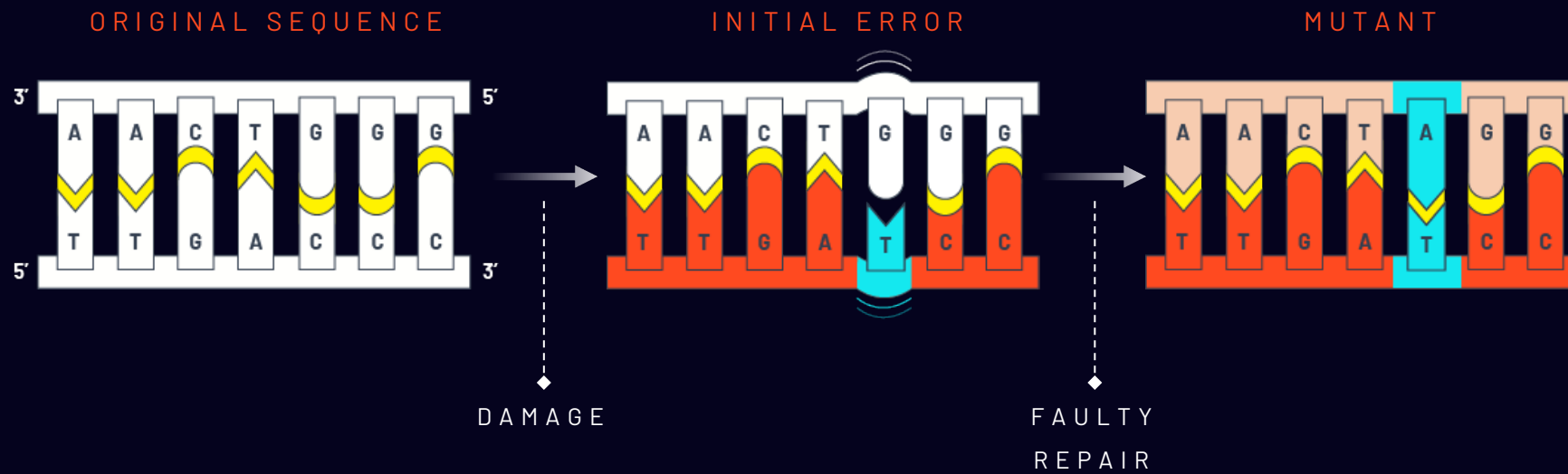


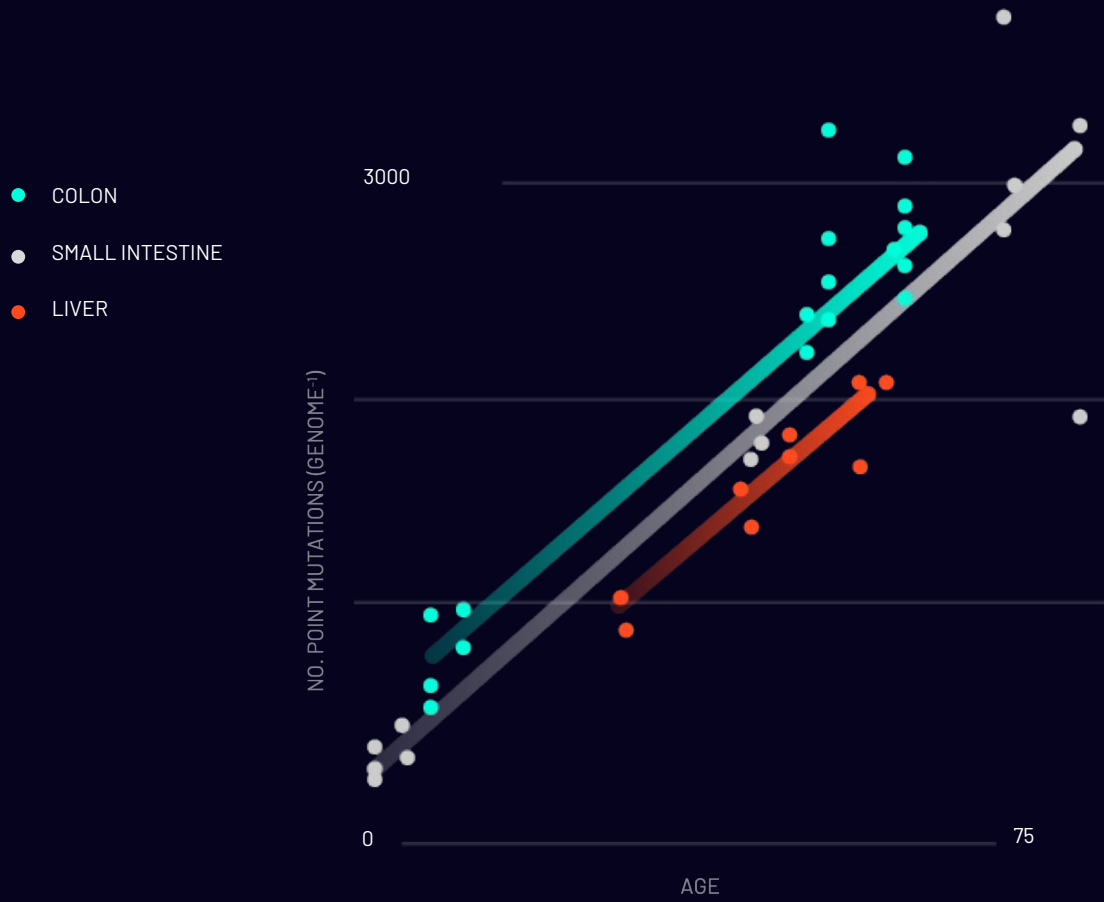
Matter Bioworks

Longevity through information preservation

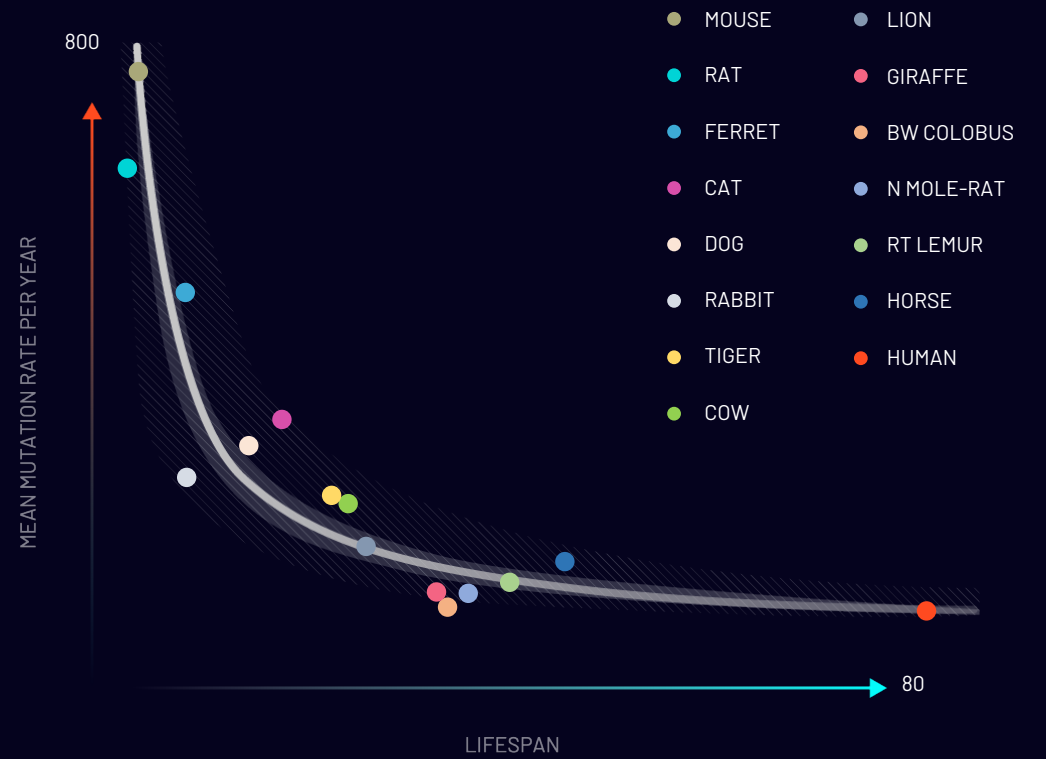
DNA DAMAGE --> DNA ERRORS



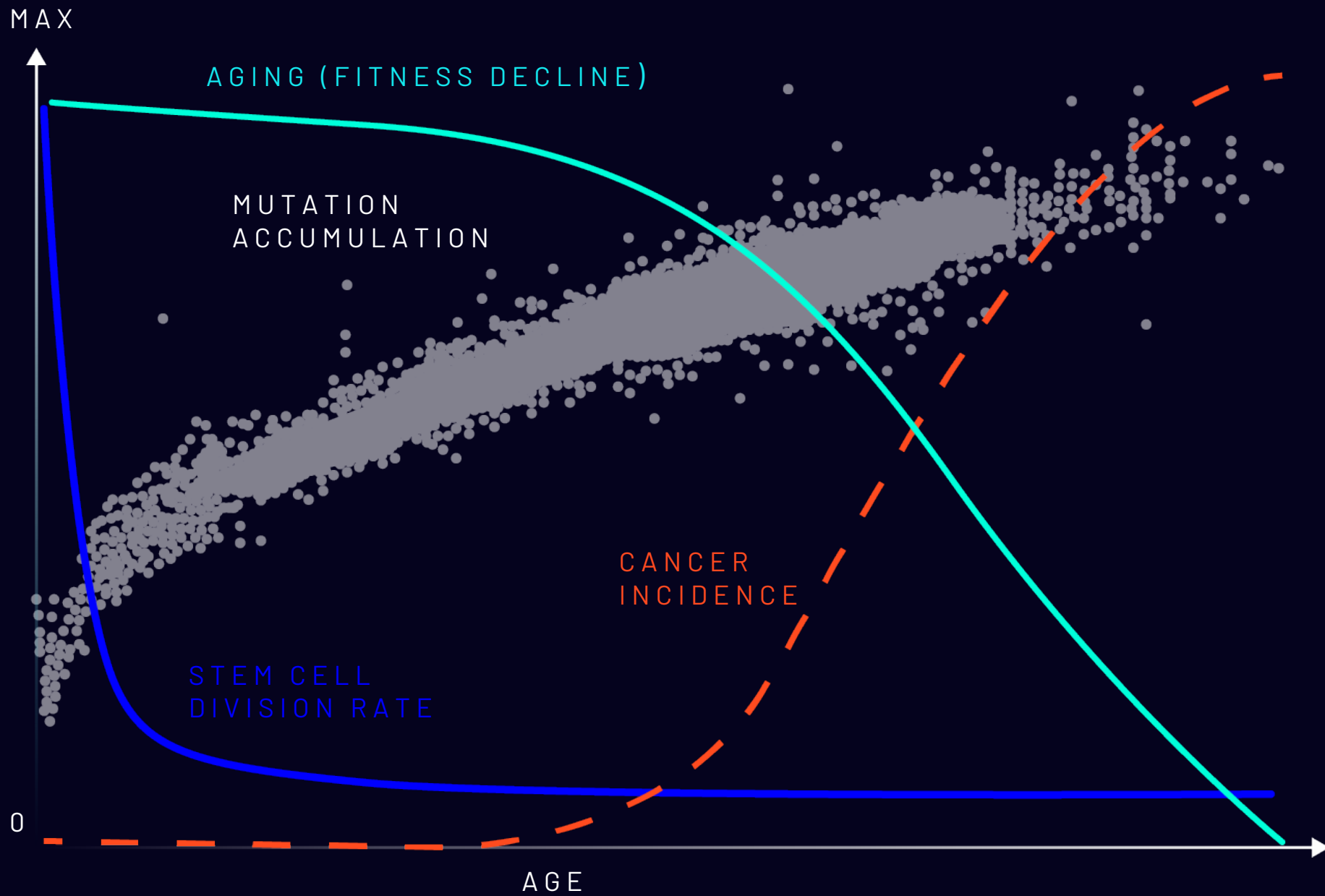
ALL TISSUES ACCUMULATE MUTATIONS WITH AGE ⁽¹⁾



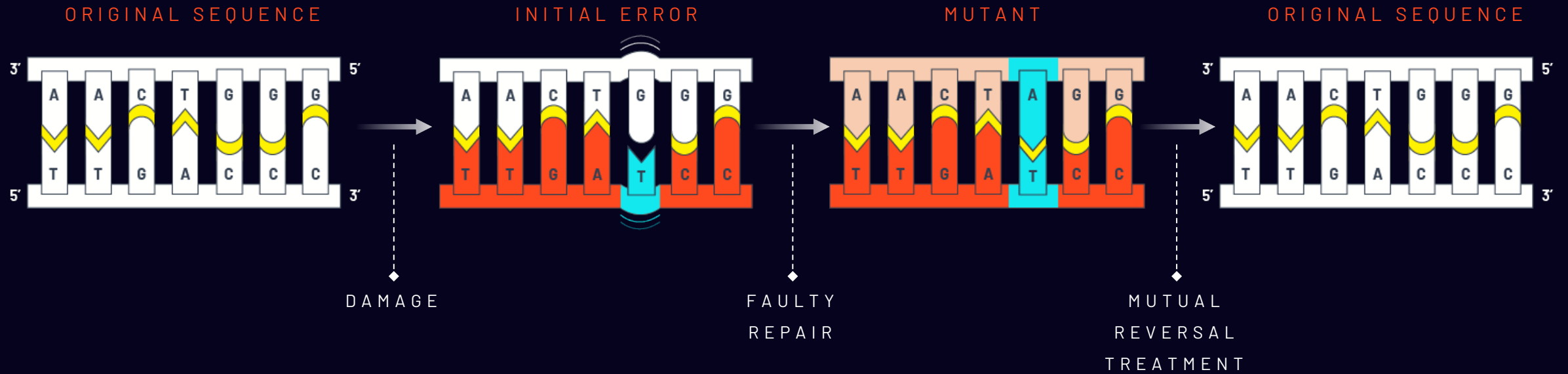
RATE OF MUTATION CORRELATES WITH LIFESPAN IN 16 SPECIES ⁽²⁾



