



applieddnasciences

**Annual General Meeting
16 May 2019
Stony Brook, NY 11790**

Immediate Top Line Drivers



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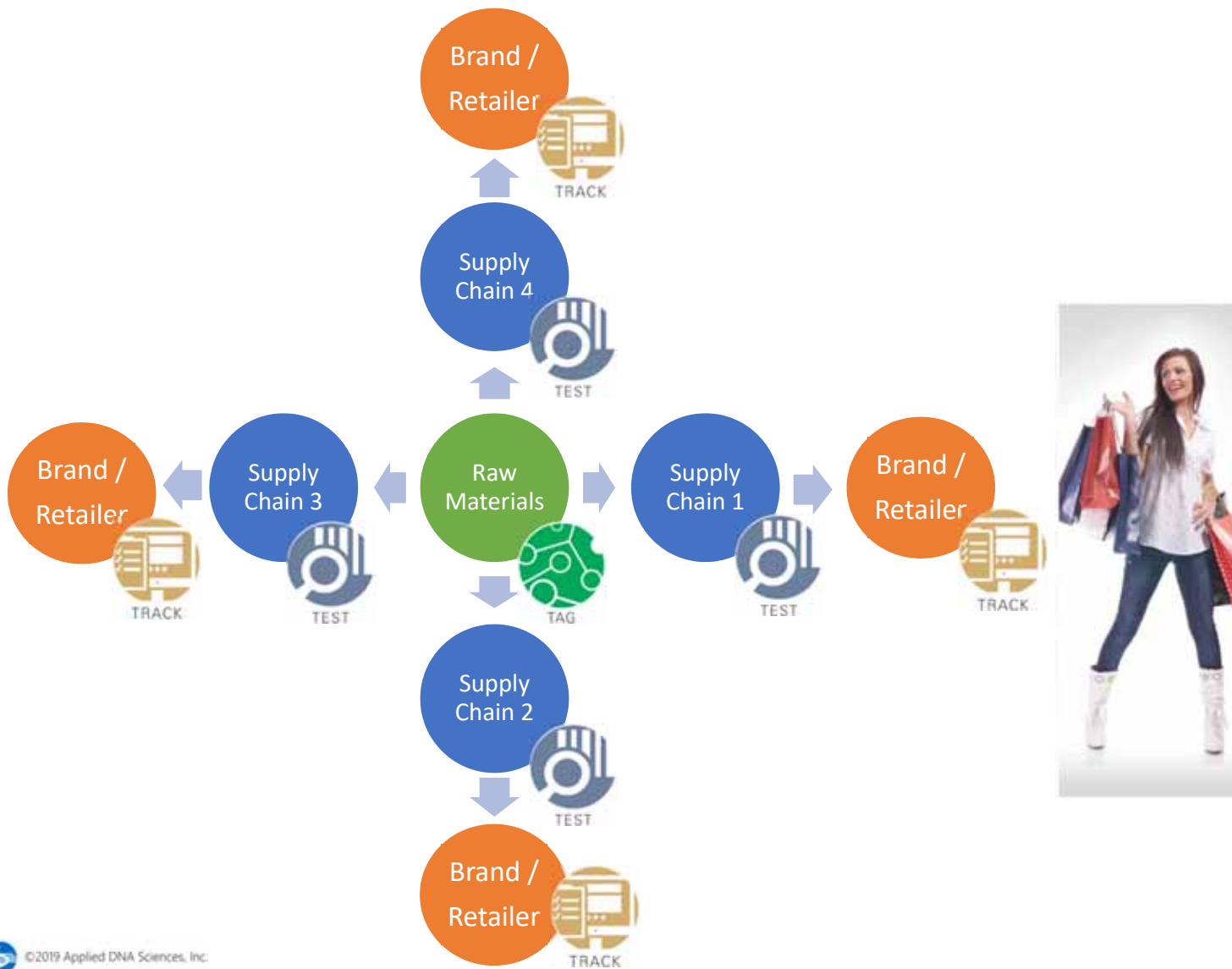
Textiles

