Enochian BioSciences

ENHANCED GENE & CELL THERAPIES HARNESSING IMMUNE RESPONSE AGAINST CANCER & INFECTIOUS DISEASES

FORWARD-LOOKING STATEMENTS

Certain statements in this presentation that are not strictly historical in nature, regarding our future operations, strategy, potential regulatory treatment, acceptance or changes, preclinical opportunities or activities, potential commercial sales, or outcomes of later clinical trials, among other topics, are “forward-looking statements” for the purposes of federal securities laws. All statements other than statements of historical fact included in this presentation are forward-looking statements, which may be identified by the use of forward-looking terminology such as “may,” “could,” “would,” “should,” “expect,” “intend,” “plan,” “anticipate,” “believe,” “approximately,” “estimate,” “predict,” “project,” “potential”, “aim,” or similar expressions, although not all forward-looking statements contain such identifying words. These forward-looking statements are predictions and expectations of future events based on currently available information and assumptions drawn from currently available information. Be advised that these forward-looking statements are subject to a number of known and unknown risks and uncertainties, many of which are difficult to predict or out of our control, including the success or efficacy of our pipeline, as well as other factors discussed under the heading “Risk Factors” in Enochian’s most recently filed Annual Report on Form 10-K and other filings with the SEC. Actual future events, outcomes or results may differ materially from those projected in any of such forward-looking statements due to the occurrence of such uncertainties or the failure of such forward-looking statements’ underlying assumptions. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date hereof. All forward-looking statements, expressed or implied, oral or written, are expressly qualified in their entirety by this cautionary statement. Except as otherwise required by applicable law, Enochian undertakes no obligation to revise or update this presentation to reflect events or circumstances after the date hereof.

ENOCHIAN BIOSCIENCES AT A GLANCE

Headquartered in Los Angeles, CA

Uplisted to Nasdaq in December 2018 (Ticker: ENOB)

Year-End: June 30th

Market Cap $103.4M;
Share Price of $1.95 as of Oct 13, 2022
(Source Nasdaq.com)

The Company has raised total cash to date of $75M*

*Private placement at acquisition of $30.6M + $6.2M in Notes Payable +$29M of Direct Offering +$4.2M of LPC equity draw + $5M private placement

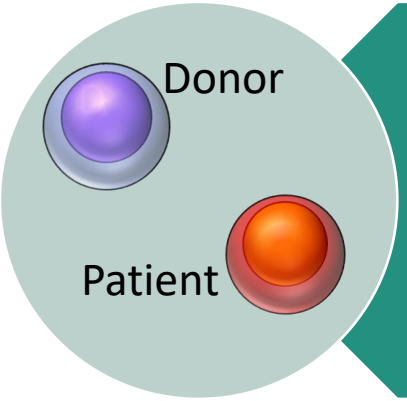
ADVANCED ALLOGENEIC CELL AND GENE THERAPY PLATFORMS MODULATING IMMUNE RESPONSE

Our goal is to provide transformational therapies for potential disease cures

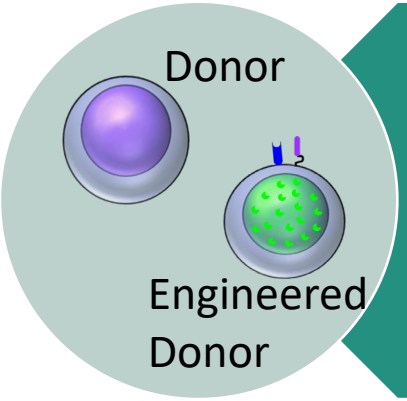
Boost patients' immune response into long-term remission or cure for solid tumors and infectious diseases

Highly adaptable platforms for quick expansion to new indications

MULTI-PRONGED APPROACH TO ENHANCE IMMUNE RESPONSE WITH PROPRIETARY ENGINEERED GENE AND/OR CELL THERAPY



The entire immune response is designed to search and destroy things that are “other/allo.” Allogenicity could enhance a person’s ability to react more aggressively to cancer and viruses



Allogeneic cells are engineered with signaling molecules to potentially enhance recognition, infiltration, and destruction of diseased cells

LONG-TERM REMISSION OR FUNCTIONAL CURES OPEN DOORS TO LARGE UNMET NEEDS WITH VALIDATED MARKET OPPORTUNITIES

DISEASE STATE	UNMET NEED	MARKET OPPORTUNITY	PRECEDENTS
SOLID TUMORS	Inadequate therapies Tumors have evolved to escape certain I/O based treatments	1st Target: pancreatic cancer **~450,000**[1] Cases per year worldwide **~60,000**[2] Cases per year in the U.S. **~10%**[2] Survival rate at 5 years	Bristol-Myers Squibb's-wholly owned subsidiary Celgene's Abraxane has ~$1B+[3] in sales per year
HIV	Currently no cure available Life-long treatment required Associated with side effects	**~38 MILLION**[4] Living with HIV worldwide in 2020 **~1.2 MILLION**[5] People living with HIV in the U.S	~$36,000 to $48,000[6] Yearly cost of ART in the US in 2018 ~Half Trillion $ spent[7] between 2000-2015 ~ $35 billion/year USA[8]
HEPATITIS B	Life-long treatment required Side effects Second leading cause of cancer death worldwide	**~296 million**[9] Living with chronic HBV worldwide in 2019 **~2.4 MILLION** Living with chronic HBV in the U.S **~1.5 MILLION**[9] newly infected with HBV worldwide Every Year **~820 Thousand**[9] HBV related deaths/year worldwide	Gilead purchased global rights for Hepatitis C virus (HCV) cure for $11 billion[11]; 177 million[12] people are living with HCV globally; half as many as HBV; peak sales $19 billion[13]

See Appendix I: Data Source For Footnote References

STRATEGY: LEVERAGE INNOVATIVE PLATFORMS TO CREATE "MULTIPLE SHOTS ON GOAL" & NEW INTELLECTUAL PROPERTY

Combining novel cell, gene and immunotherapy to build a diverse pipeline across and within diseases to allow for better business decisions to sell, sub-license, partner or manufacture and maximize patient impact and shareholder value.

