CRISPR/Cas9 For Rapid Vaccine Development

CRISPR/CAS9 AS A PLATFORM FOR VACCINE DEVELOPMENT

The prevention and management of outbreaks and epidemics like COVID-19 and other emerging infectious illnesses emphasises the critical importance of vaccinations and quick vaccine development. Vaccination is one of the most cost-efficient and effective public health strategies for infectious disease prevention and control, as well as one of the most successful ways to prevent the spread of infectious pathogens on a wide scale. However, developing a vaccine is a lengthy, complex, and costly procedure. Scientists are constantly grappling with how to quickly and easily develop specialised vaccines, and CRISPR/Cas 9 can provide a solution.

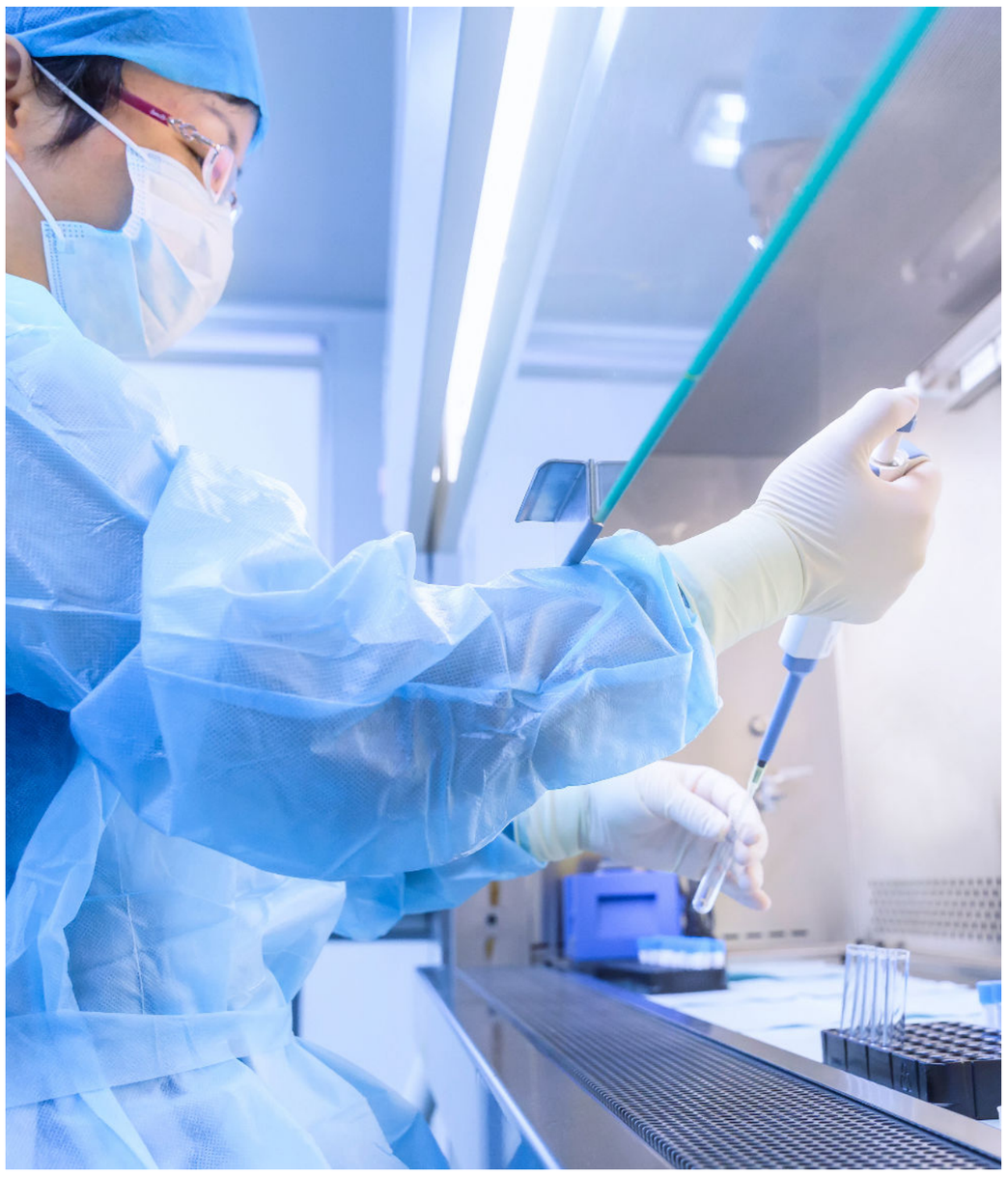
"The application of CRISPR/Cas9 provides a novel platform in the development of recombinant viral vaccines through improvements in vaccine design and experimental vaccination approaches across different species" - Julianne Vilela

CRISPR has revolutionised the world of gene editing through its inexpensive nature, unlimited applications, high specificity and ability to target virtually any organism; and in response to emerging infectious diseases, CRISPR/Cas9 can accelerate and further advance progress in vaccine development. CRISPR/CAS 9 when employed in vaccine development can enable for the efficient and rapid deletion of virulence factors and insertion of antigens into the infectious laryngotracheitis virus, resulting in recombinant, multivalent vaccine vectors using NHEJ-CRISPR/Cas9. (Atasoy and colleagues, 2019). Research groups such as Chang et al. developed recombinant Turkey herpesvirus vectors for avian influenza vaccines using Homology-directed repair CRISPR/Cas9.

The rapid generation of recombinant African swine fever virus has also been enabled by CRISPR/Cas9 gene editing. (Borca et al., 2018).

More recently, Cas9 knock-in mice have been altered to express hACE2, allowing researchers to study SARS-CoV-2 transmission and pathology. (Sun and others, 2020).

The ability to remove virulence factors, attenuate pathogens, insert antigens for host recognition, develop recombinant & safe viral vectors for vaccine delivery, rapidly create animal models and accelerate viral production for studies, demonstrates the versatility of CRISPR/Cas 9 in vaccine development, and are just some of the limitless ways CRISPR/Cas9 can be employed.



CRISPR/CAS9 VACCINE APPLICATIONS

CRISPR/Cas9 provides an alternative method to conventional approaches which is fast, efficient, and straightforward, accelerating the vaccine development process through:

- CRISPR Pathogen- Host Interaction Studies
- CRISPR Functional Pathogen Gene Function Studies
- Pathogen Virulence Editing & Attenuation
- CRISPR Genome-Wide Screening
- Recombinant Vaccines and Vectors
- Accelerating Virus Production for slow-growing viruses eg. influenza.
- Rapid Generation of Animal Models

As the global licensing leader for CRISPR/Cas9, ERS Genomics is the first port of call when developing a commercial or research application using CRISPR/Cas9. This applies whether you're a new biotech start-up or an established life sciences organisation.

We have already completed more than 100 licence agreements across a range of life science sectors and make patent rights available in more than 80 countries – the most comprehensive collection of proprietary rights to CRISPR/Cas9 available.

Talk to us today to discuss your licensing needs and let our experienced team help you to leverage the power of CRISPR/Cas9.

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