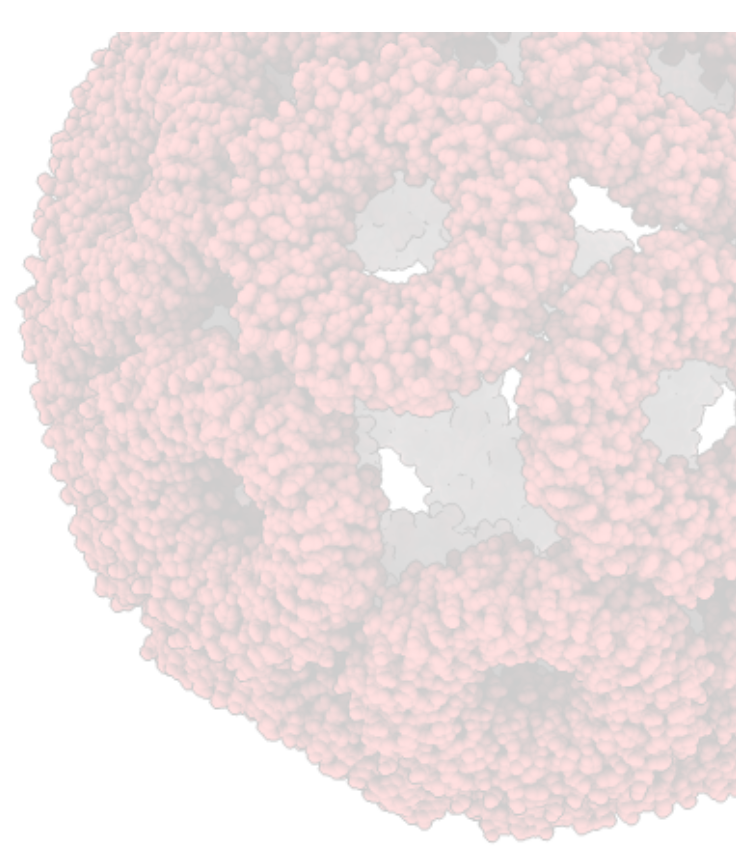




Programmable TRAP-cages: A Next-Generation Vaccine Platform

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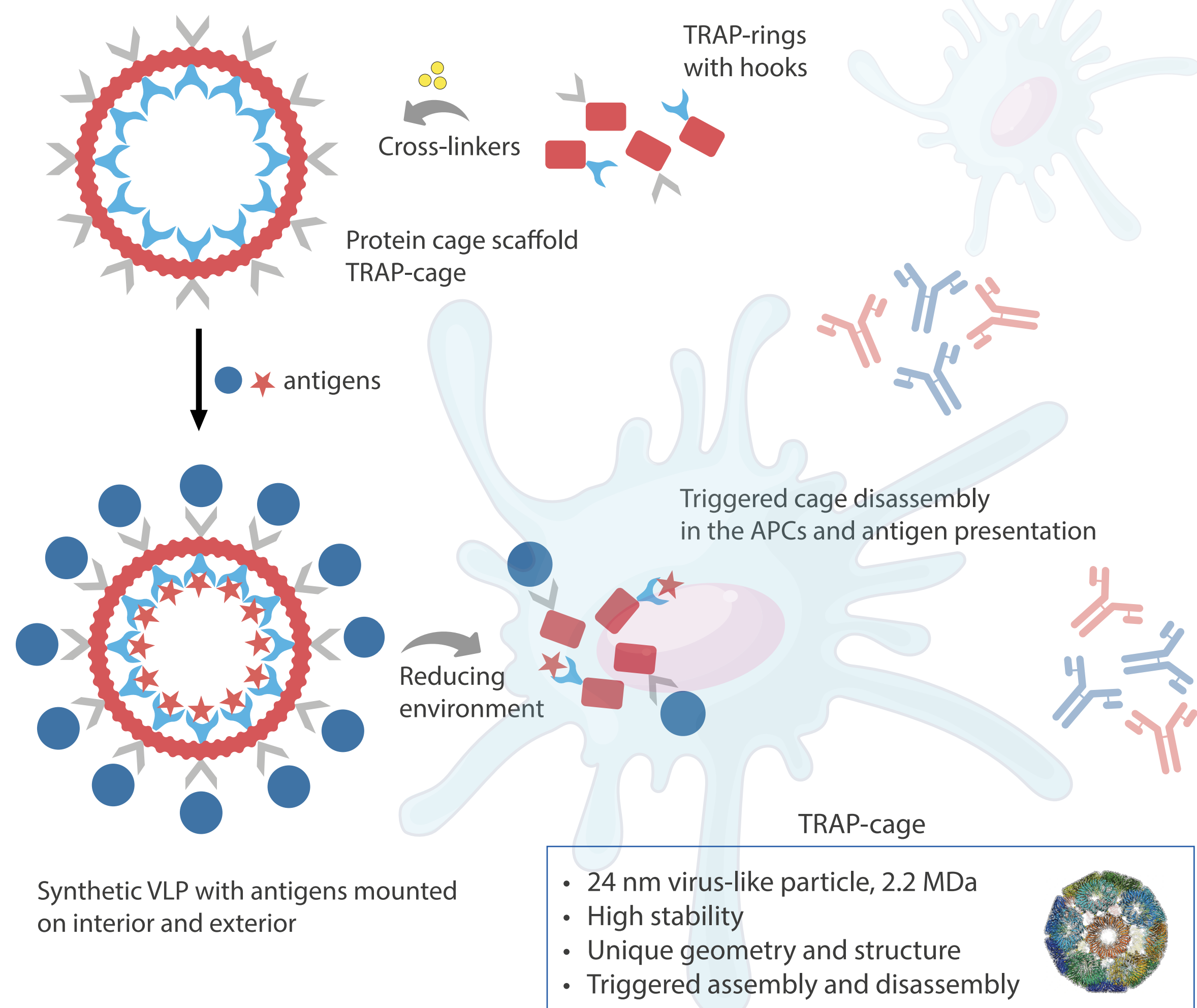
Protein cages are nanoscale structures with significant biological and therapeutic potential. De novo protein cages, particularly synthetic Virus-Like Particles (VLPs), offer advantages in vaccine development by enabling ordered and dense antigen presentation (mimicking the shape and structure of a virus), which enhances B- cell activation and immune response.

At nCage Therapeutics, we utilize a novel protein cage platform based on the tryptophan RNA-binding attenuation protein (TRAP)^{1,2}. Unlike other developed protein cages, TRAP-cages are assembled via metal ion mediation or chemical crosslinking, granting exceptional stability under extreme conditions while allowing the programmable opening and closing.

