



PRECIGEN

Adenovirus Vectors for Human Therapeutics

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SVP, Head of Research

21 May 2021

Forward-looking Statements

Some of the statements made in this press release are forward-looking statements. These forward-looking statements are based upon Precigen's current expectations and projections about future events and generally relate to plans, objectives, and expectations for the development of Precigen's business, including the timing, pace and progress of preclinical studies, clinical trials, discovery programs and related milestones, and the promise of the Company's portfolio of therapies, and in particular its CAR-T therapies. Although management believes that the plans, objectives and results reflected in or suggested by these forward-looking statements are reasonable, all forward-looking statements involve risks and uncertainties, and actual future results may be materially different from the plans, objectives and expectations expressed. These risks and uncertainties include, but are not limited to, (i) the impact of the COVID-19 pandemic on our clinical trials, businesses, operating results, cash flows and/or financial condition, (ii) Precigen's strategy and overall approach to its health-focused business model; (iii) the ability to successfully enter new markets or develop additional products, including the expected timing and results of investigational studies and preclinical and clinical trials, including any delays or potential delays as a result of the COVID-19 pandemic, whether with its collaborators or independently; (iv) the ability to successfully enter into optimal strategic relationships with its subsidiaries and operating companies that it may form in the future; (v) the ability to hold or generate significant operating capital, including through partnering, asset sales and operating cost reductions; (vi) actual or anticipated variations in operating results; (vii) actual or anticipated fluctuations in competitors' or collaborators' operating results or changes in their respective growth rates; (viii) cash position; (ix) market conditions in Precigen's industry; (x) the volatility of Precigen's stock price; (xi) the ability, and the ability of collaborators, to protect Precigen's intellectual property and other proprietary rights and technologies; (xii) the ability, and the ability of collaborators, to adapt to changes in laws or regulations and policies, including federal, state, and local government responses to the COVID-19 pandemic; (xiii) outcomes of pending and future litigation; (xiv) the rate and degree of market acceptance of any products developed by Precigen, its subsidiaries, collaborations or joint ventures; (xv) the ability to retain and recruit key personnel; (xvi) expectations related to the use of proceeds from public offerings and other financing efforts; and (xvii) estimates regarding expenses, future revenue, capital requirements and needs for additional financing. For further information on potential risks and uncertainties, and other important factors, any of which could cause Precigen's actual results to differ from those contained in the forward-looking statements, see the section entitled "Risk Factors" in Precigen's most recent Annual Report on Form 10-K and subsequent reports filed with the Securities and Exchange Commission.

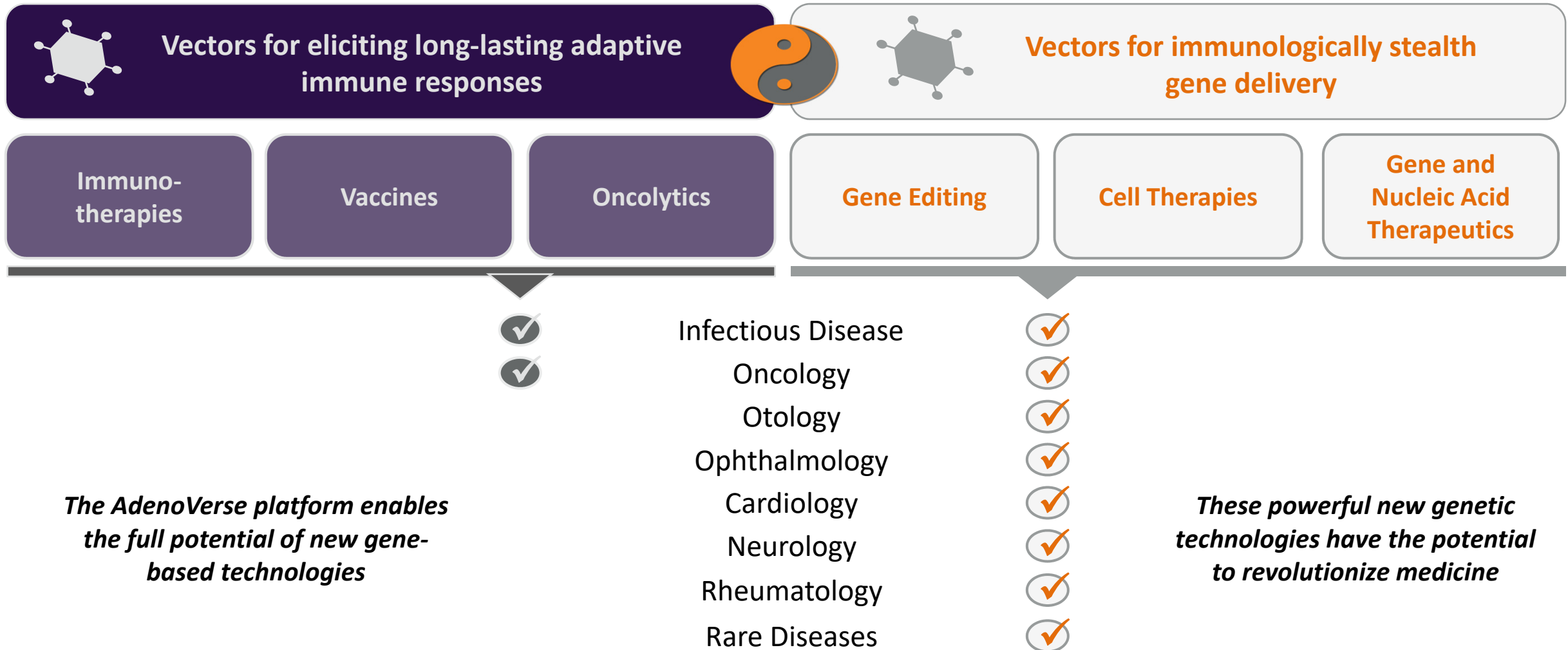
This presentation contains market data and industry statistics and forecasts based on studies and clinical trials sponsored by third parties, independent industry publications and other publicly available information. Although Precigen believes these sources are reliable, it does not guarantee the accuracy or completeness of this information and has not verified this data.

All of the pharmaceutical products described in this presentation are investigational new drugs, which are currently undergoing pre-clinical and/or human clinical trial testing. As a result, none of them have had their safety or efficacy established or are approved by the U.S. Food and Drug Administration or any other regulatory agency.

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AdenoVerse™ Platform: Broad Applications

A library of adenoviral vectors with diverse and unique biological properties



The AdenoVerse™ platform provides industry-leading adenovector technology



Precigen believes these gorilla adenovectors have performance characteristics that surpass:

- Standard adenovirus serotype 5 (Ad5)
- Leading rare human adenovirus types currently employed in the field
- Leading non-human primate adenovirus types currently employed in the field

