Eradication of HIV by T cell immunotherapy

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Baylor College of Medicine

HOUSTON HEALTH DEPARTMENT

Why We Did this Study

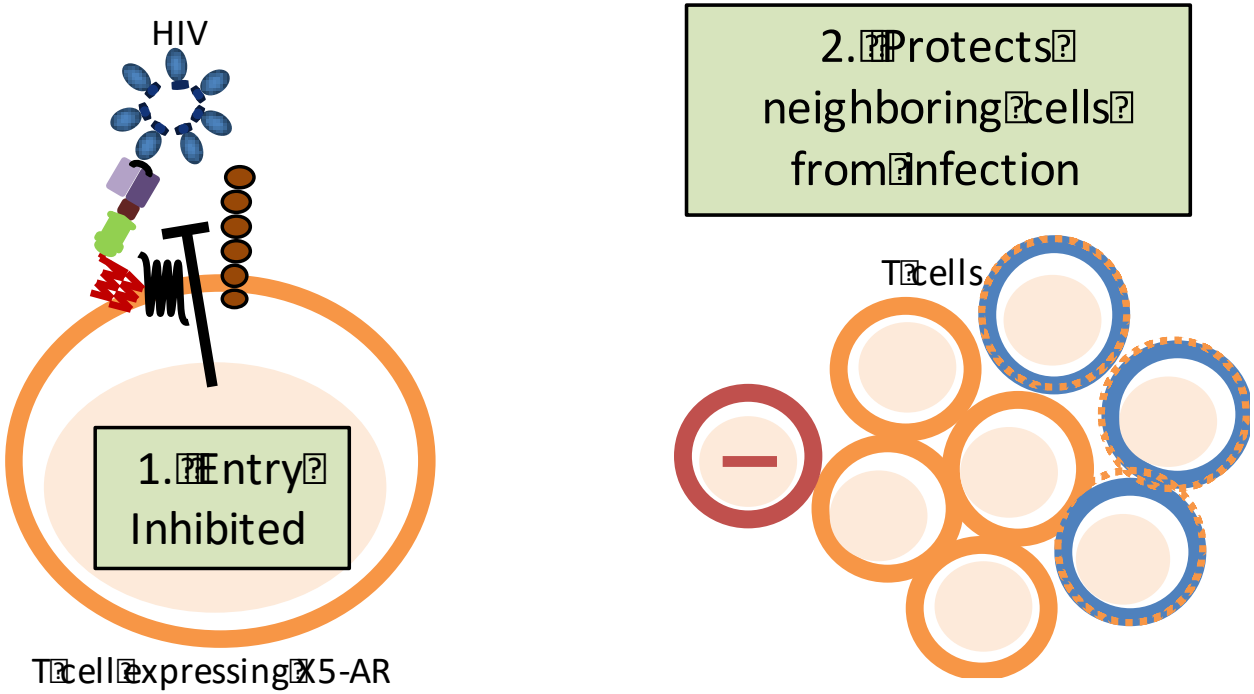
- The Problem: Antiretroviral therapy inhibits HIV replication and drives down the level of virus in the body, but does not cure infection.
- The Reason: HIV can persist in CD4+ T cells in a silent state, or in protected sites within the body, and escapes the host immune response.
- The Question: How can we help improve the immune response against HIV?
- The Idea: Create HIV-specific killer T cells (CD4+ and CD8+) capable of preventing HIV infection and destroying the infected cells.

What We Did

- We developed a cell-associated HIV inhibitor that can protect CD4+ T cells from infection
- Developed a method to expand HIV-specific killer T cells from infected individuals
- Used the inhibitor to genetically modify HIV-specific killer T cells
- Examined the ability of these killer cells to eradicate HIV infected cells