Traceability, Transparency, Trust...
and Transformation

applieddnasciences 



CertainT[®]
 One Supply Chain
 at a Time




CertainT[®]
Hub and Spoke



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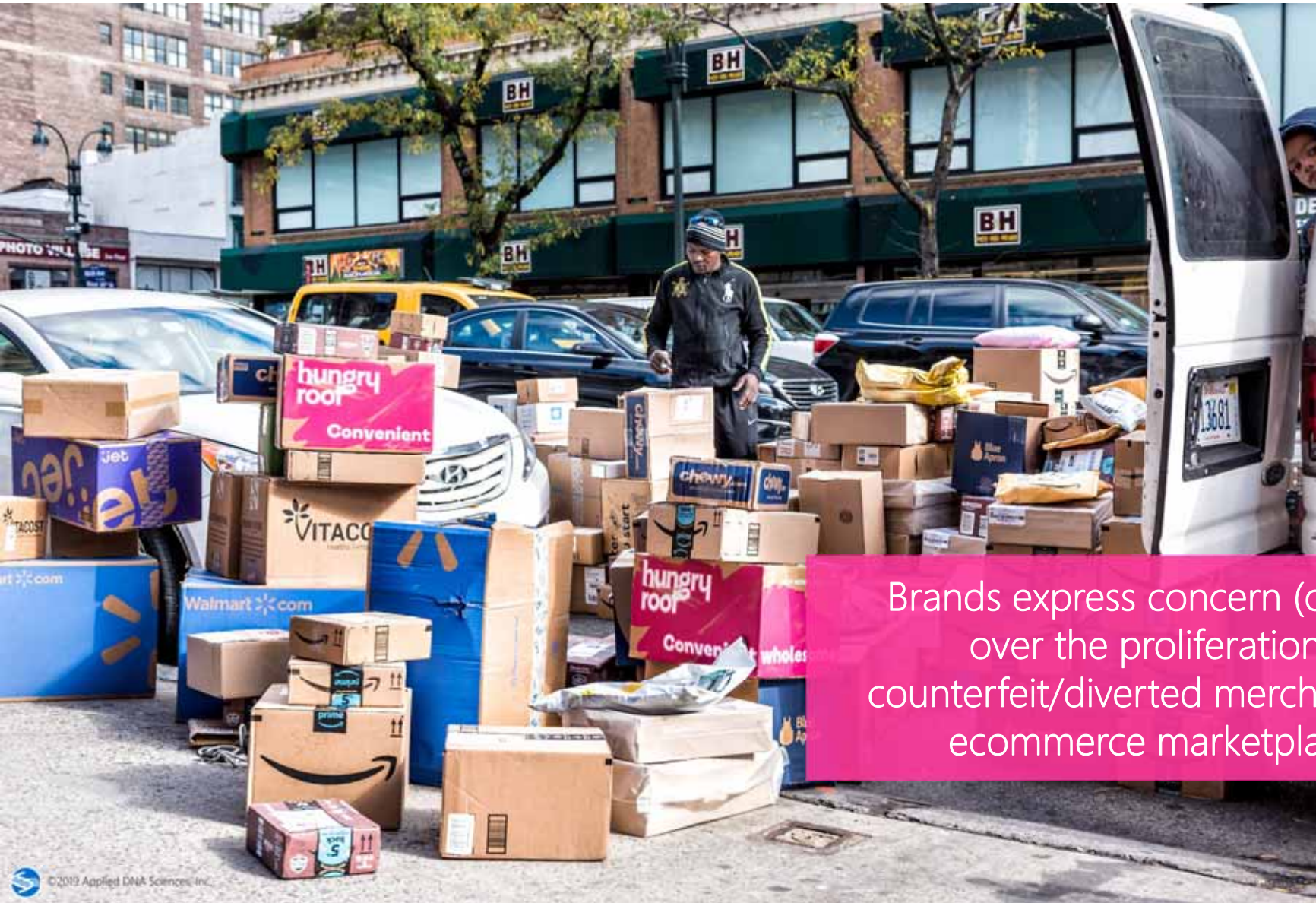
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Brand assurance:
higher consumer expectations
regarding integrity of goods.



Sustainability and ethical conduct:
on the minds of consumers.



Brands express concern (outrage) over the proliferation of counterfeit/diverted merchandise in ecommerce marketplaces.