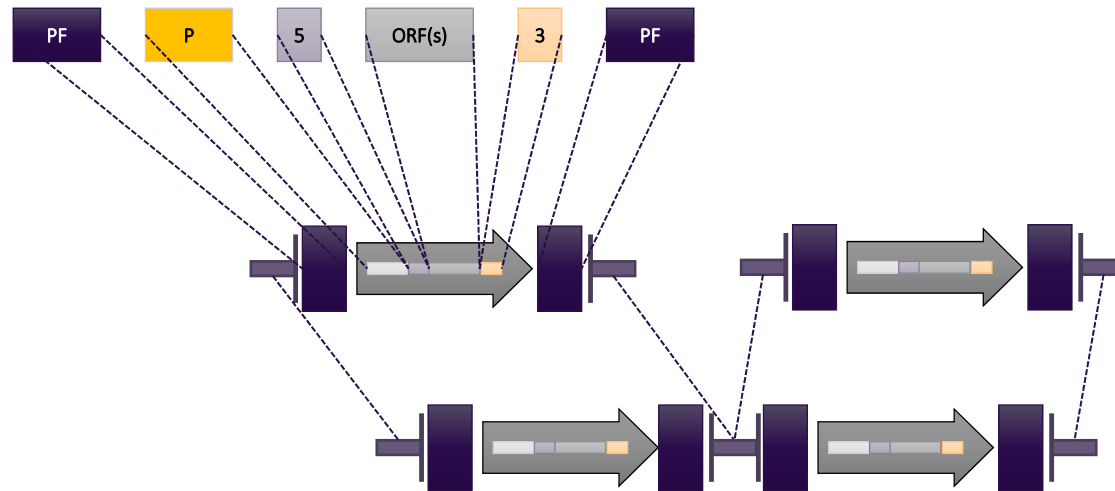


Off-the-shelf AdenoVerse Immunotherapies

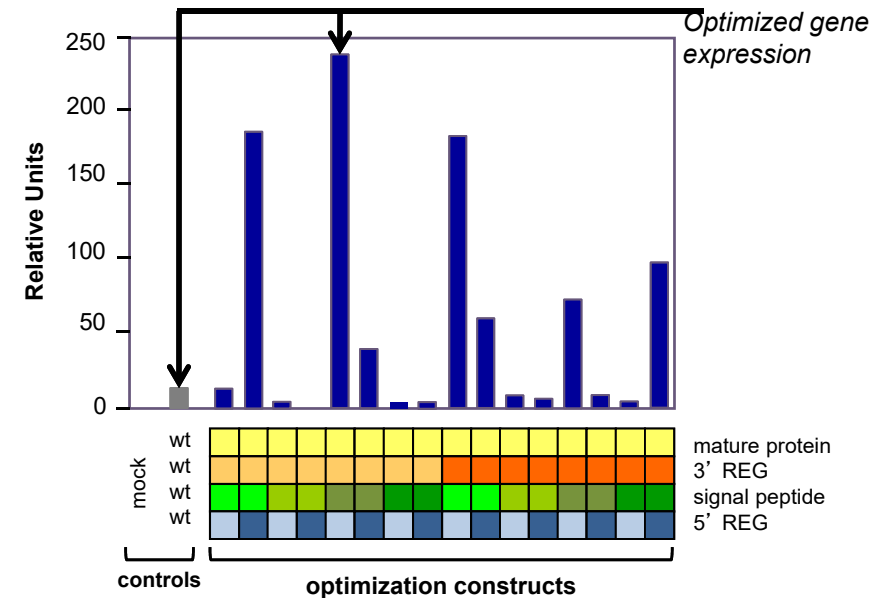
Leveraging Precigen's technology platforms to design innovative adenovirus immunotherapies

UltraVector® Enables Construction of Powerful Gene Programs

UltraVector® enabled matrices facilitate rapid identification of components and configurations for optimal expression of multiple genes



Significant improvement in gene expression



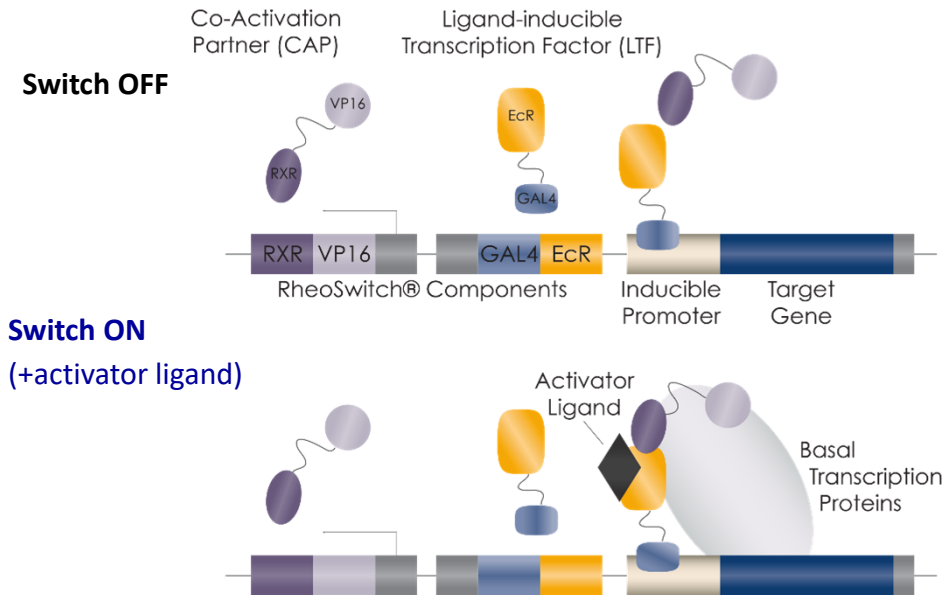
Industrialized assembly and screening of multigenic vectors

Optimized expression of multiple effector genes for precision medicine

Viral and non-viral (DNA, RNA and proteins)

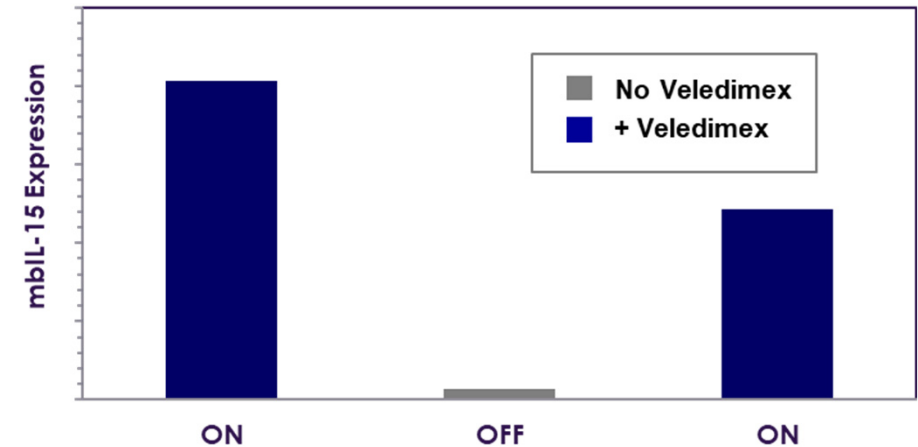
Control of Gene Expression *In Vivo* with RheoSwitch[®]

Most clinically-advanced gene switch platform

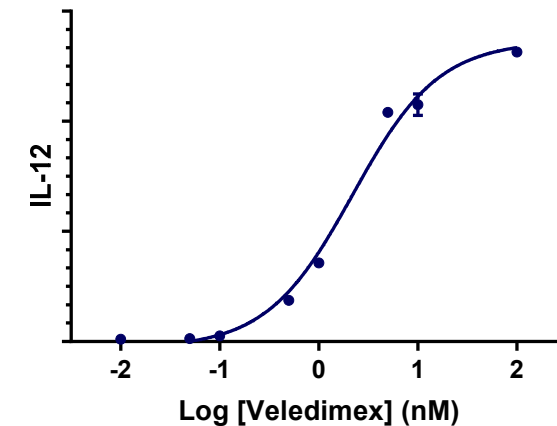


- Turn expression of genes ON and OFF repeatedly *in vivo* using oral activator ligand (Veledimex)
- Highly controllable, oral ligand dose dependent gene expression
- Clinically evaluated with excellent safety profile

