One profile or many?
Plasma biomarkers CXCL10, sCD163 and sCD14 reveal distinct associations with HIV treatment response, choice of treatment, and cardiovascular risk factors

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Abstract

CD4+ T cell and viral load monitoring: a successful paradigm

CD4 T cell and viral load monitoring: a successful paradigm

Background

Elevated Plasma Soluble CD14 and Skewed CD16+ Monocyte Distribution Persist despite Normalization of Soluble CD163 and CXCL10 by Effective HIV Therapy: A Changing Paradigm for Routine HIV Laboratory Monitoring?

Methods

• Study population: 474 consecutive patients with documented CVD risk (age, ethnicity, gender, smoking, blood pressure, BMI, fasting metabolic profile), as well as HIV treatment history and immunological/virological outcomes

• Plasma biomarker assessment: Plasma sCD14, sCD163 and CXCL10 levels measured by ELISA methods

• Statistical analysis: ANOVA for comparison of mean values, multiple regression analysis.
Results: Gender, age, and ethnicity

- 372 Males (87.7% Caucasian)
- 102 Females (28.7% Caucasian)

Results: CD4 counts and viral loads

- Mean CD4 count: Male = 41.7 yrs, Female = 51.1 yrs
- 88.5% ART-treated
- 11.5% ART-treated

Results: Detectable viral load, residual viremia, and no detectable HIV RNA

- 56.7% ART-treated
- 27.1% ART-treated

Results: Smoking status and cardiovascular risk assessment

- 43% of males, 20% of females
- 36% of males, 3% of females

Results: Correlations between plasma biomarkers

- Log CXCL10
- Log sCD163
- Log sCD14
Results: Plasma biomarkers and viral load

- **CXCL10**
  - No PCR
  - VL < 400 copies/mL
  - VL 400 – 1000 copies/mL
  - VL > 1000 copies/mL

- **sCD163**
  - No PCR
  - VL < 400 copies/mL
  - VL 400 – 1000 copies/mL
  - VL > 1000 copies/mL

- **sCD14**
  - No PCR
  - VL < 400 copies/mL
  - VL 400 – 1000 copies/mL
  - VL > 1000 copies/mL

Results: Plasma biomarkers and CD4%

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  - No PCR
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- **sCD14**
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  - VL > 1000 copies/mL

Integrase inhibitors and plasma biomarker levels
(on Int=17: not on Int=455)

- **CXCL10**
  - No PCR
  - VL < 400 copies/mL
  - VL 400 – 1000 copies/mL
  - VL > 1000 copies/mL

- **sCD163**
  - No PCR
  - VL < 400 copies/mL
  - VL 400 – 1000 copies/mL
  - VL > 1000 copies/mL

- **sCD14**
  - No PCR
  - VL < 400 copies/mL
  - VL 400 – 1000 copies/mL
  - VL > 1000 copies/mL

PIs and plasma biomarker levels
(on PIs=162: not on PIs=310)

- **CXCL10**
  - No PCR
  - VL < 400 copies/mL
  - VL 400 – 1000 copies/mL
  - VL > 1000 copies/mL

- **sCD163**
  - No PCR
  - VL < 400 copies/mL
  - VL 400 – 1000 copies/mL
  - VL > 1000 copies/mL

- **sCD14**
  - No PCR
  - VL < 400 copies/mL
  - VL 400 – 1000 copies/mL
  - VL > 1000 copies/mL

NNRTIs and plasma biomarker levels
(on NNRTI=215: not on NNRTI=257)

- **CXCL10**
  - No PCR
  - VL < 400 copies/mL
  - VL 400 – 1000 copies/mL
  - VL > 1000 copies/mL

- **sCD163**
  - No PCR
  - VL < 400 copies/mL
  - VL 400 – 1000 copies/mL
  - VL > 1000 copies/mL

- **sCD14**
  - No PCR
  - VL < 400 copies/mL
  - VL 400 – 1000 copies/mL
  - VL > 1000 copies/mL

Correlations between HIV clinical parameters, ART and plasma biomarkers
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### sCD163

**Correlations between CVD risk factors and plasma biomarkers**

- **sCD163**
  - Positive correlation

- **CXCL10**
  - Positive correlation

- **sCD14**
  - Positive correlation

### sCD14

**Correlations between HIV clinical parameters, ART and plasma biomarkers**

- **AP**
  - p=0.29

- **CoxB-110**
  - p=0.62

- **Abs CD14**
  - p=0.73

- **VX403**
  - p=0.90

- **log10 CD163**
  - p=0.95

- **log10 CXCL10**
  - p=0.94

- **VL400**
  - p=0.90

- **VL**
  - p=0.90

- **CD4%**
  - p=0.90

- **Abs CD4**
  - p=0.90

- **CD4:8 ratio**
  - p=0.90

- **Ethnicity**
  - p=0.90

- **Gender**
  - p=0.90

- **Age**
  - p=0.90

### Multivariate regression analysis

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Correlation coefficients and significance levels for various biomarkers and clinical parameters are shown in the diagrams and tables.
HIV-1 infection induces strong production of IP-10 through TLR7/8-dependent pathways

**References**

Rachel P. Simonds, Eliza P. Scullion, Edo E. Groddo, Kelly Benedict, T. Judy Chang, Kayla L. Van, and Robert E. Rosenkrantz


**Differential Reduction in Monocyte Activation and Vascular Inflammation With Integrase Inhibitor-Based Initial Antiretroviral Therapy Among HIV-Infected Individuals**