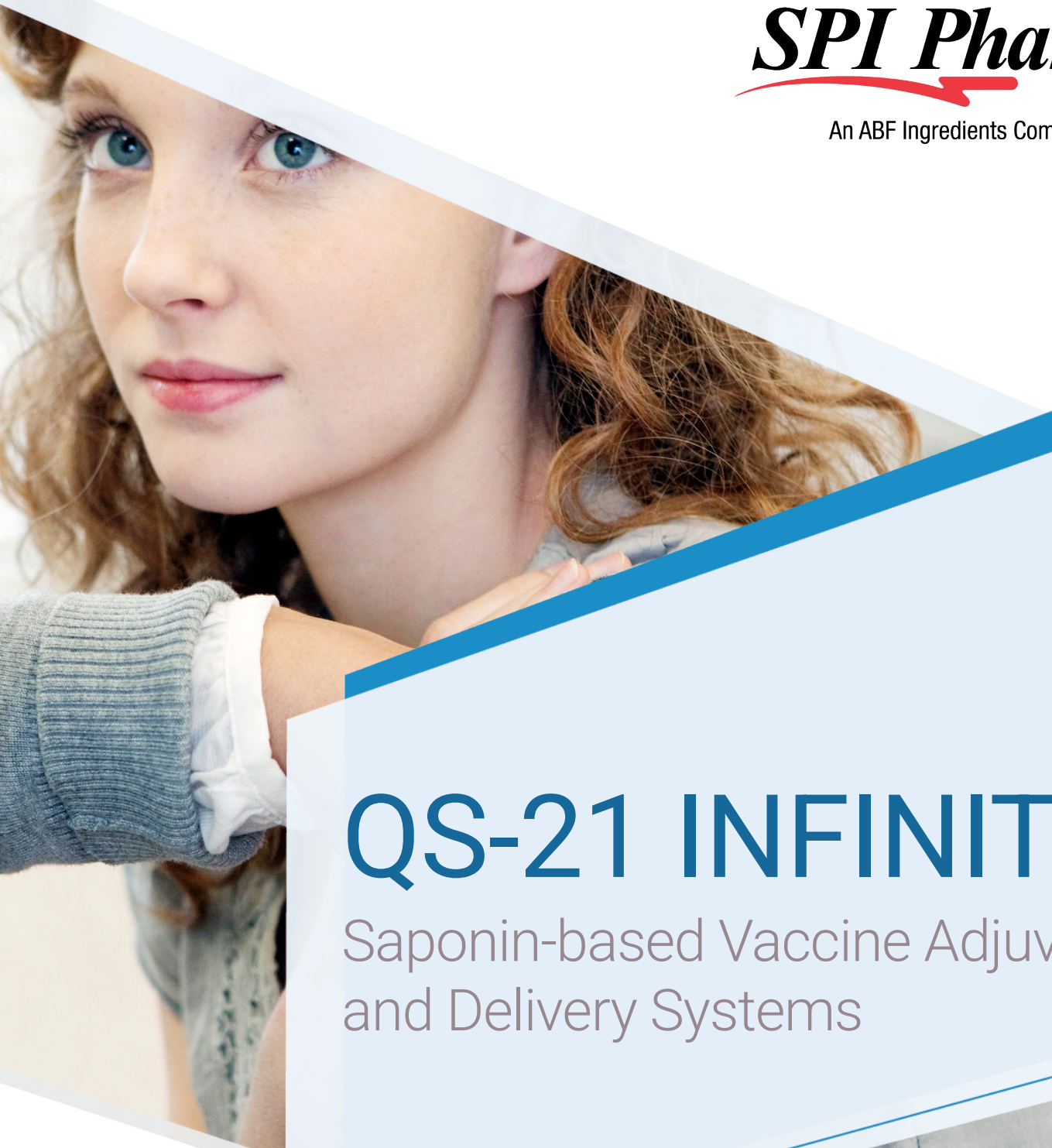
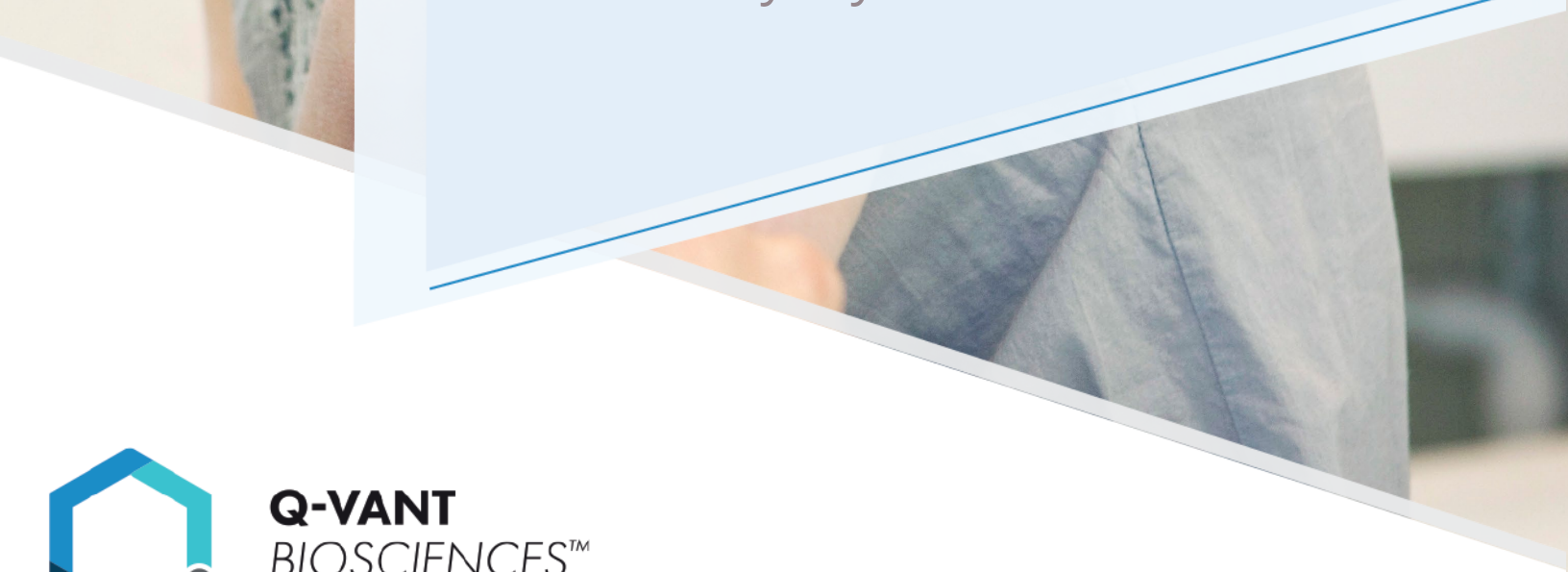
SPI Pharma™

