

Synthetic molecules may boost immunity against HIV

Scientists have developed synthetic molecules that could boost our immunity against HIV and HIV-infected cells as well as prostate cancer cells.

Their findings potentially open the way to novel therapeutic approaches for the treatment of these diseases.

HIV is a global pandemic that affects 33 million people worldwide, while prostate cancer is the second leading cause of cancer-related death among American males.

These molecules, called 'antibody-recruiting molecule targeting HIV' (ARM-H) and 'antibody-recruiting molecule targeting prostate cancer' (ARM-P), bind simultaneously to an antibody present in the blood and to proteins on HIV, HIV-infected cells or cancer cells.

By coating these pathogens in antibodies, the molecules flag them as a threat and trigger the body's own immune response.

In the case of ARM-H, by binding to proteins on the outside of the virus, they also prevent healthy human cells from being infected.

'Instead of trying to kill the pathogens directly, these molecules manipulate our immune system to do something it wouldn't ordinarily do,' said David Spiegel, professor of chemistry at Yale University and study co-author.

Because both HIV and cancer have methods for evading the body's immune system, treatments and vaccinations for the two diseases have proven difficult.

Current options for HIV and prostate cancer, including antiviral drugs, radiation and chemotherapy, involve severe side-effects and are often ineffective against advanced cases.

Conversely, ARM-H and ARM-P molecules, which the team has begun testing in mice, are structurally simple, inexpensive to produce, and could in theory be taken in pill form, Spiegel said.

'This is an entirely new approach to treating these two diseases, which are extraordinarily important in terms of their impact on human health,' Spiegel said.

These findings were published online in the Journal of the American Chemical Society.

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