Sangamo THERAPEUTICS

Corporate Presentation

September 2019

Forward-Looking Statements

This presentation contains forward-looking statements within the meaning of the "safe harbor" provisions of the Private Securities Litigation Reform Act of 1995, as amended. These forward-looking statements include, but are not limited to, the therapeutic potential of Sangamo's product candidates; the design of clinical trials and expected timing for initiation, enrollment and presentation of data; anticipated clinical development and other milestones; the expected benefits of Sangamo's collaborations; the anticipated capability of Sangamo's technologies; the research and development of novel gene-based therapies and the application of Sangamo's ZFP technology platform to specific human diseases; successful manufacturing of Sangamo's product candidates; the potential of Sangamo's genome editing technology to safely treat genetic diseases; the potential for ZFNs to be effectively designed to treat diseases through genome editing; the potential for CAR-T and CAR-Tregs to effectively treat diseases; and other statements that are not historical fact. These statements are based upon Sangamo's current expectations and speak only as of the date hereof. Sangamo's actual results may differ materially and adversely from those expressed in any forward-looking statements. Factors that could cause actual results to differ include, but are not limited to, risks and uncertainties related to Sangamo's dependence on the success of clinical trials of its lead programs; the uncertain regulatory approval process; the costly and research and development process, including the uncertain timing of clinical trials; whether interim, preliminary or initial data from ongoing clinical trials will be representative of the final results from such clinical trials; whether the final results from ongoing clinical trials will validate and support the safety and efficacy of Sangamo's product candidates; the risk that clinical trial data are subject to differing interpretations and assessments by regulatory authorities; Sangamo's limited experience in conducting later stage clinical trials and the potential inability of Sangamo and its partners to advance any of Sangamo's product candidates into registrational studies; Sangamo's reliance on itself, partners and other third-parties to meet clinical and manufacturing obligations; Sangamo's ability to maintain strategic partnerships; and the potential for technological developments by Sangamo's competitors that will obviate Sangamo's gene therapy technology. Further, there can be no assurance that the necessary regulatory approvals will be obtained or that Sangamo and its partners will be able to develop commercially viable gene-based therapeutics. Actual results may differ from those projected in forward-looking statements due to risks and uncertainties that exist in Sangamo's operations. These risks and uncertainties are described more fully in Sangamo's Annual Report on Form 10-K for the year ended December 31, 2018 as filed with the Securities and Exchange Commission on March 1, 2019 and Sangamo's Quarterly Report on Form 10-Q for the quarter ended June 30, 2019 that it filed on August 7, 2019. Forward-looking statements contained in this presentation are made as of the date hereof, and Sangamo undertakes no obligation to update such information except as required under applicable law.

Sangamo THERAPEUTICS

We are committed to translating ground-breaking science into genomic medicines that transform patients' lives

Our capabilities allow us to design therapeutic approaches targeting the underlying genetic causes of disease

