TetraVecta™

INTRODUCING 4TH GENERATION LENTIVIRAL VECTORS

The TetraVecta™ system by Oxford Biomedica

Oxford Biomedica

A WORLD LEADING VIRAL VECTOR CDMO

TRUSTED, RELIABLE AND SAFE SOLUTIONS

— Oxford Biomedica is a quality and innovation-led viral vector CDMO focused on helping its clients to deliver life changing therapies to patients.

— A pioneer in developing the previous generation of lentiviral vectors.

— A global leader in viral vector development & manufacturing with over 25 years of experience.

Oxford Biomedica pioneered the use of lentiviral vectors (LV) for *ex-vivo* and *in-vivo* gene therapy.

Strong track record

330+

Batches manufactured
330+ lentiviral vector GMP batches manufactured in the last 9 years.

1st

FDA approved
Supplier of lentiviral vectors for the first FDA approved CAR-T product .

>6k

Patients treated
Over 6,000 patients have been treated with Oxford Biomedica lentiviral vectors to date and this continues to increase every day.

A global footprint
Oxford Biomedica has nine facilities spread over eight sites across Oxford, UK; Dublin, Ireland and Boston, US, and employs over 900 people.

RESPONDING TO A DEMAND FOR INNOVATION

WHY WE HAVE DEVELOPED THE TETRAVECTA™ SYSTEM, THE 4TH GENERATION LENTIVIRAL VECTOR

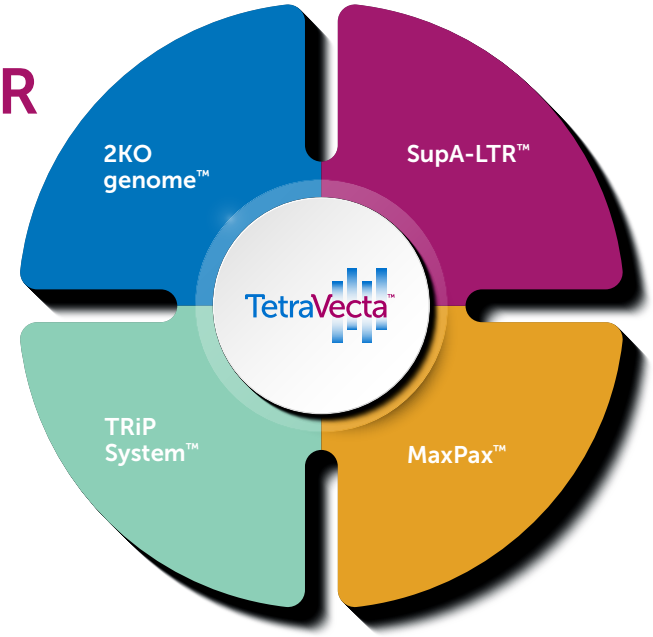
The architecture and features of lentiviral vectors used in clinical trials have not significantly changed over the last two decades. 3rd generation vectors are accepted as the current 'industry standard' technology.

After many years of research to improve the features of lentiviral vectors, Oxford Biomedica has launched this new vector to further improve the quality, potency and safety of lentiviral vectors, while increasing transgene packaging capacity.

We have identified and addressed challenges faced by the industry such as the impact of transgene expression on titre, payload capacity, difficulty in developing high-titre stable producer cell lines and the need for more predictable process development and manufacturing consistency.

Nick Clarkson
Head of Platform Research at Oxford Biomedica.

TETRAVECTA™ – BEST-IN-CLASS MODULAR LENTIVIRAL VECTOR SYSTEM



THE TETRAVECTA™ SYSTEM COMBINES 4 BUILDING BLOCKS ACTING ON 4 ATTRIBUTES OF LENTIVIRAL VECTORS

Quality
- Increased full length vector RNA production
- Improved consistency of vector

Potency
- Higher gene expression in target cells
- Improved particle activity

Capacity
- 1kb additional space enabling larger payloads
- Potential yield increase

Safety
- Minimal therapeutic protein in vector
- Transcriptional insulation

2KO genome™
Eliminates aberrant splicing during LV production, reducing vector RNA contaminants.

SupA-LTR™
Improves transcriptional termination signal, limiting interaction with host cell transcriptome and increasing gene expression in target cells.

MaxPax™
Minimises backbone sequences, liberating 1kb of packaging space.

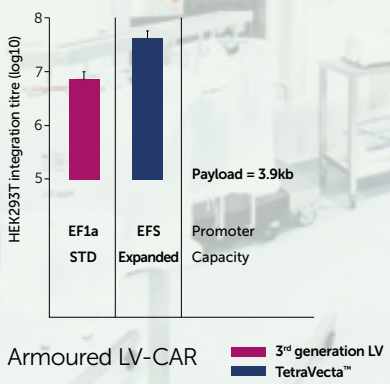
TRiP System™
Suppresses transgene protein expression during LV production, increasing titre when cytotoxic payloads are used and removing transgene protein contaminants.