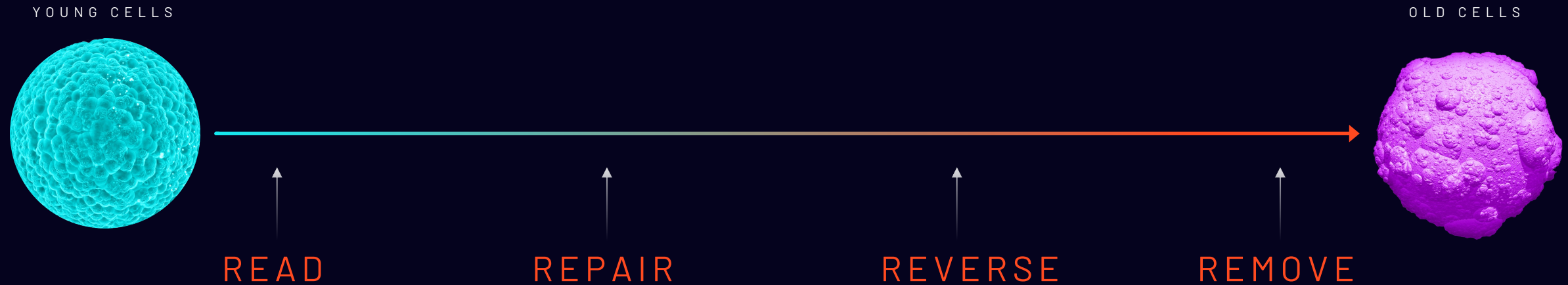
1. TISSUE-SPECIFIC MUTATION ACCUMULATION IN HUMAN ADULT STEM CELLS DURING LIFESPAN. 2016 OCTOBER 13; 538(7624):260-264. DOI: 10.1038/NATURE19768
 2. SOMATIC MUTATION RATE SCALES WITH LIFESPAN ACROSS MAMMALS. EXCAGAN ET AL. BIORXIV 2021.08.19.456982; DOI: [HTTPS://DOI.ORG/10.1101/2021.08.19.456982](https://doi.org/10.1101/2021.08.19.456982)