Ex Vivo

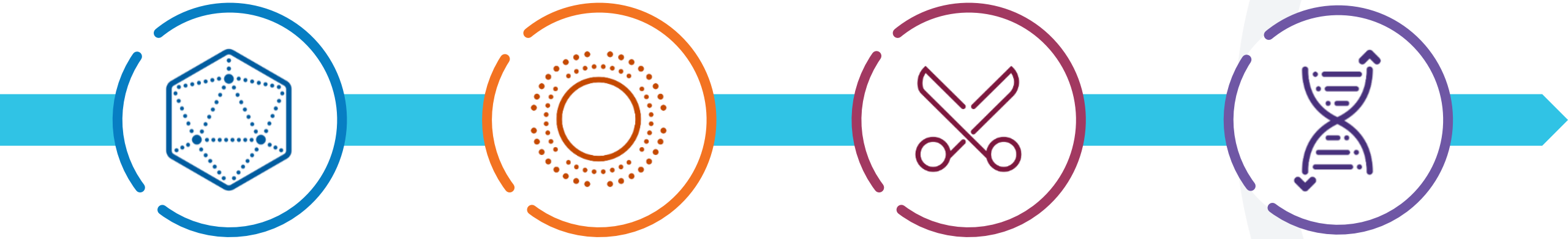
In Vivo

Gene Therapy

Gene-Edited Cell Therapy

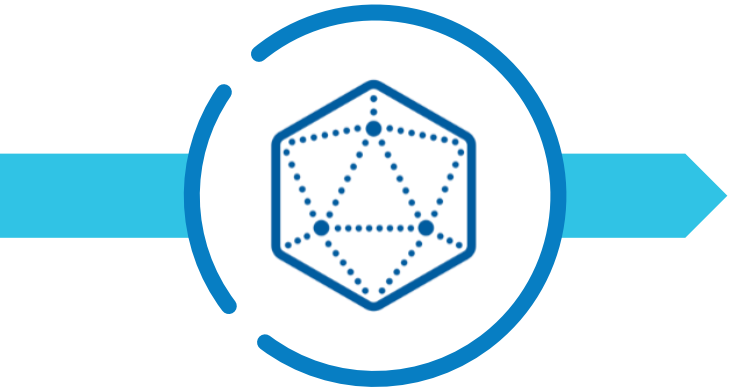
Genome Editing

Gene Regulation



Our capabilities allow us to design therapeutic approaches targeting the underlying genetic causes of disease

Gene Therapy



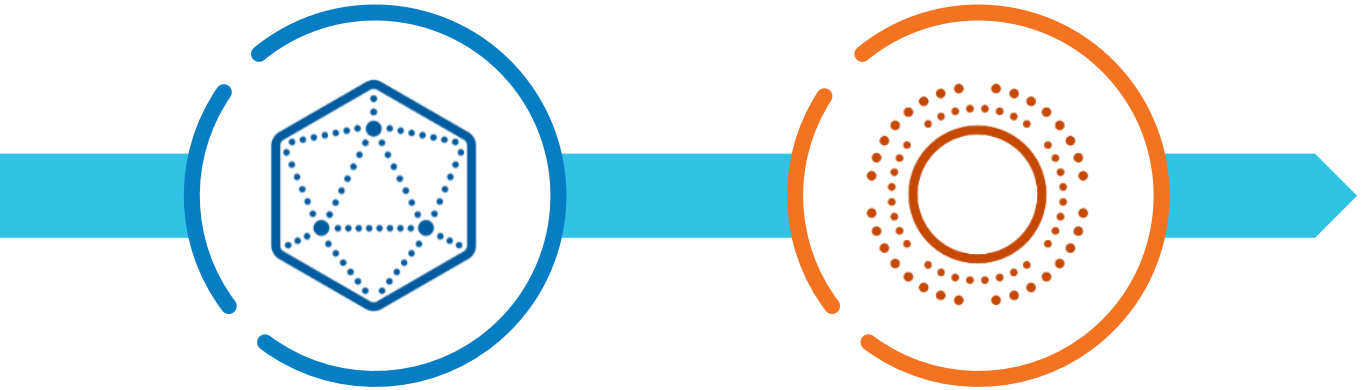
Gene therapy provides tractable, valuable near-term opportunities

Our capabilities allow us to design therapeutic approaches targeting the underlying genetic causes of disease

Ex Vivo

Gene Therapy

Gene-Edited Cell Therapy



Gene therapy provides tractable, valuable near-term opportunities

Continue to advance *ex vivo* editing to create cell therapies

Our capabilities allow us to design therapeutic approaches targeting the underlying genetic causes of disease