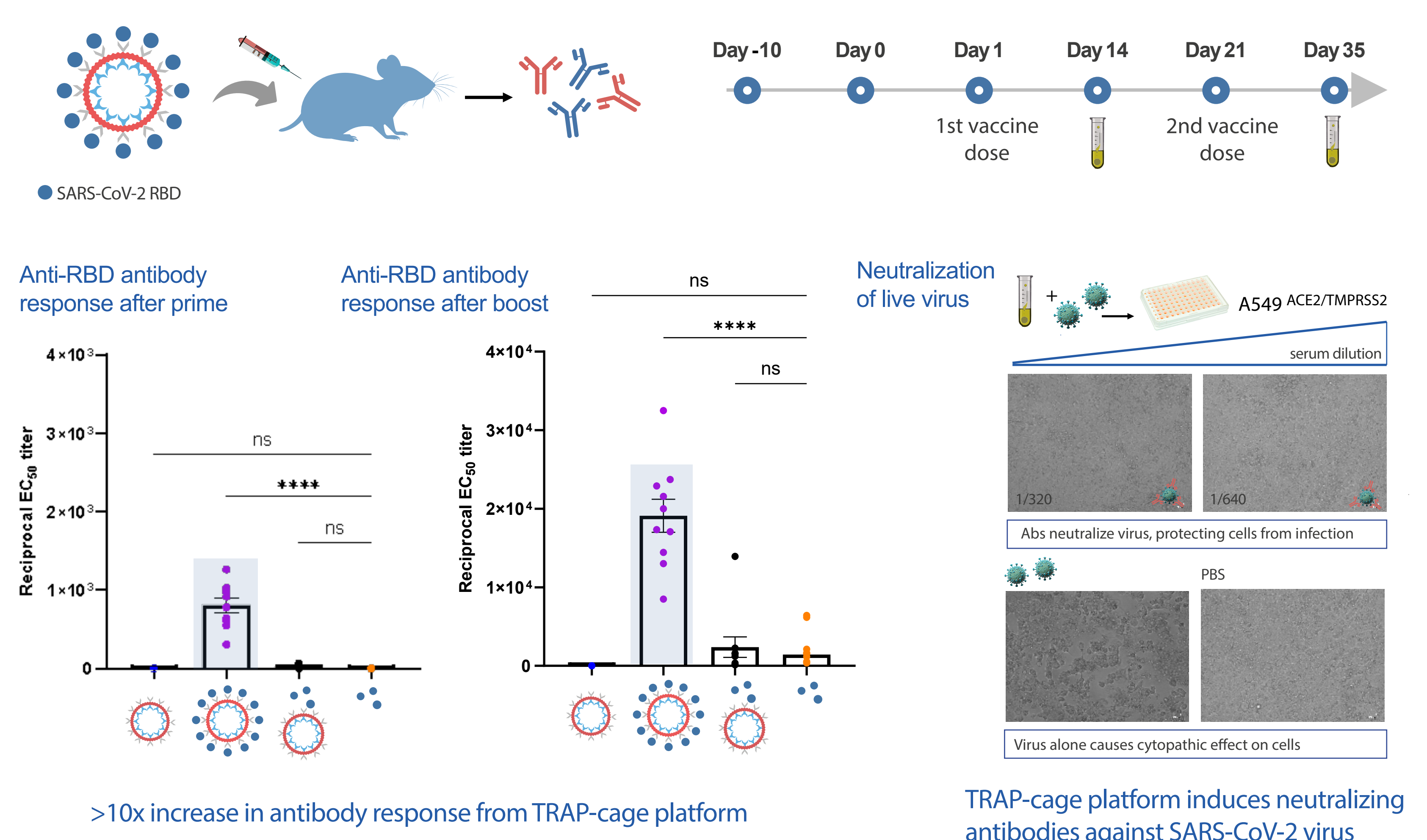
The TRAP-cage platform supports a dual antigen-loading strategy: pathogenic antigens are displayed on the exterior, while pathogenic peptides are encapsulated internally. The approach enhances activation of both the B- and T-cell arms of the immune system. In preclinical mouse models, TRAP-cage based vaccines have demonstrated strong neutralizing responses, highlighting their potential for next-generation vaccine development

The results achieved showcase the potential of programmable synthetic protein cages as vaccine candidates that can help meet growing unmet needs and provide protection against emerging viral and bacterial threats to public health.

