Treatment interruption and T cell immunity in ART-treated primary HIV infection

Timothy L Tipoe1, Ane Ogbe1, Helen Brown1, Nicola Robinson1, Ming Lee2, Rebecca Hall1, Claire Petersen2, Heather Lewis3, John Thomhill3, Julianna Lwanga4, Fiona Ryan5, Julie Fox6, Sarah Fidler7,8, John Frater7,8

1Peter Medawar Building for Pathogen Research, Nuffield Dept of Medicine, University of Oxford, UK; 2Department of Infectious Disease, Imperial College London, UK; 3Department of HIV Medicine, St Mary’s Hospital, Imperial College Healthcare NHS Trust, UK; 4Barts Health NHS Trust, London, UK; 5Guy’s and St Thomas’ NHS Foundation Trust, UK; 6Department of Infection, Harrison Wing and NIHR Clinical Research Facility, Guys and St Thomas’ NHS Trust, UK; 7NIHR Guy’s and St Thomas’ Biomedical Research Centre; 8NIHR Oxford Biomedical Research Centre, Oxford, UK

BACKGROUND
- Factors that predict post-treatment control (PTC) after stopping antiretroviral therapy remain undetermined. In animal models, HIV-specific T cell immunity has been associated with improved viral control following treatment interruption (TI).

METHODS
- We conducted a prospective open-label study of treatment interruption (PITCH) in primary HIV infection (PHI) to look for PTC and determine immune correlates of protection.
- A total of 7 participants underwent TI, all of whom initiated ART within 6 months of estimated seroconversion (Table 1).
- The decision to re-start ART was determined using a rule-based algorithm incorporating degree and duration of viraemia.

RESULTS
- All 7 participants who agreed to take a TI rebounded and re-started ART, achieving fully suppressed plasma viral loads. No major adverse events were reported, including during the ART.
- Time to rebound after TI ranged from 15 – 170 days (median 36 days) with 4 participants showing evidence of viral control for >30 days (seen opposite).
- There was heterogeneity in T cell responses following TI. Participants tended to show dominant responses towards Gag, Env and Nef prior to TI.
- After ART resumption, all participants had dominant responses toward Gag and/or Pol (Figure 2). Only Env-specific responses were positively correlated with viral load (r=0.44, p=0.0015).

CONCLUSIONS
Treatment interruptions enhance and can cause shifts in immunodominance of host T cell responses towards Gag and sometimes Pol. Further studies will resolve epitope-specific responses in the context of times to rebound.

ADDITIONAL KEY INFORMATION
Author Contact Information
timothy.tipoe@schch.ox.ac.uk

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Figure 1: change in HIV viral load of PITCH participants throughout TI

Figure 2: pie charts showing change in number of targeted epitopes before, after and/or during TI in participants PSTM03/PSTM04/PSTM06/PSTM07

Figure 3: pie chart showing increase in number of targeted Gag epitopes after TI in participant PSTM04

Table 1: Participant demographics

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<thead>
<tr>
<th>Gender</th>
<th>Age (yrs)</th>
<th>HIV clade</th>
<th>Time from PHI to ART start (days)</th>
<th>Years on ART before TI</th>
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