Ex Vivo

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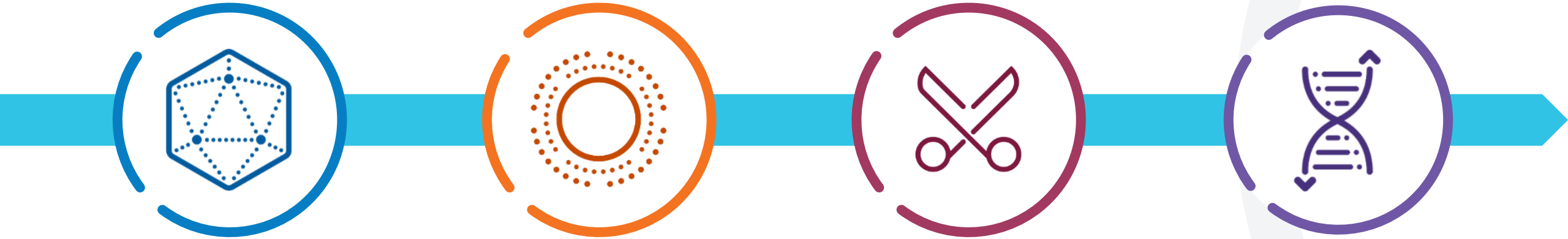
Gene Therapy

Gene-Edited Cell Therapy

Genome Editing

Gene Regulation



Gene therapy provides tractable, valuable near-term opportunities

Continue to advance *ex vivo* editing to create cell therapies

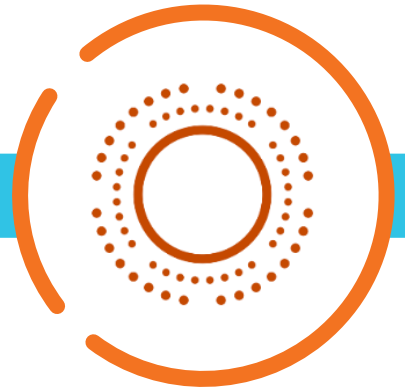
Sustain momentum toward the long-term goal with *in vivo* gene editing and gene regulation

Sangamo THERAPEUTICS

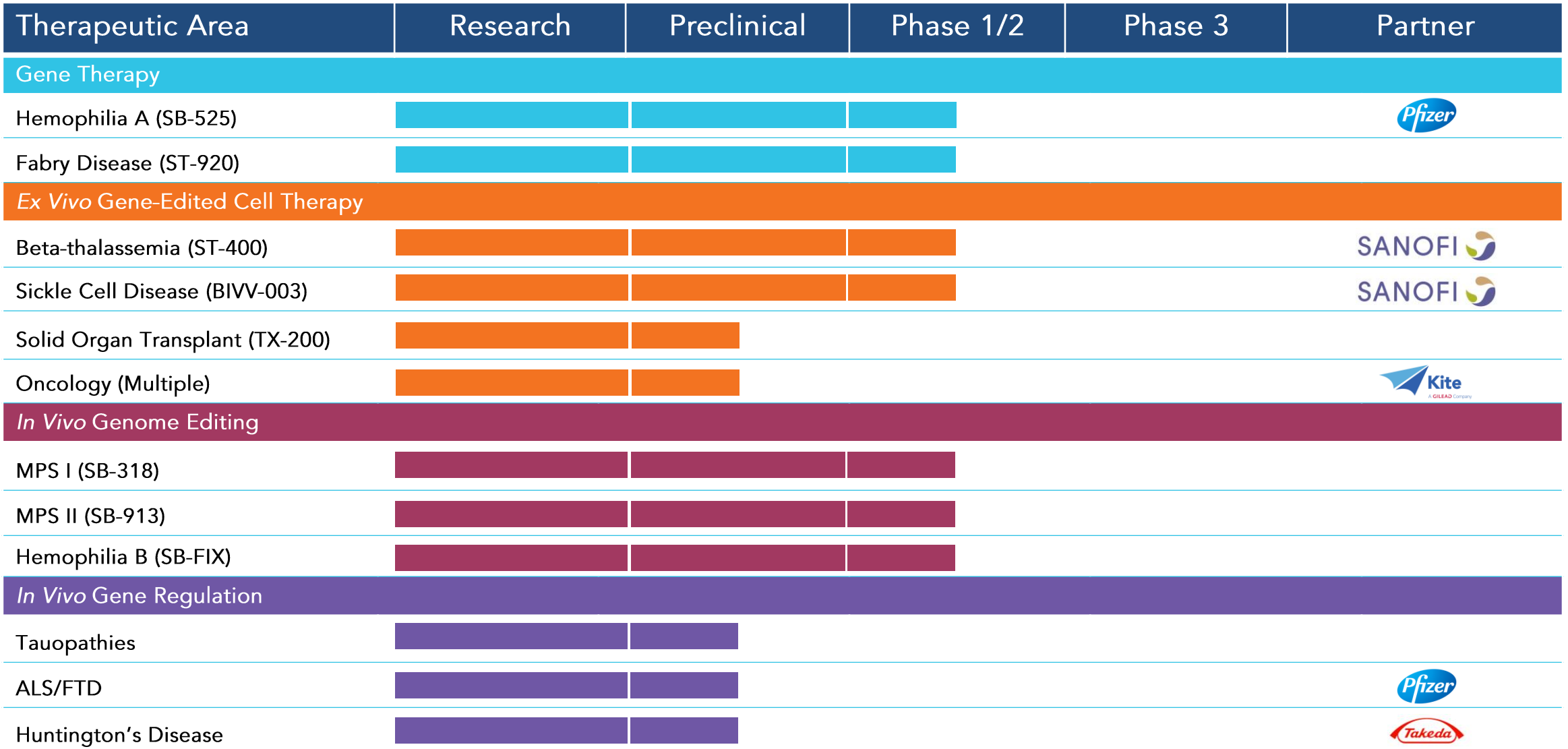
Sangamo's genomic medicines encompass a breadth of technical approaches and diverse pipeline assets

