

# THE HIV BREAKTHROUGH OFFERS HOPE FOR A CURE

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A “London patient” became the second man after the “Berlin patient”, to be cured of HIV after stem cell therapy put their infections in remission without medication, a breakthrough that has given hope to 37 million people living with HIV, which causes AIDS. The “Berlin patient”, Timothy Ray Brown, has been HIV-free since 2007 after undergoing a bone marrow transplantation (BMT) to treat his acute myeloid leukaemia, and the London man has been in remission for 18 months after his transplantation for advanced Hodgkin’s lymphoma. In both cases, the bone marrow was taken from donors with natural resistance to HIV because of a genetic mutation in two copies of their CCR5-delta 32 gene, which encodes a critical protein that allows HIV to enter and infect cells.

In itself, the CCR mutation is not a cure. For one, it is extremely rare and is found mostly in people of north European descent, particularly Swedes. In the 1% north Europeans who inherit the mutation from each parent, it offers immunity against infection. Around 14-18% Eurasians have one copy of the mutation, which does not prevent infection but delays the progression of AIDS. The mutation is very rare in Africans, East Asians, or Amerindians, show studies. Since the Berlin patient was cured, stem cell therapy and BMT have failed for many HIV-infected people with blood cancer, with the virus rebounding in some cases, and patients succumbing to their leukaemia or lymphoma in others.

The London breakthrough offers hope for a potential cure using gene manipulation and antibody technology to develop next generation therapeutics for an infection on which at least half a trillion dollars (US \$562.6 billion) have been spent worldwide between 2000 and 2015. In India, anyone who tests positive for HIV is given antiretroviral therapy free under India’s National AIDS Control Programme to prolong their lives and lower their chances of infecting others. Gene manipulation, like with any experimental technology, comes with several caveats, including concerns about the “off-target effects” that can cause adverse mutations, including cancer.

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