New smart polymers that can accurately **measure lentivirus** were **synthesized and evaluated** in just **4 months**.

Development of VSV-G Smart Polymers for Lentivirus Quantification: from *in silico* modelling to application

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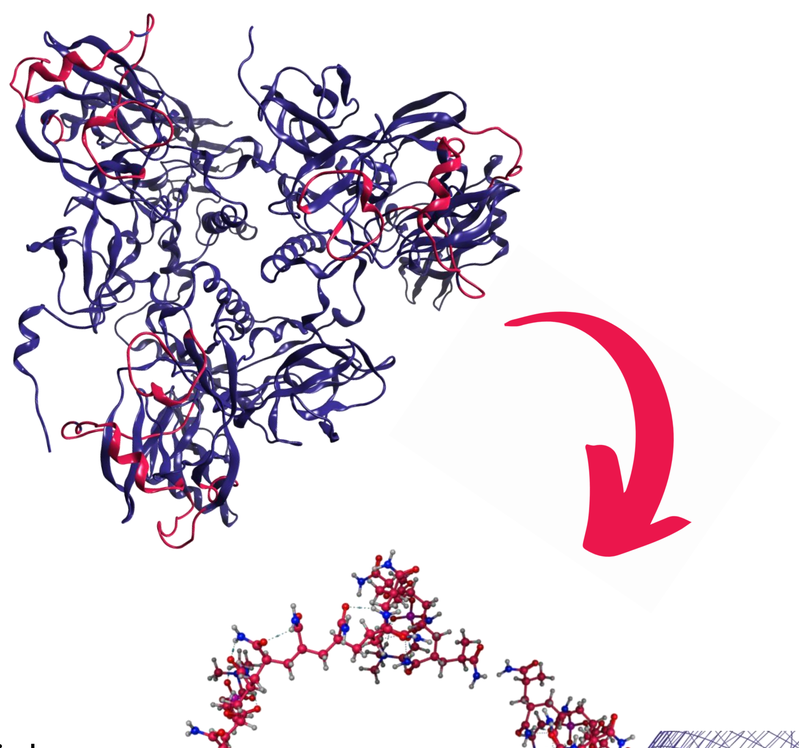
In silico Modelling

Computational modelling was used to assess the surface of VSV-G, an envelope protein of Lentivirus (LV). **7 epitopes** were selected for use as templates in the development of smart polymers. Subsequently, each epitope was screened against a library of **>500 monomers** (the building blocks of smart polymers). Monomers that interacted favorably with the epitopes were used in the next step of polymer development.

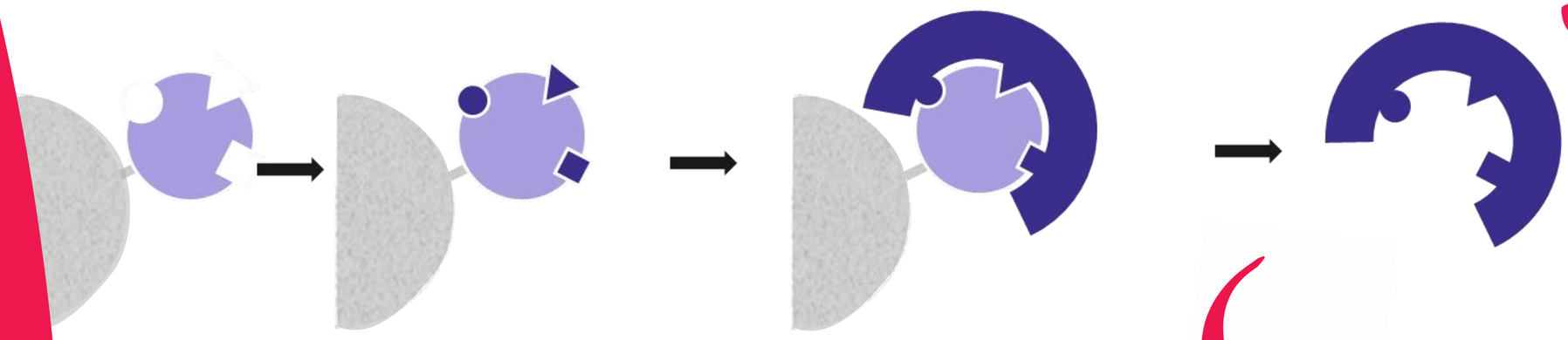


HPLC Screening

Each epitope template was immobilized onto porous beads and used as the solid support in high performance liquid chromatography (HPLC). Each epitope-functionalized solid phase was screened against **91 linear polymers**, built using the favorable binders identified from *in silico* modelling. If a polymer showed a strong interaction to the template, its HPLC retention time changed. The compositions of strongly binding polymers were used to design new VSV-G smart polymers, and the remaining data was used to improve our *in silico* predictive model.

Smart Polymer Synthesis

Polymers were made using our patented solid phase imprinting technique. Each template (epitope) identified by *in silico* modelling was immobilized onto the glass beads. These were then exposed to a polymerization solution including crosslinkers and monomers, as identified by HPLC screening. After polymerization, the templated glass beads were removed, and high affinity nanoparticles (smart polymers) were collected.



>50 smart polymers were made in 4 months of hands-on lab time!

Evaluation in Application

Each VSV-G smart polymer was tested for affinity to VSV-G protein in SPR. **19 hits** were identified, giving a **~38% hit rate**! So far, 3 of those hits have been further tested against intact lentivirus using the Octet BLI platform. All **3 smart polymers worked in application** – they could be immobilized onto BLI biosensors and showed affinity towards LV across a 10^5 to 10^8 TU/mL range.

19 Hits against VSV-G in SPR

3 x Protypes against LV in BLI

3 new prototypes for the detection of in-tact lentivirus were made and evaluated in just **4 months,** showing that our **smart polymer development process** can be used for **rapid generation of new reagents** to support proprietary gene therapy manufacturing processes.

To discuss collaboration opportunities, contact our team at enquiries@tozaro.com