Ex Vivo

In Vivo

Gene Therapy	Gene-Edited Cell Therapy	Genome Editing	Gene Regulation
			
SB-525: Hemophilia A ST-920: Fabry disease Undisclosed targets	ST-400: Beta thalassemia BIVV003: Sickle cell disease TX200: Solid organ transplant KITE-037: Allo-CD19 CAR-T Undisclosed targets	SB-913: MPS II SB-318: MPS I SB-FIX: Hemophilia B Undisclosed targets	Tauopathies C9ORF72-linked ALS/FTLD Huntington's disease Undisclosed targets

Robust pipeline of genomic medicines in clinical and preclinical stages of development



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Gene Therapy

SB-525: Hemophilia A

ST-920: Fabry disease

SB-525, gene therapy for hemophilia A

Phase I/II Open Label Study (ALTA)

Dose Escalation Complete

Cohort 1	Cohort 2	Cohort 3	Cohort 4
9e11 vg/kg	2e12 vg/kg	1e13 vg/kg	3e13 vg/kg

(Patients did not receive prophylactic steroids)

Ongoing Phase I/II Study

- Enrollment complete
- Updated results presented at ISTH

Next steps

- Present follow-up patient data in 4Q 2019
- Complete transfer of manufacturing to Pfizer
- Regulatory discussions underway for Phase III