Oncology Pipeline

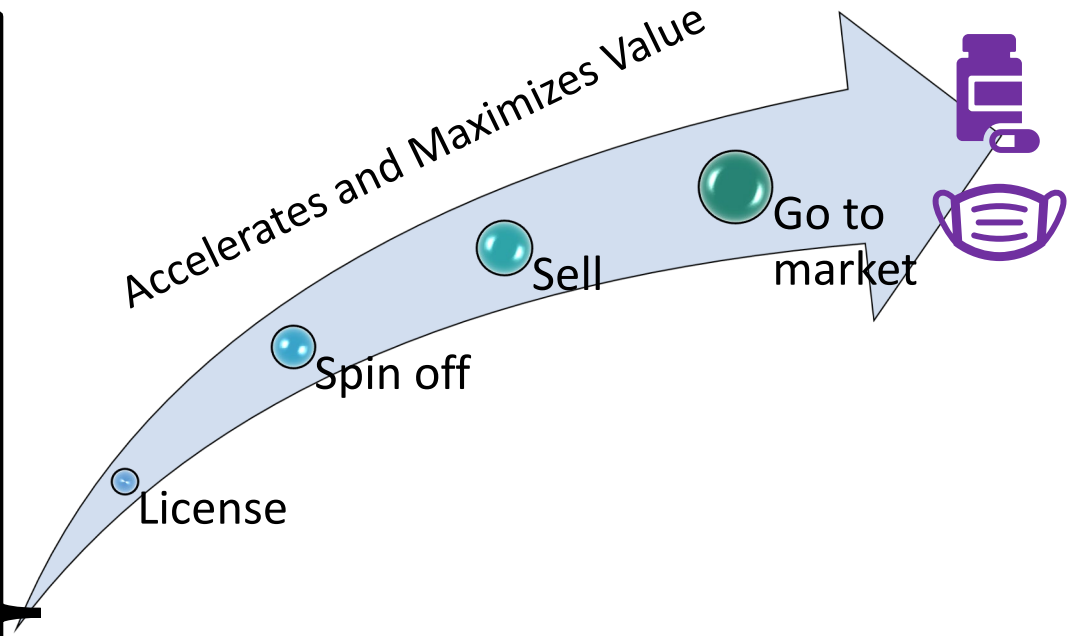
1st indication: Pancreatic Cancer

Future possible indications:
- Renal Cell Carcinoma
- Glioblastoma
- Breast Cancer…

Infectious Disease Pipeline

1st Product concept: HIV Engineered T-Cell Vaccine

Additional product opportunities:
- HIV Natural Killer & Gamma Delta T-Cell
- HIV Autologous Transplant
- HBV Gene Therapy
- Additional pandemic preparedness



OUR DEVELOPMENT PIPELINE

Program	Indication	Proof of Concept	Pre-IND	IND-Enabling	IND-SUB	Phase 1/2A
ENOB-DC-11*	Dendritic Cell Therapeutic Vaccine for Pancreatic Cancer		EARLY/MID 2023		LATE 2023/ EARLY 2024	
ENOB-DC-12-XX	Dendritic Cell Therapeutic Vaccine for Other Solid Tumors (TBD)					
ENOB-HV-12*	HIV Therapeutic Vaccine		MID/LATE 2023		EARLY/MID 2024	
ENOB-HV-21	HIV Natural Killer & Gamma Delta T-Cell Treatment or Cure					
ENOB-HV-01**	HIV Autologous Transplant					
ENOB-HB-01	HBV Gene Therapy					

CANCER HIV HBV

Tier 1 Programs

*** Enochian has entered into a profit-sharing sub-license with Caring Cross for a key component of this technology*

EXPERIENCED LEADERSHIP: MANAGEMENT TEAM –
Composition of members ~60% Diverse

The Hon. Mark Dybul, MD

Chief Executive Officer
& Director

- Global Fund for AIDS, Tuberculosis and Malaria
- US President's Emergency Plan for AIDS Relief (PEPFAR)
- National Institute of Health (NIAID)

Luisa Puche

Chief Financial Officer,
Corporate Secretary

- Brightstar Corp
- Puche Group LLC
- Ernst & Young LLP

Francois Binette, PhD

Executive Vice President
of Research & Development

- Lineage Cell Therapeutics
- Medtronic
- Johnson and Johnson
- Genzyme

Greg Duczynski, PhD

Senior Vice President of
Clinical Operations

- Pfizer

Lu Chen, PhD

VP of Product
Development & CMC

- Atara Biotherapeutics
- Irvine Scientific
- Allergan
- Caladrius Biosciences

EXPERIENCED LEADERSHIP: BOARD OF DIRECTORS –
Composition of members ~70% Diverse

Rene Sindlev
Chairperson

Gregg Alton, JD
Lead Independent Director

Mark Dybul, MD
Chief Executive Officer
& Director

Jayne McNicol
Director

James Sapirstein, RPh, MBA
Director

Carol Brosgart, MD
Director

Henrik Grønfeldt –Sørensen
Director

Bios are available at www.enochianbio.com

DEEP SCIENTIFIC EXPERTISE: STRATEGIC RESEARCH ADVISORS & COLLABORATORS

RICHARD WHITLEY, MD: SENIOR SCIENTIFIC ADVISOR

- Distinguished Professor of Pediatrics, Professor of Microbiology, Medicine and Neurosurgery; Co-Director, Division of Pediatric Infectious Diseases; Senior Scientist, Department of Gene Therapy; Senior Advisor for Drug Discovery and Development and Senior Leader, Pediatric Oncology Program, O'Neal Comprehensive Cancer Center at UAB. He is also the Co-Founder and Co-Director, of the Alabama Drug Discovery Alliance.
- Responsible for the National Institute of Allergy and Infectious Diseases Collaborative Antiviral Study Group