Global Commercialization and Diversification Textiles Activities

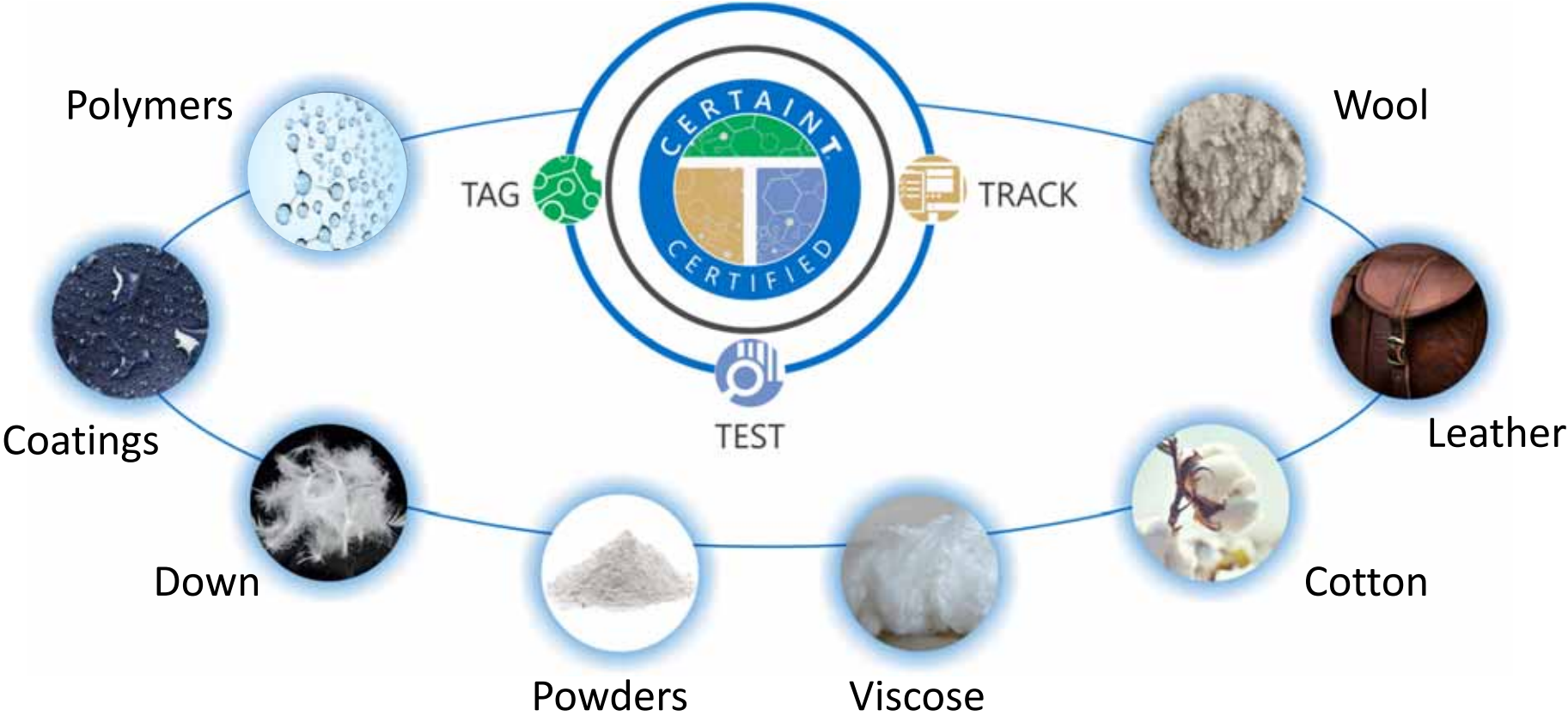


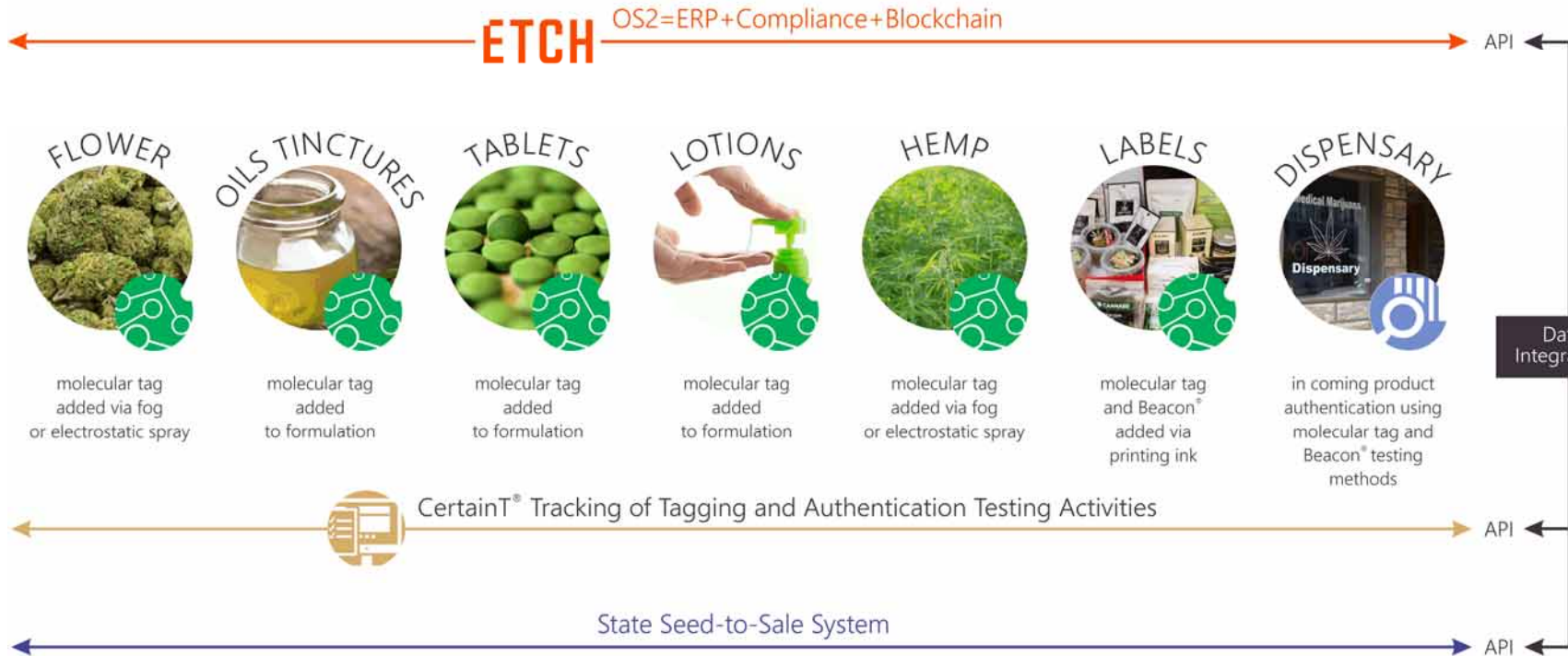
- C** Cotton
- R** RPET
- V** Viscose
- W** Wool
- D** Down
- L** Leather
- Y** Yarn



Other Textiles Portfolio

Commercial and Pre-commercial







Therapeutic Solutions
Based on Large-Scale, Linear DNA

LineaRx – A New Paradigm in Biotherapeutic Production

PCR Production of DNA at Large Scale

LineaRx's proprietary process enables large, gram-scale production of DNA through PCR for bio-based therapeutics.

Linear DNA does not require recombination; hence, no need for virus.

No need for plasmids, eliminating risks and unwanted DNA or contaminants that need to be removed.



Unique in that it can be centrally scaled for low cost manufacturing or distributed for point of care.

Focused on Adoptive Cell Therapies, Vaccines (including Cancer), CRISPR and other Nucleic Acid-based Therapies.

Pending IP for modulating immunogenicity, translational efficiency and protein circulating lifetimes. Offer IP to customers.

Active CMO/CRO business now supplying GLP product; cGMP plans in place.

Qualifications



- Deep background in pharmaceutical reporting, quality and compliance
- 20-30 year's experience in the creation and management of cGMP facilities in support of molecular therapeutics (on Stony Brook Campus and in \$100 mm cGMP human protein production facility in Smithfield, RI).
- cGMP (Human Proteins) and GLP (liposomes and dermatologics) production facilities sold to Dow Biosciences and BASF.
- Multiple approvals by FDA, EMA and MHW (Japan).

A vertical slide with a dark background. At the top is a circular logo with a stylized globe. Below it is the word "APPLICATIONS" in white, bold, uppercase letters. A list of applications follows, with each item underlined. At the bottom is a decorative graphic of a DNA double helix with glowing nodes.