Repeated ability to turn expression ON and OFF

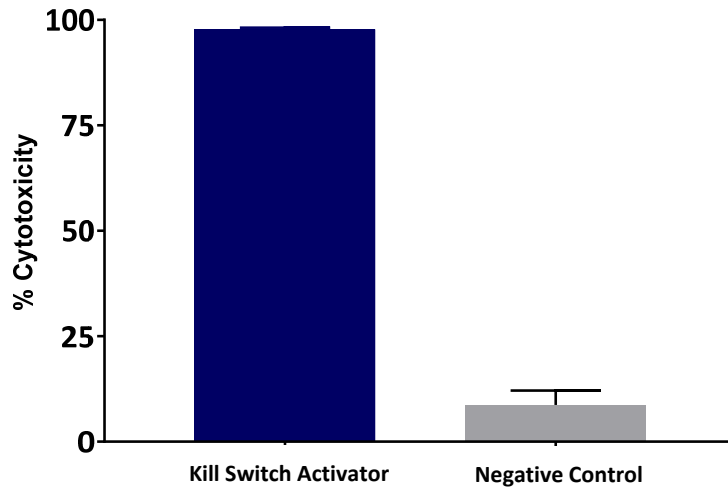


RheoSwitch[®] controlled cytokine expression by UltraCAR-T cells



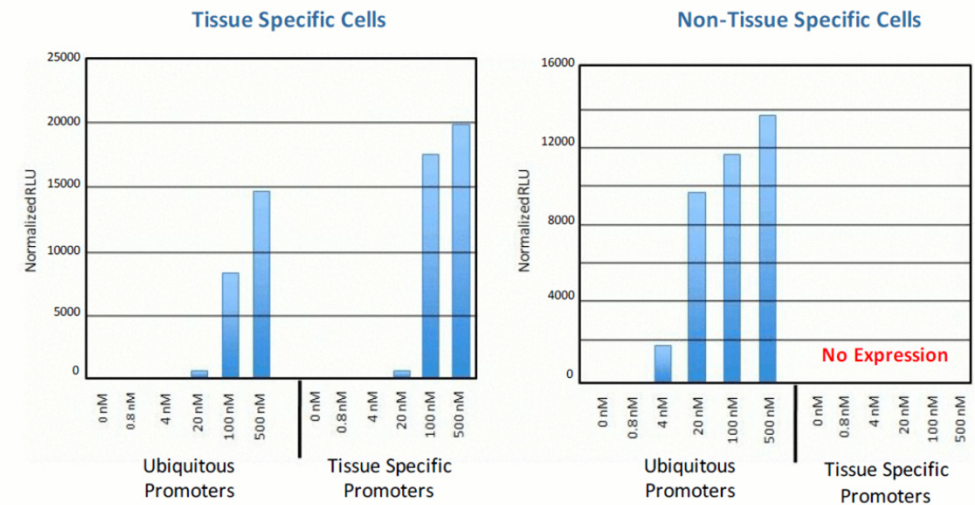
Kill Switches and Tissue Specific Promoters Improve Safety Profile

Kill switches



Ability to selectively deplete cell therapy products post administration to patients

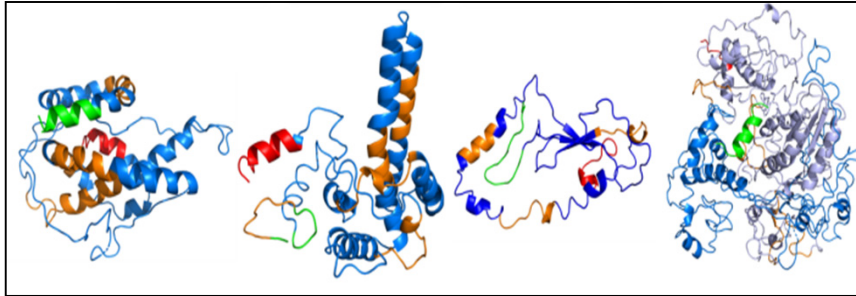
Tissue specific promoters



Conditional local expression of effector genes

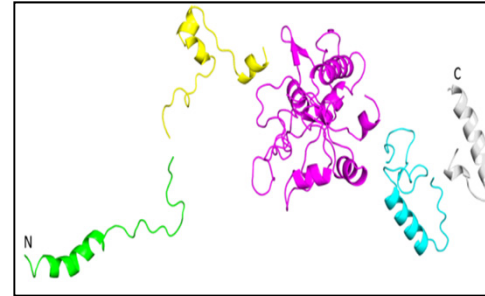
AdenoVerse Immunotherapy: Innovative Antigen Design Strategies

Modular fusion protein design

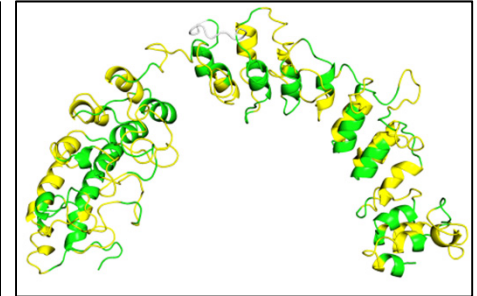


Multi-epitope designs

Linkers

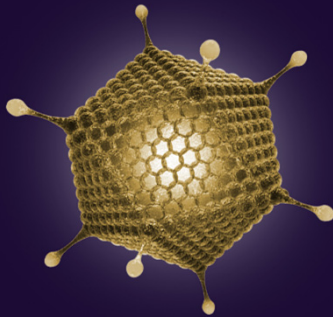


Scaffold



Off-the-shelf AdenoVerse™ Immunotherapy

Precigen's Gorilla Adenovectors Show Superior Characteristics Over Ad5 and other Rare Human and Non-human Primate Adenoviruses



AdenoVerse Advantages

- Large genetic payload capacity
- Off-the-shelf availability
- Ability for repeat administration
- Durable antigen-specific immune response
- Non-replicating adenoviruses
- Highly productive manufacturing process

Limitations of Competing Approaches

Vaccines

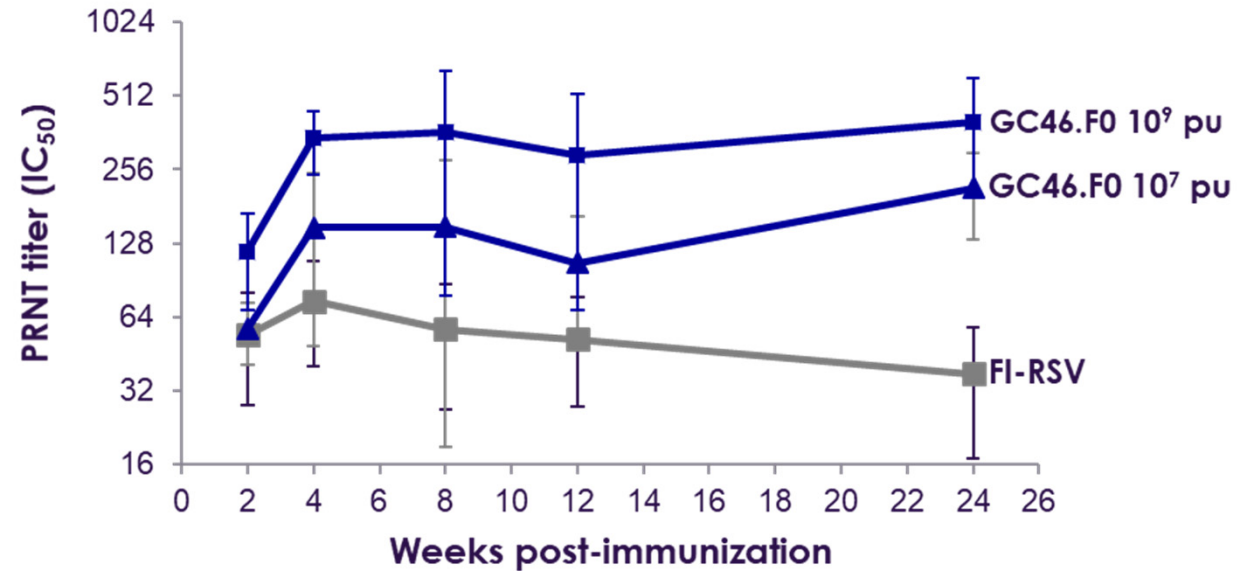
- Limited antigen coverage
- DNA vaccines may have relatively poor immunogenicity
- Pre-existing immunity to human Ad5 may limit efficacy¹