ANA JEWETT, PHD: LEAD COLLABORATOR ONCOLOGY

- Dr. Anahid Jewett is a Professor in the Section of Biosystems and Function in the Division of Oral and Systemic Health Sciences at the UCLA School of Dentistry. Dr. Jewett is also a member of the Jane and Jerry Weintraub Center for Reconstructive Biotechnology, the Jonsson Comprehensive Cancer Center (JCCC) and the UCLA Tumor Immunology subgroup.

FRED HUTCHINSON CANCER RESEARCH CENTER: LEAD COLLABORATOR HIV THERAPEUTIC VACCINE

CARING CROSS: *SUB-LICENSED ENOB-HV-01 FOR NOVEL IN VIVO GENE THERAPY APPROACH FOR HIV*

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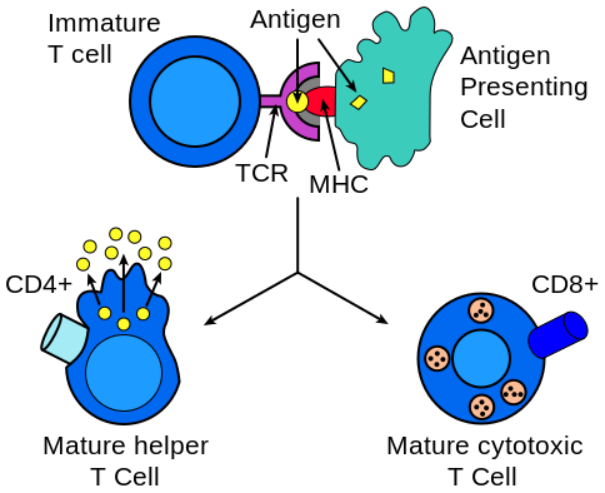
ENOB-DC-11: ONCOLOGY PROGRAM

ADAPTIVE IMMUNITY FOR CANCER IS OFTEN INADEQUATE/INSUFFICIENT

Dendritic cells orchestrate the immune response by "presenting" pieces of a tumor (antigens) to stimulate a reaction

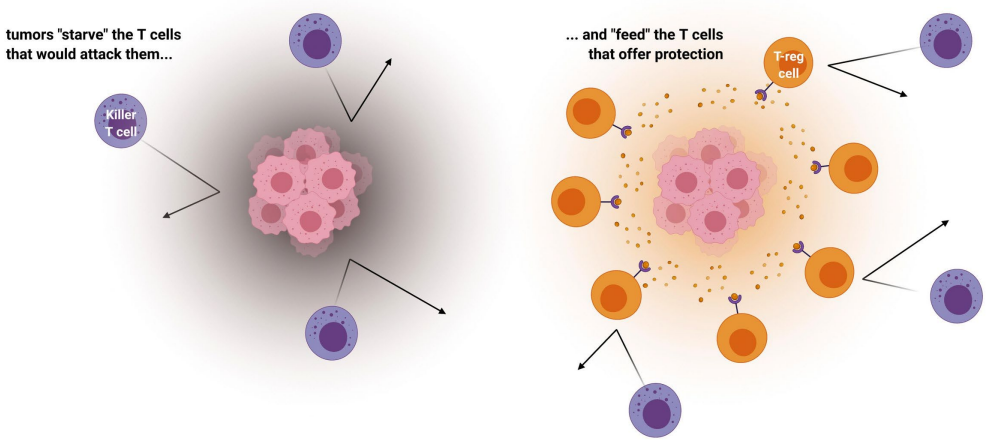
- "Educating" immune cells to recognize and eliminate diseased cells and pathogens



*UPMC, CREATED WITH BIORENDER.COM

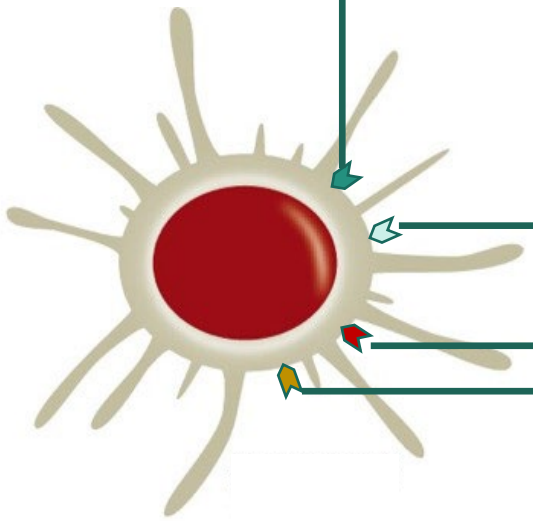
TUMOR CELLS CAN EVADE NORMAL IMMUNE RESPONSE

Cancer cells can evolve to evade immune responses by releasing inhibitory signals against, or hiding from, key parts of the system designed to seek and kill tumors