An ABF Ingredients Company



QS-21 INFINITY™

Saponin-based Vaccine Adjuvants and Delivery Systems



Q-VANT BIOSCIENCES™

QS-21 INFINITY is purified QS-21 fraction, collected from scalable and sustainable biomass source. Today, QS-21 is a vital component in three FDA or WHO approved vaccines: Mosquirix® (Malaria), Shingrix® (Varicella-Zoster), Arexvy® (RSV), and in multiple human vaccine candidates.

Potent immune protection

QS-21 is backed by over 35 years of scientific validation and remains a leadin candidate for the development of new vaccines. QS-21 possesses a cross-cutting activating effect on key cell populations involved in the immunization process [1-3] resulting in a strong antibody and cell mediated response [4, 5]. This dual adjuvant effect on the adaptive immune response greatly increases the likelihood of vaccine efficacy.

QS-21 enhances the immunogenicity of proteins, glycoproteins, and polysaccharide antigens in several animal models [6]. QS-21 is incorporated in vaccine developments against infectious [2], neurodegenerative [2] and cancer [7] diseases (melanoma, brain, breast, ovarian and lungs) in the form of immunotherapeutic vaccines.

In antigen presenting cells, QS-21 stimulates activation [3], antigen uptake [8], processing [9] and cross-presentation via MHC-I to naive CD8+ T cells enhancing the formation of CTLs [4, 5]. QS-21 activates T cells directly through CD2 receptor stimulation that in turn promotes secretion of Th1 profile cytokines [10].

QS-21 has been studied and tested in over 120 clinical trials involving approximately 50,000 patients as both a standalone adjuvant and formulated in adjuvant systems. Vaccines containing QS-21 are used to prevent difficult diseases such as malaria, which it was previously not possible to develop effective vaccines against.

QS-21 INFINITY vs QS-21 benchmark (bark-derived)

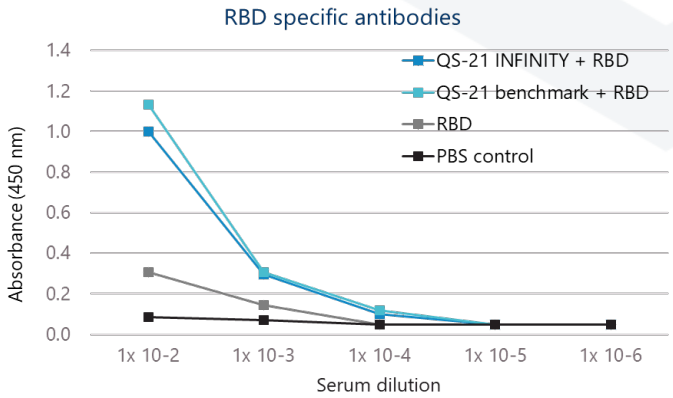


Figure 1. Levels of specific RBD antibodies in the serum of previously vaccinated mice. All RBD specific IgG antibodies indicate high reactivity against RBD antigen, showing no statistically significant difference between QS-21 INFINITY and benchmark QS-21.

