

Expression and biological activity of recombinant bovine IL-22: a key cytokine in mucosal defenses

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Abstract

Little is known about bovine Interleukin-22 (IL-22) or T cell responses governing bovine mucosal immunity. The objective of this work was to develop an expression vector for bovine IL-22 in order to provide reagents for the development of monoclonal antibodies against the cytokine and to have recombinant cytokine to study its biological activity *in vitro*. During a Summer Internship at the Plum Island Animal Disease Center (PIADC), USDA in the immunology lab of Dr. William Golde, a human Adenovirus 5 vector expressing the synthetic construct of bIL-22 was generated, referred to as Ad5bIL-22. Human embryonic kidney 293 cells were used to replicate this virus and express the transgene. Supernatants from infection of HEK293 cells with Ad5bIL-22 have been used in biological activity assays at the University of Vermont to test the hypothesis that recombinant bovine IL-22 has enough functional homology to human IL-22 to induce human IL-10 production in Colo205 colon epithelial cells. Supernatants from Colo205 stimulations with rbIL-22 demonstrated successful IL-10 induction indicated by hIL-10 ELISA. The work confirms biological activity of the recombinant bovine IL-22 from Ad5bIL-22 and suggests a level of functional homology and cross-reactivity of bovine and human IL-22. Further study of bovine IL-22 and its relationship with IL-10 induction may provide significant contributions to the understanding of bovine mucosal immunity and inflammatory diseases of the lung and bowel.