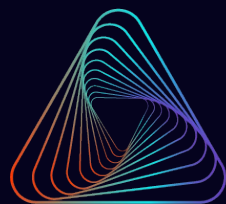


WE WANT TO BRING DNA BACK TO BASELINE



There are 4 critical junctures of this information loss process





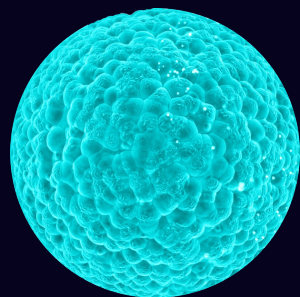
Matter Bioworks

MUTAGENTECH

INCUBATING

SPELLCHECK BIO

LOKI TX



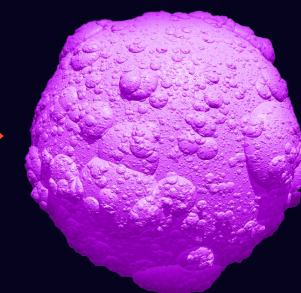
YOUNG CELLS

READ

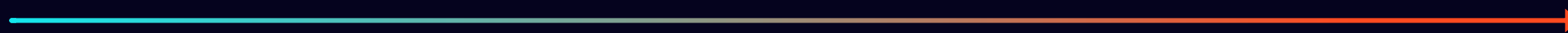
REPAIR

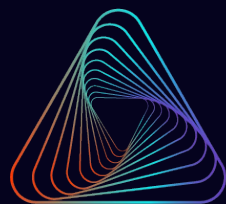
REVERSE

REMOVE



OLD CELLS





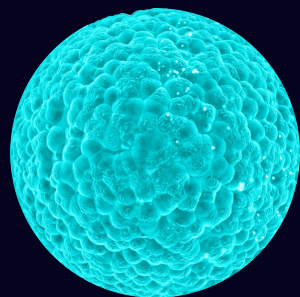
Matter Bioworks

MUTAGENTECH

INCUBATING

SPELLCHECK BIO

LOKI TX



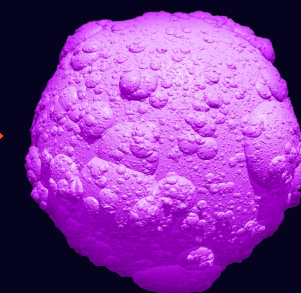
YOUNG CELLS

READ

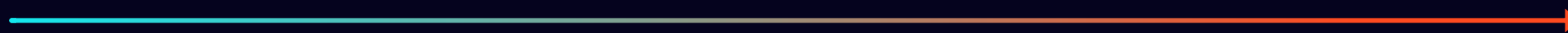
REPAIR

REVERSE

REMOVE



OLD CELLS

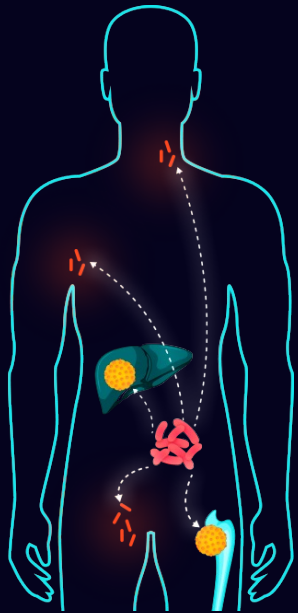




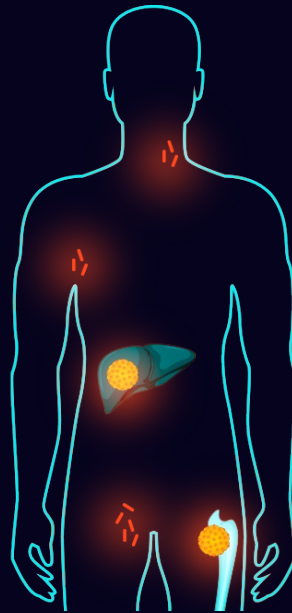
Loki Therapeutics

**Redirecting immune
memory to kill cancer**

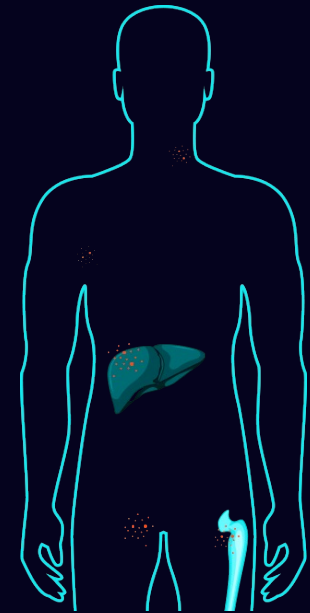
Our platform unlocks major tumor fighting capabilities



