OPEN ACCESS Freely availableonline

Journal of Antivirals & Antiretrovirals

Editorial

Scientific Advances in HIV

John F Bebawy*

Department for Infectious Disease Epidemiology, Robert Koch Institute (RKI), Berlin, Germany

Over the past several decades, researchers have learned tons about the Human Immunodeficiency Virus (HIV) and therefore the disease caused by it, which is Acquired Immuno Deficiency Syndrome (AIDS). But still more research is required to assist the many people whose health continues to be threatened by the worldwide HIV/AIDS pandemic.

At the National Institutes of Health, the HIV/AIDS attempt is led by the National Institute of Allergy and Infectious Diseases (NIAID). A huge network of NIAID-supported scientists, located on the NIH campus in Bethesda, Maryland, and at research centers round the globe, are exploring new ways to stop and treat HIV infection, also on better understand the virus with the goal of finding a cure. For instance, in recent months, NIAID and its partners made progress toward finding a vaccine to stop HIV infection.

HIV GENOME REPLICATION

It undergoes in 3 stages. They're Reverse transcription, RNA/DNA hybrids and Genomic integration.

Reverse transcription

The goal of the Section on Viral Gene Regulation, a part of the Program on Genomics of Differentiation within the NICHD Division of Intramural Research (DIR), is to define the molecular mechanisms liable for the replication of HIV and related mammalian retroviruses and to research the role of host proteins that block viral infection. These studies help to spot new targets for anti-HIV therapy and are critical for developing novel strategies to combat the AIDS epidemic. Research is currently focused on several broad areas of interest: (i) reverse transcription and therefore the critical role of the HIV-1 nucleocapsid protein during this process; (ii) molecular characterization, biological activity, and structure of human defense proteins APOBEC3G and APOBEC3A, which are cytidine deaminases that inhibit HIV-1 replication; and (iii) structure-function analysis of the HIV-1 capsid protein and its essential role in proper assembly of HIV-1 particles and therefore the ability of virions to undergo reverse transcription.

RNA/DNA hybrids

The research of the Section on Formation of RNA within the DIR Program on Genomics of Differentiation investigates the formation and determination of RNA/DNA hybrids, which are essential intermediates within the replication of HIV's genome. Additionally to their presence in HIV replication, RNA/DNA hybrids are omnipresent intermediates in normal DNA replication and RNA synthesis but when mishandled can cause human diseases and disorders.

Genomic integration

The Section on Eukaryotic Transposable Elements, of the Program in Cellular Regulation and Metabolism, uses a retrotransposon within the fission yeast genome as a model for understanding how retroviruses like HIV insert their genetic material into the host cell genome. Especially, the Section's research aims to work out the viral genome's mechanisms of choosing its target integration sites.

RESEARCH ON HIV

Progress towards creating a 'functional cure' focuses not on the elimination of HIV from the body, but rather on reducing the virus to A level that's undetectable; where the person not must take HIV-related medication, nor has any risk of getting to AIDS or transmitting the virus.

This can more precisely be described as a level of 'remission'. Some advisory bodies have further suggested that this term be prioritised over calling it a 'cure', as suppressing viral replication still leaves traces of dormant HIV within the body which has the potential to re-emerge.

Early antiretroviral treatment (ART), which is initiated on the brink of the time-point of primary infection, certainly doesn't cure HIV, but there has been some success in individuals achieving temporary and long-term remission through this strategy. These people are called post-treatment controllers.

Correspondence to: John F Bebawy, Department for Infectious Disease Epidemiology, Robert Koch Institute (RKI), Berlin, Germany, E-mail: bebwayjohn@rki.de

Received: December 1, 2020; **Accepted:** December 16, 2020; **Published:** December 23, 2020

Citation: Bebawy JF (2020) Scientific Advances in HIV. J Antivir Antiretrovir. S14: e001.