TCR-T Cells

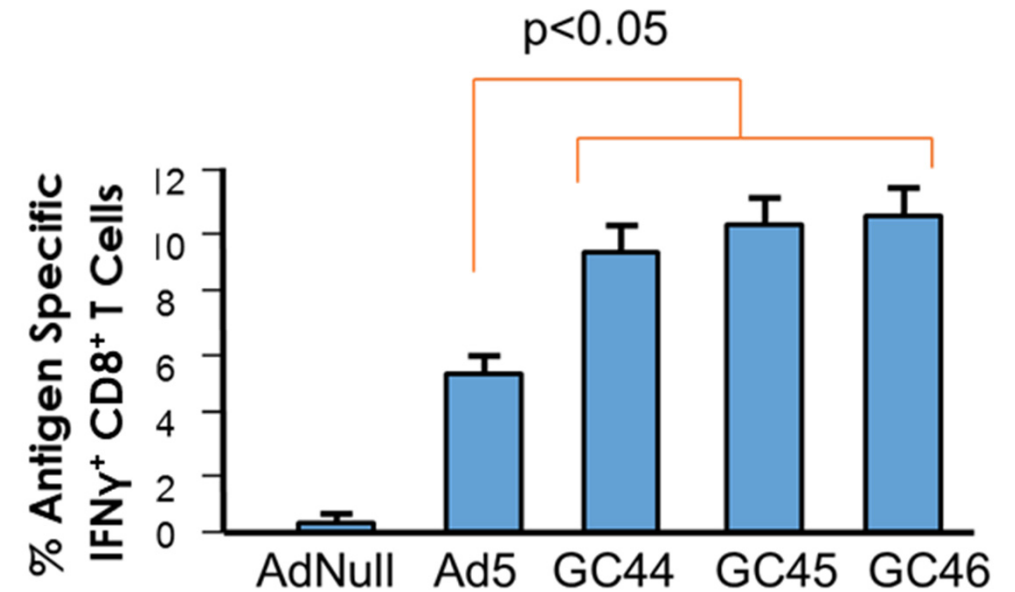
- Applicable in only a small subset of patients due to HLA polymorphism
- Target only a single antigen epitope
- Long and expensive manufacturing process
- Potential for the mispairing of endogenous and exogenous TCR chains

AdenoVerse™ Vectors Elicit Durable Antibody and T-cell Immune Response

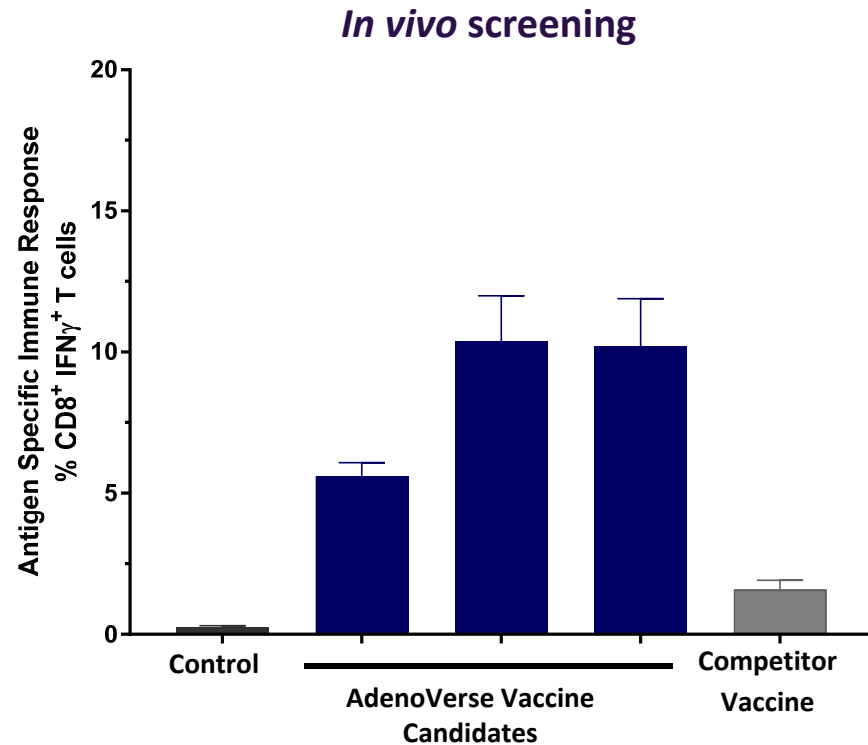
Durable neutralizing antibody response



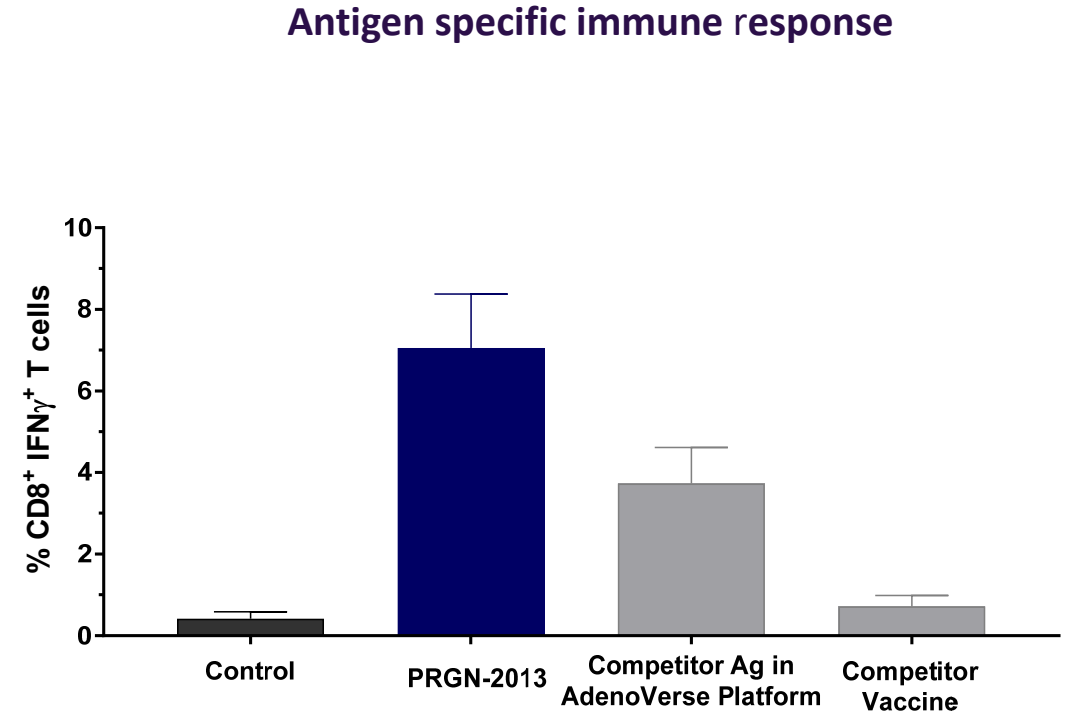
Robust antigen specific T cell response



Precigen AdenoVerse™ Vaccine Candidates and Technology platform generate superior immune responses



