Supporting Information

Molecular mechanisms of heparin-induced modulation of human interleukin 12 bioactivity

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Running title: *Mechanisms of heparin-induced IL-12 modulation*

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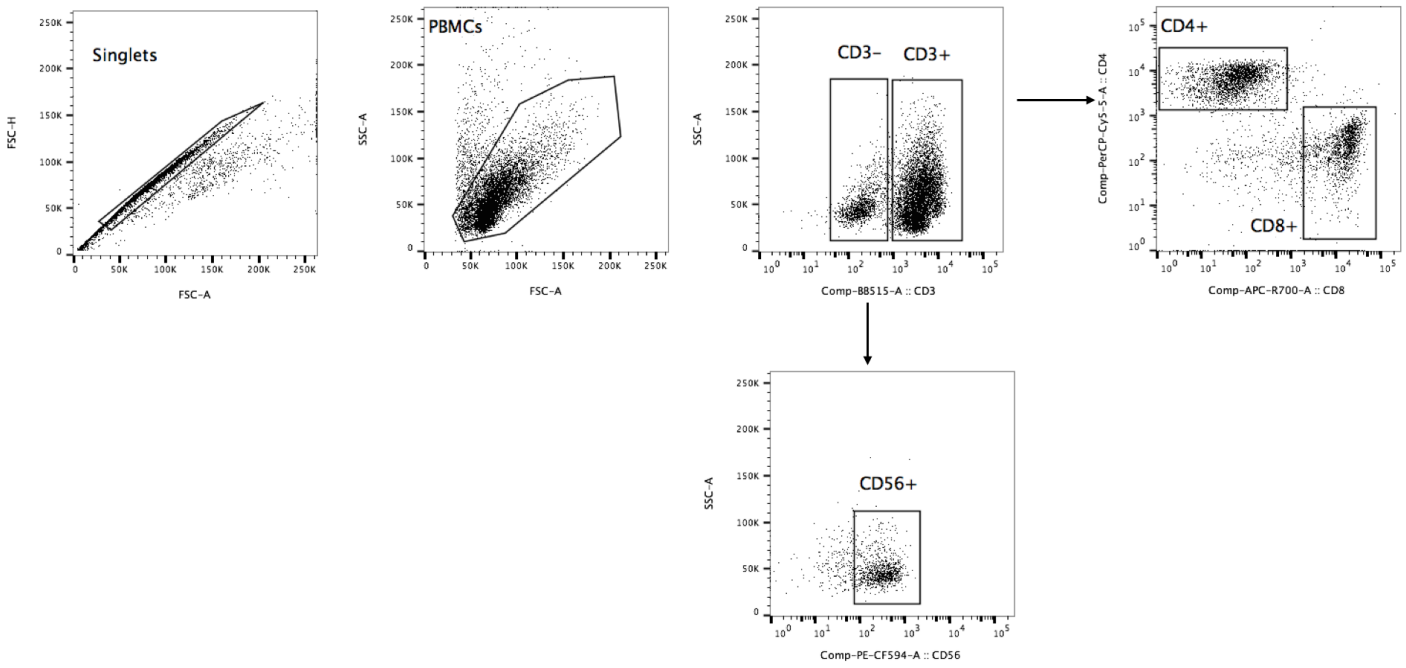
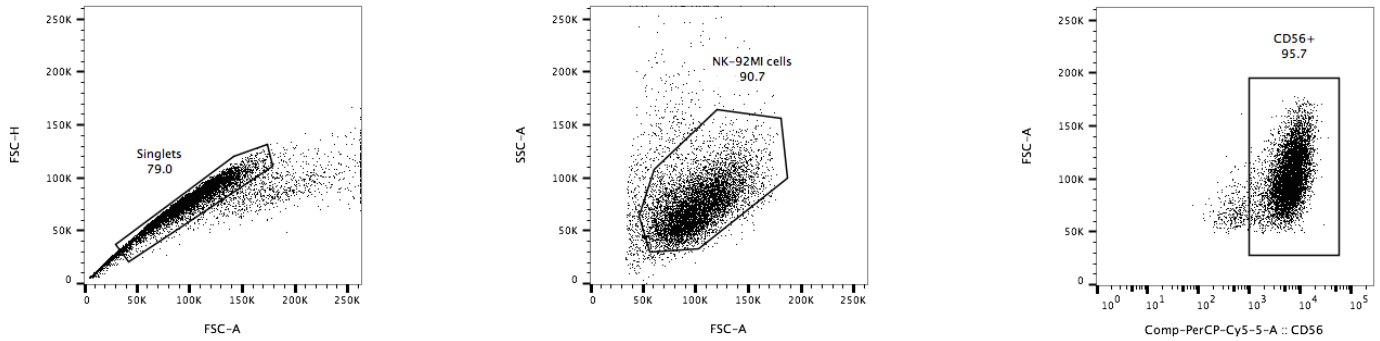
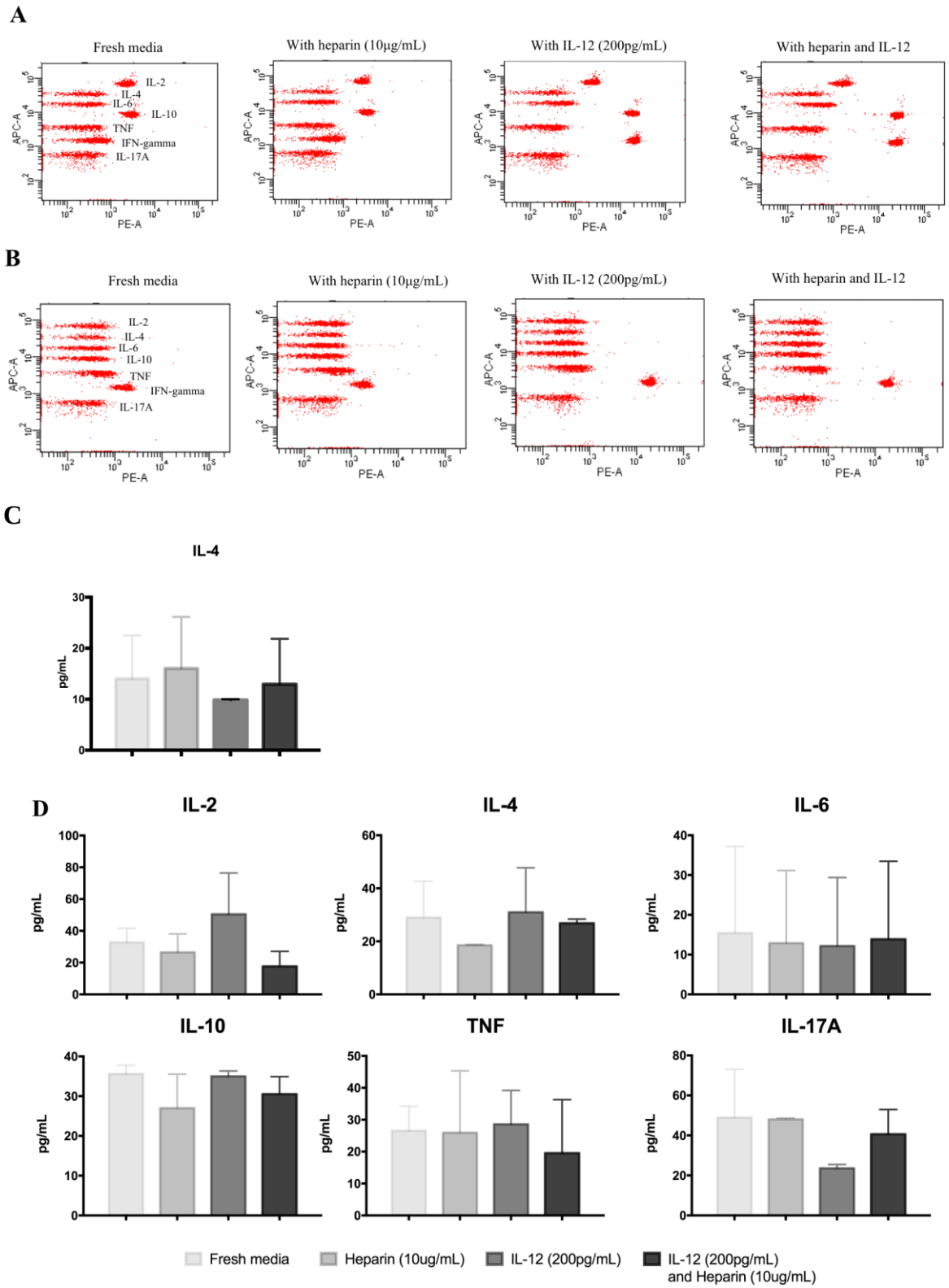


