**TARGETED GENE MODIFICATION OF VIRAL HOST RECEPTORS IN CHICKEN MEDIATED BY PROGRAMMABLE GENOME EDITING**

**Jin Se Park1, Hong Jo Lee1, Kyung Youn Lee1, Kyung Min Jung1, Yongxiu Yao2 and Venugopal Nair2, and Jae Yong Han1**

1Department of Agricultural Biotechnology, College of Agriculture and Life Sciences, Seoul National University, Korea

2The Pirbright Institute, United Kingdom

The 3rd generation of programmable genome editing technology, clustered regulatory interspaced short palindromic repeats (CRISPR)-CRISPR-associated protein 9 (Cas9), is efficient tool for targeted gene disruption. Previous researches reported that the genome editing technology could be adapted to produce genome-edited chicken, however, it has not been fully applied for practical uses in avian species. Therefore, here, we used the evolutionary tool to targeted gene disruption for viral disease control. By applying the tool, we efficiently modified the gene of viral host receptors in chicken cells, and we identified mutations on the receptor gene alter the virus susceptibility. Furthermore, analysis of protein structure of receptor gene-modified cells revealed that the acquiring of virus resistance was may due to the protein structure change. These results suggest that targeted genome editing mediated by CRISPR/Cas9 system is efficient and precise tool in avian species and could be applied to develop viral disease resistant lines using primordial germ cell (PGC)-mediated germline transmission system.

Keyword: Viral host receptor modification

Type of abstract: Poster presentation