Pentavax: Pentraxin Proteins With Dengue Virus Immunoreactivity

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The dengue virus infects over 400 million people each year and can lead to organ failure and death. Until 2024, there was only one current vaccine option for dengue; however, studies have shown that this vaccine led to worsened symptoms for patients because it is ineffective at building immunity to all four serotypes of the virus. This leads to antibody-dependent enhancement (ADE), a phenomenon where patients who take the vaccine produce faulty antibodies that cannot fight the dengue virus, and the patients get sicker. This highlights a pertinent need for a new dengue vaccine. Current research points to a location on the virus known as the NS1 protein that can potentially lead to both a dengue therapeutic or a vaccine. This highly immunogenic region may produce a sufficiently intense immune response, diminishing the risk of ADE. This year, three Pentraxin proteins were developed with different conserved NS1 peptides as potential candidates for a new dengue vaccine. The proteins, named "Pentavaxes", were produced through plasmid preparation and CHO mammalian cell transfection, and purified using PE chromatography. UV scans determined that protein was present, and protein gels determined that the Pentavaxes had been produced at the correct molecular weight of 27 kDa. A western blot will be run to determine if the Pentavaxes can bind to DENV antibodies, indicating immunoreactivity. Additionally, "heteropentamers" with combinations of multiple NS1 peptides on the same Pentraxin are being produced as a possible method for achieving multivalency.

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