Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

mals resembled those produced under physiological aging process.

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A comparative analysis of the porcine, murine, and human immune systems

Harry D. Dawson, Joshua J. Reece, Joseph F. Urban Jr.

United States Department of Agriculture, Agricultural Research Service, Beltsville Human Nutrition Research Center, Nutrient Requirements and Functions Laboratory, Beltsville, MD 20705, USA
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Species: Other

A literature and laboratory-based analysis compared selected features of genotype, phenotype, and functional expression of the porcine, murine, and human immune systems. A total of 147 parameters were examined. Post-genomic analysis found about 300 unique mRNA coding sequences between mice and humans with approximately 100 related to immunity. To date, we or others have identified 43 porcine immune-related genes not found in rodents. Further analysis identified a limited number of genes present in rodents and pigs but not in humans, and genes absent in pigs but found in rodents and humans. The phenotype of many immune cells, including alternatively activated macrophages and T regulatory cells, are more similar between pigs and humans compared to rodents. Pigs are naturally susceptible to infection with species of helminths that are closely related or identical to those infecting humans (*Ascaris*, *Taenia*, *Trichuris*, *Trichinella*, *Shistosoma*, *Strongyloides*) indicating functionally similar host characteristics. Additionally, pigs are excellent models for bacterial (*Campylobacter*, *E. coli*, *Helicobacter*, *Neisseria*, *Mycoplasma*, *Salmonella*), protozoan (*Toxoplasma*) and viral infections (*Coronavirus*, *Hepatitis E*, *Influenza*, *Nipah*, *Reovirus*, *Rotavirus*) infections. Overall, approximately 80% of the 147 parameters examined were more similar between pigs and humans, suggesting that evaluating immune function in pigs provides data that is more physiologically relevant to humans.

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Gene expression of chicken interleukine-4 by baculovirus

Takayuki Kubota*, Makiko Yokayama, Masato Kishima, Satoko Watanabe, Masato Ohota, Hirokazu Hikono, Charles O.A. Omwandho, Shigeki Inumaru

National Institute of Animal Health, Japan
Keywords: Intereukin4; Chicken; Protein; Activity

E-mail address: tkubota@affrc.go.jp (T. Kubota).

Species: Avian

Introduction: Mammalian T cells are classified into Th1 and Th2 according to the cytokine production. Although chicken Th2 cytokines have not been identified until recent years, existence of Th2 cytokine was suspected temporarily. Following the cloning of Th2 cytokines such as interleukin 4 (IL-4), IL-5, and IL-13 in 2004, it became clear that these cytokines and their loci are conserved in chicken. In this study, we used a baculovirus gene expression system to express chicken IL-4 and investigate its function.

Methods: mRNA was isolated from chicken peripheral blood or thymus and RT-PCR was used to synthesis cDNA. IL-4 cDNA was inserted into pFastBac1 vector and transferred into AcNPV baculovirus by using Bac-to-Bac system (Invitrogen). Recombinant virus was infected into Tn5 insect cells. The culture supernatant containing recombinant chicken IL-4 (rIL-4) protein was harvested and partially purified by ammonium sulfate sedimentation method. Biological activity was examined by ^{3}H-tymidne uptake.

Result and discussion: After the recombinant baculovirus was infected into Tn5 insect cells, the protein secreted in the medium was accumulated into the culture supernatant. Supernatant was collected on the 5th day when protein concentration was highest. When partial refining of this protein was carried out with the ammonium sulfate sedimentation method, it precipitated between 80% to 90% saturation. Expression was checked by tricine polyacrylamide gel electrophoresis (PAGE). Two unique bands were found. The molecular masses of the two expressed proteins were about 18.6 kDa and 15.5 kDa. The molecular mass of mature chicken IL-4 calculated from the amino acid sequence is 12.4 kDa and the precursor with signal peptide is 14.8 kDa. We presume larger size of these proteins on the gel were due to glycosylation, because the sequence of chicken IL-4 contains 5 N-linked glycosylation sites and those diffused bands are typical of glycoprotein. These precipitated proteins facilitated proliferation activity of peripheral white blood cell in dose dependent manner suggesting chicken possibly have Th2 function.

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