- Orphan Drug
- Fast Track
- RMAT

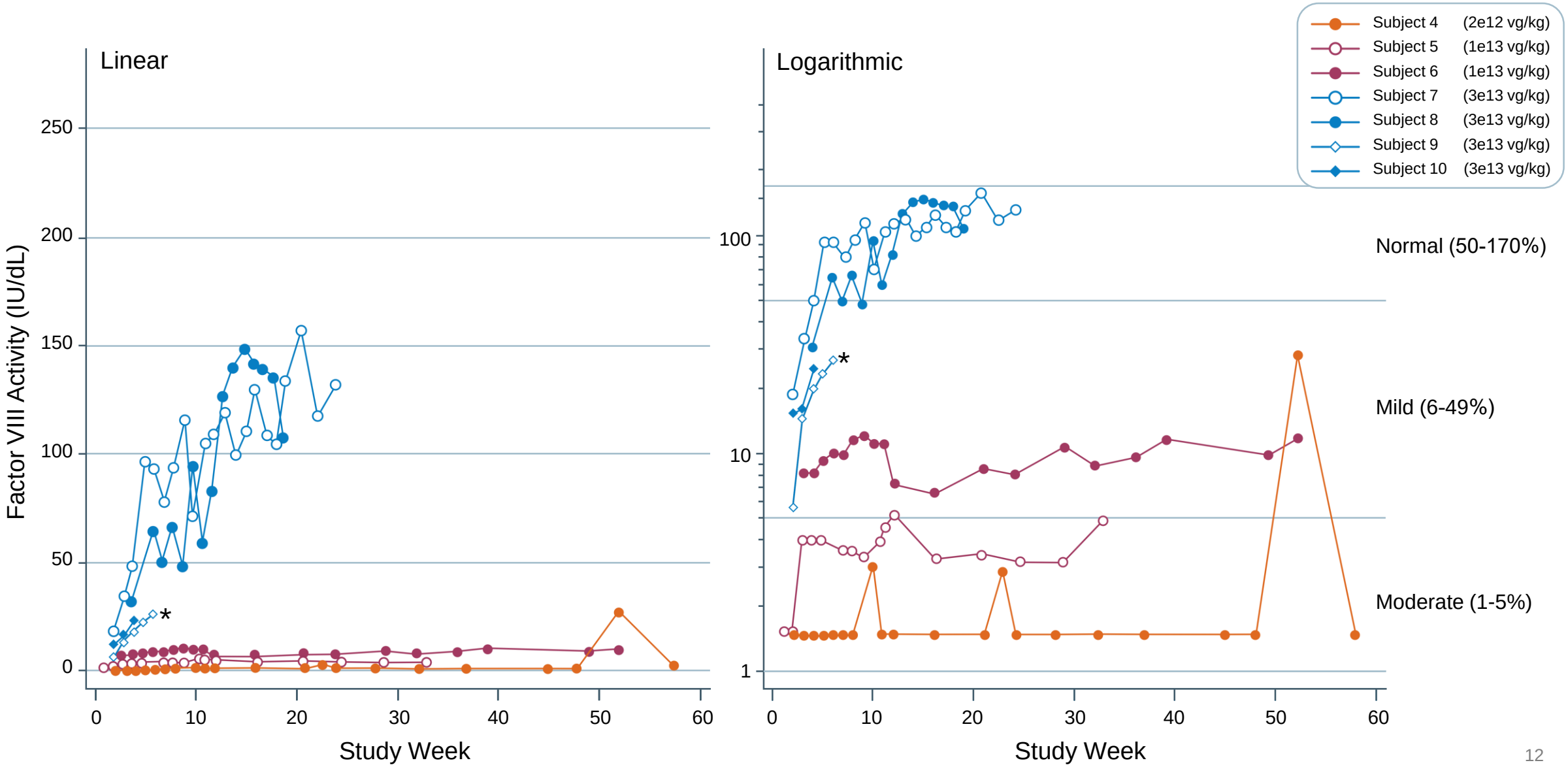
- Orphan Medicinal Product

IND open

Goals

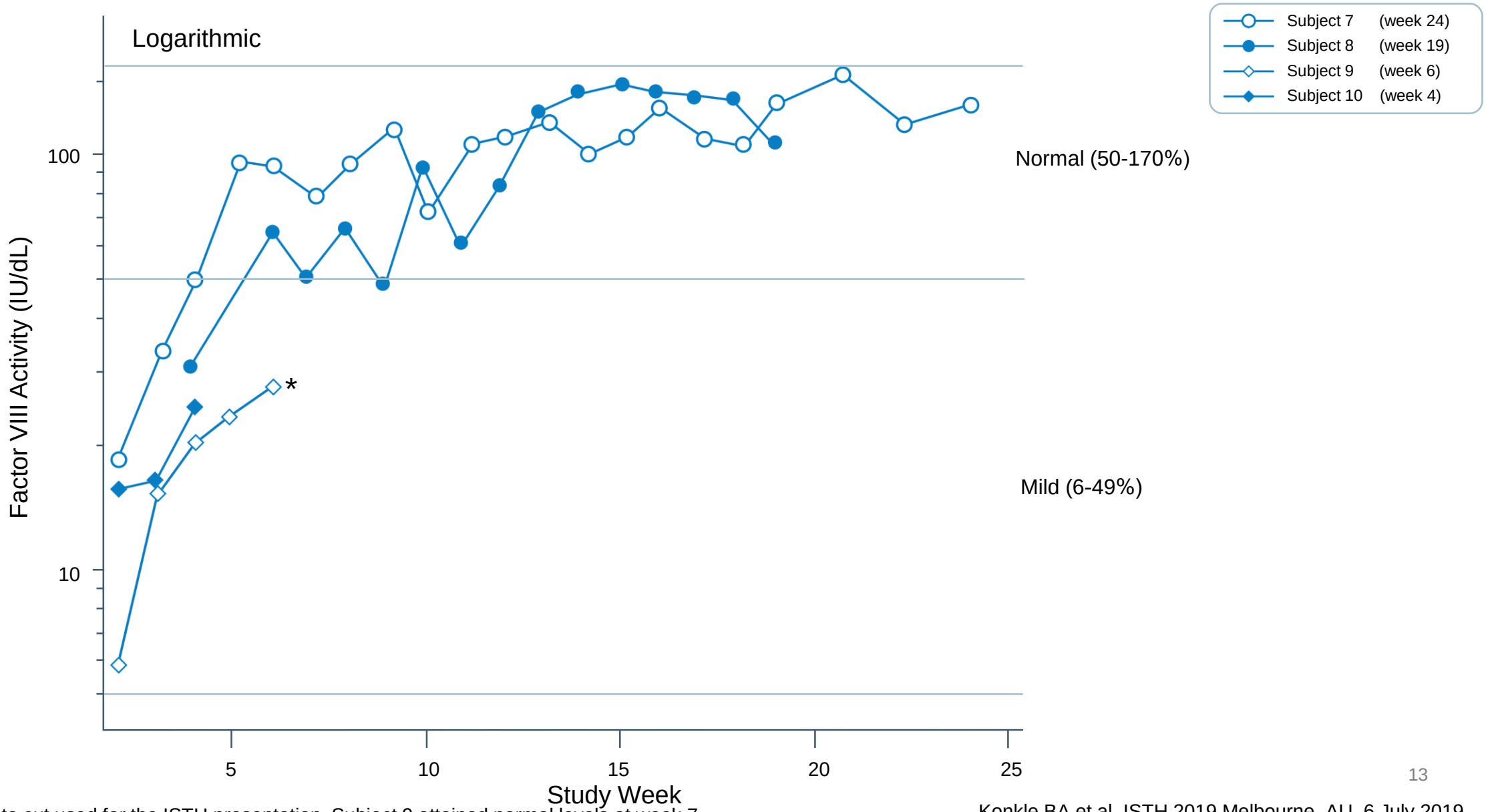
Patient safety | FVIII activity | Reduction of bleeding events | Reduction of factor replacement use

Factor VIII activity: Chromogenic



* Subsequent to the data cut used for the ISTH presentation, Subject 9 attained normal levels at week 7

Factor VIII activity: Chromogenic, Cohort 4 (3e13 vg/kg)



* Subsequent to the data cut used for the ISTH presentation, Subject 9 attained normal levels at week 7

Spontaneous Bleeding Episodes

Dose Cohort (dose vg/kg)	Subject	Follow-Up (weeks)	Bleeding Episodes ≥3 weeks Post Treatment
1 (9e11)	1	93	7
1 (9e11)	2	83	5
2 (2e12)	3	73	8
2 (2e12)	4	66	5
3 (1e13)	5	50	5
3 (1e13)	6	41	0
4 (3e13)	7	24	0
4 (3e13)	8	18	0
4 (3e13)	9	5	0
4 (3e13)	10	2	n/a*