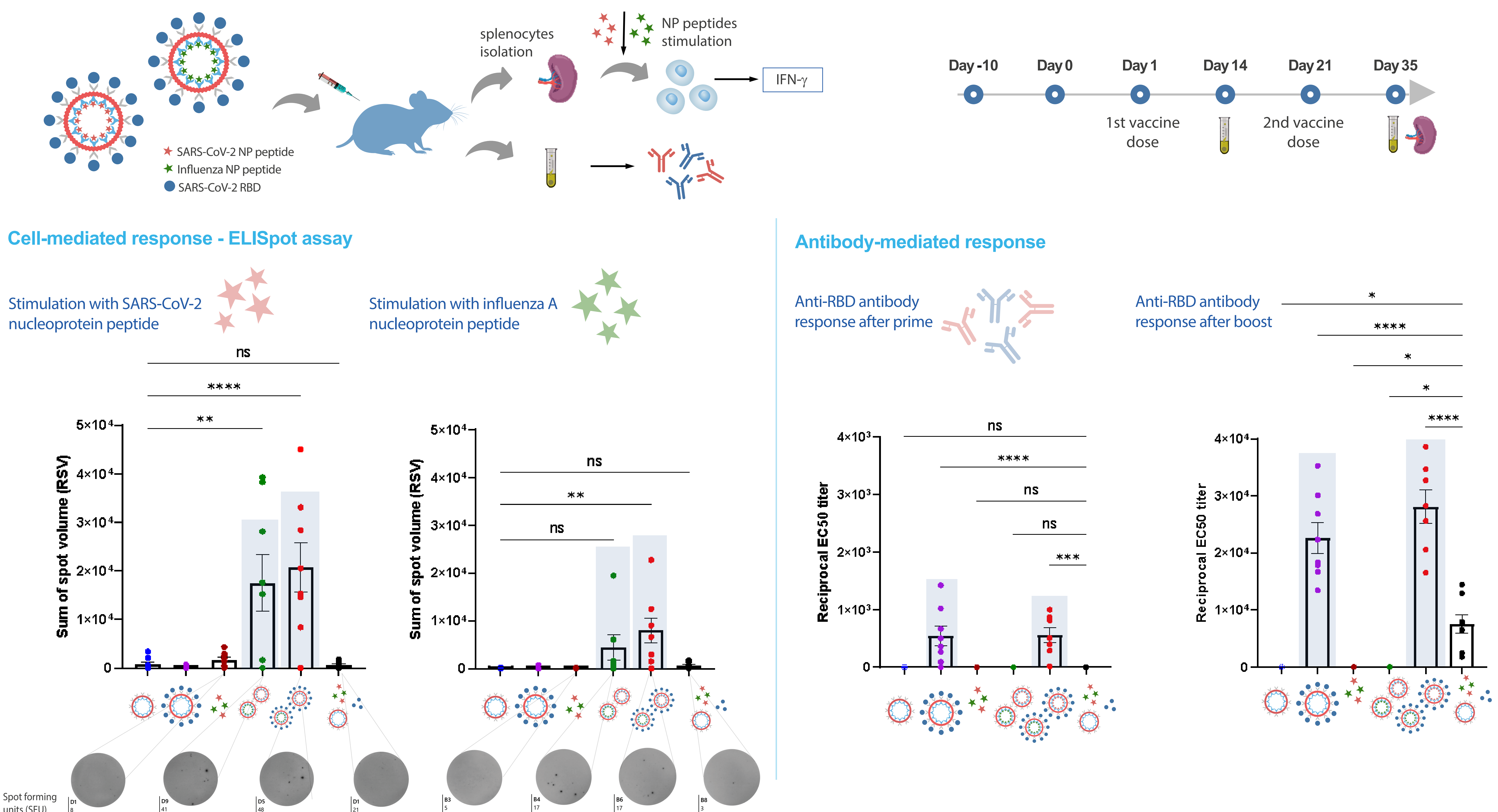
TRAP-cage assembly and antigen presentation



Vaccination with TRAP-cage displaying SARS-CoV-2-RBD



Vaccination with TRAP-cage displaying SARS-CoV-2 RBD and viral peptides in combination



Conclusion

- TRAP-cages are synthetic protein cages that mimic the shape and structure of a virus
- nCage has demonstrated the potential of our protein cage platform by showing a ten-fold increase in antibody response for antigen displayed on the TRAP-cage, as opposed to an antigen in a soluble formulation
- TRAP-cages loading with viral peptides shows a T-cell response as measured by interferon-gamma (IFN- γ)
- TRAP-cages have large potential as a vaccine platform offering multiple design opportunities for novel vaccine candidates.



Malay A., et al. Nature, 2019



Stupka I., et al. Sci. Adv., 2022

¹ Malay A., et al. *Nature*, 2019
² Stupka I., et al. *Sci. Adv.*, 2022

