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In-depth single-cell analysis of translation-competent HIV-1 reservoirs identifies cellular sources of plasma viremia

BEST PAPER

Basiel Cole¹, Laurens Lambrechts^{1,2}, Pierre Gantner³, Ytse Noppe⁴, Noah Bonine^{1,2}, Wojciech Witkowski¹, Lennie Chen⁴, Sarah Palmer⁵, James I. Mullins^{4,6,7}, Nicolas Chomont^{3,8}, Marion Pardons^{1,9} & Linos Vandekerckhove^{1,9}✉

Basic Science

Clonal expansion of HIV-infected cells contributes to the long-term persistence of the HIV reservoir in ART-suppressed individuals. However, the contribution from cell clones that harbor inducible proviruses to plasma viremia is poorly understood. Here, we describe a single-cell approach to simultaneously sequence the TCR, integration sites and proviral genomes from translation-competent reservoir cells, called STIP-Seq. By applying this approach to HIV-1 reservoirs, we find that the translation-competent HIV-1 reservoir mainly consists of proviruses with short deletions at the 3'-end of the genome, often involving the gag gene. Furthermore, we find several matches between proviruses retrieved with STIP-Seq and plasma viruses obtained during ART and upon treatment interruption, suggesting that STIP-Seq can capture clones that are responsible for low-level viremia or viral rebound.

“IN-DEPTH SINGLE-CELL ANALYSIS OF TRANSLATION-COMPETENT HIV-1 RESERVOIRS IDENTIFIES CELLULAR SOURCES OF PLASMA VIREMIA”

Basiel Cole, Laurens Lambrechts, Pierre Gantner, Ytse Noppe, Noah Bonine, Wojciech Witkowski, Lennie Chen, Sarah Palmer, James I. Mullins, Nicolas Chomont, Marion Pardons & Linos Vandekerckhove

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Immunogenicity and Safety of the 9-Valent Human Papillomavirus Vaccine in Solid Organ Transplant Recipients and Adults Infected With Human Immunodeficiency Virus

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BEST PAPER

Clinical Science

Background. The burden of human papillomavirus (HPV) in human immunodeficiency virus (HIV)-infected persons and solid organ transplant (SOT) recipients is high. Clinical trials on HPV vaccines in persons living with HIV and particularly in SOT recipients have been sparse to date, included low numbers of participants, and none of them assessed the 9-valent HPV (9vHPV) vaccine. We investigated the immunogenicity with respect to HPV types 6, 11, 16, 18, 31, 33, 45, 52, and 58 and the safety of the 9vHPV vaccine in persons living with HIV and recipients of a solid organ transplant.

Methods. This is a phase III investigator-initiated, randomized, controlled trial of 9vHPV (age 18–45 years) and 171 SOT recipients (age 18–55 years). The 9vHPV vaccine was administered at day 1, month 2, and month 6. Primary outcome was seroconversion rates to the 9vHPV types at month 7. Secondary outcomes were geometric mean titers (GMTs) and frequency of adverse events (AEs).

Results. All HIV-infected participants seroconverted for all HPV types, but seroconversion ranged from 46% for HPV45 to 72% for HPV58 in SOT recipients. GMTs ranged from 180 to 2985 mMU/mL in HIV-positive participants and from 17 to 170 mMU/mL in SOT recipients, depending on the HPV type. Injection-site AEs occurred in 62% of participants but were mostly mild or moderate in intensity.

Conclusion. The 9vHPV vaccine is safe and immunogenic in persons living with HIV, and safe in SOT recipients. The vaccine is safe and immunogenic in persons living with HIV, and safe in SOT recipients.

Keywords: human papillomavirus, HIV, immunogenicity, safety, solid organ transplant, 9-valent HPV vaccine

“IMMUNOGENICITY AND SAFETY OF THE 9-VALENT HUMAN PAPILOMAVIRUS VACCINE IN SOLID ORGAN TRANSPLANT RECIPIENTS AND ADULTS INFECTED WITH HUMAN IMMUNODEFICIENCY VIRUS (HIV)”

Lise Boey, Ans Curinckx, Mathieu Roelants, Inge Derdelinckx, Eric Van Wijngaerden, Paul De Munter, Robin Vos, Dirk Cuyppers, Johan Van Cleemput, Corinne Vandermeulen