*UPMC, CREATED WITH BIORENDER.COM

GENE-ENHANCED DENDRITIC CELLS: PROPRIETARY THERAPEUTIC VACCINE PLATFORM AIMS TO BYPASS TUMOR IMMUNE RESPONSE EVASION AND ENHANCE TUMOR ERADICATION



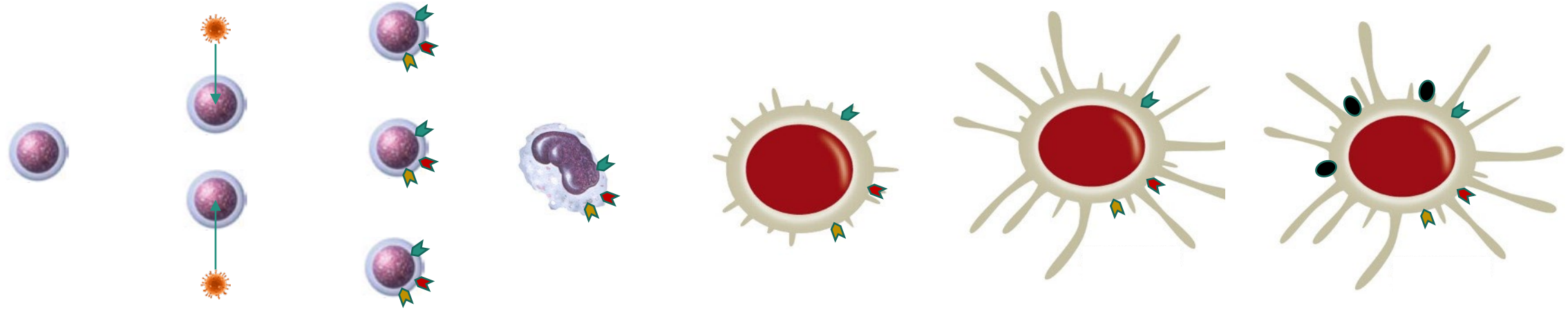
Induces T-Cell killing and suppresses Regulatory T-Cells
Activates cytotoxic T-Cells known to be the most effective immune cell population to kill the cancer cells

Promotes the immune cell **tumor infiltration or cell migration**

Promotes B memory cell response for the **long-term immune response and immune surveillance**

Activates the NK cells and the T helper cells

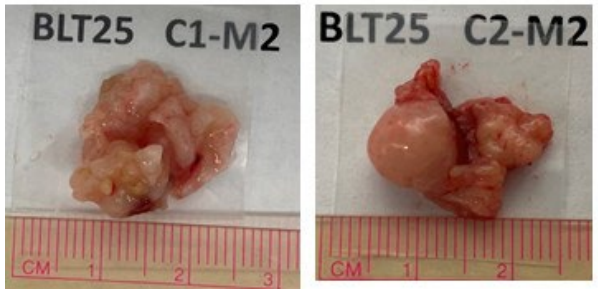
ENOB-DC-11 PRODUCT CANDIDATE: ALLOGENEIC, GENETICALLY ENGINEERED DENDRITIC CELLS LOADED WITH TUMOR ANTIGENS



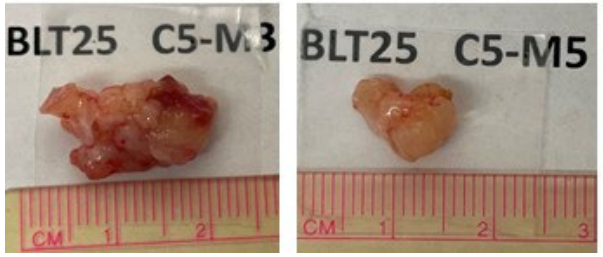
Cell banking	Gene engineering	Differentiation into dendritic cells (drug substance)	Final Drug product: Pancreas cancer Antigen presenting DC
Expand and engineer stem cells for “off-the-shelf” on demand product availability		Drive differentiation into gene-modified, mature dendritic cells	Tumor Antigen pulse for final product

ENOB-DC-11 SIGNIFICANTLY DECREASED PANCREATIC TUMOR SIZE IN HUMANIZED MICE WITH IMPLANTED TUMORS CORRELATED TO INCREASES OF KEY IMMUNE RESPONSES

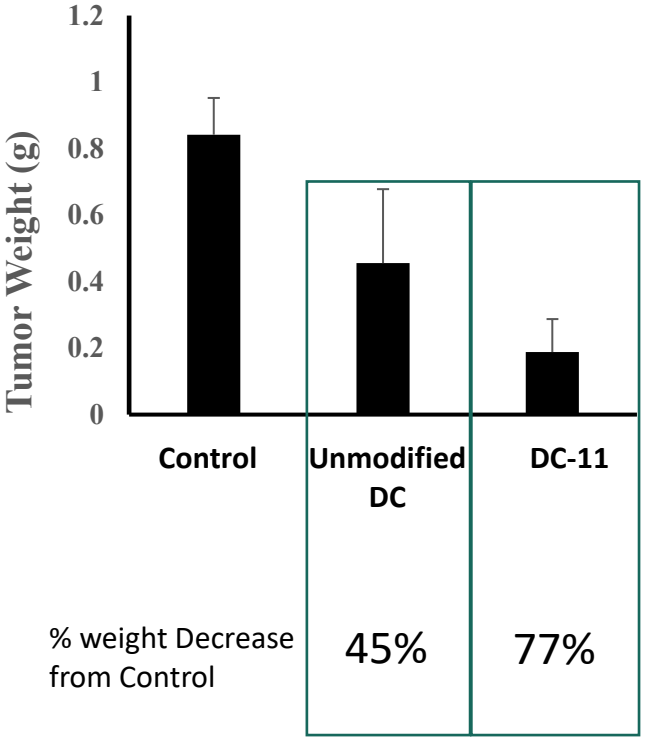
Tumor alone (Control)

