



## O-82

# ACROSS-LINE SNP ASSOCIATION STUDY FOR (INNATE) IMMUNE TRAITS IN LAYING HENS

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A population of about 600 hens was genotyped with 1022 SNP for an association study. The immune parameters measured in blood samples were natural and acquired antibody titers and complement activity. Natural antibodies (NAb) for keyhole limpet hemocyanin (KLH), Lipopolysaccharide (LPS) were measured at 20, 40 and 65 weeks, acquired antibodies (SpAb) to Newcastle disease virus vaccine at 20 weeks, and classical and alternative *Complement* activity measured at 20, 40 and 65 weeks. The association analysis was conducted across nine different lines of White Leghorn and Rhode Island Red origin. Across lines linkage disequilibrium is conserved at shorter distances than within lines; therefore, SNP significantly associated with traits across lines are expected to be closer to functional mutations. SNP having a significant across-line effect but no significant SNP-by-line interaction were identified, to test for consistency of association across lines.

For immune traits 59 significant SNP associations were detected, confirming previously identified QTL and identifying new QTL potentially involved in the immune function. *IL17A* (chromosome 3) is involved in NAb and SpAb titers as well as *Complement* cascade activation.

We found evidence for a role of *IL17A* (chromosome 3) in NAb and SpAb titers and in the classical and alternative pathways of complement activation. The major histocompatibility complex genes on chromosome 16 showed significant association with NAb and SpAb titers and classical complement activity. The *IL12B* gene (chromosome 13) was associated with NAb titers and *IRF1* with NAb and SpAb titers and classical complement activity.

In addition feather condition score on the back, rump and belly of laying hens was performed as a measure of feather damage, which is closely related to feather pecking behavior in group-housed hens. The serotonin receptor 2C (*HTR2C*) gene on chromosome 4 was highlighted, supporting existing evidence of the prominent involvement of the serotonergic system in modulation of feather pecking behavior in laying hens. *HTR2C* also affected classical complement levels.