by the immune system. When a human host immunized by a certain strain of influenza is infected by a new influenza virus, the immune system is able to promptly respond to the aggression provided the virus presents only a few mutations with respect to the previous immunizing strain. In general a number of mutations is necessary in more than one antigenic site in order for the immune system not to be able to recognize the virus. So, on the one hand immune escape is possible when a number of mutations occur; on the other hand, any new mutation of an infecting virus will still be recognized by the immune system and will hardly survive in the host. Hence the mechanism through which new influenza strains can escape the immune response and spread, leading to the occurrence of an antigenic drift is still not understood. Here we propose a possible origin for such mechanism. Some studies have underlined the fact that the immune response of adult individuals is more developed than that of young individuals. In particular, young humans with age up to a few years, show a high degree of specificity in their immune response. We explore the interplay of an age-dependent immune response in humans, and we show how this can lead to interesting epidemic time-patterns with synchronized subsequent epidemics of mutants in both the adult's and children populations.