1. Deliver payload to Tumor Cells

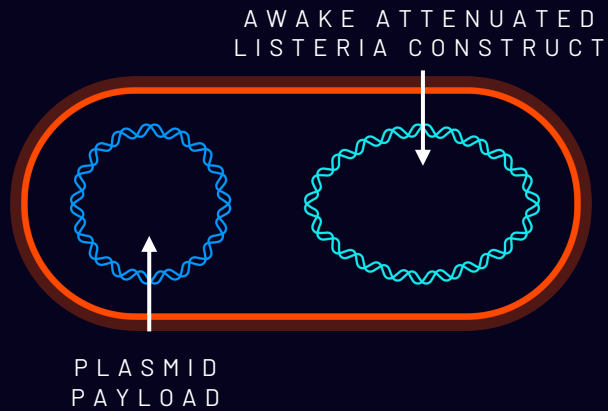


2. Cells Express Tetanus Antigens

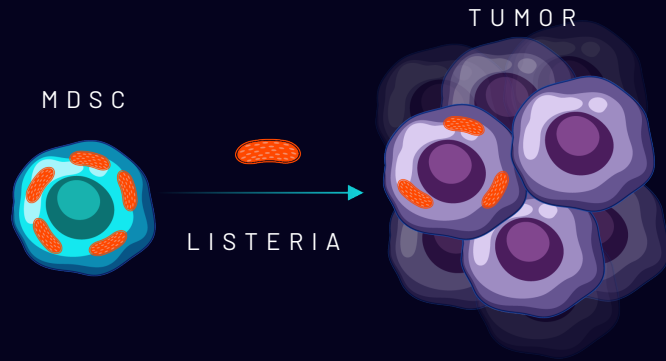


3. Memory T-Cells Destroy Tumor

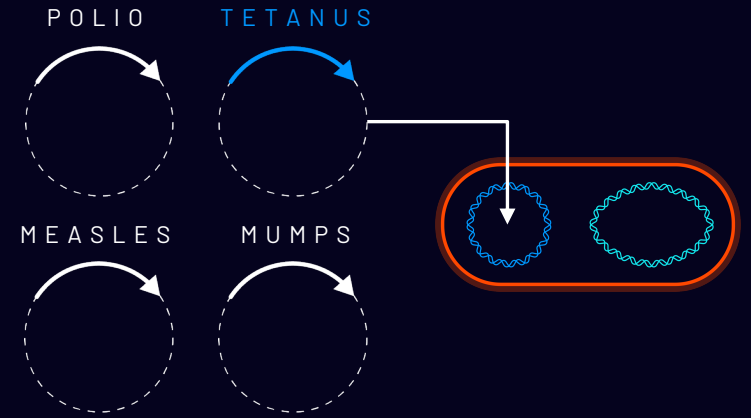
Enable by 3 key innovations



1. Attenuated Listeria



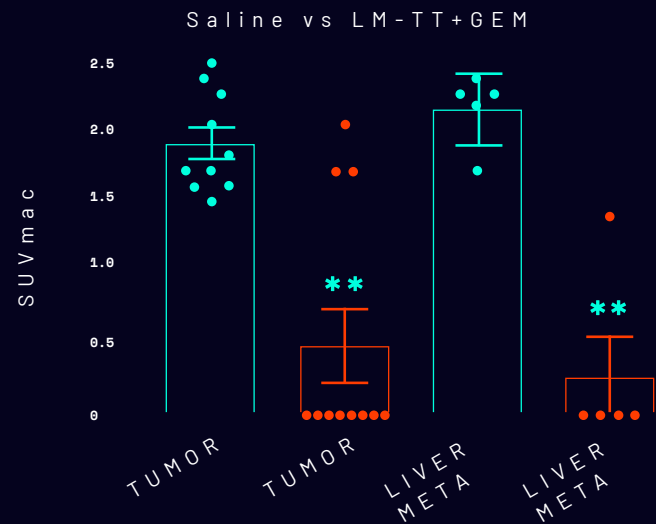
2. Myeloid Mediated Delivery



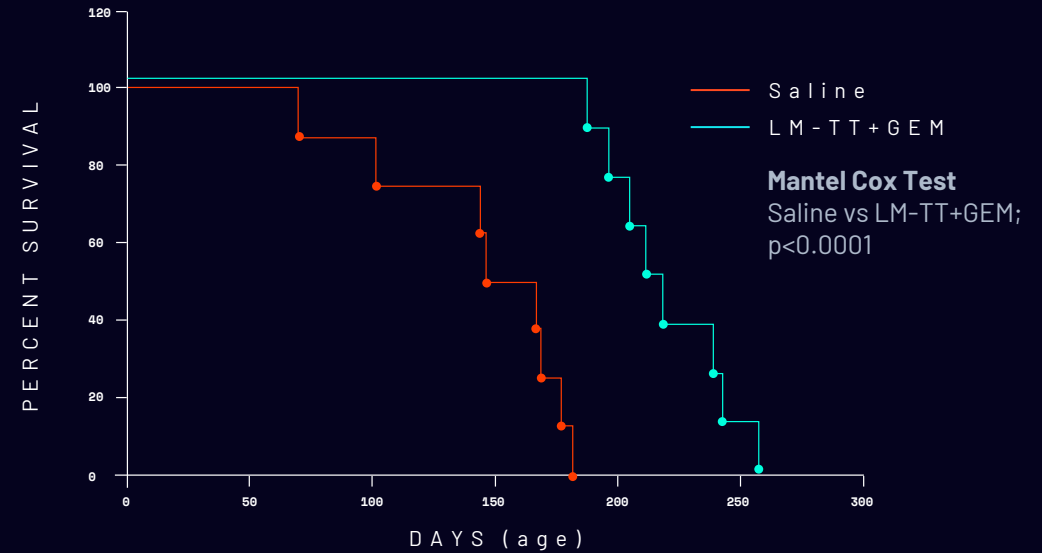
3. Recall Antigen Payload

Pancreatic Cancer Model 1:

INDICATION: ADVANCED PANCREATIC CANCER
MODEL ORGANISM: TRANSGENIC KPC MICE



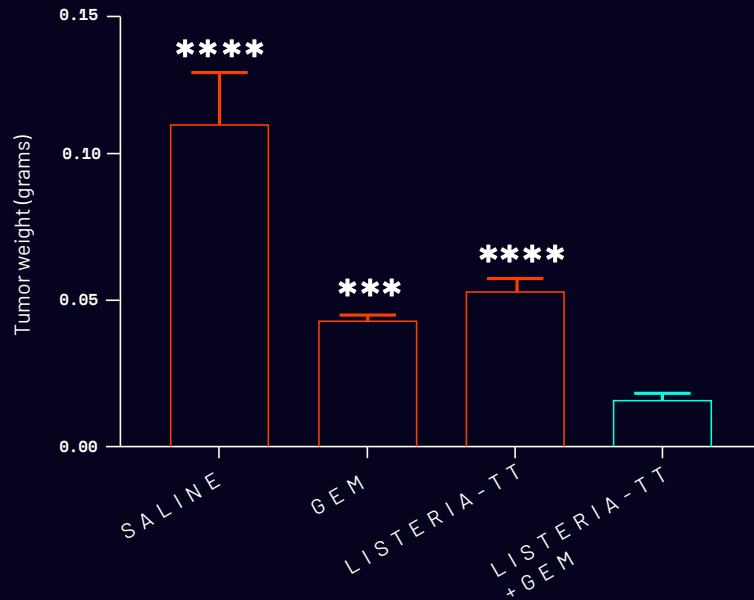
Strong Effect on Tumors and Metastases



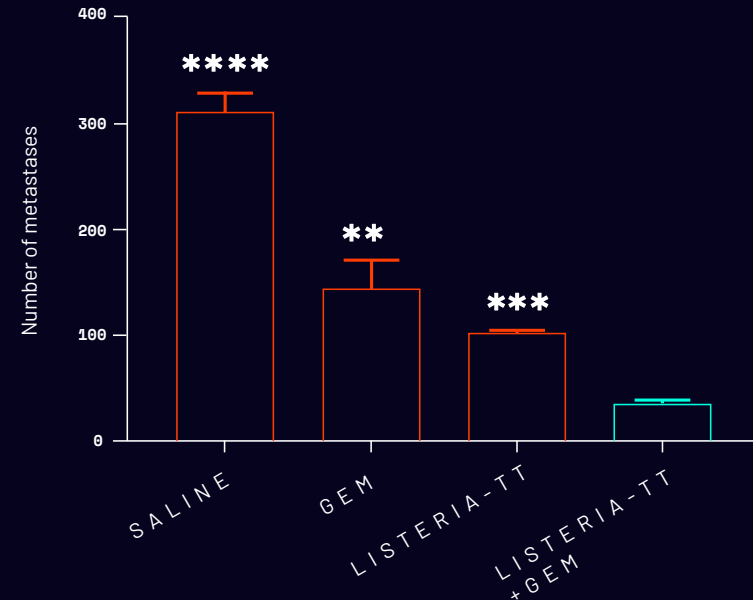
Substantial increase in Survival

Pancreatic Cancer Model 2

INDICATION: ADVANCED PANCREATIC CANCER
MODEL ORGANISM: SYNGENIC PAN-02 MICE



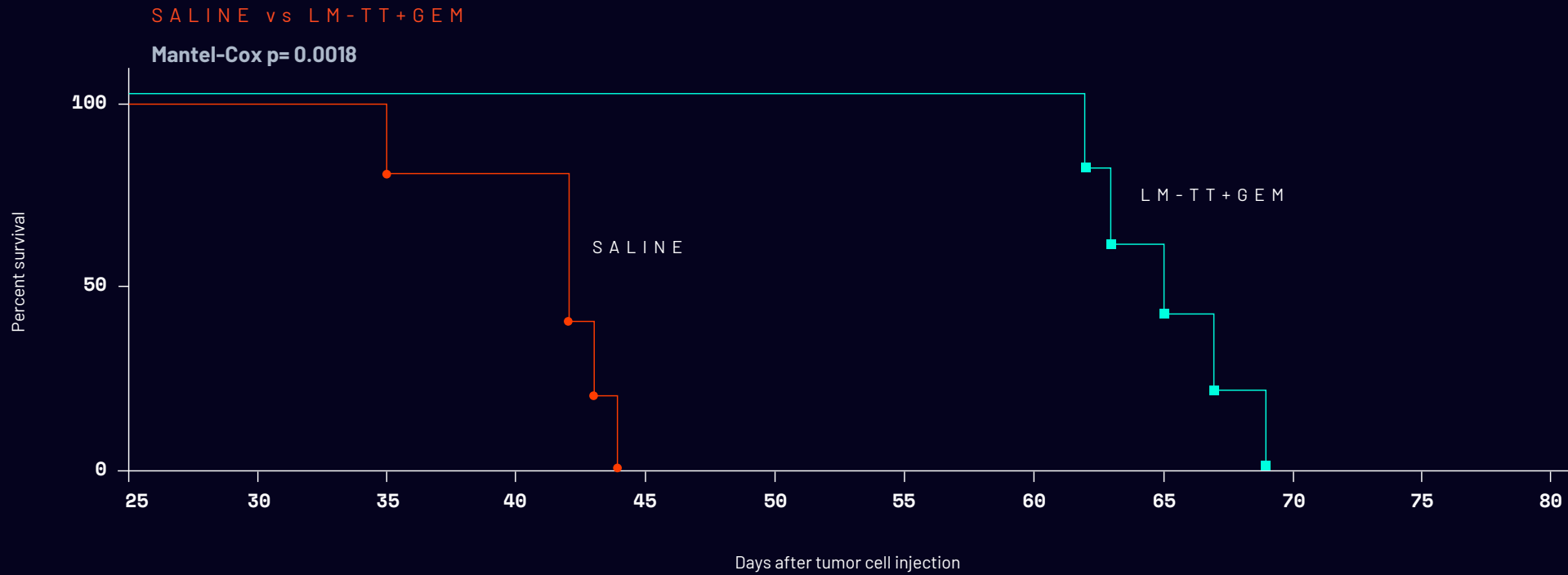
Strong Reduction of Tumor Weight



Substantial Reduction in Number of Metastases

Ovarian Cancer Survival

INDICATION: ADVANCED OVARIAN CANCER
MODEL ORGANISM: ID8-LUC P53-/- MICE

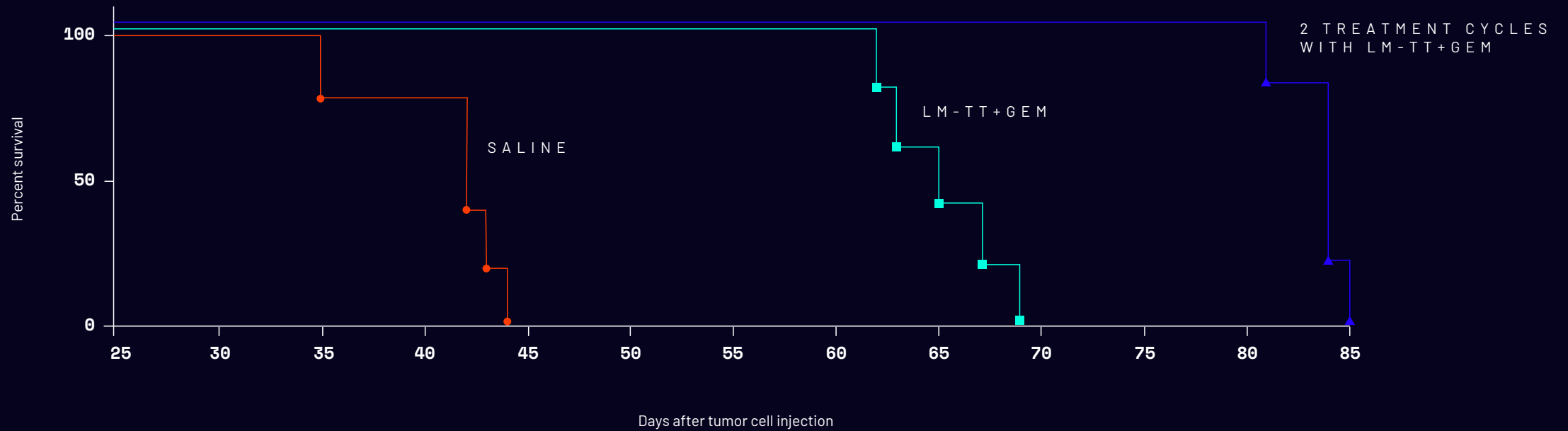


Ovarian cancer: Two treatment cycles almost doubles survival time

INDICATION: ADVANCED OVARIAN CANCER
MODEL ORGANISM: ID8-LUC P53-/- MICE

1 VS 2 TREATMENT CYCLES WITH LM-TT+GEM

Mantel-Cox $p=0.0018$



We have assembled over 30 top scientists & clinicians



Chris Bradley, MS
CEO + Co-Founder



Sam Sharifi, PhD
CSO + Co-Founder



Cian Doherty, ~PhD
Venture Partner + Co-Founder

SPELLCHECK BIO



George Church, PhD
Co-Founder + CSO/Advisor

MUTAGENTECH



Alex Maslov, PhD
Co-Founder + CSO



Jan Vijg, PhD
Co-Founder + CSO

LOKI TX



Claudia Gravekamp, PhD
Co-Founder + CSO

AUGMENTED TEAM



Patricia Williams, PhD
25+ years FDA IND Expert



Joy Cavagnaro, PhD
30+ years EX-FDA/CBER Officer



Linda Pullan, PhD
30+ years Business Development



Tim Bortree, JD, MBA
20+ years IP Strategy and Operations



Cooley LLP



Cytovance Biologics



Tiberand Strategic Advisors



Daniel Ayzenberg CPA

KEY SCIENTIFIC ADVISORS



Eric Kmiec, PhD
Director, Gene Editing, Institute Christiana Care



Florian Heide, PhD
Director, University Medicine Greifswald



Björn Schumacher, PhD
Professor, CECAD Cologne



Matthew Yousefzadeh, PhD
Asst. Professor University of Minnesota



Michale Wyand, DVM, PhD
CEO Oxella Biopharmaceuticals



Bert Liang, MD
CMO Kytov Pharma



Eileen O'Reilly, MD
Winthrop Rockefeller Endowed Chair In Medical Oncology; Co-Director, Medical Initiatives, Memorial Sloan Kettering



Holger Bierhoff, PhD
P.I. FSU Jena



Nava Whitford
Founder + CEO Reticula Sequencing



Alex Cagan, PhD
Post-doc, Wellcome Sanger Institute



Raman Bahal, PhD
P.I. University of Connecticut



John McAuliffe MD, PhD, FACS
Asst. Professor, Dept. of Surgery / Pathology, Montefior Medical Center

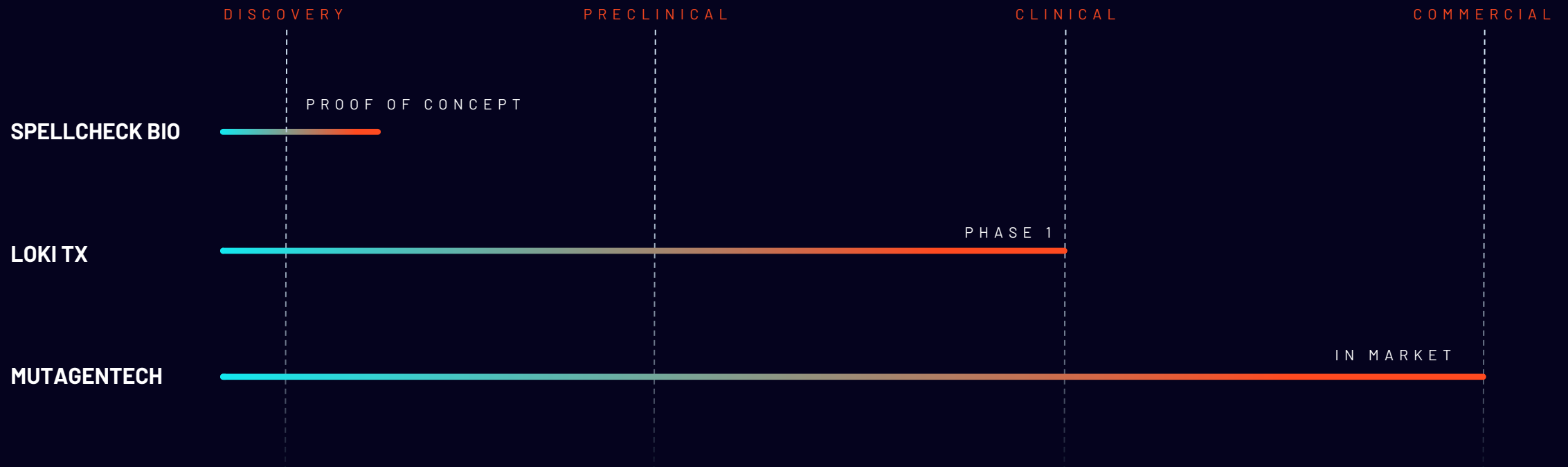


Alan Forsythe, PhD
VP Corporate Biomedical Information @ Amgen (ret.)