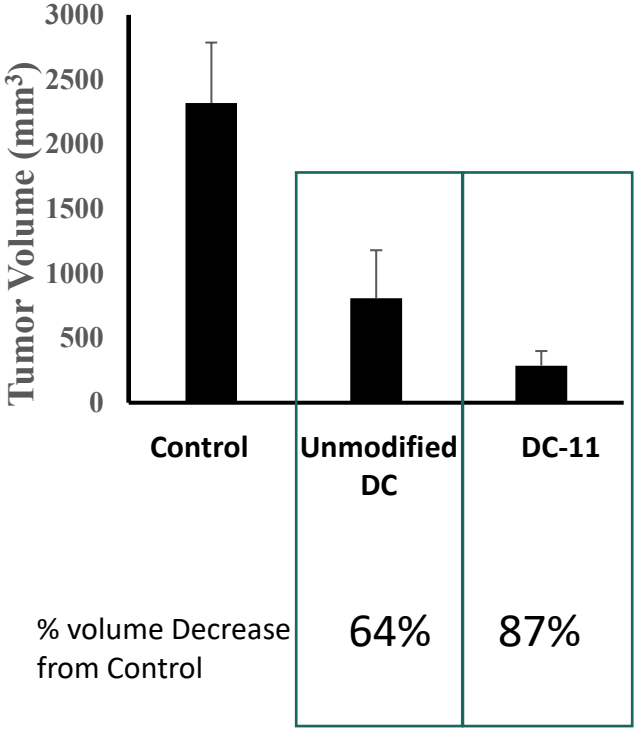


Unmodified DC



ENOB-DC-11 (gene-modified DC)





ENOB-DC-11: CURRENT STATUS & POTENTIAL NEAR-TERM MILESTONES

Humanized mouse model of human pancreatic cancer Proof-of-Concept: Substantial tumor size reduction and impressive immune responses

Process & Analytical Development ongoing

Potential Pre-IND – Q1/2 2023
Potential IND Filing – Q4 2023/Q1 2024
Potential Phase I Trial – Late 2023/early 2024

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HIV PROGRAMS

HIV PIPELINES

Three Complementary Therapeutic Approaches: T-cell Vaccine, Allogeneic T-cell Therapy, & Gene Therapy

Engineered Allogeneic T-Cell Vaccine

- **ENOB-HV-12: Therapeutic HIV Vaccine**
  - Enhances infiltration
  - Enhances killing
  - Enhances surveillance

Allogeneic T-Cell Therapy

- **ENOB-HV-21: HIV NK/GDT Treatment**
  - Allogenicity is a potent immune stimulator
  - GDT have been reported to be both a potential reservoir for, and effector T-Cells to kill HIV-infected cells

Gene Therapy Autologous Transplant

- **ENOB-HV-01: Gene Therapy for HIV**
  - Gene conferring T-Cell resistant to infection
  - Gene conferring engraftment advantage T-Cell compartment replacement
  - *Latter Technology Sub-Licensed for Potential use in vivo CAR-T Approach for HIV*

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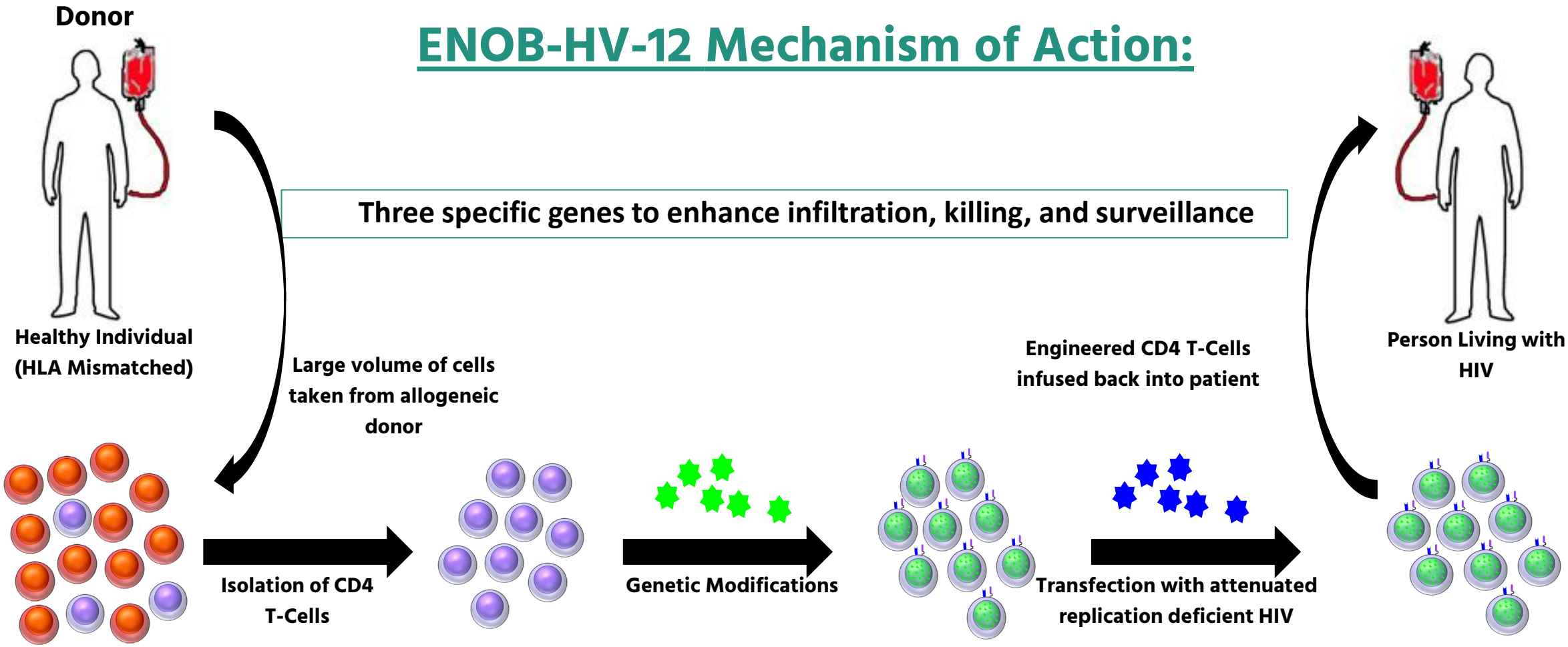
ENOB-HV-12: ENGINEERED THERAPEUTIC VACCINE