APPLICATIONS

- Partnering available
- Antibody production
- CAR T cells
- Antisense RNA and siRNA
- DNA and RNA vaccine production
- Engineering of lymphocytes, gene therapy constructs and stem cells
- Biomarker-driven cancer gene identification to screen for epitopes



CMO

- Multiple grams per quarter shipped to customers serving the diagnostic markets
- Custom DNA for 2 additional diagnostic assays under development

CRO

- LineaRx Linear DNA being evaluated by a number of therapeutics companies as an alternative to Plasmid

Cancer Vaccine – Partnership with Takis/Evvivax SRL

- PCR-produced linear DNA delivered via electroporation produces expression levels statistically indistinguishable from plasmid produced DNA
- PCR-produced linear DNA cancer vaccine delivered via electroporation produces immunogenicity levels statistically indistinguishable from plasmid produced DNA vaccine

Anti-CD19b CAR T Adoptive Cell Therapy

- Retroviral, plasmid format in clinical trial in China
- Licensed from iCell in LineaRx format for North America
- Transfection studies underway

Clinical Outcomes of Virally-Transduced, Plasmid DNA LinCD19

CAR	Case name	Disease	No treatment option	% blasts in marrow	Dose*	Enrollment	CRS/ neurotoxicity	Response
ICG131: CD19 CAR	CD19b-case-B01-LWL	B-ALL	yes	11%	Low, 2x10 ⁵ /kg	yes	Grade 1/No	CR (morphology)
ICG131: CD19 CAR	CD19B-CASE-B02-WLX	B-ALL	yes	71% 16	Low, 2x10 ⁵ /kg	yes	No	CR (Flow cytometry)
ICG131: CD19 CAR	CD19B-case-B03-XZQ	B-ALL	yes	89%	Low, 2x10 ⁵ /kg	yes	Grade I/No	CR (flow cytometry)

Data produced by iCell

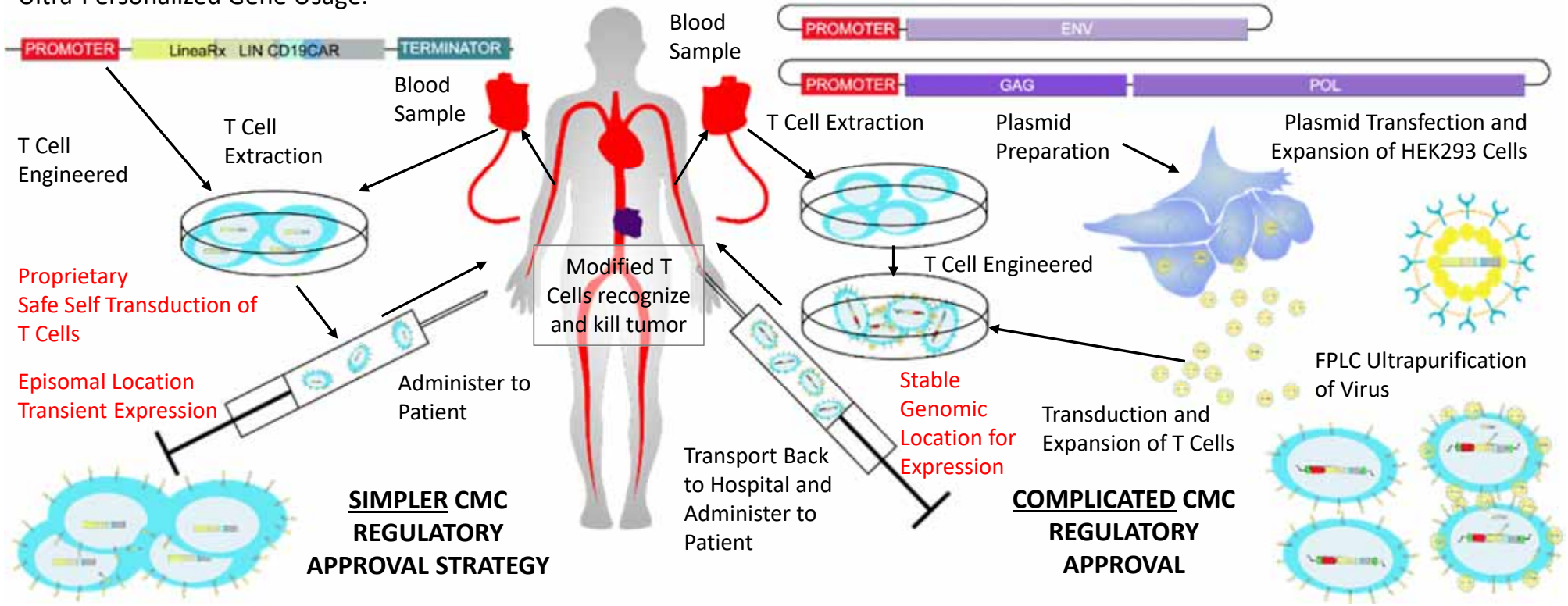
Note: Dose used for CD19b is about 10-fold lower than Kite and Novartis. The target YESCARTA dose is 2 x 10⁶ CAR-positive viable T cells per kg body weight. Novartis KYMRIAHA: For patients above 50 kg, administer 0.1 to 2.5 x 10⁸ total CAR-positive viable T cells (non-weight based) intravenously.