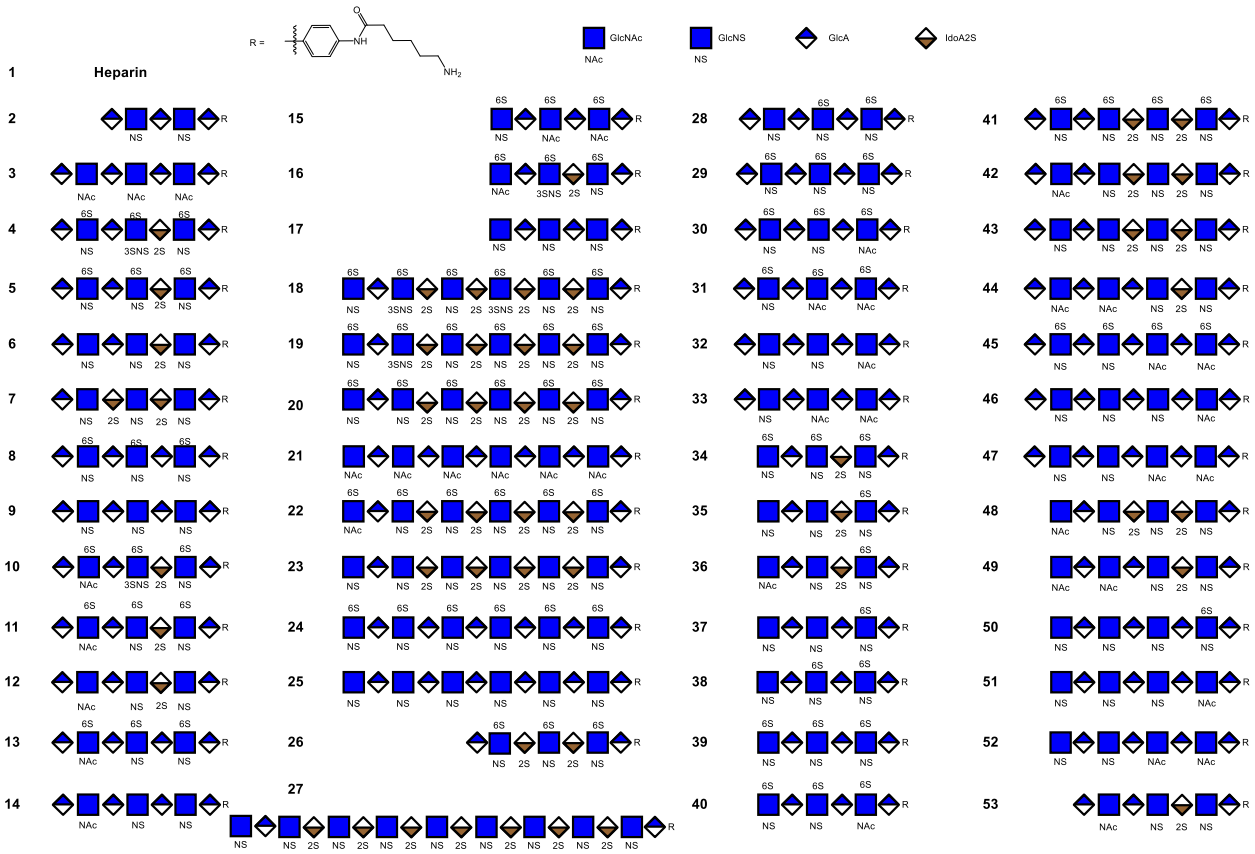
Supplemental Figure S1. Gating strategies of CD4 T cells, CD8 T cells, CD56 NK cells from PBMCs. Lymphocytes for analysis of CD4 T cells, CD8 T cells, and NK cells were gated based on using forward scatter (FSC)/side scatter (SSC) dot plots. Single cells were gated based on FSC-H and FSC-A dot plots. T cells were gated from lymphocytes based on dot plots SSC/CD3. From the T cell (CD3+) gate, Th (CD4+) and Tc (CD8+) cells were gated based on CD8/CD4 dot plots. From the non-T cell (CD3-) gate, NK cells (CD3-/CD56+) were gated based on SSC/CD56 dot plots.



Supplemental Figure S2. Gating strategies of NK-92MI cells. Single cells were gated based on FSC-H and FSC-A dot plots. NK-92MI cells were gated based on using FSC-A/SSC-A and FSC-A/CD56 dot plots.



Supplemental Figure S3. Cytokine profiles produced by NK-92MI cells and CD3 T cells in response with induction from fresh media, with heparin alone, with IL-12 alone, or with both reagents. Cytometric bead array (CBA) dot plots showing the productions of 7 cytokines including IL-2, IL-4, IL-6, IL-10, TNF, IFNγ, and IL-17A from **(A)** NK-92MI cells, **(B)** Human CD3 T cells. Bar graph showing the production of cytokines including IL-4 from **(C)** NK-92MI cells, and the production of IL-2, IL-4, IL-6, IL-10, TNF and IL-17A from **(D)** Human CD3 T cells.



Supplemental Figure S4. Fifty-three unique heparin constructs were synthesized to provide a range of lengths and sulfation levels. Abbreviations: GlcNAc: N-acetylglucosamine; GlcNS: N-sulfated glucosamine; GlcA: glucuronic acid; IdoA2S: 2-O-sulfo-α-L-iduronic acid; 6S: 6-O-sulfate.