

Rapid Cytokine Production by NK T and NK Cells Correlates With Pre-formed Cytokine mRNAs

Daniel B. Stetson*, Markus Mohrs*%, R. Lee Reinhardt*, Jody L. Baron*, Zhi-En Wang*, Laurent Gapin^#, Mitchell Kronenberg^, and Richard M. Locksley*

*Howard Hughes Medical Institute, Departments of Medicine and Microbiology/Immunology, University of California San Francisco, San Francisco, CA 94143; ^The La Jolla Institute of Allergy and Immunology, San Diego, CA 92121; Present addresses: %The Trudeau Institute, Saranac Lake, NY 12983; #University of Colorado Health Sciences Center, National Jewish Medical and Research Center, Denver, CO 80206

NK T cells and NK cells are tissue lymphocytes that secrete cytokines rapidly upon stimulation. Here, we show that one mechanism underlying this rapid response is the presence of pre-formed cytokine mRNAs in mature NK T and NK cells. Unlike conventional T cells, NK T cells accumulate both IL-4 and IFN- γ mRNA transcripts during thymic development, and populate the periphery with both cytokine loci modified by histone acetylation. Similarly, NK cells transcribe and modify the IFN- γ gene during development in the bone marrow. Developmental activation and maintenance of lineage-specific cytokine transcription suggests these lymphocytes enter their resident tissues poised for a rapid effector response.