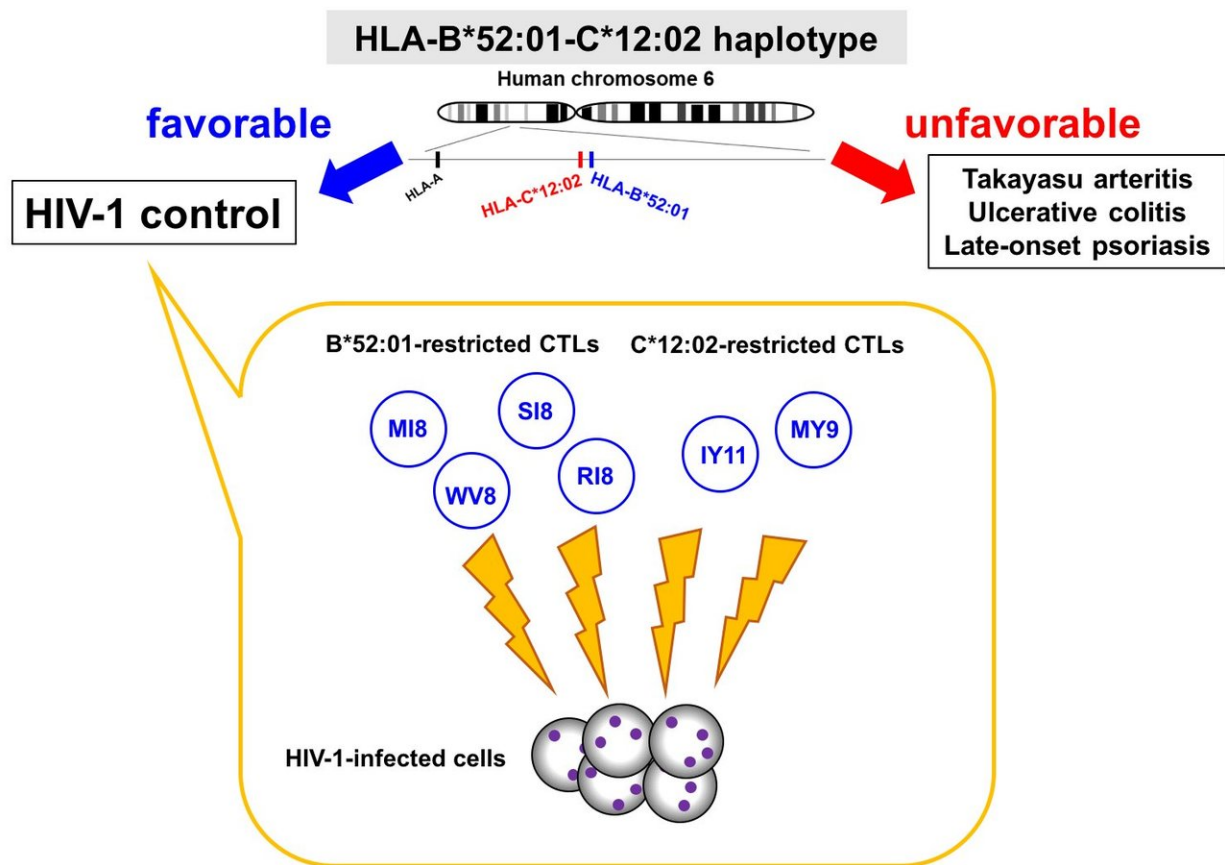


# HIV-1 regulation via protective human leukocyte antigen (HLA) haplotypes

December 13 2017



The HLA-B\*52:01 and -C\*12:02-restricted CTLs strongly suppress HIV-1 replication resulting in slower disease progression. In contrast, the HLA-B\*52:01-C\*12:02 haplotypes are susceptible to autoimmune diseases. Credit: Professor Masafumi Takiguchi

Twenty percent of the Japanese population have a group of genes inherited from a single parent (haplotype) that, while connected to ulcerative colitis and Takayasu arteritis, is known to be protective against HIV-1.

Researchers from the Center for AIDS Research at Kumamoto University previously found that HLA-B\*52:01 and -C\*12:02 haplotypes associate with lower plasma viral loads (pVL) and higher CD4 counts than patients with neither haplotype and that HLA-B\*52:01 can suppress HIV-1 replication by producing HIV-1-specific cytotoxic T lymphocytes (CTLs). However, direct evidence of HLA-C alleles and their related CTLs controlling HIV-1 have remained obscured until now.

In a previous study of natural killer (NK) cells, the Kumamoto researchers found that HIV-1 infected patients with a combination of HLA-C\*12:02 and KIR2LD2 (a receptor for HLA-C\*12:02) had a lower pVL than patients with just one or neither of those immunological constituents. They indicated that, like HLA-B, the HLA-C group also plays a part in regulating HIV-1. However, due to the strong linkage between the two alleles, distinguishing which of the two effects the HIV-1 virus has been difficult to determine.

To overcome this problem, the researchers searched for particular parts (T cell epitopes) of antigens to determine which produced the strongest [immune response](#) to the HLA-C\*12:02 haplotype. In a population of HIV-1 infected Japanese HLA-C\*12:02 carriers, they were able to identify Nef MY9 and Pol IY11 as immunodominant epitopes, thereby showing that HLA-C supplements HLA-B's control of HIV-1 in infected individuals.

"Unfortunately, this haplotype is associated with several other diseases in the Japanese population," said Professor Masafumi Takiguchi, leader of the research project. "Though they can evidently control HIV-1, they

may also cause other autoimmune diseases or even allergies when the immune response is too strong. Even so, this study adds a piece to the AIDS research knowledge puzzle."

**More information:** Takayuki Chikata et al, Control of HIV-1 by an HLA-B\*52:01-C\*12:02 Protective Haplotype, *The Journal of Infectious Diseases* (2017). [DOI: 10.1093/infdis/jix483](https://doi.org/10.1093/infdis/jix483)

Provided by Kumamoto University

Citation: HIV-1 regulation via protective human leukocyte antigen (HLA) haplotypes (2017, December 13) retrieved 3 May 2024 from <https://medicalxpress.com/news/2017-12-hiv-human-leukocyte-antigen-hla.html>

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