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| **Supplementary Table 1. Demopraphic and clinical characteristics of study subjects stratified by body mass index**  |
| **Variable** | **All subjects (n=70)** | **BMI <25 kg/m2 (n=20)** | **BMI 25.0-29.9 kg/m2 (n=15)** | **BMI 30.0-34.9 kg/m2 (n=16)** | **BMI >35 kg/m2 (n=19)** | **p-value** |
| Age, median years (IQR) | 45 (39, 50) | 44 (37, 49) | 45 (42, 51) | 46 (40, 50) | 48 (35, 52) | 0.61 |
| Female, % | 30 (43%) | 6 (30%) | 8 (53%) | 7 (44%) | 9 (47%) | 0.54 |
| Non-white, % | 38 (54%) | 11 (55%) | 7 (47%) | 10 (63%) | 10 (53%) | 0.85 |
| BMI, kg/m2 | 30.3 (23.9, 35.7) | 22.5 (19.7, 23.8) | 26.6 (26.2, 28.9) | 32.9 (31.9, 34.2) | 40.05 (37.0, 42.1) | **<0.001** |
| Smoker, % | 25 (36%) | 9 (45%) | 3 (20%) | 5 (31%) | 8 (42%) | 0.42 |
| Hepatitis C, % | 8 (11%) | 2 (10%) | 2 (13%) | 1 (6%) | 3 (16%) | 0.83 |
| CD4 at enrollment, cells/µl | 701 (540, 954) | 587 (496, 820) | 681 (583, 992) | 711 (508, 1091) | 858 (676, 958) | 0.19 |
| CD4 at ART initiation, cells/µl | 257 (140, 378) | 241 (173, 372) | 276 (134, 302) | 284 (72, 557) | 251 (150, 383) | 0.88 |
| Duration of ART treatment, years | 6.2 (4.3, 10.1) | 5.9 (3.9, 9.3) | 6.21 (4.3, 12.4) | 5.90 (4.5, 13.0) | 6.9 (4.4, 9.4) | 0.80 |
| DEXA lean mass, kg | 50.93 (44.82, 58.66) | 49.15 (41.69, 50.65) | 47.24 (40.63, 57.36) | 55.71 (44.55, 63.17) | 60.12 (52.56, 69.09) | **0.001** |
| DEXA fat mass, kg | 31.48 (21.11, 46.39) | 14.92 (9.63, 19.53) | 27.98 (26.20, 31.05) | 37.88 (34.48, 43.41) | 51.22 (48.07, 57.04) | **<0.001** |
| Fat mass index, kg/m2 | 11.33 (7.07, 14.82) | 5.21 (3.02, 6.71) | 9.82 (8.47, 11.24) | 13.34 (11.67, 14.53) | 18.18 (14.85, 20.15) | **<0.001** |
| Plasma leptin, ng/ml | 17.27 (8.53, 32.12) | 5.06 (2.15, 8.79) | 13.40 (9.69, 21.92) | 24.80 (11.68, 38.07) | 37.18 (21.14, 46.92) | **<0.001** |
| Abbreviations: ART, antiretroviral therapy; BMI, body mass index; DEXA, dual-energy x-ray absorptiometry; IQR, interquartile range |

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| **Supplementary Table 2. Adjusted correlation of all innate and adaptive immune parameters with measures of total body adiposity** |
|  | **Body mass index** | **Fat mass index** | **Serum leptin** |
| **Soluble Biomarkers** | **Correlation****(95% CI)** | **P-value** | **Correlation****(95% CI)** | **P-value** | **Correlation****(95% CI)** | **P-value** |
| C-reactive protein | ***0.48******(0.23, 0.67)*** | ***< 0.001*** | ***0.48******(0.22, 0.67)*** | ***< 0.001*** | ***0.4******(0.14, 0.6)*** | ***0.003*** |
| Serum amyloid A | ***0.45******(0.22, 0.64)*** | ***< 0.001*** | ***0.41******(0.17, 0.6)*** | ***0.001*** | ***0.4******(0.14, 0.6)*** | ***0.003*** |
