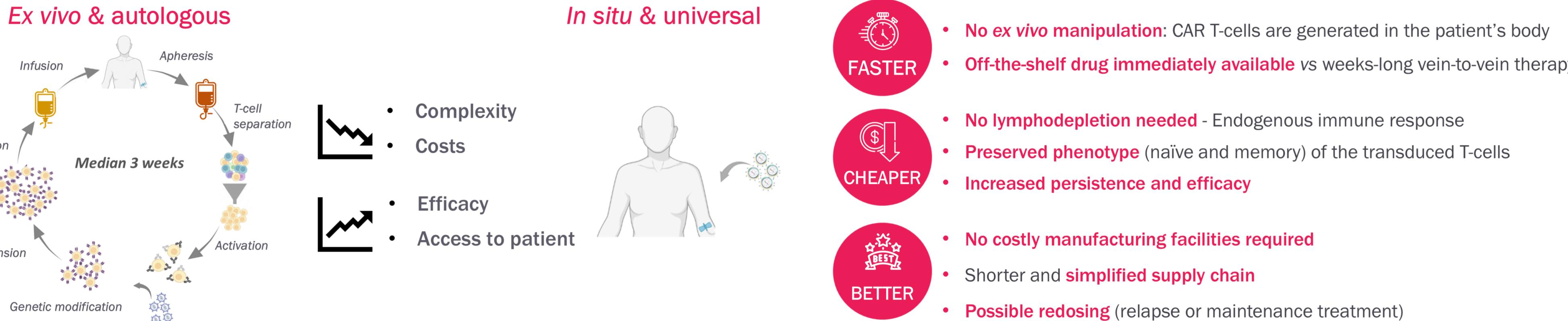


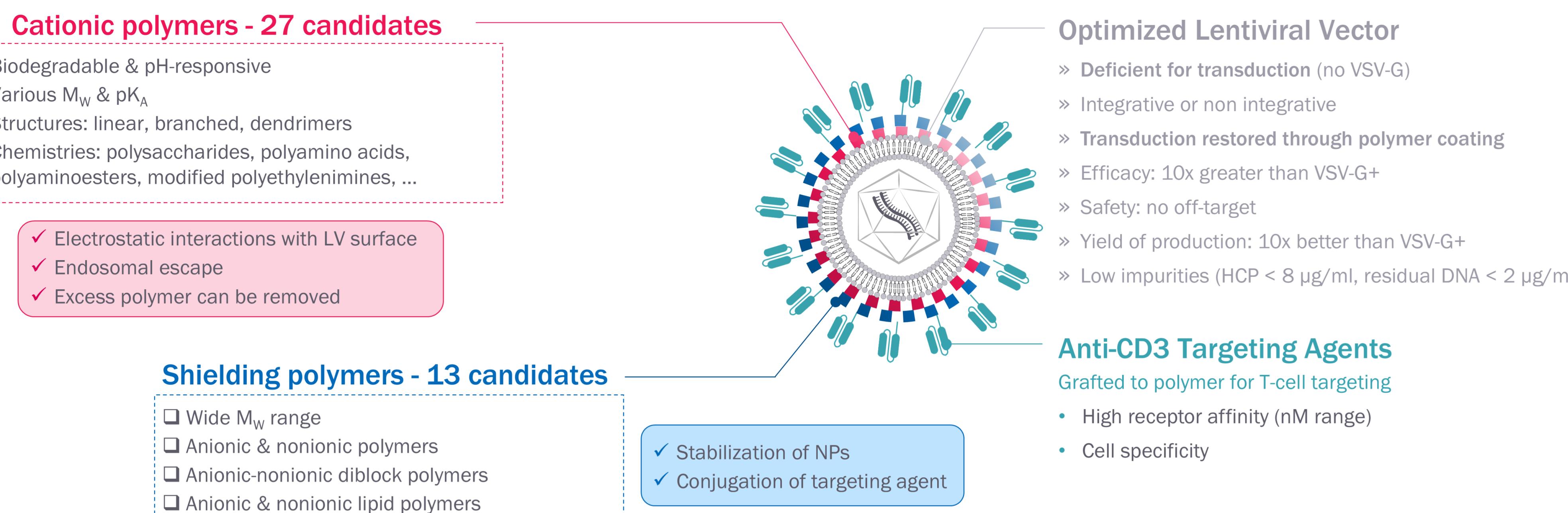
Advanced Lentiviral Vector Engineering with Polymer Surface Modification for CAR-T Cell Therapy