Novel antigen designs for infectious disease vaccine candidates produce robust antigen-specific response



AdenoVerse™ vaccine produces superior immune response

AdenoVerse Immunotherapy Pipeline

Immuno-oncology

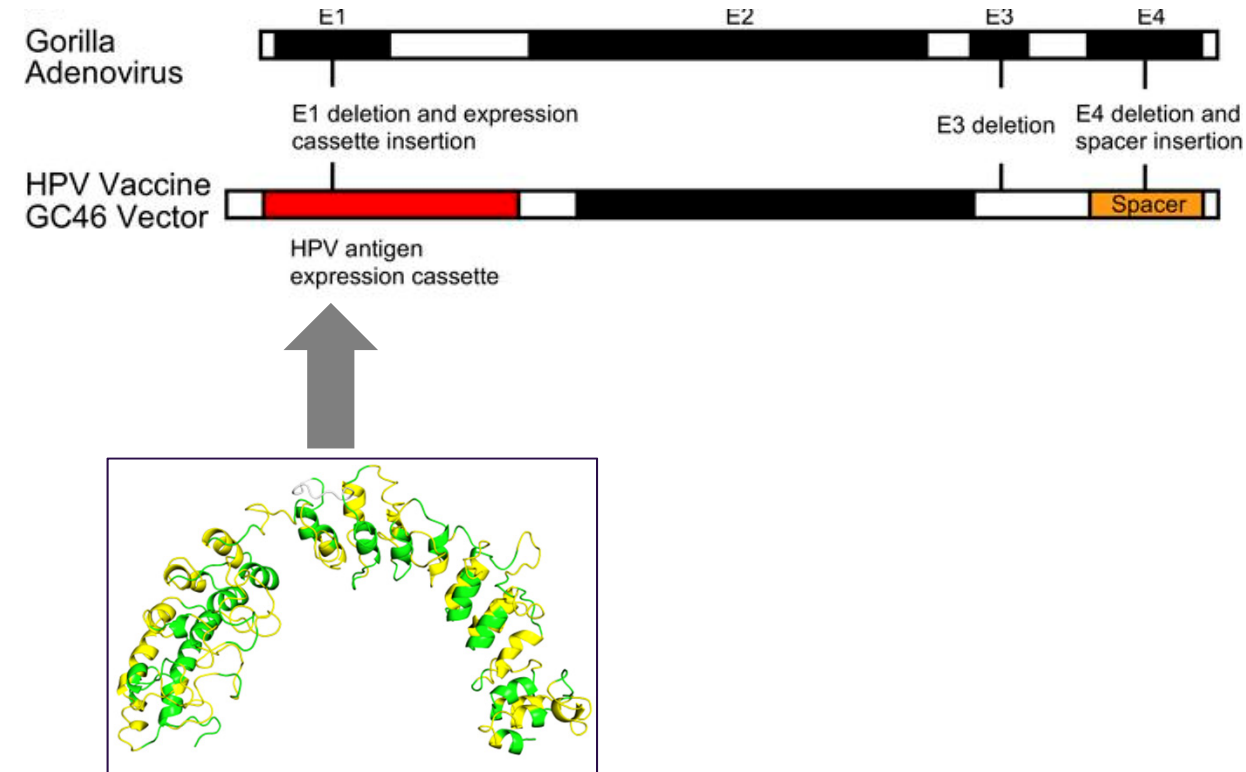
PRODUCT	PLATFORM	INDICATION	DISCOVERY	PRECLINICAL	PHASE 1	PHASE 2	PHASE 3
PRGN-2009	OTS AdenoVerse Immunotherapy	HPV+ Solid Tumors					

Infectious Diseases

PRODUCT	PLATFORM	INDICATION	DISCOVERY	PRECLINICAL	PHASE 1	PHASE 2	PHASE 3
PRGN-2012	OTS AdenoVerse Immunotherapy	Recurrent Respiratory Papillomatosis					
PRGN-2013	OTS AdenoVerse Immunotherapy	HBV Infection					

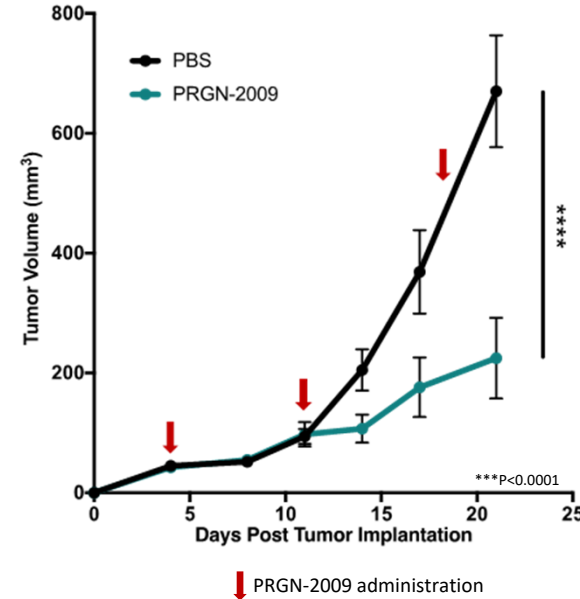
PRGN-2009 Incorporates Innovative Multi-epitope Antigen Design Optimized to Induce a Robust Immune Response Against HPV16/18

Design of Gorilla Adenovirus vaccine PRGN-2009

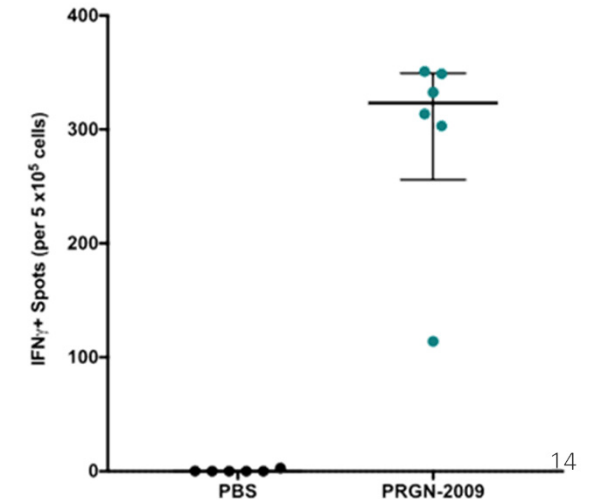


PRGN-2009 induces strong HPV-specific immune response and anti-tumor response in TC-1 syngeneic mouse model of HPV⁺ cancer

