

The Structural Basis for Macaque Fc A Receptor (CD89) Activation by Iga Fc

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Rhesus macaques (RM), *Macacca mulatta*, are one of the main nonhuman primate models for the testing of vaccines and antibody-based therapeutics. But even given their close evolutionary proximity to humans have significant differences in immune function. One key difference is with respect to IgA. Macaques have one IgA isoform that can exist as monomeric IgA (IgA), dimeric IgA with the addition of the joining chain (dIgA), polymeric IgA (pIgA), and secretory IgA (SIgA) with the further addition of the secretory component.

Humans have two isoforms, IgA1 and IgA2, which can also exist in multiple forms. These differences potentially impact immune responses. Vaccine elicited SIV and HIV envelope-specific IgA responses have been shown to be protective against SIV and SHIV challenge in macaques. In contrast, the RV144 vaccine trial in humans, the only vaccine trial against HIV-1 to show efficacy, indicated that high levels of vaccine induced antigen specific serum IgA enhanced the risk of infection. Here we describe molecular basis of the interaction of macaque Fc α receptor (CD89) with macaque IgA to describe differences in the IgA function between human and RM. These data provide insight into the interspecies difference in the protective function of the IgA immune response with respect to HIV-1.