ENOB-HV-12: ALLOGENEIC ENGINEERED T-CELL DESIGNED TO ENHANCE IMMUNE RESPONSE AGAINST HIV

ENOB-HV-12 Mechanism of Action:

Three specific genes to enhance infiltration, killing, and surveillance



ENOB-HV-12: CURRENT STATUS & POTENTIAL NEAR-TERM MILESTONES

Non-human primate infected with simian-human variant of HIV: begun in early 2021

Manufactured drug product
First dose in Monkeys Aug 2022

Monitoring end points: preliminary data by end of 2022/early 2023
IND-enabling: Potential 2023
IND-submission: Potential late 2023

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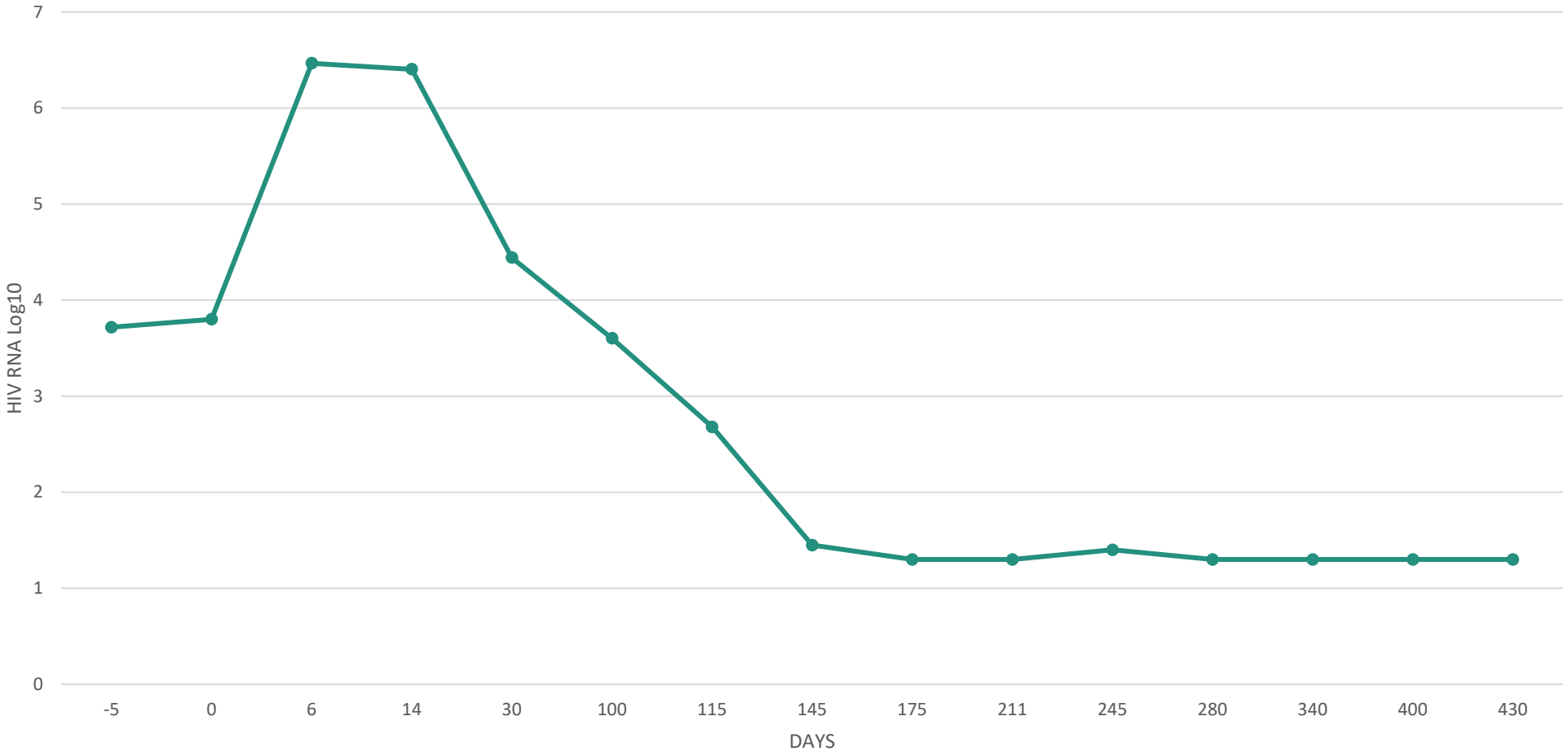
ENOB-HV-21: ALLOGENEIC NK & GDT-CELL THERAPY

