Cell-Surface Receptor Expression on Monocytes of Young and Old Mice

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Background. Monocyte assessment is used in aging research. In humans, reduced expression of toll-like receptors, T-lymphocyte priming receptors and increases in intracellular adhesion molecules on monocytes have been associated with functional decrements, resulting in increased disease risk. While use of mouse models is extensive in aging research, mouse monocyte assessment is rare. We aimed to evaluate differences in cell-surface protein expression in classic (CD115$^+$/Gr-1^{high}) and non-classic (CD115$^+$/Gr-1^{low}) monocyte subsets of old and young mice. **Methods.** Venous blood was drawn from 18 old (80-wks) and 18 young CD-1 mice (15-20-wks). Flow cytometry was used to assess subpopulations of CD115$^+$ monocytes for TLR2, TLR4, CD80, CD86, MHC II, CD54 and CD25. Data were analyzed with 2 (age groups) x 2 (monocyte populations) repeated measures ANOVA; significance was set at $P<0.05$. **Results.** Old mice had greater proportions of classic monocytes ($P<0.05$). TLR4 and CD80 was 27% and 37% lower in classic monocytes of old mice ($P<0.05$). Body weight was not a significant covariate in the analysis. **Conclusions.** We found that old mice had elevated classic monocyte proportions and with lower expression of TLR4 and CD80. Because similar findings in older adults have been associated with increased risk of cardiovascular disease and infection, we surmise that old mice were also had increased disease risk compared to young mice. These findings support the use of monocyte subset phenotyping in murine models of aging.