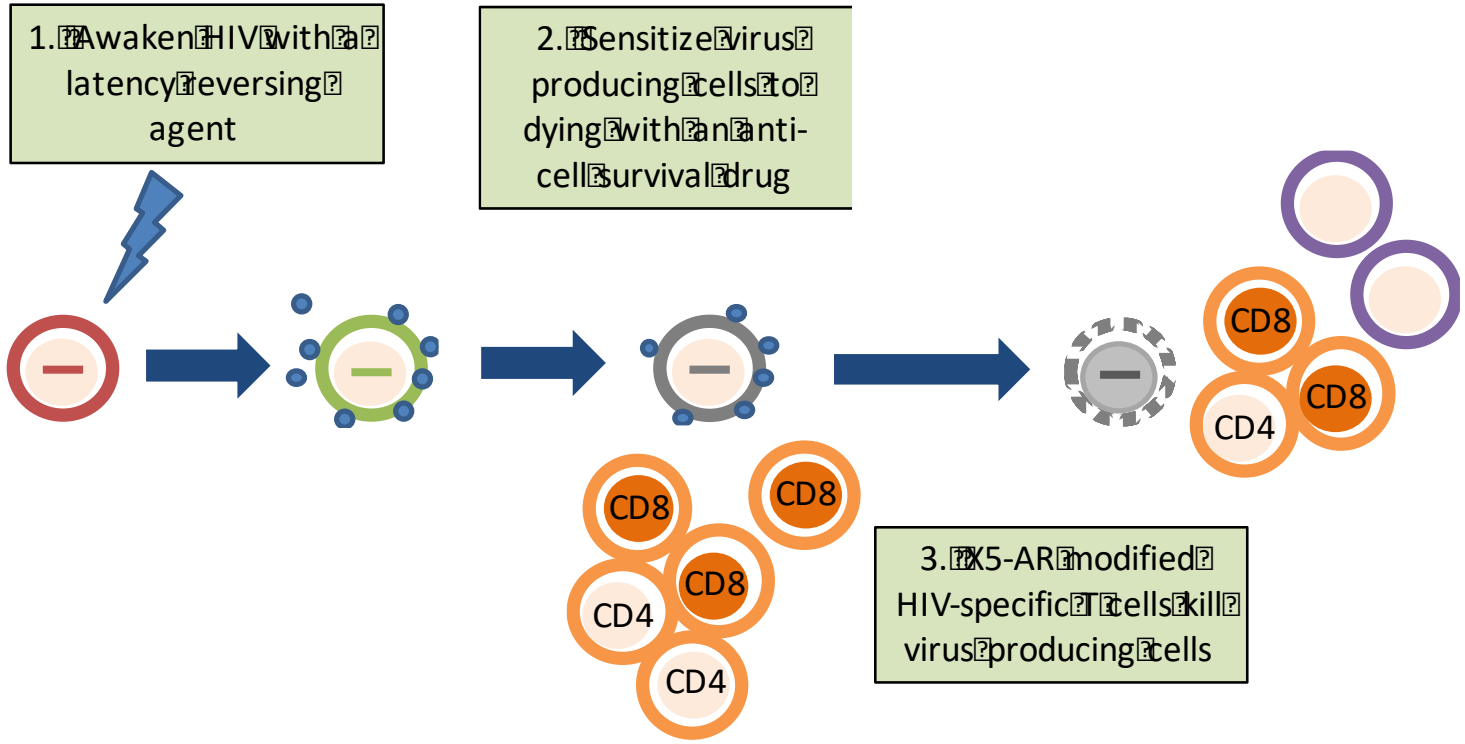
What We Found

I. Potent inhibition of HIV infection by a cell-anchored inhibitor



What We Found

II. Eradication of HIV-infected cells



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What Our Results Mean and Why this Matters

- It is possible to overcome the resistance of HIV-producing cells to killer T cells by combining the activities of:
  - i) an anti-cancer drug that prevents cell survival, and primes HIV-producing cells to die
  - ii) genetically-modified HIV-killer T cells
- Immune restoration with genetically modified HIV-specific killer T cells may be a feasible way to eliminate infected cells, even in the absence of antiretroviral therapy.

Acknowledgments

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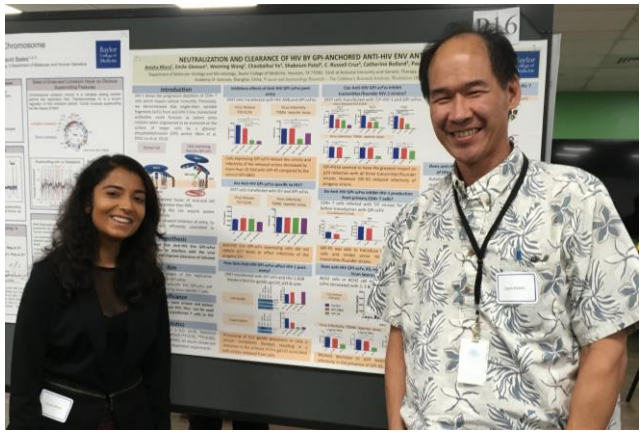

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