5. Sun K, Metzger DW. Inhibition of pulmonary
function for pneumococcal surface pro-
include prevention of killing by lactofer-
zymereceptor: bridging innate and adap-
zyme linked immunosorbent assays. Gp120 con-
 conference stems from relevant gp120 con-
concentrations by commercially available enzy-
Gp120 concentrations ranging from 0 to 9007 pg/mL
of gp120 in chronically HIV-infected pa-
high concentrations of gp120 accumulate in second-
concentrations of gp120 present in HIV-
from primary lymphoid organs in chronic-
ted immunodeficiency virus type 1 (HIV-1)
gp120dependent of active viral replication.
We have concerns, however, that read-
that would be more biologically relevant to
reports range from 1 pg/mL to
measure gp120 concentrations to commercial-
levels. Several notable limits are raised be-
the brief report by Santosuosso et al [1] investigat-
immunodeficiency virus type 1 (HIV-1)
gp120 in chronically HIV-infected pa-
prevention of killing by lactoferrin and
inhibition of complement-mediated clear-
discovered a role for pneumococcal surface
in secondary pneumococcal infection in animals with
mucosal surfaces [6]. The virulence mecha-
nisms of PsPA are well established and
include prevention of killing by lactoferrin 
and inhibition of complement-mediated clear-
ance [3–8]. To our knowledge, PsPA has not been characterized as bind-
going to plgR deserves investigation with respect to secondary pneumococcal infec-
early not the same protein. Although we
agreed that the role of PsPC and its bind-
ing the polymeric immunoglobulin receptor
Polymer CS. The polymeric immunoglobulin re-
ceptor: bridging innate and adaptive immune
zymereceptor (plgR). This is, however, a described 
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2. Luo R, Mann B, Lewis WS, et al. Solution struc-
ture of choline binding protein A, the major adhesin of Streptococcus pneumoniae. EMBO J 2005; 24:34–43.
1. Eisenhut M. Influenza virus amplifies inter-
zymereceptor (plgR). This is, however, a described 
dunction for pneumococcal surface pro-

Potential conflicts of interest: none reported.

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able Hospital NHS Foundation Trust, Lewsey Road, Luton, LU4 0DZ (michael_eisenhut@yahoo.com).
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DOI: 10.1086/651432

Reply to Eisenhut
To the Editor—We appreciate Dr Eisenhut’s [1] interest in our recent article desc-
scribing the concentrations of human immunodeficiency virus type 1 (HIV-1)
gp120 in chronically HIV-infected pa-
prevention of killing by lactoferrin and
inhibition of complement-mediated clear-
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The authors acknowledged that linked immunosorbent assay was low. This study was underpowered to determine this.

Second, the sensitivity of their enzyme-linked immunosorbent assay was low. The authors acknowledged that <25% of a known concentration of recombinant gp120 was detected after it was added to a negative sample.

Third, the samples were obtained fresh at necropsy a mean of 7.6 h after death and were then shipped on ice to the investigators’ laboratory for processing. It would be important to investigate the effect of postmortem delay on the amount of gp120 level measured.

Fourth, the tissue lysates were obtained by repeated freeze-thaw cycles of a cell pellet. This may have an adverse effect on protein levels, compared with other methods of cell lysis, such as dounce homogenization, sonication, or use of detergents.

Previous studies by Oh et al [3] measured 1–8 nmol/L of gp120 in the serum of HIV-infected patients. Given that 1 nmol/L of gp120 is ∼0.12 μg/mL [2], we estimate that the concentrations of soluble gp120 would range between 120 and 960 ng/mL in the serum of HIV-infected individuals. Other studies have quantitated the amount of HIV RNA per gram of lymphoid tissue [4], finding 4.8 × 10^9 copies of HIV per gram of tissue. Assuming that 1 HIV RNA molecule will encode 1 gp120 molecule, one can extrapolate that there should be at least 100 ng per gram. Total gp120 levels would, of course, reflect both newly synthesized gp120 as well as accumulated gp120, which would increase this concentration by several logs. Membranes of HIV-1 are studded with up to 72 spikes of gp120 [5, 6], each of which is formed by 2–4 monomers of gp120 molecules [7], resulting in up to 300 gp120 molecules on each HIV virion. In situations where plasma viremia can reach levels as high as 1 × 10^8 virions/mL, this would represent gp120 levels of up to 700 pg/mL. In addition, it has been estimated that between 1/100 and 1/1000 CD4+ T cells are HIV infected [8], and each expresses thousands of gp120 oligomers. Assuming 500 CD4 T cells/μL in an HIV-infected patient and 5 infected cells/μL, gp120 amounts in the picogram to nanogram range would be present per milliliter. Although it is difficult to consolidate the total amount of gp120 in vivo to include soluble, lymphoid, and cell-expressed sources into 1 unit of measurement, from these calculations we estimate that the range of gp120 levels observed in an HIV-infected patient are likely between 500 ng/mL and 5 μg/mL, when concentrations of soluble gp120, cell-associated gp120, and virion-associated gp120 are added.

Despite these notable limitations, Santosuosso and colleagues’ report demonstrates clearly that gp120 is present in high concentration in secondary lymphoid tissues in chronically HIV-infected patients receiving suppressive antiretroviral therapy. However, the actual in vivo plasma and tissue concentrations of gp120 remain unclear, and this report should not be used as the sole basis for determining relevant concentrations for future in vitro studies.

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Potential conflicts of interest: none reported.

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The Journal of Infectious Diseases 2010; 201: 1273–1274
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Reply to Cummins et al

To the Editor—We appreciate the opportunity to respond to the comments by Cummins et al [1] on our recent article in which we report the presence of high concentrations of gp120 in the lymphoid tissues of 6 chronically human immunodeficiency virus (HIV)–infected individuals and describe the relevance of this to the study of nonentry functions of the envelope protein in vivo [2]. This is of particular importance because Badley and others have reported that gp120 induces immune cell dysfunction in vitro [3–6]. Cummins et al [1] raise caveats about measuring HIV type 1 (HIV-1) gp120 levels in tissues which we agree with and which we were careful to define in the article with relation to the postmortem collection of materials, the fact that patients had low or undetectable viral loads at the time of sampling, and the limited sensitivity of the enzyme-linked immunosorbent assay [2].

Cummins and colleagues focus their concerns about the report on the finding that concentrations of gp120 in lymphoid tissues documented in this article were at the lower end of the range used in assays to measure the effects of gp120 on immune function in vitro. In both principle