Jennifer Chu, MD
Medical Oncology NYU Langone

Seed Round: We are raising to unlock key value inflection milestones for core programs



Matter is well positioned to show extensive value in the short-term with a strong long term growth strategy



Thank you

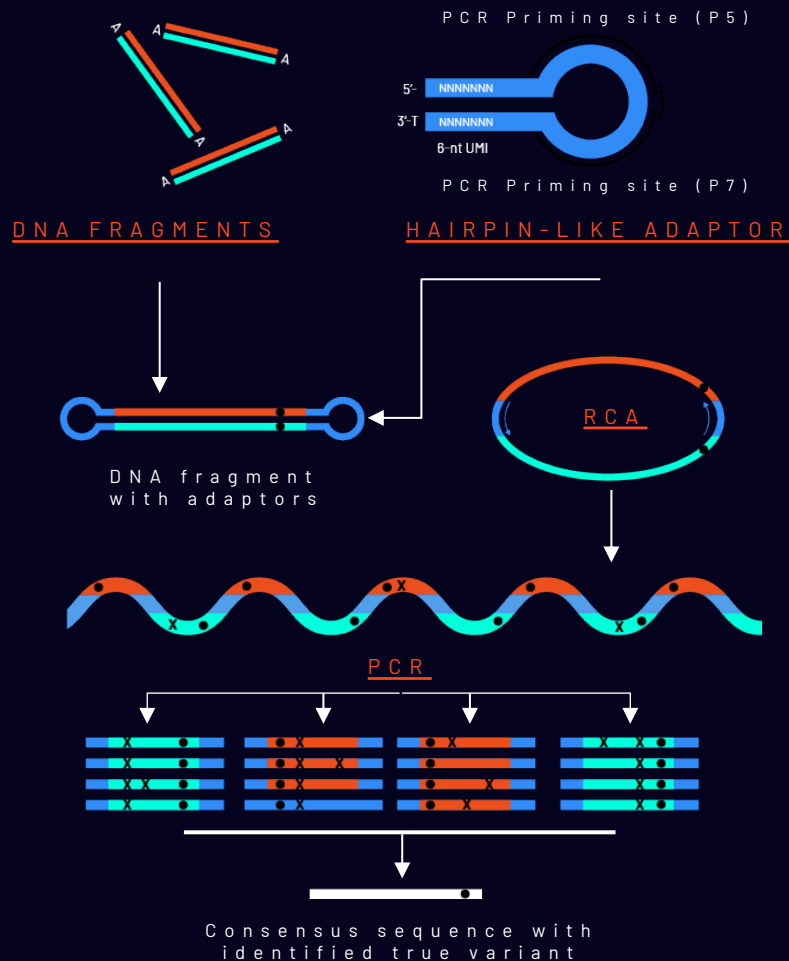
CHRIS@MATTERBIO.COM

WWW.MATTERBIO.COM

Appendix



Single-molecule, quantitative detection of low-abundance somatic mutations by high-throughput sequencing



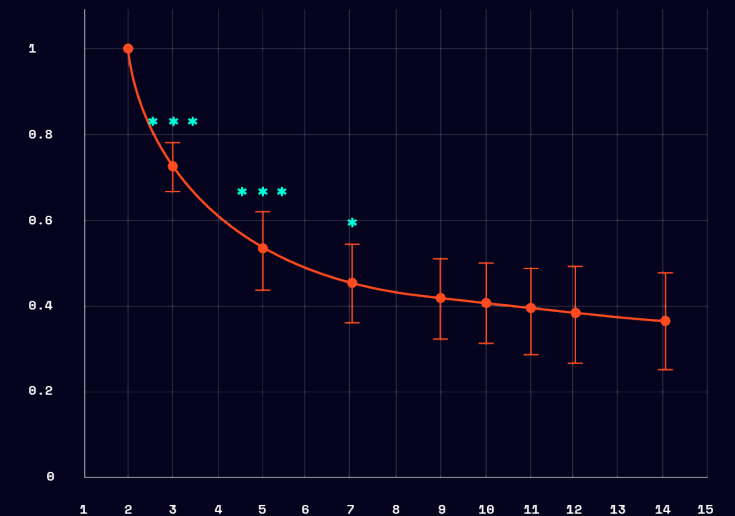
The key feature of SMM-seq is a two-step library preparation protocol. First, rolling circle-based linear amplification (RCA) is used to produce single-stranded DNA molecules composed of multiple concatemeric copies of equally represented DNA strands of each particular DNA fragment.

Because all these copies are independent replicas of the original DNA fragment, potential errors of amplification remain unique for each copy and do not propagate further.

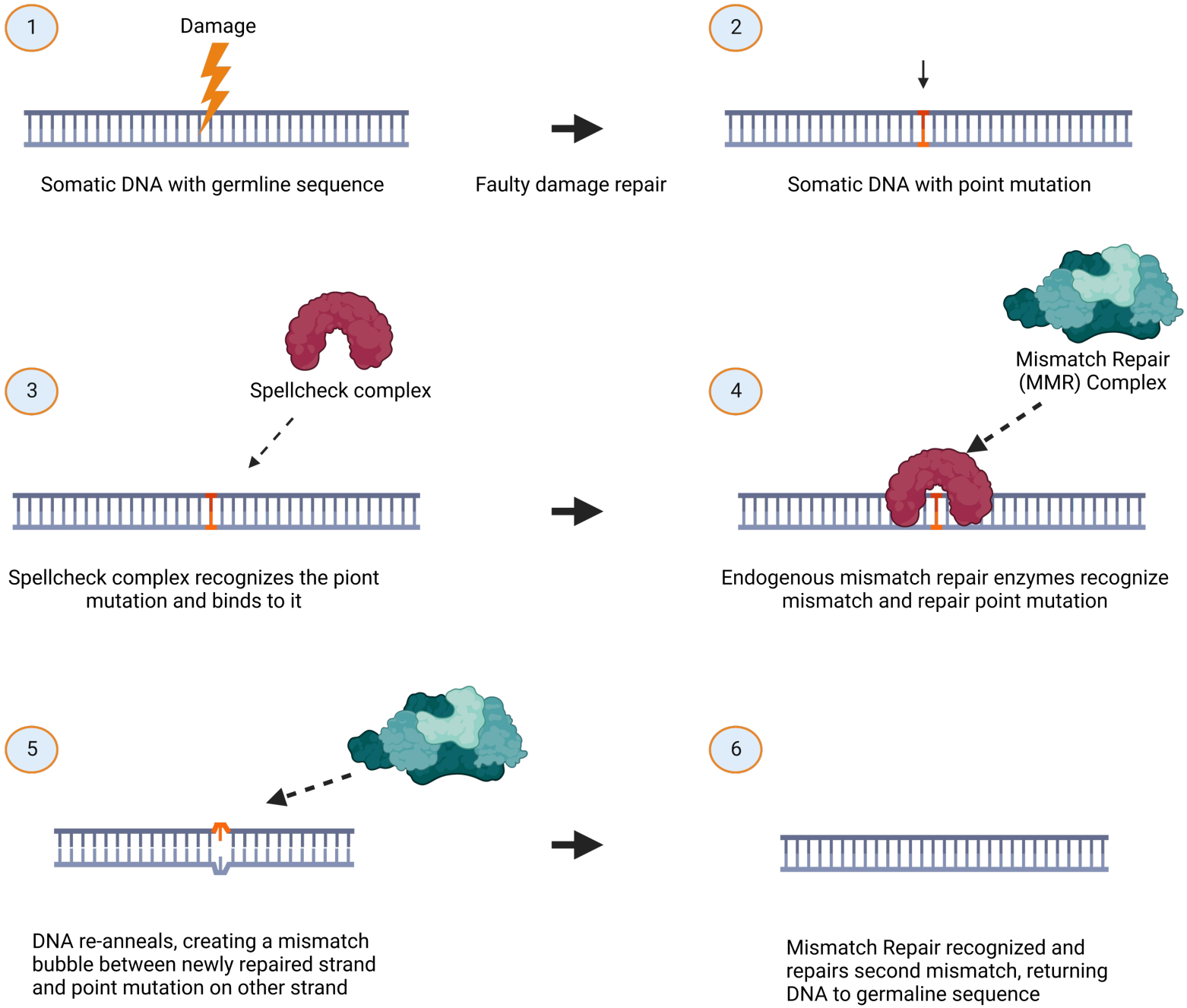
Copies of opposite strands are in an end-to-end orientation and separated by common spacers used as polymerase chain reaction (PCR) priming sites during the second step of the process when concatemeric copies are individually amplified and converted into a sequencing library (Fig. 1A).

