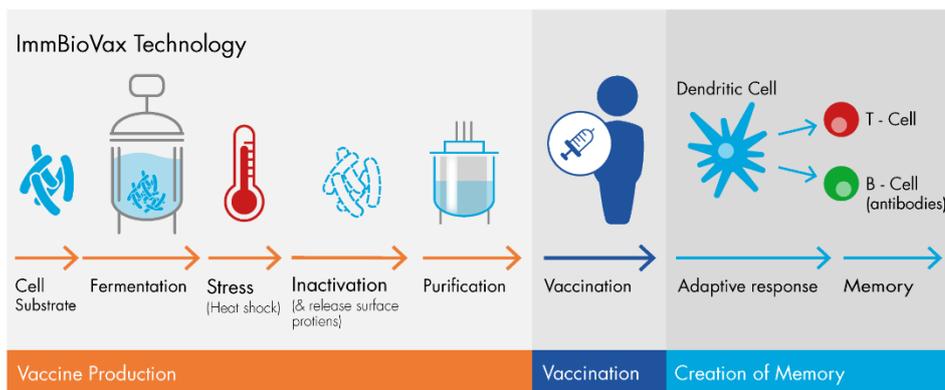


## Developing strain independent, cost-effective vaccines

ImmBio is a clinical stage, next generation vaccine development company, addressing life threatening, debilitating bacterial infections with unmet medical needs. ImmBio's approach provides, for the first time, the potential for a universal pneumococcal disease prophylactic vaccine that would lead to protection independent of specific *Streptococcus pneumoniae* strains.

## ImmBioVax Technology

At the core of ImmBio's platform technology, **ImmBioVax**, is the ability to produce a vaccine encompassing multiple proteins, common between strains of a particular bacteria species and capable of invoking a T cell and B cell immune response that leads to immune cell memory. On actual infection with the bacteria, the immunological memory triggers both T and B cells to recognise and destroy the pathogen.



## Key benefits

- Potential to address many different bacterial pathogens, for prophylactic and therapeutic use, including use in cancer immunotherapy.
- Incorporates multiple functional antigens to address pathogen and human diversity.
- Simple and cost effective technique using readily-available, scalable methods, with no *a priori* need to identify protective antigens.
- Although the end-product is multi-protein based, only a single fermentation stage is required, resulting in high yields and low cost of goods.
- Vaccines produced using **ImmBioVax** confer immunity through activating the body's own innate and adaptive response<sup>1</sup>, resulting in an excellent safety profile.

## Key facts

- Lead product PnuBioVax, a vaccine against *Streptococcus pneumoniae* based on the company's ImmBioVax platform technology, has successfully completed Phase I clinical studies.
- Pneumonia kills more than 4 million people a year and causes the largest number of deaths in children under five worldwide.
- Current available products protect against less than 23 of the 90+ known serotypes of *S. pneumoniae*. New strains emerging and the frequency of serotypes not covered by current vaccines is growing, as is antibacterial resistance.
- With therapeutic intervention expensive and not always successful, especially in the young, elderly and when co-morbid, prophylaxis is globally beneficial, hence current vaccine sales of in excess of \$6b pa.
- **PnuBioVax is designed to be a universal vaccine, independent of strains.**
- PnuBioVax is adjuvant free, and manufactured using a reproducible process. It requires a single fermentation step, unlike multi-valent products, inherently reducing the Cost of Goods.
- **The technology is protected by four IP families, as well as the trademark, substantial know-how and the proprietary master cell bank of a genetically-modified cell substrate.**

**PnuBioVax**, the Company's lead product, is being developed as a cost-effective universal vaccine against *S. pneumoniae* and has successfully completed Phase I clinical studies. This vaccine has the potential to protect across all strains, including those not covered by currently available vaccines.

In addition **PnuBioVax** is expected to address immune system variation that arises within the human population as a result of an individual's age, race, sex, health status or geographic location.

**PnuBioVax** is an adjuvant-free, multi-protein vaccine against *S. pneumoniae* and is based on the pathogen's proteins, including cell surface protein antigens and detoxified toxin protein.

If used prophylactically, **PnuBioVax** has the potential to provide long term protection against life threatening diseases such as pneumonia, meningitis and sepsis.

Extensive **PnuBioVax** preclinical data<sup>2</sup> support multiple Mechanisms of Action, notably prevention of *S. pneumoniae* carriage, known to lead to invasive disease<sup>3</sup>, as well as killing activity and neutralisation of the Pneumolysin (Ply) toxin, a key source of tissue damage and disease progression. The data from our completed Phase I clinical studies will be published in *Vaccine*.

## Other Products in Portfolio

ImmBio has several vaccines in its portfolio that are derived from the **ImmBioVax** technology platform. These include **T-BioVax**, a vaccine against *Mycobacterium tuberculosis*, the major cause of tuberculosis and **MenBioVax**, a novel potential universal vaccine against *Neisseria meningitidis*, a major cause of meningitis. **T-BioVax** is being co-developed in China. ImmBio also has a number of early-stage research programmes targeting serious bacterial diseases including *C. difficile* and *H. pylori*, as well as exploratory research in oncology applications.

## Partnering

ImmBio is interested in partnering its PnuBioVax programme with organisations that have the vaccine development, manufacturing and commercialisation capabilities and resources to take PnuBioVax through to market.

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