Anti-tumor Response

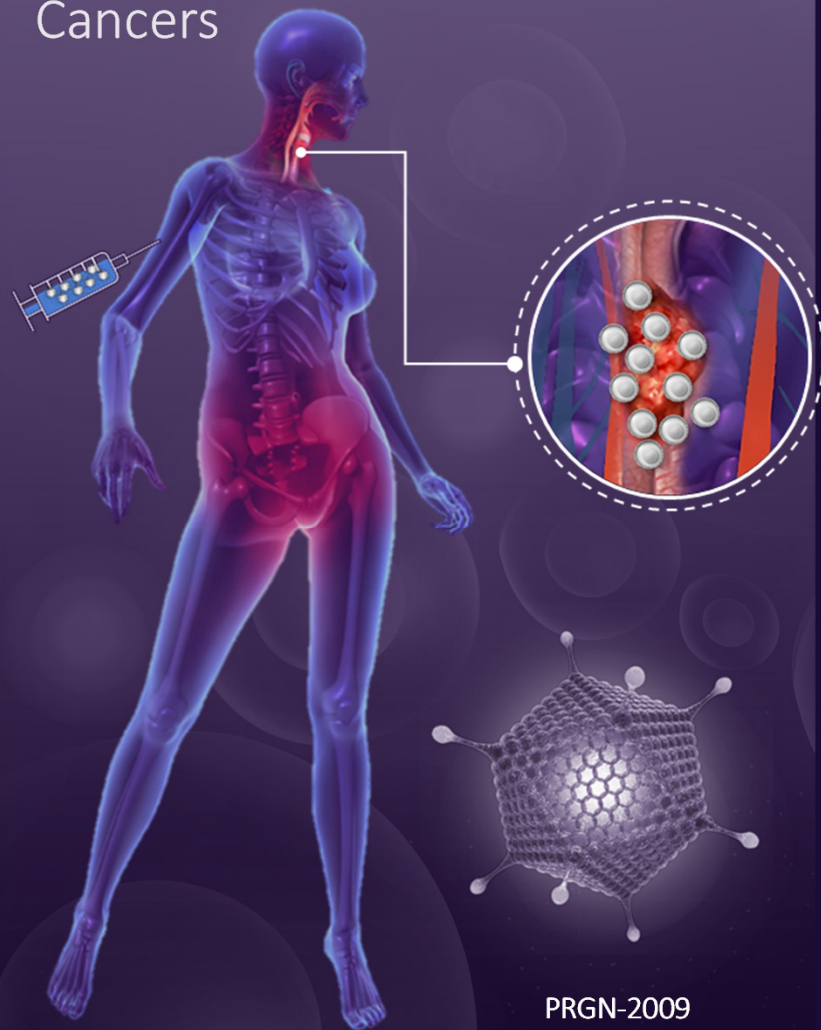


HPV-specific T Cell Response



PRGN-2009

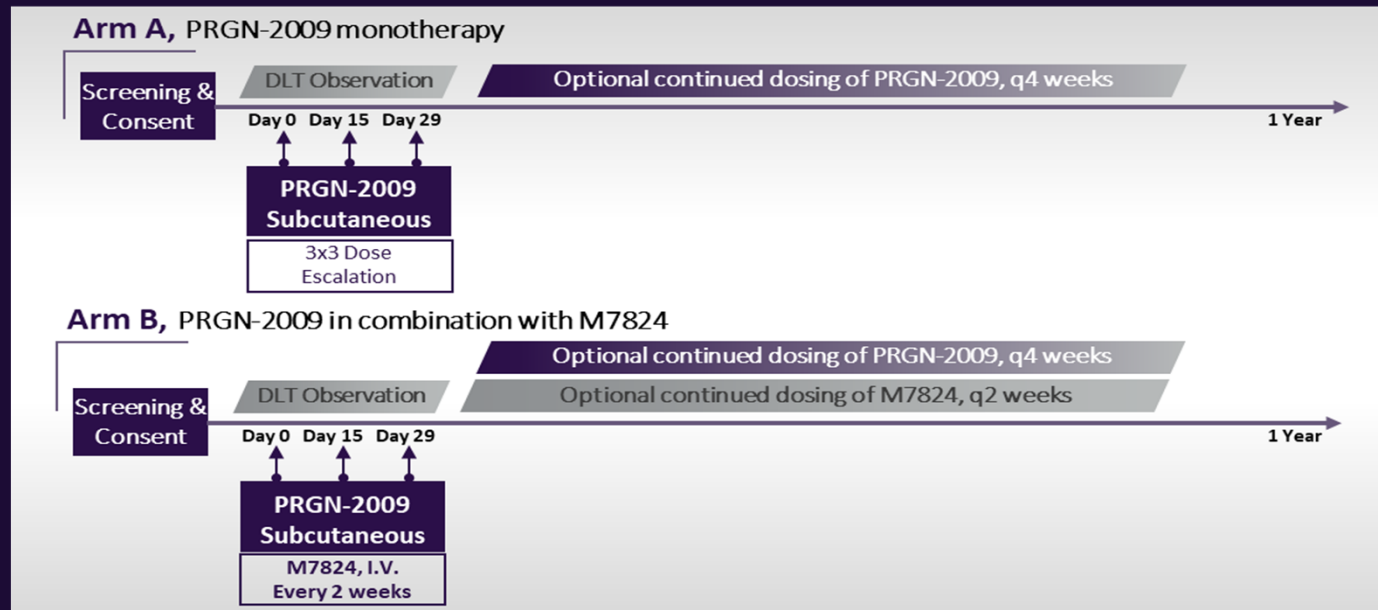
A First-in-Class Investigational Therapy for HPV-associated Cancers



PRGN-2009

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- Phase 1/2 trial is ongoing in collaboration with NCI through a CRADA
 - Phase 1 study to evaluate safety and response of PRGN-2009 alone and in combination with M7824 (bintrafusp alfa) in patients with HPV-associated cancers
 - Clinicaltrials.gov identifier: NCT04432597; Principal Investigator: Charalampos Floudas, M.D.
- Enrollment in Phase 1 monotherapy arm (Arm A) completed**
 - All 6 patients enrolled in monotherapy arm received multiple PRGN-2009 administrations to date
 - Repeated administration of PRGN-2009 treatment was well-tolerated with no DLTs reported to date
- Phase 1 trial schema

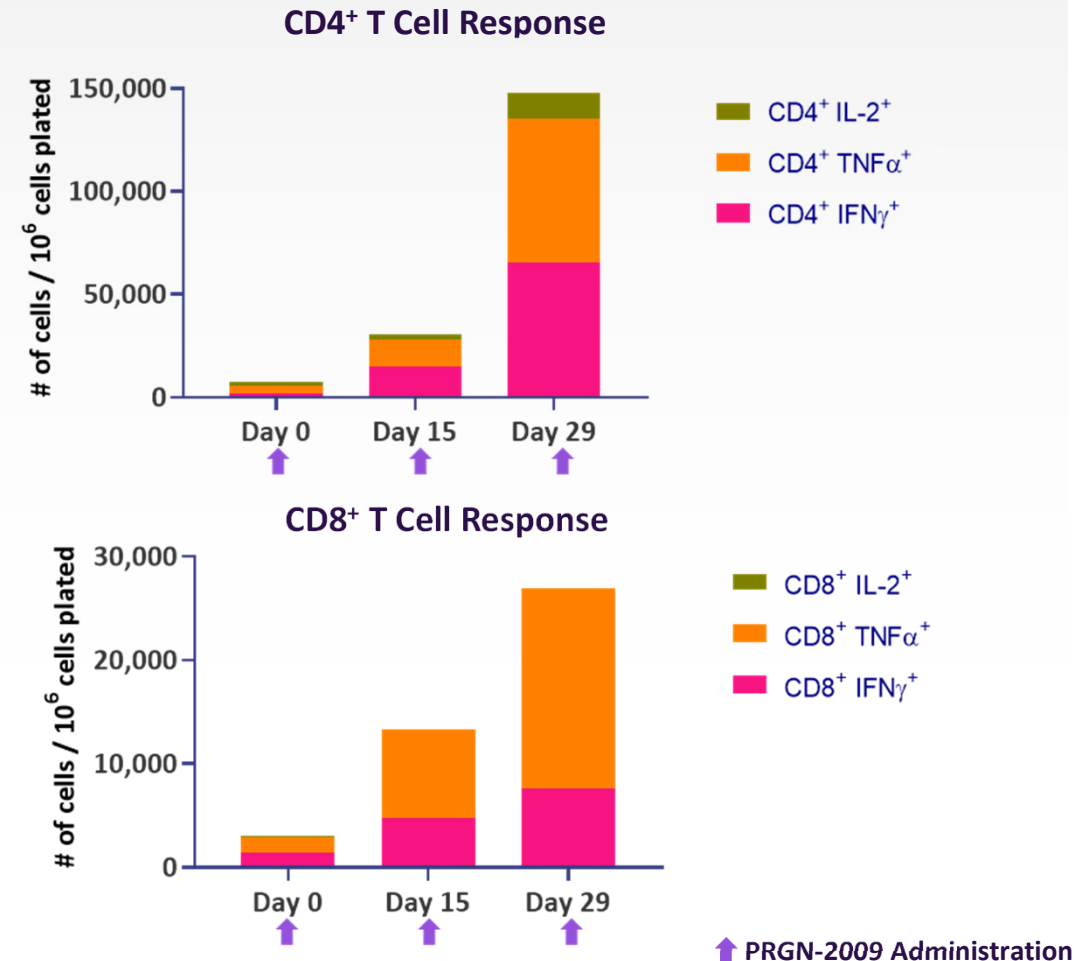


Preliminary Phase 1 Data Demonstrate Increase in HPV-specific T Cell Response in Patients Upon Repeated Dosing of PRGN-2009