/// What applications could benefit first?

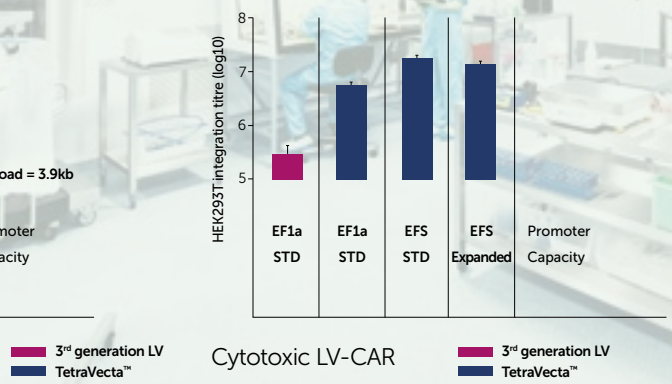
NEW POSSIBILITIES FOR BREAKTHROUGH TREATMENTS

The TetraVecta™ system will open new possibilities for breakthrough lentiviral vector-based treatments previously difficult or impossible to make. For example, therapeutic products involving a cytotoxic transgene, a large or complex payload (such as dualCAR and armoured CAR).

The TetraVecta™ system increases titre in LV carrying a large or cytotoxic payload



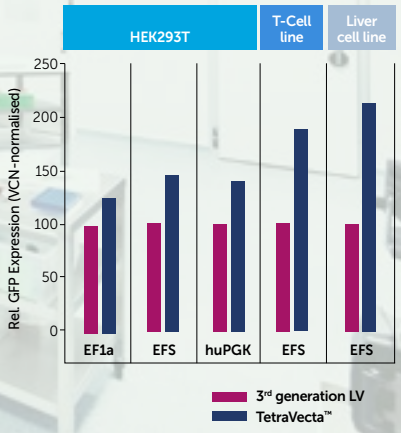
Armoured LV-CAR



Cytotoxic LV-CAR

3rd generation LV
TetraVecta™

The TetraVecta™ system increases gene expression in target cells



3rd generation LV
TetraVecta™

TETRAVECTA™ – A NOVEL LENTIVIRAL VECTOR BACKBONE WITH IMPROVED FEATURES

The TetraVecta™ system outperforms traditional 3rd generation lentiviral vectors

	3rd generation	TetraVecta™	
Packaging size	Standard	1kb additional space	👍
Particle activity (P:I ratio)	Standard	Improved	👍
Yield	Standard	Up to 3-fold higher	👍
Contaminants in LV particles	Transgene protein / spliced vRNA	Minimal	👍
Transgene expression in target cells	Standard	Up to 3-fold higher	👍

Did you know?

High quality

Up to 95% of vector genome RNA is spliced in production cells.

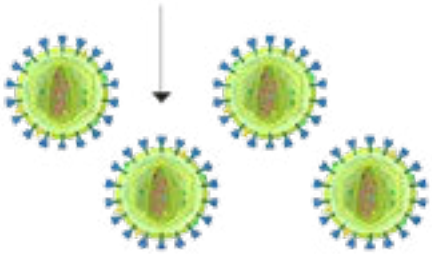
The 2KO genome™ feature of the TetraVecta™ system removes the major splice donor (MSD) sequence, reducing to undetectable levels of splicing of vRNA during vector production.

High expression

Standard SIN-LTR polyadenylation of the sequences are sub-optimal.

The SupA-LTR™ feature of the TetraVecta™ system provides modified self-inactivating LTRs with bidirectional optimised polyadenylation sequences, improving termination during mRNA synthesis, leading to transcriptional insulation and increased expression.

THE BUILDING BLOCKS OF POSSIBILITIES



The door to genuine plug and play manufacturing
The TetraVecta™ system reduces RNA and protein contaminants in LV particles. Process development is more predictable for any given product, increasing manufacturing consistency, saving time and money.

The development of high-titre stable producer cell lines for any transgene
The limited availability of full-length vector RNA and the chronic expression of transgene protein in production cells prevent the development of certain stable cell lines and reduce the ability to isolate high production clones. The TetraVecta™ system overcomes these challenges and allows the development of any stable producer cell lines.

Speeding up the adoption of *in-vivo* therapies
The absence of transgene protein in the final drug product made with the TetraVecta™ system, negates potential induction of an immune response to the transgene, further increasing the safety of *in-vivo* therapies.

TetraVecta™

1. High-quality streamlined lentiviral vector production
2. Enables the manufacture of previously unachievable lentiviral vectors
3. Enables development of high-titre producer cell lines
4. Speed up adoption of *in-vivo* gene therapies

Contact us to discover how the TetraVecta™ system can help you achieve your goals.

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