* low dose.
B-ALL: Acute lymphoblastic leukemia
CRS: cytokine release

Linear CAR Process vs Viral Plasmid CAR Process

LineaRx LinCD19CAR **24 hour** PCR Process
 Self-Transducing PCR Bedside in Hospital.
 High Expression Amplicon (HEA).
 Ultra-Personalized Gene Usage.

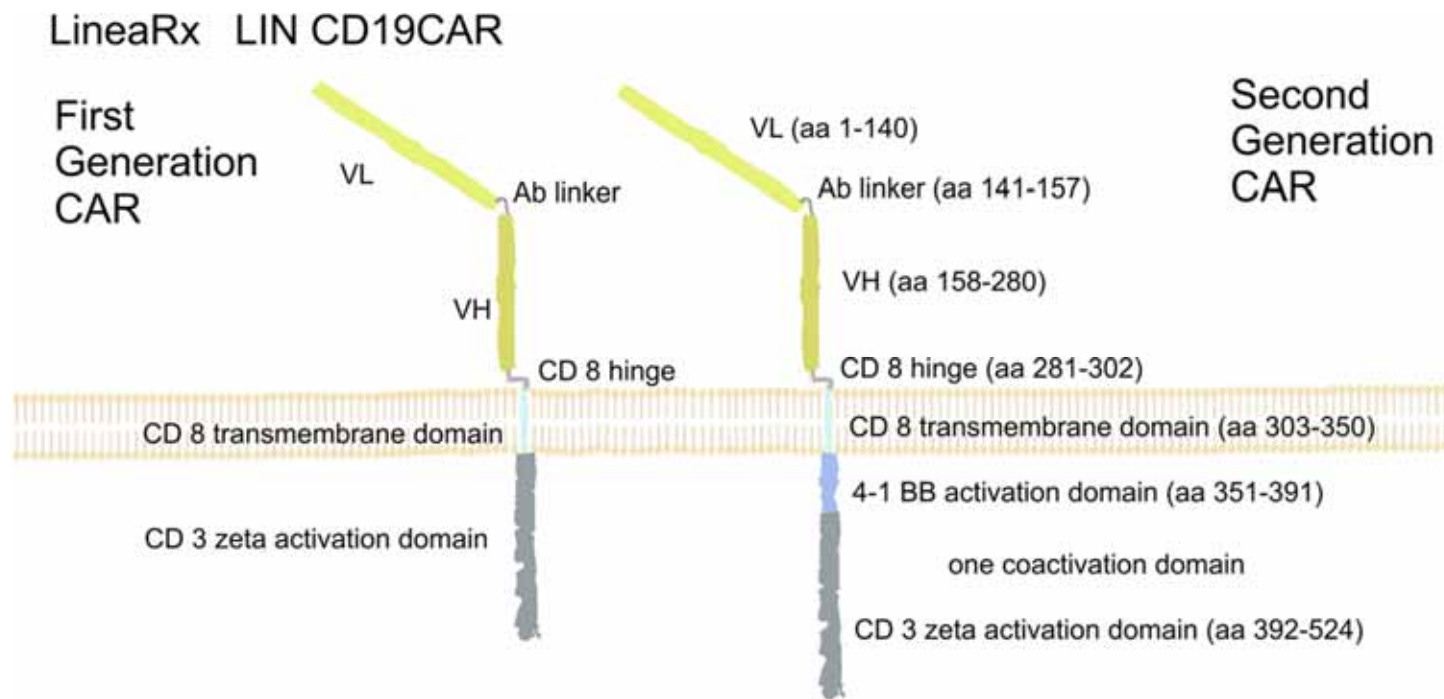
Present Lentiviral CD 19 CAR T Process up to **30 day** Production
 Process at an offsite GMP facility. Common Gene Usage.