ENOB-HV-21: ALLOGENEIC NK PLUS GAMMA DELTA T (GDT) CELLS AS POTENTIAL THERAPY FOR HIV

- GDT have been reported to be both a potential reservoir for, and effector T-Cells to kill, HIV-infected cells
- Allogenicity is a potent immuno-stimulator
- Allogeneic GDT could be a potential therapy for HIV, in particular patients who cannot tolerate ART
- Enochian owns exclusive license
- Promising preliminary results from the subject without confounding factors

CONTROL OF HIV WITHOUT ANTIVIRAL TREATMENT FOR 360 DAYS; A LOWER LEVEL OF VIRUS THAN WHEN WITH ANTIVIRAL TREATMENT



Presented at 2021 annual conference of the American Society of Gene and Cell Therapy at 255 days

ENOB-HV-21: CURRENT STATUS & POTENTIAL MILESTONES

Investigator-initiated Pre-IND completed
Potential IND & human trials in 2024

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ENOB-HV-01: AUTOLOGOUS HUMAN PERIPHERAL STEM CELL TRANSPLANTATION

ENOB-HV-01: POTENTIAL TO INCREASE SELECTION OF CAR-T CELLS FOR HIV TREATMENT OR CURE

- Caring Cross, a non-profit corporation, has shown that their proprietary CAR-T cells cure HIV in a mouse model; studies in humans have begun
- CAR-T is a promising therapy, but the selection of the cells is difficult, increasing cost ($300,000-$450,000 per person) and side effects
- Enochian's proprietary "special sauce" technology that could increase uptake of transplanted cells for ENOB-HV-01 could also potentially enhance the selection of CAR-T cells
  - ***Enochian has entered into a profit-sharing sub-license with Caring Cross for a key component of this technology***

<u>If successful, this approach to CAR-T gene therapy could increase the selection of cells, potentially decreasing cost and side effects and expanding the number of people who could be treated</u>

<u>Enochian would share in profits if the product is commercialized</u>

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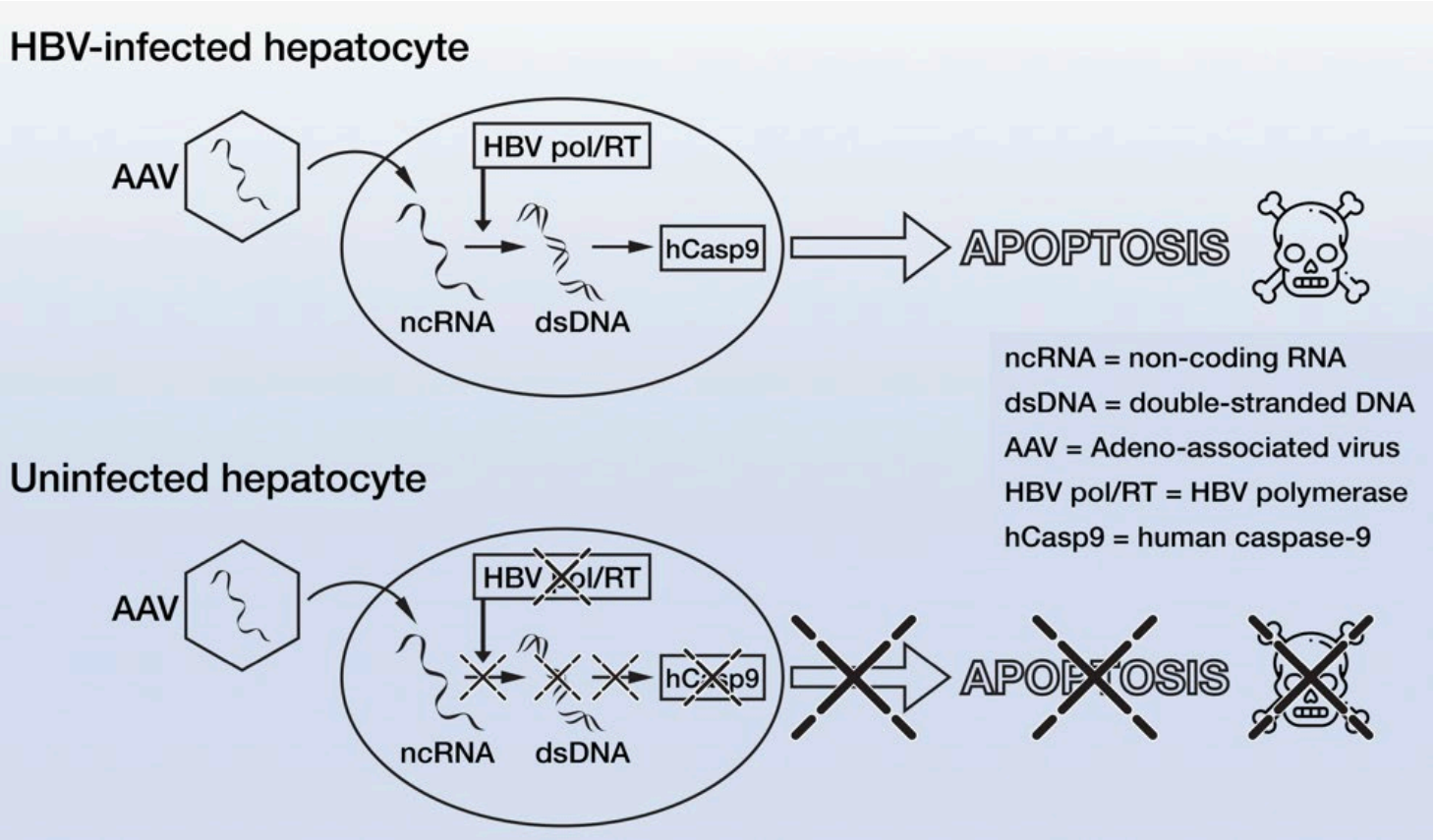
ENOB-HB-01: HEPATITIS B VIRUS PROGRAM

