HLA FUNCTIONAL DIVERSITY AND HIV

As a simple evolutionary rule, the higher an individual's heterozygosity, the better! In particular, HLA heterozygosity is linked to better outcomes of HIV infection, possibly because it allows the immune system to present a wider range of HIV-related elements to fight the virus. However, not all combinations of gene versions are equally effective in presenting these elements. Viard et al. (1) moved forward and created a measure called "functional divergence" to quantify how well different combinations of gene versions work together in presenting viral elements. They found that greater functional divergence in certain combinations was associated with slower progression to AIDS and better control of viral load. This measure predicts the effectiveness of the immune response at the level of specific viral elements, rather than just looking at the overall diversity of the genes.

The findings might also have implications for responses to other infections, vaccinations, immunotherapy, and other diseases where having diverse gene versions provides an advantage.

1. https://www.science.org/doi/10.1126/science.adk0777