

Characterization of natural killer cell subsets in chickens

Background:

Natural killer (NK) cells play an important role in the early defense against intracellular pathogens such as viruses, bacteria and intracellular parasites. In mammals phenotypically distinct NK-cell subsets have been described with different functional properties (regulatory versus effector NK cells).

Knowledge on NK cell biology in non-mammalian species like the chicken is limited. Recently, new markers have been identified for chicken NK cells and assays have been developed to measure NK-cell activity (1). With these assays, different NK cell subsets were found in various organs such as spleen, liver and lung (2). However, the importance of these different NK-cell subsets and their contribution to the immune response against viral infections is currently not clear.

Research question:

This project addresses the question if different NK-cell subsets exist in chickens (for example cytokine producing NK cells versus cytotoxic NK cells) and if these subsets may explain the differences in virus-induced NK-cell activation.

Experimental approach and anticipated results

Vitally frozen cells from different organs will be used. These cells will be stained with a panel of NK markers and analysed by flow cytometry. Next, different populations of cells will be sorted, RNA will be isolated and qPCR will be performed to determine the cytokine profile of the different NK subsets. In parallel, immunoprecipitations will be performed with several NK antibodies in order to isolate the antigen which is recognized.

Techniques:

Isolation of primary cells, cell culture, functional cellular assays, flowcytometry, ELISA, qPCR, immune precipitation, SDS-PAGE, Westernblot

Duration:

6-9 months

Contact:

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References

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2. Jansen, C. A., E. D. de Geus, D. A. van Haarlem, P. M. van de Haar, B. Z. Londt, S. P. Graham, T. W. Gobel, W. van Eden, S. M. Brookes, and L. Vervelde. 2013. Differential lung NK cell responses in avian influenza virus infected chickens correlate with pathogenicity. *Sci. Rep.* 3: 2478.