ENOB-HB-01: TARGET PROFILE

- Two to three dose treatment regimen
- Therapeutic approach aims to eliminate all HBV rapidly (“seek and kill”), versus interrupting replication and slowly reducing persistent infection (ccc-DNA)
- Applicable for early disease to maximize impact
- Low risk of toxicity

ENOB-HB-01: AAV MECHANISM OF ACTION

- A novel adeno-associated virus (AAV) vector that expresses a non-functional RNA which is designed to engage with HBV polymerase enzyme to produce a kill gene to kill HBV infected cells only
- Inducing preferential death of HBV-infected hepatocytes with very high specificity (safe for healthy cells)



ENOB-HB-01: CURRENT STATUS & POTENTIAL NEAR-TERM MILESTONES

Proof-of-Concept using AAV-delivery system demonstrated potential therapeutic activity of ENOB-HB-01 approach both in vitro & in vivo infection models

Pre-IND comments received from FDA for AAV-delivery system

Exploring advanced viral vector designs
Confirmatory studies with new delivery systems

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INTELLECTUAL PROPERTY

INTELLECTUAL PROPERTY

Our intellectual property covering our innovative platform gene and gene-modified cell therapies in the US and abroad includes:

- Patents and patents applications for composition of matter and methods of use
- Trade secrets/knowhow

ENOCHIAN PIPELINE	PATENT TITLE/OWNERSHIP	LINK TO PATENT/APPLICATION NO.
ENOB-DC-11: DENDRITIC CELL THERAPEUTIC VACCINE FOR PANCREATIC CANCER **ENOB-DC-12-XX** DENDRITIC CELL THERAPEUTIC VACCINE FOR SOLID TUMORS (TBD)	METHODS AND COMPOSITIONS USING RECOMBINANT DENDRITIC CELLS FOR CANCER THERAPY **(OWNED)**	HTTPS://USPTO.REPORT/PATENT/GRANT/11,413,338
ENOB-HV-12: HIV THERAPEUTIC VACCINE	ALLOGENEIC T-CELL-BASED HIV VACCINE TO INDUCE CELLULAR AND HUMORAL IMMUNITY **(OWNED)**	HTTPS://USPTO.REPORT/PATENT/APP/20210030795
ENOB-HV-21: HIV NATURAL KILLER & GAMMA DELTA T-CELL TREATMENT OR CURE	ACTIVATED LYMPHOCYTIC CELLS AND METHODS OF USING THE SAME TO TREAT CANCER AND INFECTIOUS CONDITIONS **(LICENSED)**	HTTPS://USPTO.REPORT/PATENT/APP/20210008110
ENOB-HV-01: HIV AUTOLOGOUS TRANSPLANT	METHODS AND COMPOSITIONS FOR NON-MYELOABLATIVE BONE MARROW RECONSTITUTION **(LICENSED)**	HTTPS://USPTO.REPORT/PATENT/APP/20190269734.
ENOB-HB-01: HBV GENE THERAPY	COMPOSITIONS AND METHODS FOR TREATING VIRAL INFECTIONS **(LICENSED)**	IAN: PCT/US2020/048370 IPN: WO 2021/041787 A1; PUBLISHED 4 MARCH 2021

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MOVING FORWARD

MOVING FORWARD: SUMMARY OF POTENTIAL MILESTONES

THERAEPEUTIC VACCINE PLATFORM: pre-clinical to clinical development

ENOB-DC-11

- Pre-IND Q1/Q2 2023
- IND submission late 2023-early 2024
- Initiate Phase I/IIA 2024

ENOB-HV-12

- Pre-IND Q2-3 2023
- IND submission 2024
- Initiate Phase I/IIA later 2024

PLATFORM EXPANSION

ENOB-HV-01

- Secure non-dilutive funding
- Collaborate with Caring Cross on development

ENOB-HB-01
ENOB-DC-12 -XX
ENOB-HV-21

- Optimize processes, vectors, etc.
- Advance IND-enabling studies

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THANK YOU

www.enochianbio.com

APPENDIX I: DATA SOURCES

[1] https://www.wcrf.org/dietandcancer/pancreatic-cancer-statistics/

[2] https://www.cancer.net/cancer-types/pancreatic-cancer/statistics

[3] https://www.sec.gov/Archives/edgar/data/14272/000001427222000051/bmy-20211231.htm

[4] https://www.unaids.org/en/resources/fact-sheet

[5] https://www.unaids.org/sites/default/files/media_asset/UNAIDS_FactSheet_en.pdf

[6] https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2759735

[7] https://www.thelancet.com/action/showPdf?pii=S0140-6736%2818%2930698-6

[8] https://www.kff.org/hivaids/fact-sheet/u-s-federal-funding-for-hivaids-trends-over-time/

[9] https://www.who.int/news-room/fact-sheets/detail/hepatitis-b

[10] https://www.hepb.org/what-is-hepatitis-b/what-is-hepb/facts-and-figures/

[11] https://www.sec.gov/Archives/edgar/data/882095/000119312512075335/d260199d10k.htm

[12] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5016383/

[13] https://www.sec.gov/Archives/edgar/data/882095/000088209516000039/a2015form10-k.htm