Thus, the resulting sequencing library is composed of PCR duplicates of multiple independent copies of an original DNA fragment assembled in rolling circle (RC) amplicons.

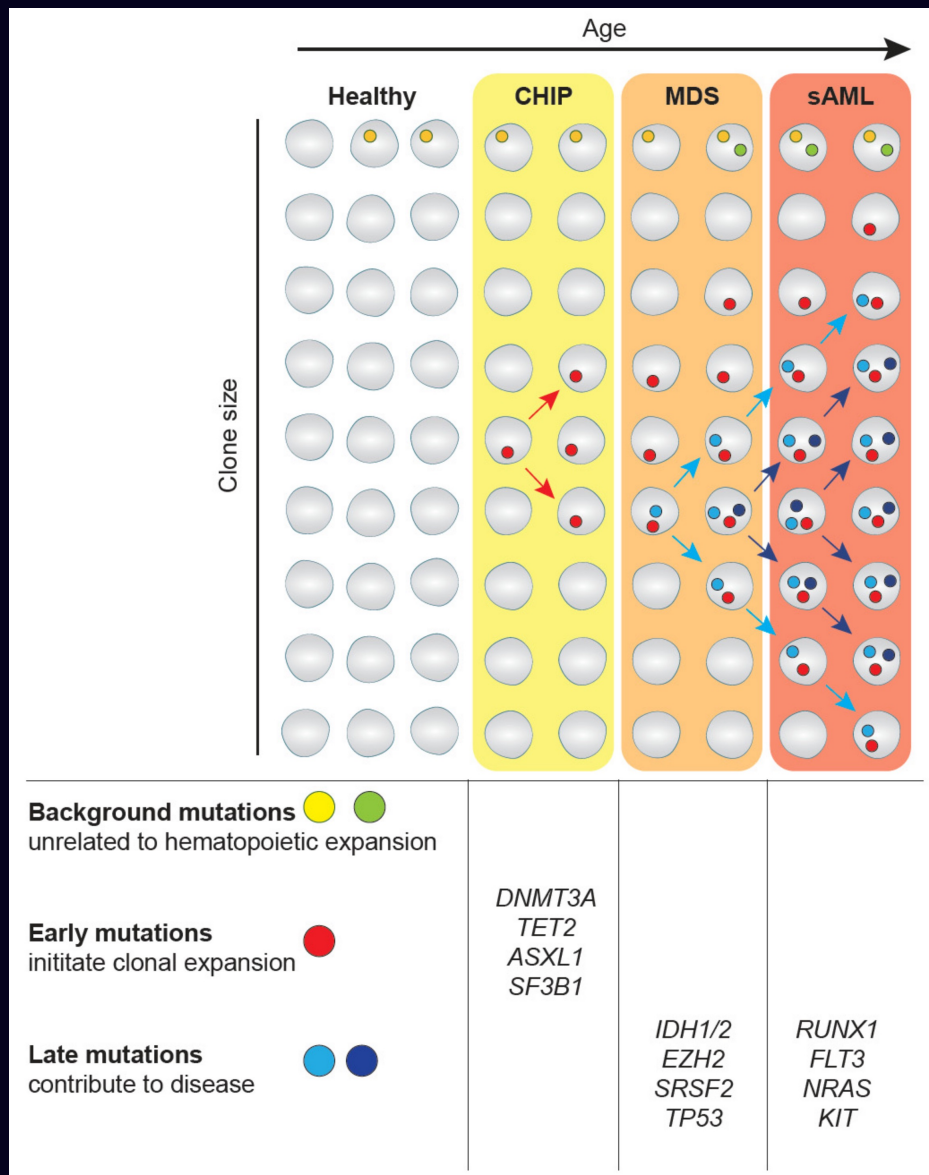
SMM-seq allows us to reach peak theoretical specificity after -7 strand copies



Activating and guiding the endogenous DNA repair



LEAD INDICATION: CLONAL HEMATOPOIESIS



- By age 70, >20% of population has Clonal hematopoiesis (CH)
- CH is where mutations accumulate in hematopoietic stem cells leading to acute disease, including blood cancer
- Myelodysplastic Syndrome (MDS), an advanced form of CH, is FDA approvable indication with no existing cure or prevention
- CH Mutations also implicated in Thrombosis, Atherosclerosis, Aortic Valve stenosis and heart failure

Loki Therapeutics

Immune therapies face a triple limitation of:

- 1. fewer blank T-cells
- 2. a highly mutagenic tumor
- 3. strong immune suppression of the tumor and it's microenvironment.

Loki's immune-AWAKE™ bacterial platform overcomes these challenges and enable visualization and eradication of solid tumors and metastases

HIGHLIGHTS

- Our attenuated Listeria vector can be used for delivery to, visualization and treatment of solid tumors and metastases
- Promising Preclinical data in metastatic pancreatic and ovarian cancer

INDUSTRY & MARKET

- Lead Indications:
 - Advanced Metastatic Pancreatic Cancer
 - Advanced Metastatic Ovarian Cancer
- First-in-Class Mechanism of Action

TRANSLATIONAL PROOF POINTS

- ✓ Preclinical Safety + Tox Completed
- ✓ Preclinical Efficacy Completed
- ✓ Preclinical Survival Completed
- ✓ GMP Manufacturing Contracted
- ✓ Key Patents Licensed + Issued
- ✓ Pre-IND meeting Completed

NEXT STEPS

- ❑ IND submission targeted Q3 2022
- ❑ Phase 1 trials in AMPC targeted Q1 23
- ❑ Orphan Disease eligible
- ❑ Breakthrough Therapy Designation will be requested

TEAM



Chris Bradley, MS
Co-founder + CEO



Claudia Gravekamp, PhD
Principal Scientist + Co-Founder



Next steps:

- Phase 1 Dose Escalation, first-in-humans clinical trial
- Treating Advanced, refractory, pancreatic cancer
- Standard 3+3 design, open label, randomized trial with up to 18 patients.
- Patients will be carefully monitored for adverse events by clinical laboratory, physical examinations and imaging per the schedule of events.
- Immunogenicity and efficacy endpoints will also be monitored.