PRGN-2009 Induced Immune Response in Patients

- All patients (N=6) enrolled in Phase 1 monotherapy arm (Arm A) have received multiple PRGN-2009 administrations to date
- Preliminary correlative analysis of peripheral blood mononuclear cells (PBMC) from patients treated at Dose Level 1 demonstrated:
 - 100% (3 out of 3) patients treated at Dose Level 1 showed increase in HPV16 and/or HPV18 specific T cells post PRGN-2009 administration
 - **Increase in magnitude and breadth of immune response with repeat administration of PRGN-2009**

Subject 3 Enrolled at Dose Level 1



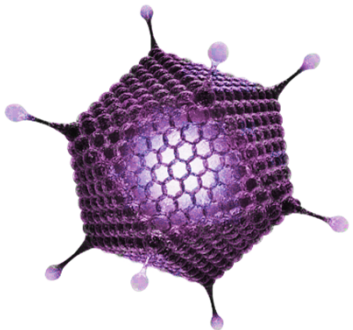
Data shown represents HPV16 specific T cell response in 1 of 3 patients treated at Dose Level 1
Source: National Cancer Institute

PRGN-2012: AdenoVerse Immunotherapy Targeting HPV6 and HPV11 for Recurrent Respiratory Papillomatosis (RRP)

Recurrent Respiratory Papillomatosis

- RRP is caused by HPV6 or HPV11 infection
- A rare disease in which benign tumors called papillomas grow in the respiratory tract
- Symptoms include hoarse voice, difficulty sleeping and swallowing, chronic coughing, or breathing problems
- There is currently no cure for RRP
- Repeated surgical excision or debulking is the only current treatment and these procedures are needed multiple times a year

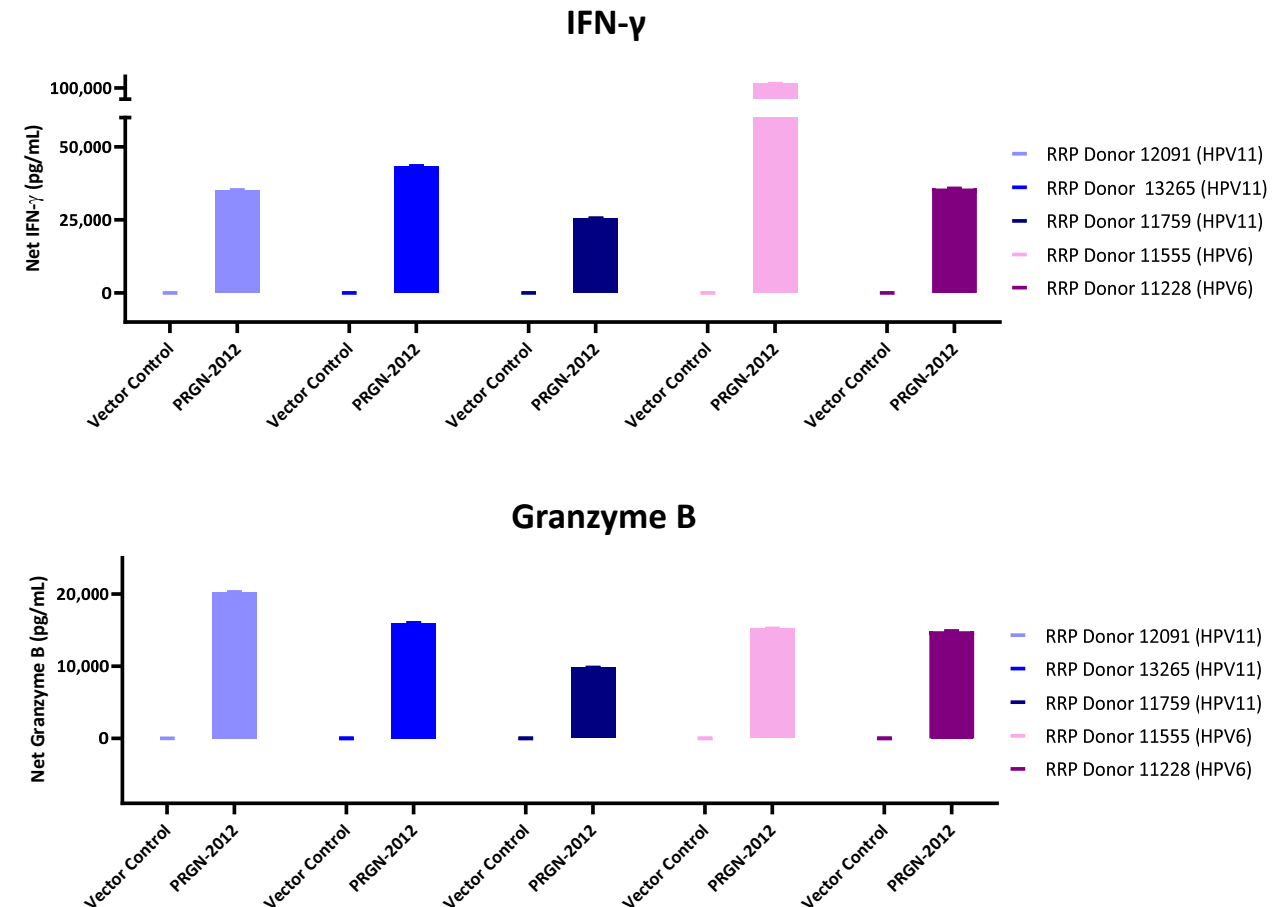
PRGN-2012 targets HPV6 and HPV11



Gorilla adenoviral vector, with the ability for repeat injections, designed to elicit T-cell mediated immune responses against papilloma cells infected with HPV6 or HPV11