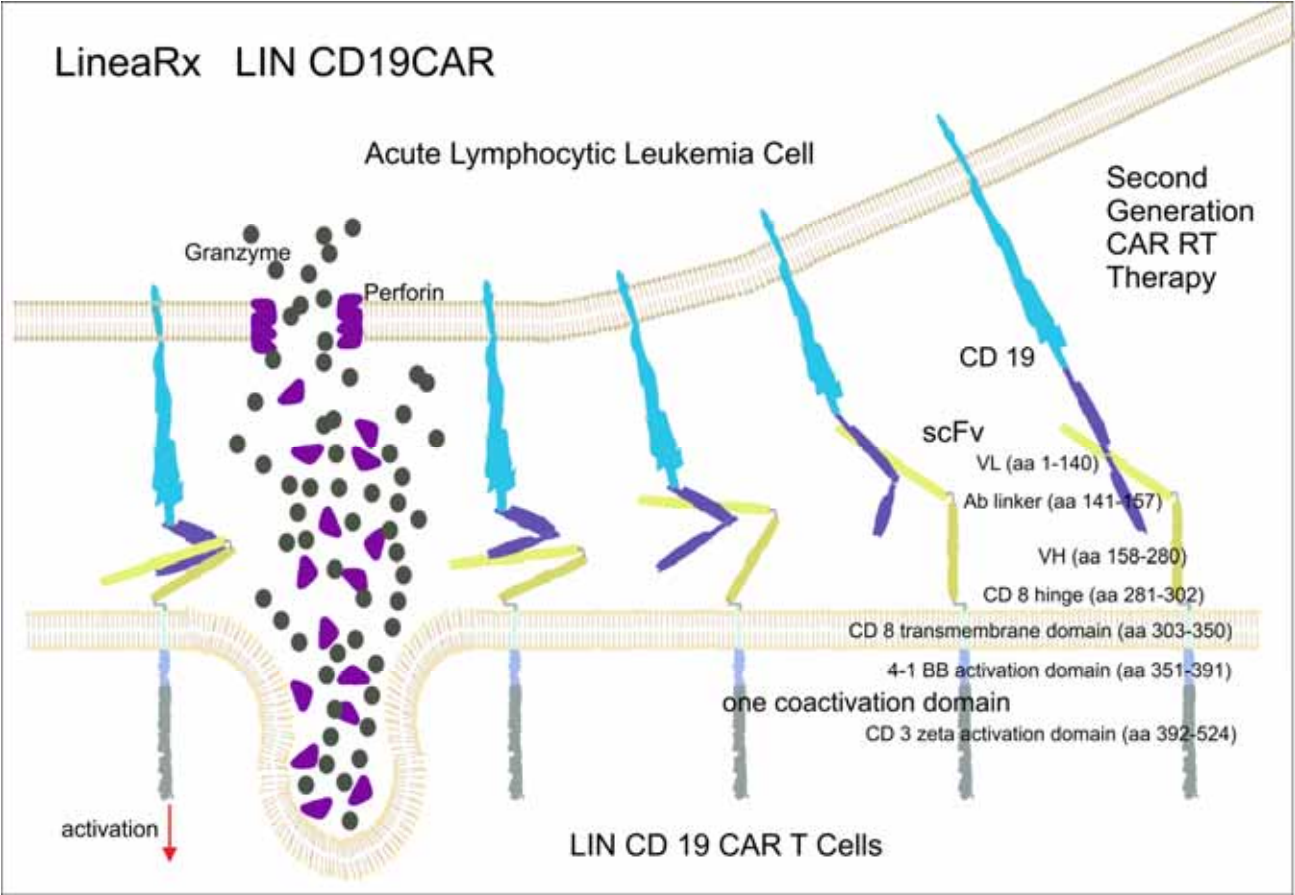


LinCD19CAR

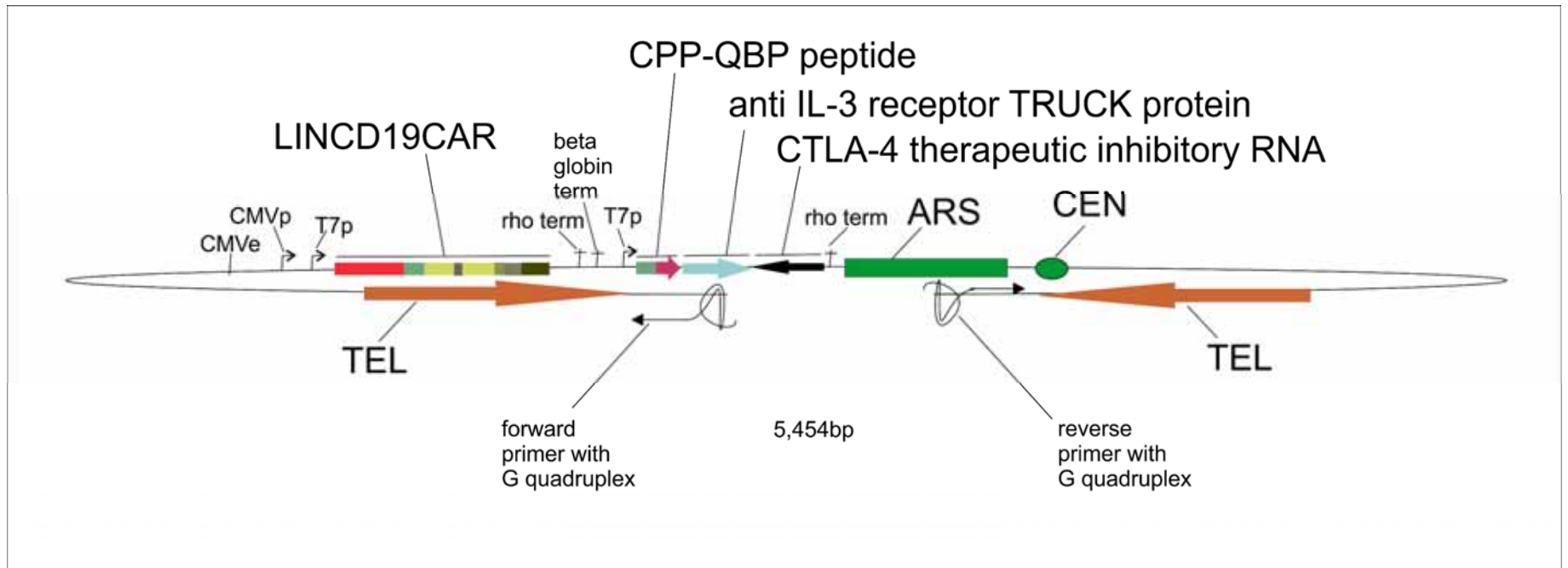
Combined platform to generate immediate clinical studies after animal safety study concluded



LinCD19CAR Uses Effective Segments for Low-Dose Cell Therapy



LineaRx HEA™ Linear DNA High Expression Amplicon



LineaRx

LineaRx HEA™ Unique Advantages

1. Simple one-enzyme process with selection in and selection out to mitigate clinical error;
2. Continuous large-scale centralized production (two weeks) or small-scale hospital-based ultrapersonal therapies at hospital (one day);
3. **Allows nonviral delivery not based on plasmids;**
4. Alternatively, can produce any viral DNA or RNA vector for delivery: AAV2, Ad5, alphaHSV, lentivirus, vaccinia without use of plasmid;
5. Synthesize up to 250 kb linear DNA;
6. Construct linear DNA with PCR or CRISPR;
7. Assemble templates for use in all other gene and cell therapies;
8. Eventually use approved production device with various approved therapies;
9. Could deliver episomal or integrated gene therapies;
10. Could deliver check point inhibitors, polyprotein ORFs, or RNA therapies;
11. Incorporate high expression tags for highest protein expression levels;
12. Chemical modifications of oligos used in PCR;
13. **Unique system for ultrapersonalized hospital-based gene therapy treatments.**



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Thank You!

Applied DNA Sciences
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adnas.com