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TINY variants in a protein that alerts the body to infection could explain how one in 300 HIV-infected people are able to resist the onset of AIDS for years without needing any treatment, researchers said.

"HIV is slowly revealing its secrets... Knowing how an effective immune response against HIV is generated is an important step toward replicating that response with a vaccine," said Bruce Walker, co-senior author of a study said.

"We have a long way to go before translating this into a treatment for infected patients and a vaccine to prevent infection, but we are an important step closer," added the director of the Ragon Institute of Massachusetts General Hospital.

For nearly 20 years, doctors have known that a small minority of HIV-infected individuals — about one in 300 — are naturally able to suppress viral replication with their immune system, keeping viral load at extremely low levels.

"We found that, of the

three billion nucleotides in the human genome, just a handful make the difference between those who can stay healthy in spite of

HIV infection and those who, without treatment, will develop AIDS," said Walker.

"Understanding where this difference occurs allows us to sharpen the

Why some sufferers resistant

focus of our efforts to ultimately harness the immune system to defend against HIV," he added in the study published in *Science* magazine.

Researchers led by Ragon Institute's Florencia Pereyra enrolled 3,500 individuals in clinics around the world, including 2,500 with progressive

HIV infection and 1,000 controllers — HIV infected people resistant to AIDS. Through a genome-wide association study, which tests variations at a million points in the human genome, the researchers identified some 300 sites that were statistically associated with immune control of HIV.

The sites were all in regions of chromosome 6 that code for so-called HLA proteins.

Without fully sequencing that genome region, which was unfeasible given the number of participants, the researchers developed a process that pinpointed specific amino acids that have a key role in viral control.

Further testing linked differences in five amino acids in the HLA-B protein to viral control mechanisms.

"Our work demonstrates that these variants could make a crucial difference in the individual's ability to control HIV by changing how HLA-B presents peptides from this virus to the immune system," said Walker. — AFP