Céline Jaudoin, Léa Dandan, Justine Hadjerci, Alexandre Da Silva, Julie Bergalet, Sarra Leschiutta, Elina Rosoy, Malika Kinyua, Alice Coillard, Laurence Sellier, Marion Lhuair, Eva Maunichy, Inès Morouche, Rachel Pacherie, Frédéric Mourlane, Renaud Vaillant and Cécile Bauche

In situ CAR-T therapies - Our innovation

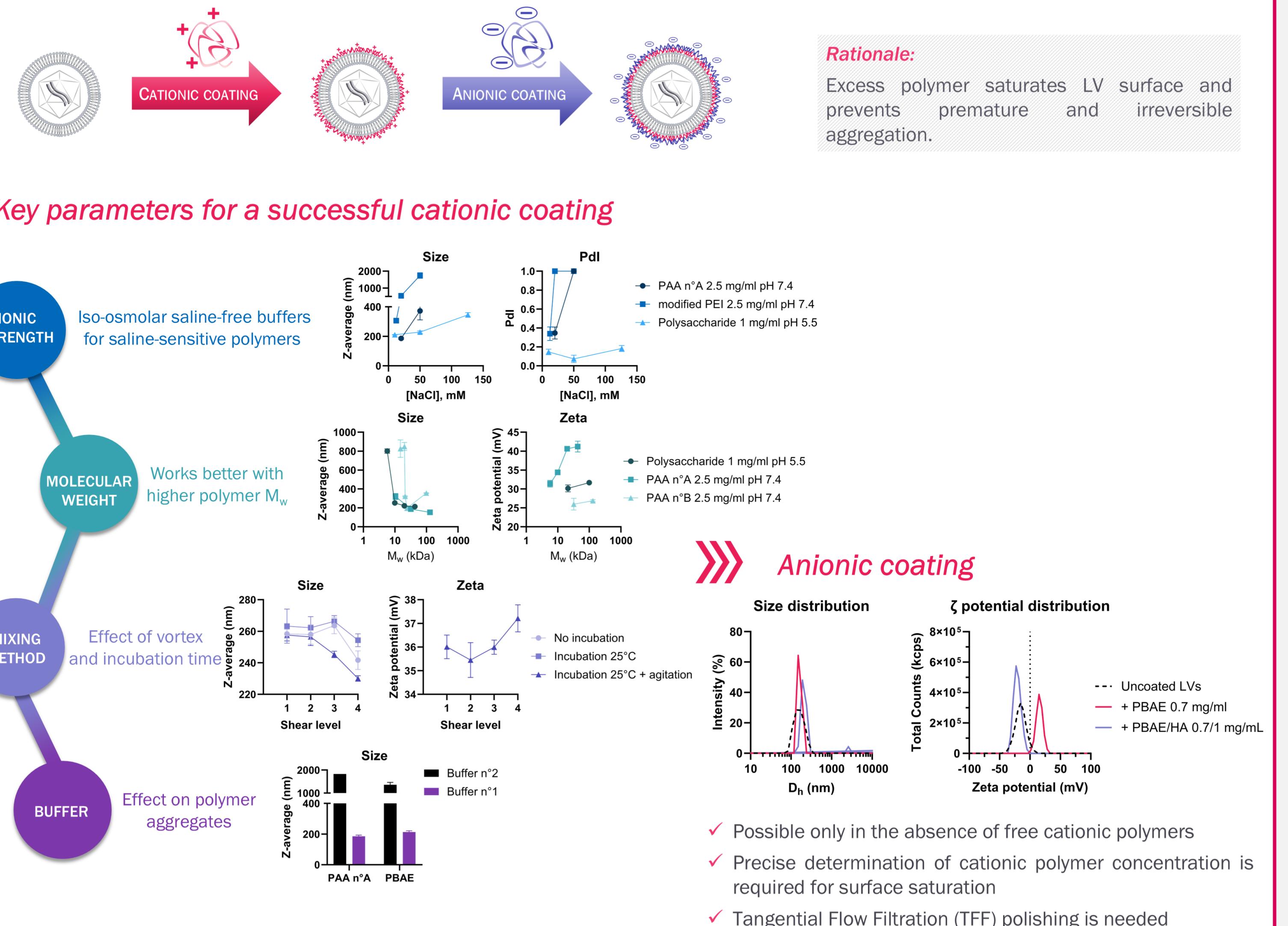


Lentivector-based nanoparticles platform

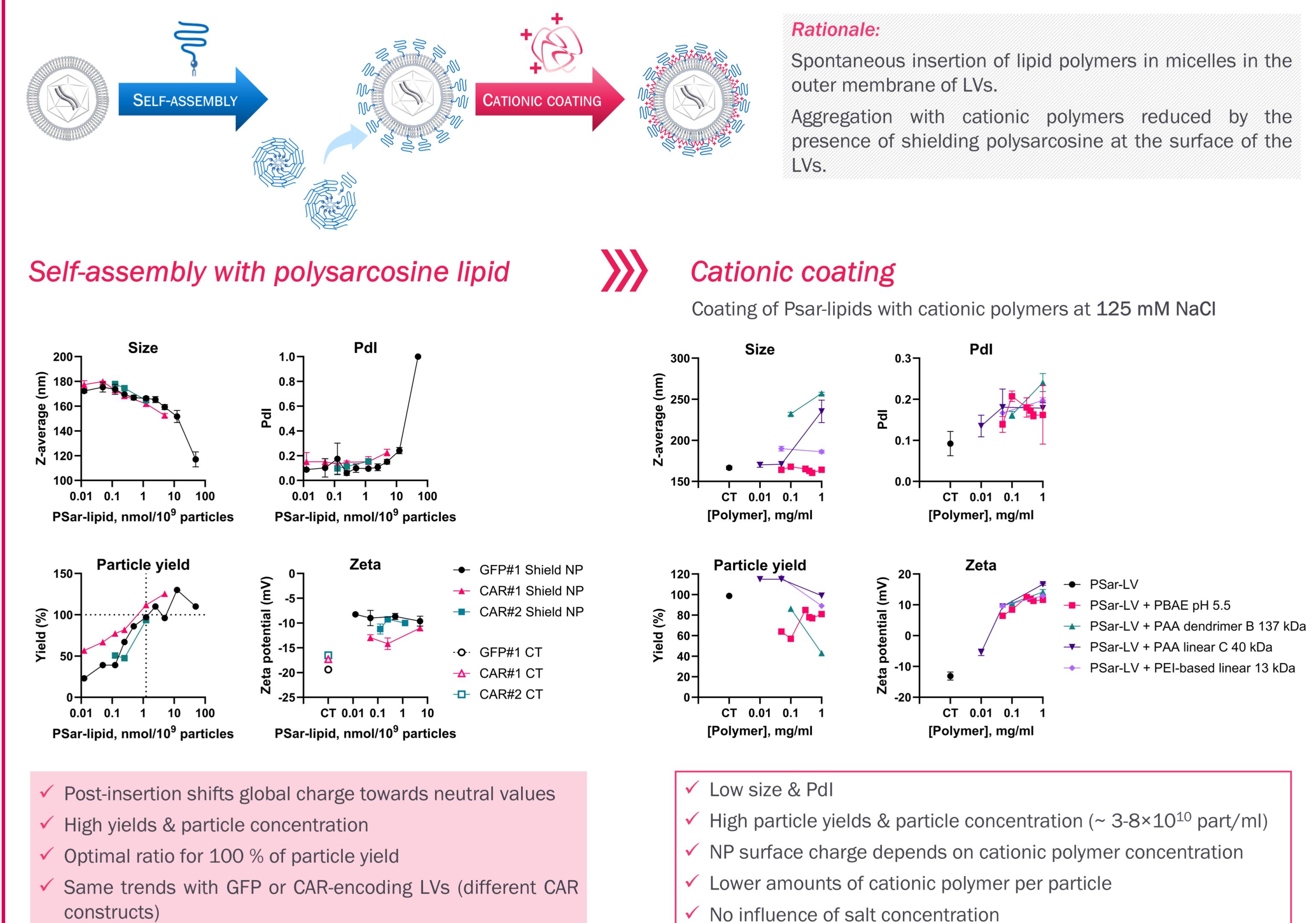


LV surface modification strategies - Biophysical & Biochemical challenges

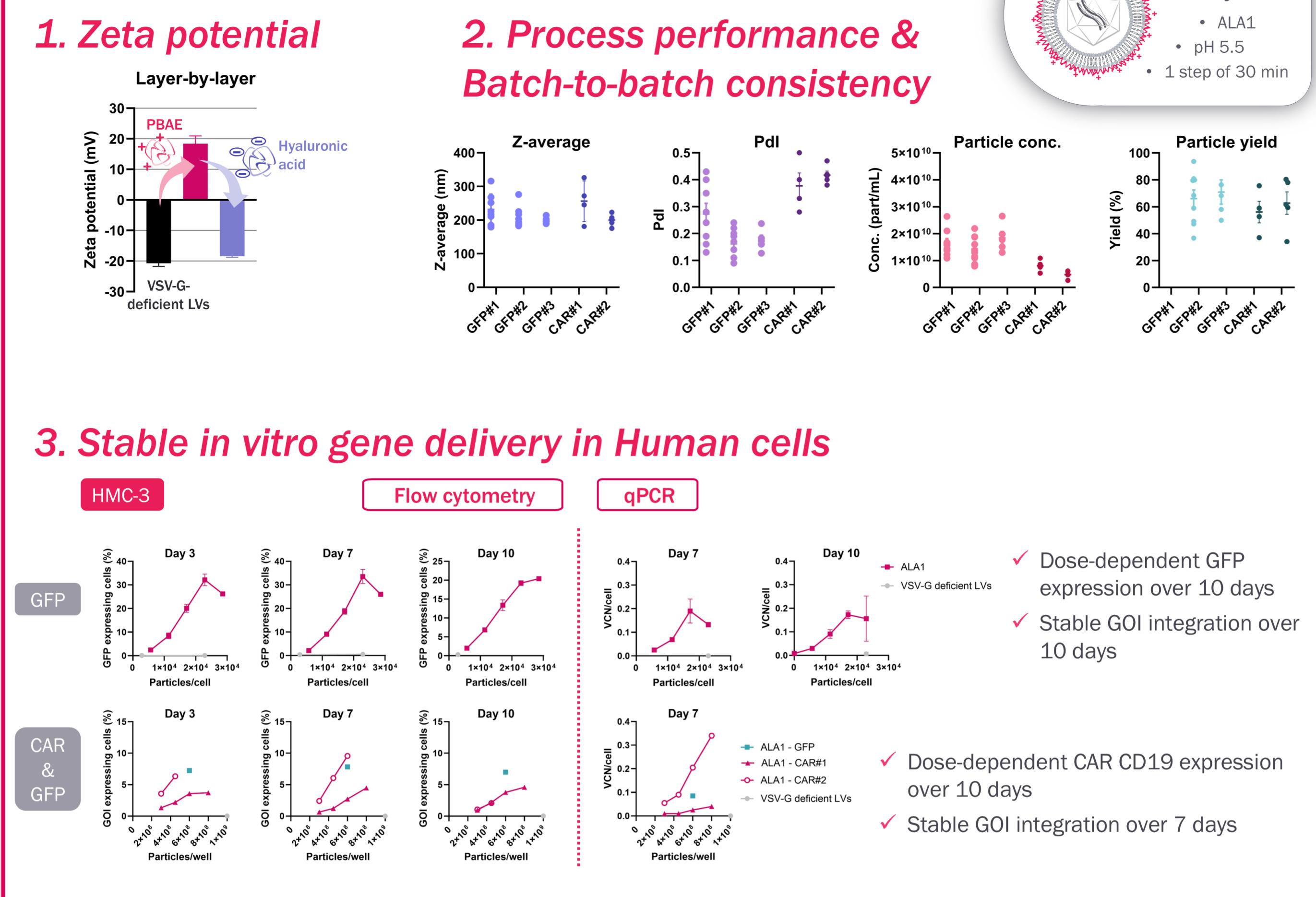
Layer-by-Layer