| IL-1β | 0.05(-0.21, 0.3) | 0.70 | 0.04(-0.22, 0.3) | 0.75 | 0.11(-0.15, 0.36) | 0.41 |
| IL-2 | 0.04(-0.22, 0.3) | 0.75 | 0.05(-0.21, 0.3) | 0.71 | 0.005(-0.24, 0.25) | 0.97 |
| IL-4 | 0.08(-0.17, 0.32) | 0.53 | 0.03(-0.22, 0.27) | 0.82 | -0.005(-0.24, 0.23) | 0.97 |
| IL-5 | -0.003(-0.25, 0.25) | 0.98 | -0.04(-0.29, 0.22) | 0.76 | -0.08(-0.31, 0.17) | 0.55 |
| IL-6 | ***0.41******(0.15, 0.61)*** | ***0.002*** | ***0.39******(0.14, 0.6)*** | ***0.003*** | ***0.4******(0.18, 0.58)*** | ***< 0.001*** |
| IL-8 | 0.04(-0.23, 0.3) | 0.79 | 0.06(-0.21, 0.31) | 0.68 | 0.02(-0.23, 0.27) | 0.86 |
| IL-10 | ***-0.3******(-0.52, -0.05)*** | ***0.02*** | ***-0.36******(-0.57, -0.11)*** | ***0.006*** | ***-0.33******(-0.55, -0.07)*** | ***0.01*** |
| IL-12p70 | -0.13(-0.37, 0.12) | 0.30 | -0.12(-0.37, 0.14) | 0.35 | -0.12(-0.36, 0.13) | 0.34 |
| IL-13 | 0.11(-0.14, 0.35) | 0.39 | 0.03(-0.23, 0.28) | 0.84 | 0.02(-0.22, 0.27) | 0.85 |
| IL-17 | 0.05(-0.21, 0.3) | 0.70 | 0.007(-0.26, 0.28) | 0.96 | -0.07(-0.33, 0.21) | 0.63 |
| Interferon-γ | -0.07(-0.32, 0.2) | 0.63 | -0.16(-0.4, 0.11) | 0.25 | -0.13(-0.37, 0.14) | 0.34 |
| Soluble CD14 | -0.14(-0.38, 0.11) | 0.27 | -0.14(-0.38, 0.11) | 0.28 | **-0.24****(-0.47, 0.02)** | **0.07** |
| Soluble CD163 | **0.23****(-0.03, 0.47)** | **0.08** | **0.22****(-0.03, 0.45)** | **0.09** | **0.22****(-0.03, 0.45)** | **0.09** |
| MCP-1 | 0.13(-0.12, 0.36) | 0.30 | 0.13(-0.13, 0.37) | 0.32 | 0.11(-0.16, 0.36) | 0.44 |
| MIP-1α | 0.05(-0.2, 0.29) | 0.70 | 0.003(-0.25, 0.25) | 0.98 | -0.05(-0.3, 0.2) | 0.68 |
| MIP-1β | 0.09(-0.16, 0.32) | 0.49 | 0.04(-0.21, 0.28) | 0.75 | -0.05(-0.31, 0.22) | 0.73 |
| TNF-α | 0.01(-0.26, 0.27) | 0.97 | -0.01(-0.28, 0.27) | 0.95 | 0.01(-0.26, 0.28) | 0.93 |
| TNF-α receptor 1 | ***0.33******(0.07, 0.55)*** | ***0.01*** | ***0.34******(0.07, 0.57)*** | ***0.02*** | **0.25****(-0.02, 0.48)** | **0.07** |
| TNF-α receptor 2 | 0.14(-0.09, 0.35) | 0.23 | 0.11(-0.13, 0.33) | 0.36 | 0.04(-0.18, 0.26) | 0.73 |
| **CD4+ T cell subsets** |
| CD4+-CD8+ T cell ratio | -0.1(-0.34, 0.15) | 0.42 | -0.04(-0.29, 0.21) | 0.74 | -0.07(-0.32, 0.18) | 0.57 |
| CD4+ CD38+ % | ***-0.32******(-0.55, -0.05)*** | ***0.02*** | ***-0.29******(-0.52, -0.01)*** | ***0.04*** | -0.2(-0.44, 0.07) | 0.15 |
| CD4+ HLA-DR+ % | -0.009(-0.31, 0.29) | 0.95 | -0.03(-0.32, 0.26) | 0.84 | -0.11(-0.37, 0.17) | 0.44 |
| CD4+ CD38+ HLA-DR+ % | -0.08(-0.35, 0.2) | 0.57 | -0.15(-0.4, 0.11) | 0.26 | *-0.23**(-0.46, 0.03)* | **0.08** |
| CD4+ CD69+ % | ***0.32******(0.08, 0.53)*** | ***0.01*** | ***0.35******(0.12, 0.55)*** | ***0.004*** | **0.23****(-0.02, 0.44)** | **0.07** |
