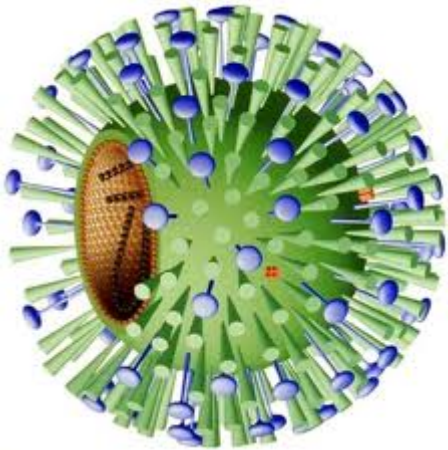


Characterization of pandemic influenza immune memory after vaccination or infection



Influenza A infection is still a major infectious disease that has appreciable morbidity and mortality as evidenced during the pandemic in 2009. Furthermore antibody responses acquired after natural infection or seasonal vaccination do not confer long-time protection against all strains because of the high seasonal-virus variability. In addition, cellular immunity recognizes conserved regions of influenza proteins and is reported to play a role in reducing morbidity from influenza infection. To gain a better understanding of the extent of immunity conferred following vaccination or infection in order to improve future vaccine design, this study examined and compared the level of persistence of antibody and cellular memory responses both to influenza A(H1N1)pdm09 vaccination and to pandemic infection, either mild or severe. In 2009, the influenza pandemic produced disease that ranged from mild to fatal, which resulted in vaccination of a portion of the population with the adjuvanted, inactivated influenza A(H1N1)pdm09 vaccine. This quantitative and qualitative study therefore compared adaptive immune memory to influenza A (H1N1) one year after this pandemic comparing cases of mild or severe infection or vaccination. The results showed that one

year after antigen encounter, severely ill subjects maintained high levels of humoral and polyfunctional effector/memory CD4+ T cells responses, while mildly ill and vaccinated subjects retained strong cellular immunity, as indicated by high levels of mucosal homing and degranulation markers on IFN- γ + antigen-specific T cells. Thus providing evidence that there are substantial similarities between the antiinfluenza response that mildly ill and vaccinated individuals develop and that this immune memory signature is different from that seen in severely ill individuals. Having a better understanding of these difference will help with future vaccine design.

[Bonduelle, O. et al. 2014. Characterization of pandemic influenza immune memory signature after vaccination or infection. *The Journal of Clinical Investigation.*](#)