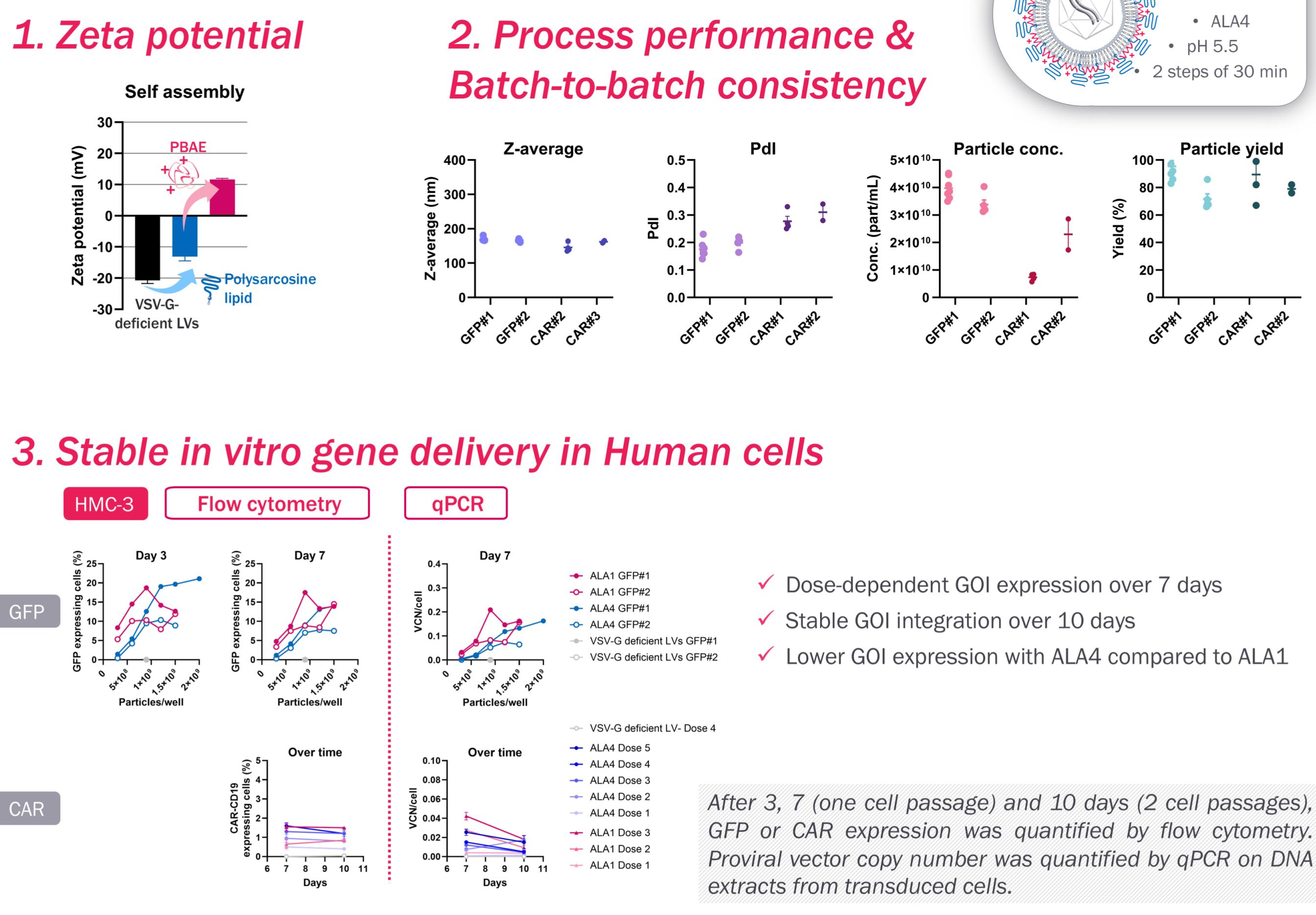
Self-assembly



Layer-by-Layer

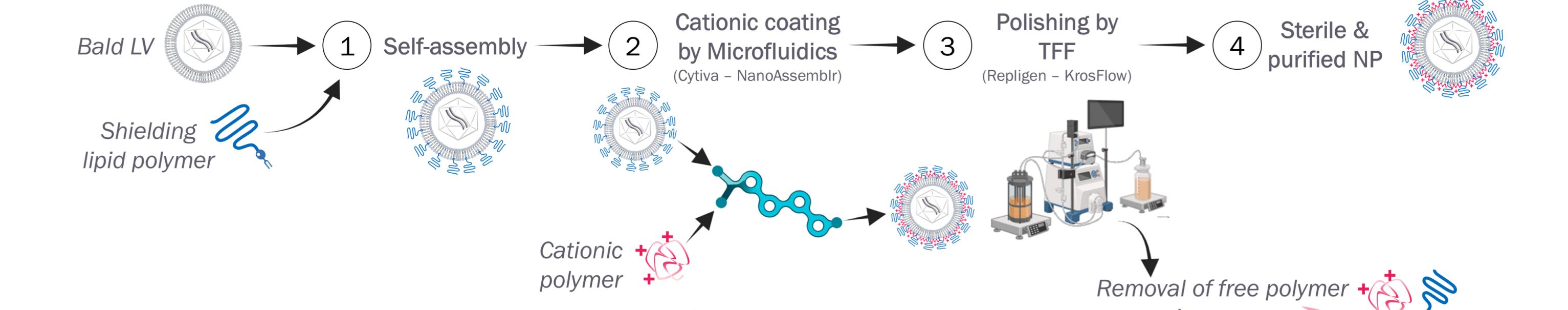


Self-assembly

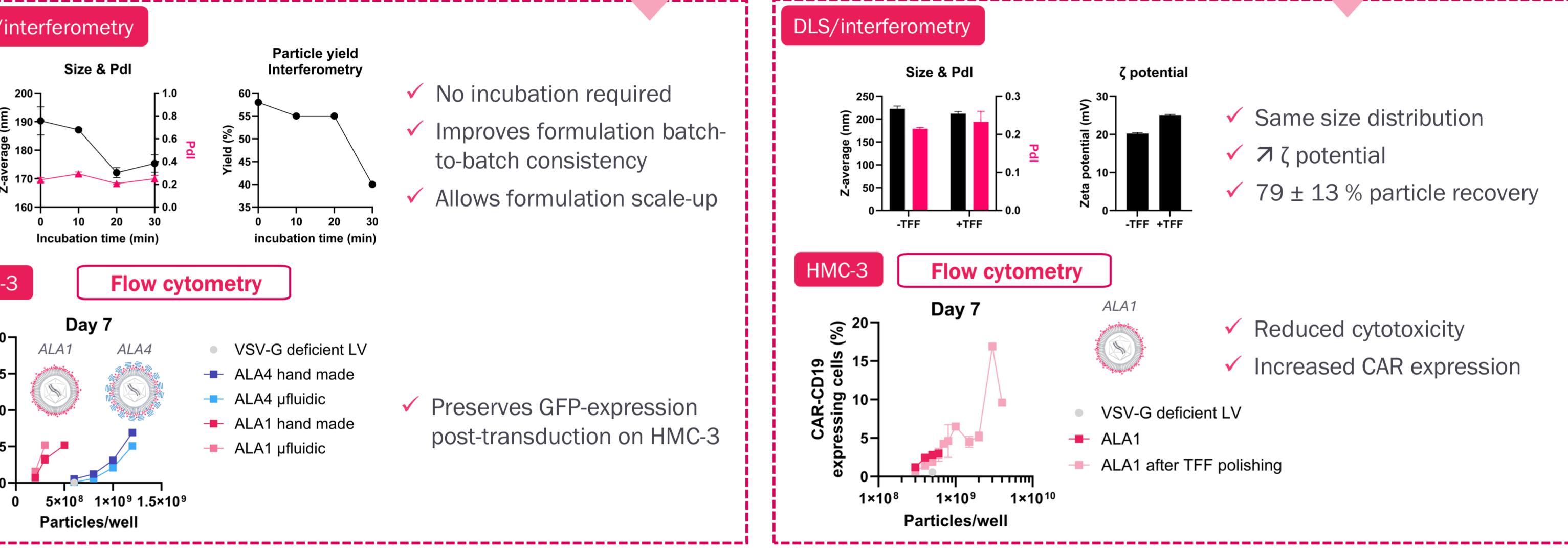


A GMP-compliant NP manufacturing process

NP concentration & Polishing process



Microfluidics



Conclusion

- Robust nanoparticle formulations compatible with LV payloads encoding intracellular and surface GOIs
- Non-targeting nanoparticles efficiently and stably transduce human cells *in vitro*
- GMP-compliant microfluidics and processes successfully integrated into nanoparticle manufacturing

Ongoing & future studies

- WORK IN PROGRESS**
- Optimization of CD3-targeting nanoparticles: bioconjugate selection, density,...
 - Biodistribution and efficacy studies in humanized mouse models
 - Application of CD3-targeting nanoparticles to accelerate *ex vivo* manufacturing of CD19-CAR T cells