

Analysis on Mannose-binding Lectin as a Treatment of *Helicobacter pylori* by Using Data Mining

Seojun Kim*, Wonjong Lee*, Juho Jung*, and Taeseon Yoon**

*Natural Science Course, Hankuk Academy of Foreign Studies, Yongin-si, Republic of Korea

**Computer Science and Engineering, Korea University, Seoul, Republic of Korea

seojunkim@hafs.hs.kr, wonjong720@gmail.com, jhjung@hafs.hs.kr, tsyoon@hafs.hs.kr

Abstract - As a critical role in overall human body reactions to foreign organisms, innate immune system, especially Mannosebinding lectin (MBL), has worked for the preservation of life. Since targeted therapy on bacterial infection using innate immune system has been researched for destroying pathogens without harming ourselves, MBL could be used for the targeted therapy. Based on three algorithms; Decision Tree Algorithm, Apriori Algorithm and Support Vector Machine, analysis on chemical bond formation by comparing the similarities between two proteins which have direct relevance with mannose could suggest the potential of utilizing proteins of MBL for targeting foreign factors. According to the results, *Helicobacter pylori* and *Homo sapiens* showed distinguishable features but indicated a few common factors. We could improve the targeting treatments by considering immunological approach using MBL; to analyze the possibility for forming chemical bond between human MBL and mannose of *Helicobacter pylori*.

Keyword—*bioinformatics, data mining, helicobacter pylori, immune system, mannose-binding lectin*



Seojun Kim was born in Gangneung, South Korea in 1999. He is studying biology and computer science in Hankuk Academy of Foreign Studies, and interested in gene expression of immune system and influenza virus research. He published a paper about H5N1, H5N3, H7N9 hemagglutinin and neuraminidase sequence analysis using decision tree algorithm on International Conference on Chemical and Process Engineering.



Wonjong Lee was born in Daejeon, South Korea in 1999. He is now in Hankuk Academy of Foreign Studies. He is interested in immunology and bioinformatics using data mining. He is majoring in bioinformatics and dental biomaterials in the academy and conducted a presentation about observation of dissociation and reformation of hydroxyapatite depending on pH and surfactant on The Korean Society for Biomaterials.



Juho Jung was born in Seongnam, South Korea in 1998. He is studying computer science in Hankuk Academy of Foreign Studies. He is interested in bioinformatics using data mining and influenza virus research. He also majoring immunology in the academy and he is planning to research on artificial intelligence.



Taeseon Yoon was born in Seoul, Korea, in 1972. He received the Ph.D. candidate degree in computer education from the Korea University, Seoul, Korea, in 2003. From 1998 to 2003, he was with EJB analyst and SCJP. From 2003 to 2004, he joined the Department of Computer Education, University of Korea, as a lecturer and Ansan University, as an adjunct professor. Since December 2004, he has been with the Hankuk Academy of Foreign Studies, where he was a computer science and statistics teacher. He was the recipient of the Best Teacher Award of the Science Conference, Gyeonggi-Do, Korea, 2013.