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Searching for potential novel Orf virus epitopes using reverse vaccinology.

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Abstract: Orf virus is a zoonotic virus that mainly affects sheep and goats and causes skin lesions, which reduce the feeding process among their lambs and kids. An Orf virus vaccine is available, however, the immunity it induces doesn't last for more than one year, making the reinfection of the virus very common. This research aims to find epitopes that could be a good target for a long-term protein-based vaccine. Using reverse vaccinology, all proteins of the three Orf virus strains (ORFV-SA00, ORFV-NZ2 & ORFV-SY17) were studied by searching for proteins that could have good subcellular localization, antigenicity, as well as being conserved among the three genomes. After selecting proteins with these properties, linear B-cell and T-cell epitopes were detected. The last step was to test the stability of these chosen epitopes by searching for potential proteasomal cleavage sites. This final step in the bioinformatics discovery pipeline left a single stable epitope candidate (DRRPCGVQD). This protein (epitope) is recommended to be tested experimentally to ensure its effectiveness as a vaccine target protein.

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