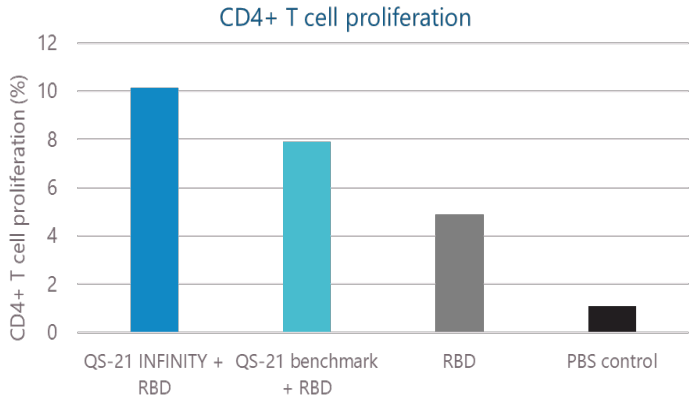


Figure 2. CD4+ T cell proliferation rates pulsed 5 days with RBD. The percentage of T cell expansion is increasing for both QS-21. This means that in vaccinated mice there are different abundances of RBD-sensitized memory T cells capable of responding by clonal expansion to a new encounter with the antigen. QS-21 INFINITY resulted in a higher proliferation of CD4+ T cells than QS-21 Benchmark ($p \leq 0.05$).

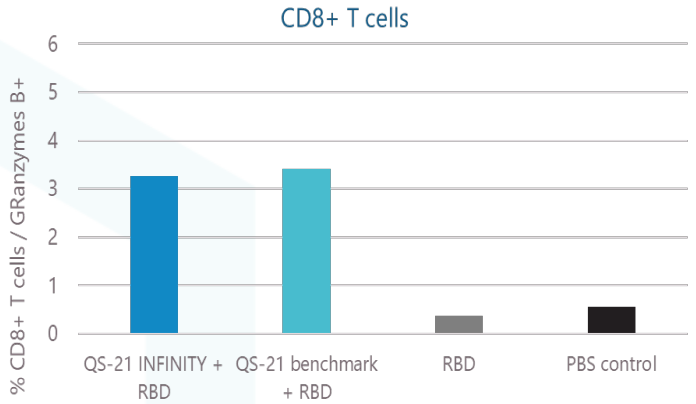


Figure 3. Intracellular expression levels of granzyme B in CD8+ T cells from splenocyte culture pulsed 6 hours with RBD antigen. No significant differences were observed between both QS-21

Scalable and robust supply chain

- Our proprietary Q-SAP process ensures high purity and quality QS-21, escalating the potential for sustainable supply resulting in a possible annual production capacity exceeding 20 billion vaccine doses.
- QS-21 INFINITY is obtained from multiple sources of renewable *Quillaja saponaria* biomass and sustainable pruning of trees.
- QS-21 INFINITY is manufactured in Chile
- cGMP QS-21 INFINITY is available in Q2-2026.

Request evaluation samples to explore QS-21 INFINITY in your pipeline.

References

1. Marciani, D.J., *Elucidating the Mechanisms of Action of Saponin-Derived Adjuvants.* Trends Pharmacol Sci, 2018. **39**(6): p. 573-585.
2. Lacaille-Dubois, M.A., *Updated insights into the mechanism of action and clinical profile of the immunoadjuvant QS-21: A review.* Phytomedicine, 2019. **60**: p. 152905.
3. Detienne, S., et al., *Central Role of CD169(+) Lymph Node Resident Macrophages in the Adjuvanticity of the QS-21 Component of AS01.* Sci Rep, 2016. **6**: p. 39475.
4. Kensil, C.R., *Saponins as vaccine adjuvants.* Crit Rev Ther Drug Carrier Syst, 1996. **13**(1-2): p. 1-55.
5. Newman, M.J., et al., *Saponin adjuvant induction of ovalbumin-specific CD8+ cytotoxic T lymphocyte responses.* J Immunol, 1992. **148**(8): p. 2357-62.
6. Ragupathi, G., et al., *Natural and synthetic saponin adjuvant QS-21 for vaccines against cancer.* Expert Rev Vaccines, 2011. **10**(4): p. 463-70.
7. Schijns, V., et al., *Modulation of immune responses using adjuvants to facilitate therapeutic vaccination.* Immunol Rev, 2020. **296**(1): p. 169-190.
8. Marciani, D.J., *Vaccine adjuvants: role and mechanisms of action in vaccine immunogenicity.* Drug Discov Today, 2003. **8**(20): p. 934-43.
9. Welsby, I., et al., *Lysosome-Dependent Activation of Human Dendritic Cells by the Vaccine Adjuvant QS-21.* Front Immunol, 2016. **7**: p. 663.
10. Kensil, C.R., et al., *QS-21 and QS-7: purified saponin adjuvants.* Dev Biol Stand, 1998. **92**: p. 41-7.1.