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DECOY 7 Technology

Increase the cell densities of your CHO processes and improve your product yield using our novel DECOY-7 miRNA technology.

The DECOY-7 Concept

Many industrial Chinese Hamster Ovary (CHO) cell production processes incorporate a 'temperature shift'; growing the cells at 37°C to build bioreactor biomass, followed by a drop in culture temperature to 31-33°C, reducing cell growth & apoptosis and increasing culture viability, with consequent improvements in product yield and quality.

Our innovation is to mimic this process using a novel miRNA technology (DECOY-7), dramatically improving cellular growth & viability in CHO and doubling product yield.

Background

We used advanced profiling technologies to identify microRNA 7 (miR-7) as a key contributor to improved CHO bioreactor performance following a temperature shift from 37°C to 31°C[1]. Subsequent functional studies using mimics and inhibitors[2] confirmed the potential of miR-7 as a genetic engineering target within CHO cells, whereby depletion has a beneficial effect on some of the traits desirable in production CHO cells, particularly increasing cell density during the early growth phase **(A)** and viability during later culture **(B)** and doubling product yield of a model secreted glycoprotein **(C)**.

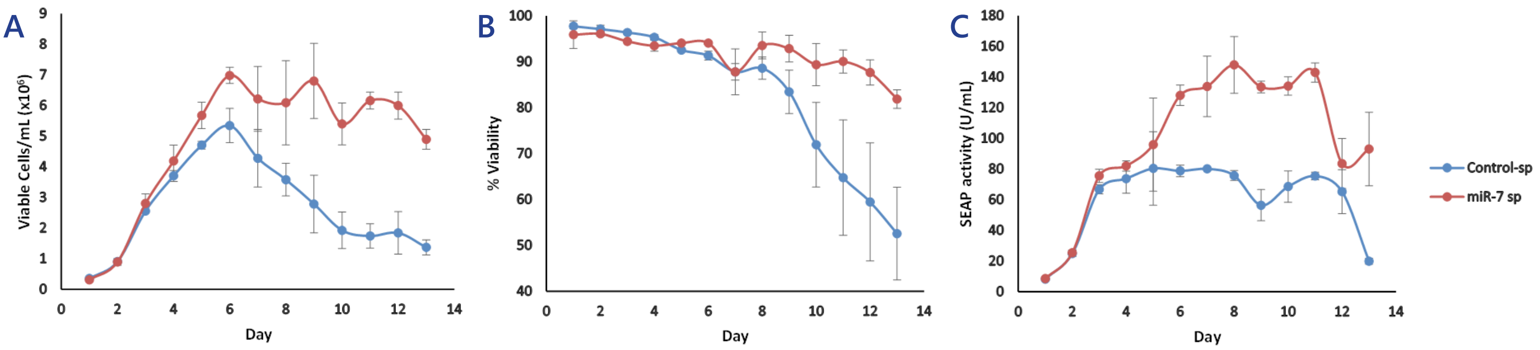

Figure legend: CHO cells engineered to be depleted of microRNA-7 by sponge decoy technology (miR-7 sp) were grown in fed-batch culture along side an engineered control sponge decoy (non-specific, control-sp). Cells were grown in suspension, serum-free media with nutrient feeds on days 3,6 and 9 and monitored for **(A)** viable cell density using a Guava Viacount stain, **(B)** Cell viability using a Viacount stain and **(C)** yield of secreted alkaline phosphatase (SEAP) using a SEAP assay over a 13 day culture period.

What DECOY-7 means for you

These features together have the potential to increase per-run profitability, decrease time required to deliver requisite titres and decrease downstream purification time.

1. Cells grow to a higher density and last longer in culture, resulting in increased per-run titres, increased per-run profitability and decreased time required to deliver product titres
2. Cell viability is improved, resulting in less contaminating protein from dead cells, facilitating downstream purification.

How we can work with you

With our extensive history in CHO cell manipulation, we will work with you to find a comprehensive solution to your upstream cell line development challenges; including Transient/Stable modulation of your existing processes, developing DECOY-7 transient transfections of your cell lines (as a media additive) or a license, whereby we can provide the technology and know-how and you will have complete freedom to implement DECOY-7 under your in-house control.

More Information

For more information, please contact: Dr. Niall Barron, Director, NICB, niall.barron@dcu.ie.

[1]Gammell et al. 2007. Initial identification of low temperature and culture stage induction of miRNA expression in suspension CHO-K1 cells. *Journal of Biotechnology*, 130, 3, pp213-218
[2]Barron et al. 2011. Engineering CHO cell growth and recombinant protein productivity by overexpression of miR-7. *J.Biotechnology* 151(2):204-11