## STUDY OF r-INSULIN SUPPLEMENTATION IN EXPISES CELL CULTURES FOR CELL GROWTH AND **BACULOVIRUS-DRIVEN HIV-1 VLP PRODUCTION**



Díaz-Maneh, A., Puente-Massaguer, E., Cervera, L., Gòdia, F.

**Cell and Bioprocess Engineering Group** 



Departament d'Enginyeria Química, Escola d'Enginyeria, Universitat Autònoma de Barcelona, 08193, Bellaterra, Barcelona, Spain

## OUTLINE

The aim of this study was to investigate the effect of r-insulin in Sf9 cell cultures growing in SF CD medium. An initial phase of adaptation to different r-insulin concentration was performed prior to experimentation. The first part focused on the evaluation of r-insulin as a supplement focell growth and viability maintenance. In the second part, r-insulin was investigated as an enhancer for HIV-1 Gag VLP production through baculovirus infection (BV). The Gag gene was fused in frame to eGFP to ease process characterization and product quantification.



## Cell growth kinetics of Sf9 cells in Sf9 CD medium.

A. Viable cell concentrations and viabilities of Sf9 cells at different r-insulin concentrations (n=3). B. Comparison of viable cell concentrations and viabilities of Sf9 cells with 1 mg/L and without r-insulin supplementation (n=3).



Gag-eGFP production kinetics in supernatant at different r-insulin concentrations The results of triplicate experiments are shown.

Gag-eGFP VLP concentrations measured using Nanoparticle Tracking Analysis (NTA) **A.** VLP concentration. **B.** Size distribution of fluorescent particles with 1 mg/L supplementation.

## CONCLUSIONS

 $\checkmark$  A 1.1-fold reduction in dt<sub>1/2</sub> was achieved with 1 mg/L r-insulin supplementation

✓ A 1.2-fold increase in VLP production was attanined with 1 mg/L r-insulin

A 1.2-fold improvement in maximal viable cell concentration was obtained with 1 mg/L r-insulin  $\checkmark$ 

REFERENCES

Cervera, L. et al. Journal of Biotechnology. 166, 152–165 (2013). Puente-Massaguer, E. et al. Engineering in Life Sciences. 1–13 (2019). The insulin used in this work was kindly provided by Novo Nordisk Pharmatech A/S (Koege, Denmark). Fruitful discussions with Sara Gualdoni and Vanessa León are acknowledged.

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