

Vaccine development for Newcastle disease virus in poultry

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Newcastle Disease Virus (NDV), an avian orthoavulavirus, is a causative agent of Newcastle Disease named (NDV), and can cause even the epidemics when disease is not treated. Previously several vaccines based on attenuated and inactivated viruses have been reported which are rendered useless with the passage of time due to versatile changes in viral genome. Therefore, we aimed to develop an effective multi-epitope vaccine against the Haemagglutinin Neuraminidase (HN) protein of 26 NDV strains from Pakistan through a modern immunoinformatic approaches. As a result, a vaccine chimaera was constructed by combining T-cell and B-cell epitopes with the appropriate linkers and adjuvant. The designed vaccine was highly immunogenic, non-allergen and antigenic; therefore, the potential 3D-structure of multi epitope vaccine was constructed, refined and validated. A molecular docking study of a multi epitope vaccine candidate with the chicken Toll-like receptor-4 indicated successful binding. An *In silico* immunological simulation was used to evaluate the candidate vaccine's ability to elicit an effective immune response. According to the computational studies, the proposed multi epitope vaccine is physically stable and may induce immune responses which suggested it a strong candidate against 26 Newcastle disease virus strains from Pakistan. A wet lab study is under process to confirm the results.

Keywords: Epitopes, Newcastle disease virus, Paramyxovirus virus, Vaccine.

Biography

Muhammad Asif Rasheed is affiliated to the COMSATS University Islamabad, Sahiwal Campus, Pakistan. He is a teacher and researcher. Teaching is his passion and he love to teach. Besides, he is also a clinician in veterinary medicine.

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