

Developmental relationship among CD56^{bright}, CD56^{dim} NK cells and type-2 innate lymphoid cells (ILC2)

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Innate lymphoid cells (ILCs) are immune effector cells which, differently from T and B lymphocytes, do not express rearranged receptors. Besides NK cells that belong to the ILC1 group, the novel lineages have raised a question regarding their developmental relationship. To this regard, the ILC groups differ not only for their effector functions but also for their anatomical localization, suggesting the possibility that a common progenitor may migrate and differentiate in different ILCs, depending on the tissue microenvironment. On the other hand, we have recently indicated that CD56^{dim} and CD56^{bright} NK cells, both considered in the ILC1 group, originate from two distinct precursors which generate cells with convergent phenotypes and functions. CD56^{bright} / CD117⁺ NK cells, differently from CD56^{dim} / CD117^{neg} NK cells, early express natural cytotoxicity receptors (NCRs), while lately upregulate granzyme-B, perforin, LFA-1, and CD94-CD159a heterodimer (1). Within the ILC family, the recently defined type-2 ILCs (ILC2), characterized by CD161⁺ / CD117⁺ / NKp44^{neg} phenotype, typically produces IL-13 and IL-5 (2). Interestingly, a similar subset had been described several years ago (3). At that time, these cells had been considered an immature stage of NK cell differentiation which, under opportune cytokine stimulation, upregulated CD56 and CD94 antigens, produced IFN-gamma and became cytotoxic. New evidences suggest that, rather than an immature NK cell stage, these cells represent a mature lineage which, similar to CD56^{bright} NK cells, early expresses CD117 and CD161 antigens. However, during their differentiation, ILC-2 upregulate granzyme B and CD94 in absence of NCRs, thus resembling the CD56^{dim} NK cell lineage in their developmental pattern of antigen expression.

References

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Keywords

Innate lymphoid cells; NK cells; Haematopoietic cell differentiation.