Docket #: S24-468

Protein-only Topical Vaccines and Methods of Use

Researchers at Stanford have developed a novel vaccine strategy that would remove the need to use needles in vaccine administration.

Vaccination is a highly effective and affordable way to prevent disease, saving an estimated 4.4 million lives each year. However, most vaccines require injection by trained healthcare workers, which can discourage people who fear needles and complicate vaccine distribution. Needle-based delivery also limits the ability to give combination vaccines that protect against multiple viruses at once. In addition, vaccines that stimulate strong mucosal immunity to block respiratory virus transmission have been difficult to achieve, highlighting a clear gap in the market for safe, effective non-needle–based vaccination strategies.

Stage of Research
This invention would allow for vaccination to occur via a topical treatment. Briefly, this topical treatment would contain a fusion protein with a binder polypeptide and an antigenic polypeptide. This binder polypeptide would be capable of binding to surface proteins on antigen presenting cells (APCs) such as a major histocompatibility complex II (MHCII) protein or an Fc receptor. By engaging with APCs present on the surface of the skin, this topical vaccine could illicit an immune (T cell or B cell) response that would confer immunity to the pathogen that is represented in the antigenic polypeptide.

Stage of Development
Research - in vivo

Applications

- **Vaccination**: A topical vaccine would allow for more widespread vaccination, especially in low resource areas where the supply chain is a limiting factor to

effective population vaccination strategies.

Advantages

- **Removes the need for needles**: A topical vaccine would remove the need for the use of needles in vaccinations, which would in turn make vaccines more accessible.
- **Ability to vaccinate for multiple viruses**: Needles make it difficult to vaccinate for multiple viruses at a time due to volume constraints, a topical vaccine would make vaccinating for multiple viruses at once possible.

Innovators

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