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Science

Evaluation of Ectopic Expression of APOBEC Cytidine Deaminases in an Avian Cell Line as an Antiviral Mechanism

Cytidine deaminases are members of a class of enzymes that modify nucleic acids. The APOBEC cytidine deaminases were identified with the discovery of Apolipoprotein B mRNA-editing enzyme catalytic polypeptide 1 (APOBEC1). APOBEC 1 is expressed in the small intestine, and modifies the Apolipoprotein B mRNA to produce a truncated apolipoprotein B product. APOBEC2 and numerous APOBEC3s (APOBEC3 A-H) were then discovered: APOBEC3G has been of interest because it demonstrates antiviral properties by inducing hypermutation resulting in a nonfunctional viral particle. More recently, a homologous protein was discovered: Activation-Induced-Deaminase (AID). Unlike mammals, avians only have demonstrated Apobec-2 and AID expression. It is possible that this is why avians are plagued with numerous endogenous retroviruses, and serve as a reservoir for many other viruses that become of increasing concern each year. This may also be the reason that some viruses propagated in non-avian cells become altered in a manner unsuitable for use such as in vaccine production: the viruses have become altered by APOBECs. This project will focus upon expressing this antiviral mechanism to avian cell lines and determining its effectiveness in preventing or altering viral pathogenesis from naive (avian) pathogens.



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