Key milestones

- Finalize GMP Manufacturing Run
- File IND
- Initiate Phase 1 Clinical Trial
- Monitor Safety and Efficacy endpoints

Our team has unlocked significant value to-date and Loki is now well positioned to initiate a Phase I clinical trial

Key milestones

- ✓ World-wide exclusive license to core
- ✓ IP from Einstein University
- ✓ Preclinical Safety + Tox Completed
- ✓ Preclinical Efficacy Completed
- ✓ Preclinical Survival Completed
- ✓ GMP Manufacturing initiated
- ✓ Key Patents Issued (US + International)
- ✓ Clinical Trial designed
- ✓ Pre-IND meeting Completed

Leadership Team



Chris Bradley, MS

Co-founder + CEO



- Serial Entrepreneur with an Exit
- Adjunct Professor at NYU
- CEO and Co-Founder - Loki Therapeutics
- Previously Executive Director - Comcast
- Previously CEO and Co-Founder - Mana Health (Acquired by Comcast 2018)
- 15 years of C-suite experience in Tech, Health IT, and Biotech
- Primary inventor on over 14 patents
- BS in Neuroscience & Cell Biology
- MS in Computer Science (NYU)



Sam Sharifi, PhD

Co-founder + CSO



- Previously Scientific Project Manager- Vincere Biosciences
- More than 10 years of aging research experience
- Expertise in epigenetics, metabolism, RNA and DNA biology
- Uncovered the impact of rRNA synthesis on aging
- Studied the role of epigenetic regulation by RNA:DNA triplex-forming ncRNA
- Co-author of DrugAge
- BS in Biology
- MS in Biomolecular Sciences



Cian Doherty, MS

Co-founder + Venture Partner



- PhD candidate in neuronal stem cell biology at the Gurdon Institute, University of Cambridge
- Investment analyst at Hummingbird Ventures
- Venture fellow at the Longevity Fund
- Venture fellow at Healthspan capital
- First class degree in biological sciences from the University of Oxford; Distinction in dissertation on leveraging autophagy for healthy lifespan extension
- MS in neural stem cell biology from the University of Cambridge

Leadership Team



George Church, PhD

Co-founder + CSO/Advisor, Spellcheck Bio



- Professor at Harvard & MIT
- Co-author of 625 papers
- 156 patent publications & a book "Regenesis"
- Developed methods used for the first genome sequence (1994)
- Million-fold cost reductions since (via fluor-NGS & nanopores), plus barcoding, DNA assembly from chips, genome editing, writing & recoding
- Co-initiated BRAIN Initiative (2011)
- Genome Projects (GP-Read-1984, GP-Write-2016, PGP-2005)
- Machine learning for protein engineering, tissue reprogramming organoids, xeno-transplantation, in situ 3D DNA, RNA, protein imaging



Jan Vijg, PhD

Co-founder, MutagenTech



- Professor & Chairman Dept of Genetics Albert Einstein College of Medicine
- Co-author of over 300 papers
- 8 patent publications & 3 books
- First to develop transgenic mouse models for studying mutagenesis in vivo (in 1989)
- Recipient of the Schreuder Award of the Netherlands Society of Gerontology (1987), the Nathan Shock New Investigator Award of The Gerontological Society of America (1994) and the Irving Wright Award of Distinction of the American Federation for Aging Research (2012).
- Fellow of the American Association for the Advancement of Science (AAAS)
- Chairman of the Board of Scientific Counselors of the National Institute on Aging's Intramural Research Program from 2013 to 2015.
- Currently Chair of the NIH study section NIAB.
- Editor in Chief of the journal Mutation Research from 2015-2018



Claudia Gravekamp, PhD

Co-founder + CSO, Loki Tx



- Associate Professor, Department of Microbiology & Immunology, Albert Einstein College of Medicine
- Previously:
 - Scientist at the California Pacific Medical Center Research (2008)
 - Associate Member Cancer Therapy and Research Center (2006)
 - Research Fellow/Instructor in Medicine Channing Laboratory of Harvard Medical School, Boston, MA (1998)
 - Head of the Laboratory for Leptospirosis Royal Tropical Institute in Amsterdam (1993)
- Published 70 scientific articles, reviewer for scientific journals, several NIH/DOD study sections



Alex Maslov, PhD

Co-founder + CSO, MutagenTech



- PhD Cell biology/Biochemistry, Voronezh State University, Russia, 1996
- M.D Vorezh State Medical Academy named after N.N Burdenko, Russia, 1992
- Developed a novel next-generation sequencing-based approaches for genome-wide assessment of somatic mutational load in normal cells and tissues
- The focus of my research is on understanding the role of genome instability in the development of human disease, cancer and aging in particular. A significant part of my efforts is devoted to the development of new approaches of the identification of somatic mutations of various types



ASSET 1

MutagenTech

MutagenTech

Single-cell sequencing to detect point mutations orders of magnitude cheaper, better and faster than competing methods

KEY APPROACH

- Bleeding edge approach
- Achieves maximal theoretical accuracy
- Much cheaper than competitors

STATUS

- Commercial Stage

MARKETS

- R&D Sales
- Predictive and Diagnostics
- DTC

NEXT KEY MILESTONES

- ☐ License Core IP
- ☐ Begin commercial roll-out

TEAM



Alex Maslov, MD, PhD
Co-founder + CSO



Jan Vijg, PhD
Co-founder



Chris Bradley, MS
Co-founder + CEO



Sam Sharifi, PhD
Co-founder





ASSET 2

Spellcheck Bio

Spellcheck Bio

Spellcheck has pioneered a new form of DNA editing that checks for somatic mutations before fixing them. This is a surgically precise approach, that only edits when needed. A "spellcheck" for the genome.

KEY APPROACH

- Repairing Somatic Mutations with Spellcheck Editor

LEAD INDICATIONS

- Clonal Hematopoietic (CHIP) mutations and Myelodysplastic Syndrome (pre-leukemia)

STATUS

- Proof of concept readouts soon

TEAM



George Church, PhD
Co-founder + CSO/Advisor



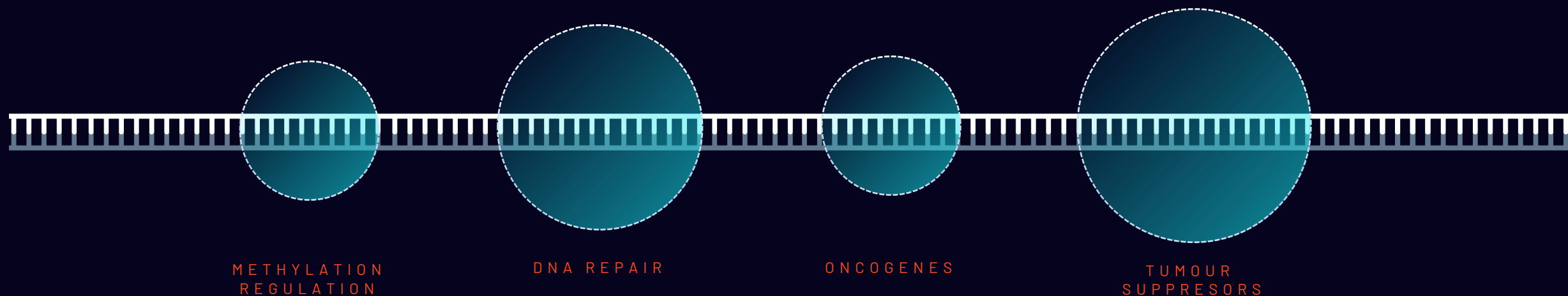
Chris Bradley, MS
Co-founder + CEO



Sam Sharifi, PhD
Co-Founder



Long Term Goal: protect the “critical infrastructure” portions of the genome to increase healthy longevity



By targeting and reversing damage at these critical genomic sites, we are able to maximize cellular health with the minimal number of edits

Seed Round: We are raising to unlock key value inflection milestones for core programs



Matter is well positioned to show extensive value in the short-term with a strong long term growth strategy