| CD4+ CD57+ % | **0.24****(-0.03, 0.47)** | **0.09** | 0.21(-0.08, 0.46) | 0.15 | **0.25****(-0.03, 0.49)** | **0.07** |
| CD4+ PD1+ % | 0.13(-0.14, 0.38) | 0.35 | 0.13(-0.15, 0.38) | 0.37 | 0.06(-0.21, 0.33) | 0.65 |
| CD4+ naive %  | -0.2(-0.45, 0.08) | 0.15 | -0.15(-0.39, 0.11) | 0.26 | -0.2(-0.42, 0.04) | 0.11 |
| CD4+ TemRA % | 0.23(-0.05, 0.48) | 0.10 | 0.18(-0.09, 0.42) | 0.18 | **0.22****(-0.03, 0.45)** | **0.09** |
| CD4+ Memory % | 0.12(-0.17, 0.4) | 0.41 | 0.12(-0.18, 0.4) | 0.43 | 0.07(-0.2, 0.33) | 0.61 |
| CD4+ Central Memory %  | -0.09(-0.35, 0.19) | 0.54 | -0.03(-0.3, 0.25) | 0.85 | -0.09(-0.34, 0.17) | 0.50 |
| CD4+ Transitional Memory % | 0.19(-0.08, 0.42) | 0.16 | 0.18(-0.08, 0.42) | 0.18 | 0.18(-0.1, 0.44) | 0.20 |
| CD4+ Effector Memory % | 0.08(-0.21, 0.35) | 0.60 | 0.02(-0.27, 0.32) | 0.87 | 0.08(-0.19, 0.34) | 0.57 |
| CD4+ T regulatory % | -0.2(-0.44, 0.07) | 0.15 | -0.22(-0.44, 0.04) | 0.10 | -0.18(-0.4, 0.06) | 0.14 |
| CD4+ T regulatory CD39+ % | 0.05(-0.2, 0.3) | 0.68 | -0.02(-0.27, 0.24) | 0.91 | 0.03(-0.23, 0.28) | 0.83 |
| CD4+ T regulatory PD1+ % | 0.05(-0.22, 0.3) | 0.74 | 0.08(-0.19, 0.33) | 0.57 | -0.02(-0.26, 0.22) | 0.88 |
| **CD8+ T cell subsets** |
| CD8+ CD38+ % | -0.11(-0.36, 0.15) | 0.41 | -0.11(-0.35, 0.14) | 0.39 | **-0.19****(-0.4, 0.04)** | **0.10** |
| CD8+ HLA-DR+ % | 0.09(-0.19, 0.35) | 0.53 | 0.08(-0.19, 0.34) | 0.56 | -0.006(-0.27, 0.26) | 0.97 |
| CD8+ CD38 HLA-DR+ % | -0.04(-0.31, 0.24) | 0.78 | -0.04(-0.31, 0.24) | 0.77 | -0.15(-0.4, 0.12) | 0.27 |
| CD8+ CD69+ % | 0.16(-0.1, 0.41) | 0.23 | **0.23****(-0.04, 0.48)** | **0.09** | 0.16(-0.1, 0.4) | 0.23 |
| CD8+ CD57+ % | **0.26****(-0.02, 0.5)** | **0.07** | 0.19(-0.11, 0.47) | 0.21 | 0.23(-0.07, 0.49) | 0.13 |
| CD8+ PD1+ % | -0.16(-0.39, 0.09) | 0.21 | -0.13(-0.38, 0.13) | 0.32 | -0.18(-0.42, 0.08) | 0.17 |
| CD8+ naive % | -0.19(-0.43, 0.07) | 0.15 | -0.15(-0.39, 0.11) | 0.27 | **-0.24****(-0.46, 0.01)** | **0.06** |
| CD8+ TemRA % | **0.25****(-0.01, 0.49)** | **0.06** | 0.2(-0.07, 0.44) | 0.14 | ***0.27******(0.01, 0.49)*** | ***0.04*** |
| CD8+ Memory % | 0.08(-0.19, 0.34) | 0.57 | 0.05(-0.22, 0.32) | 0.71 | 0.02(-0.25, 0.28) | 0.90 |
| CD8+ Central Memory %  | -0.01(-0.27, 0.25) | 0.93 | 0.07(-0.2, 0.33) | 0.63 | -0.02(-0.25, 0.21) | 0.86 |
| CD8+ Transitional Memory % | 0.07(-0.19, 0.33) | 0.60 | 0.06(-0.22, 0.32) | 0.69 | 0.03(-0.24, 0.3) | 0.82 |
| CD8+ Effector Memory % | 0.04(-0.22, 0.29) | 0.79 | -0.04(-0.3, 0.23) | 0.78 | 0.04(-0.2, 0.28) | 0.74 |

Abbreviations: IL, interleukin; MIP-1α/β, macrophage inflammatory protein-1α/β; MCP-1, monocyte chemoattractant protein-1; TemRA, T effector memory RA+ cells; TNF-α, tumor necrosis factor-α.