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Original research
Reduced sexual contacts with non-steady partners and less PrEP use among MSM in Belgium during the first weeks of the COVID-19 lockdown: results of an online survey

Thijs Reyniers,¹ Anke Rotsaert,¹ Estrelle Thunissen,² Veerle Buffel,² Caroline Masquillier,¹ Ella Van Landeghem,¹ Jef Vanhamel,¹ Christiana Nöstlinger,¹ Edwin Wouters,² Marie Laga,¹ Bea Vuylsteke

ABSTRACT

Objectives To examine changes in the occurrence of physical sex with non-steady partners among men who have sex with men (MSM) in Belgium during the first weeks of the COVID-19 lockdown and associations with sociodemographic factors, sexual practices, drug, alcohol and pre-exposure prophylaxis (PrEP) use. **Methods** A cross-sectional online survey. The questionnaire was available in Dutch, French and English, between April 10 and 27 (2020), and disseminated via social media. **Results** The proportion of men who had sex with non-steady partners decreased from 55.1% to 47.0% during the first weeks of the lockdown. PrEP use decreased from 19.7% to 15.7% during the first weeks of the lockdown. PrEP users had concerns about the effectiveness of PrEP during the lockdown. **Conclusions** MSM in our survey substantially reduced sexual contact with non-steady partners during the first weeks of the COVID-19 lockdown, suggesting that the risk for HIV and STI transmission is reduced. We recommend HIV testing and follow-up for PrEP for the small group having multiple sex partners and engaging in sexual practices such as chemsex, or group sex, even in times of a pandemic threat.

Public Health

“REDUCED SEXUAL CONTACTS WITH NON-STEADY PARTNERS AND LESS PREP USE AMONG MSM IN BELGIUM DURING THE FIRST WEEKS OF THE COVID-19 LOCKDOWN: RESULTS OF AN ONLINE SURVEY”

Thijs Reyniers, Anke Rotsaert, Estrelle Thunissen, Veerle Buffel, Caroline Masquillier, Ella Van Landeghem, Jef Vanhamel, Christiana Nöstlinger, Edwin Wouters, Marie Laga, Bea Vuylsteke

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INTRODUCTION

The current COVID-19 pandemic has led to an unprecedented threat to public health. The

measures taken to control this pandemic have disrupted everyday life globally. Like other countries, the Belgian government imposed guidelines and measures restricting close physical contact to control COVID-19.² In the first weeks of this initial ‘lockdown’, from 18 March to 10 May 2020, these measures included restricting real-life social contact to the household, while keeping a distance of 1.5 m from non-household members, also referred to as ‘physical distancing’. Such physical distancing measures and stay-at-home recommendations are likely to impact on social life in general. In addition, these measures will have influenced sexual relations. People who live alone, who do not have a partner, or who live with a partner but do not have sex with their partner outside the household, may find it difficult to adhere to these physical distancing measures. For people who have sex with men (MSM), these measures may be difficult, or even impossible, to follow. For example, for people who have an open relationship, an inclusive term to indicate all ways in which MSM can have emotional and/or sexual bonds, such as being single with casual sex partners, serial monogamy, or open relationships.^{3–5} A subgroup of MSM has multiple casual sex partners and may engage in a steady relationship. These sexual behaviours that are shown to be associated with an elevated risk for a sexually transmitted infection such as group sex or sex under the influence of recreational drugs.^{6–8} As a result, some MSM are at high risk for HIV and STIs, such as gonorrhoea and syphilis.^{9–11} It is hypothesised that preventive COVID-19 measures have an impact on sexual behaviour of MSM and that, consequently, the risk for HIV and STIs is reduced.¹² However, evidence of reduced sexual contacts is currently scarce and may help to estimate the potential impact of the COVID-19 preventive measures on the STI and HIV epidemics.

Since June 2017, pre-exposure prophylaxis (PrEP) for HIV prevention is available and partly reimbursed for individuals at high risk for HIV infection in Belgium.¹³ PrEP users can opt for daily oral PrEP and are required to visit a healthcare provider every 3 months. PrEP users are advised to have regular HIV and STI testing. PrEP is most effective when used consistently and correctly. PrEP is most effective when used consistently and correctly. PrEP is most effective when used consistently and correctly.

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