PRGN-2012
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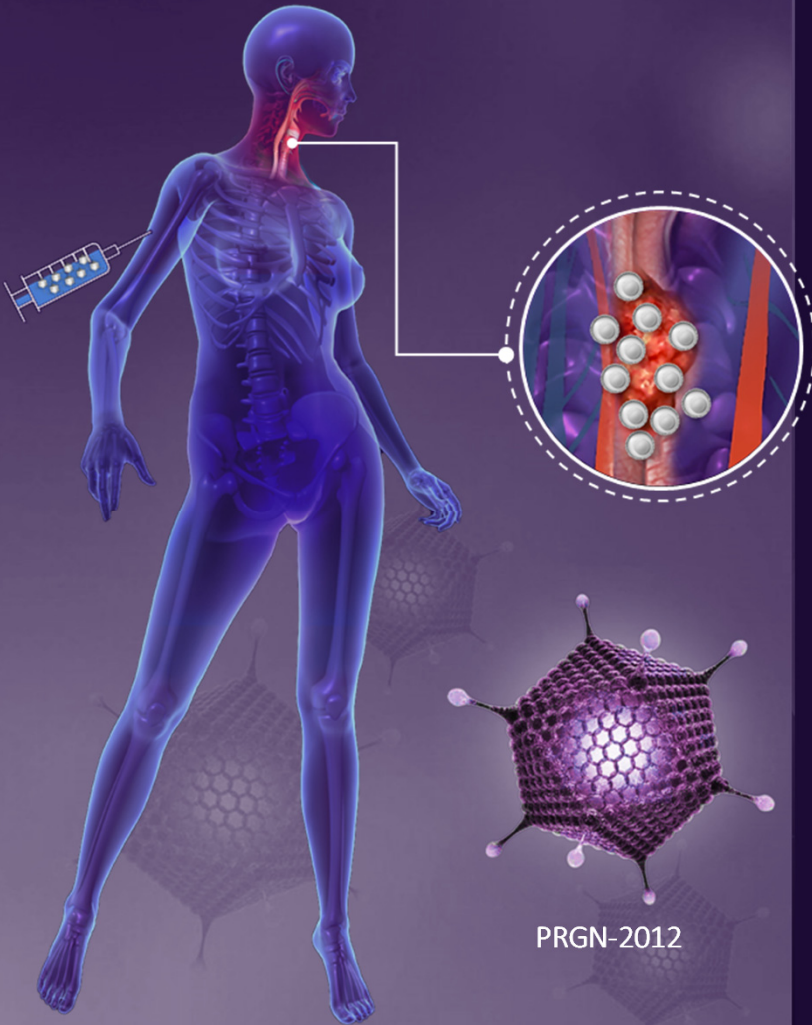
PRGN-2012 Induces Robust HPV6 and HPV11 Specific T-cell Response in RRP Patient Samples *In Vitro*



Co-culture of PRGN-2012 transduced monocyte-derived dendritic cells and T cells

PRGN-2012

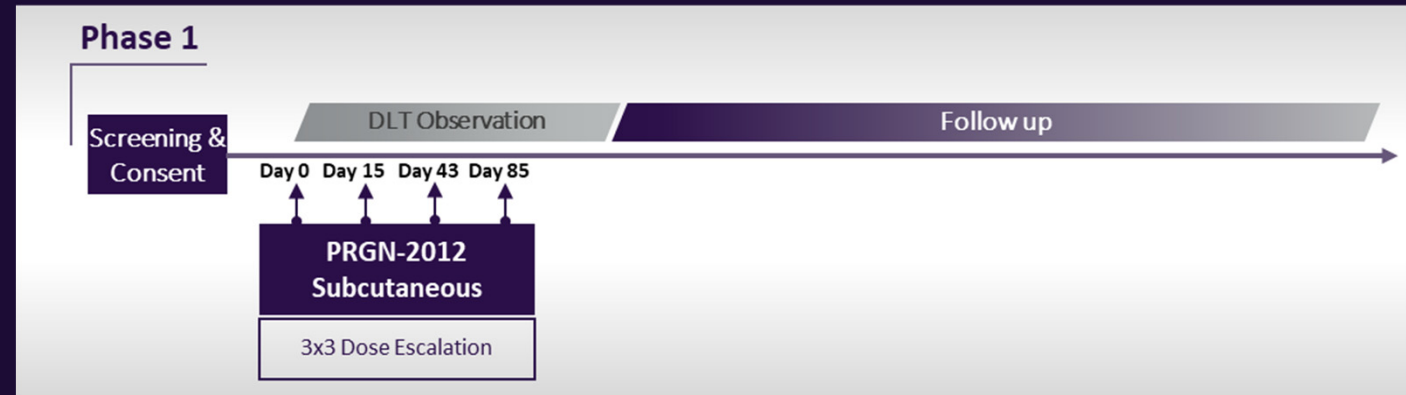
A First-in-Class Investigational Therapy for RRP



PRGN-2012

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- **Phase 1 trial is ongoing in collaboration with NCI through a CRADA**
- First AdenoVerse Immunotherapy to enter clinic for infectious disease indication
- Phase 1 study to evaluate safety and maximum tolerated dose of PRGN-2012



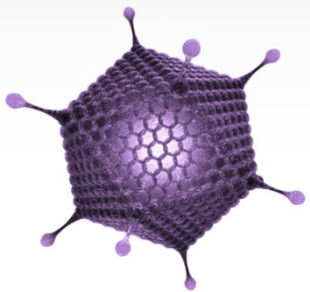
- Orphan Drug Designation (ODD) granted by the FDA

PRGN-2013: Opportunity in Chronic Hepatitis B Virus (HBV) Infection

Chronic Hepatitis B Virus Infection

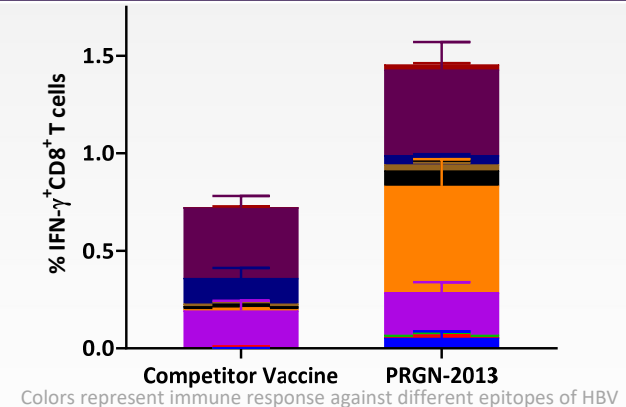
- Liver infection caused by HBV may lead to chronic infection and hepatocellular carcinoma (HCC)²
- Chronic HBV infection can cause serious health problems, including liver damage, cirrhosis, liver cancer, and death¹
- No cure for chronic HBV infection
- Global prevalence of 257M³
- US prevalence of 850K¹

PRGN-2013 Targets HBV

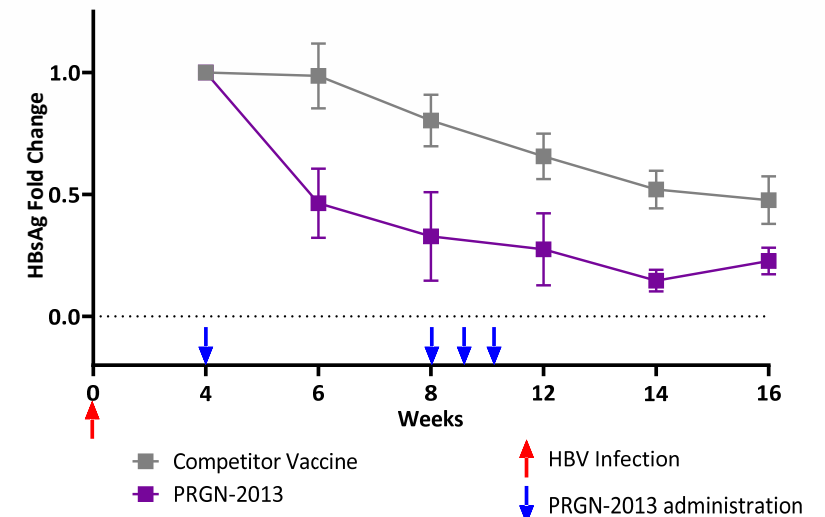


- Gorilla adenoviral vector, with ability for repeat injections, designed to elicit specific immune response against HBV
- Novel antigen design is differentiated from the competition

PRGN-2013 Induces Superior Cytotoxic T-cell Response against more HBV epitopes in Mice and differentiates from Competition



PRGN-2013 Administration Decreases Plasma Levels of HBsAg, the Key Marker of Chronic HBV Infection, in Mice





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