*n/a: < 3 weeks of follow-up at time of data cut

Data cut-off date: 30 MAY 2019

Konkle BA et al. ISTH 2019 Melbourne, AU, 6 July 2019

Factor VIII Replacement Usage

Dose Cohort (dose vg/kg)	Subject	Follow-Up (weeks)	Factor VIII Prophylactic Regimen Prior to Dosing	Factor VIII Infusions ≥ 3 weeks Following SB-525 Treatment
1 (9e11)	1	93	2/Week	115
1 (9e11)	2	83	2/Week	26
2 (2e12)	3	73	2/Week	13
2 (2e12)	4	66	3/Week	9
3 (1e13)	5	50	Every Other Day	11
3 (1e13)	6	41	Every Other Day	0
4 (3e13)	7	24	Every 4 Days	0
4 (3e13)	8	18	Every Other Day	1*
4 (3e13)	9	5	Every 3 Days	0
4 (3e13)	10	2	Every 3 Days	n/a§

*Prophylactic coverage stopped 3 weeks and 2 days after SB-525 administration, §n/a: < 3 weeks of follow-up at time of data cut

Data cut-off date: 30 MAY 2019

Konkle BA et al. ISTH 2019 Melbourne, AU, 6 July 2019

Treatment-Related Adverse Event (TRAE) Summary

MedDRA Preferred Term	Cohort 1 9e11 vg/kg (N=2) n(%)[T]	Cohort 2 2e12 vg/kg (N=2) n(%)[T]	Cohort 3 1e13 vg/kg (N=2) n(%)[T]	Cohort 4 3e13 vg/kg (N=4) n(%)[T]	Overall (N=10) n(%)[T]
Any treatment-related event	0	2 (100) [4]	0	3 (75) [8]	5 (50) [12]
Alanine aminotransferase increased	0	2 (100) [3]	0	1 (25) [1]	3 (30) [4]
Pyrexia	0	0	0	3 (75) [3]*	3 (30) [3]
Aspartate aminotransferase increased	0	1 (50) [1]	0	0	1 (10) [1]
Fatigue	0	0	0	1 (25) [1]	1 (10) [1]
Hypotension	0	0	0	1 (25) [1]**	1 (10) [1]
Myalgia	0	0	0	1 (25) [1]	1 (10) [1]
Tachycardia	0	0	0	1 (25) [1]	1 (10) [1]

N= Total number of subjects in each treatment group, n= number of subjects in each system organ class (SOC), [T]= total number of treatment-related adverse events. *All 3 events were reported as Grade 2 ** Grade 3 event reported

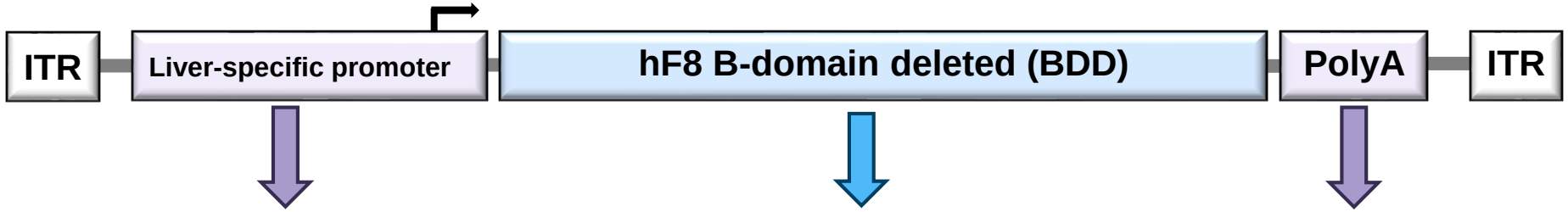
Data cut-off date: 30 MAY 2019

Safety Summary

- Treatment-related SAEs of hypotension (grade 3) and fever (grade 2) in one Cohort 4 subject occurred 6 hrs following SB-525 infusion. Fully resolved with treatment within 24 hrs
  - Based on the temporal association, assessed as related to study treatment
  - No similar hypotension observed in subsequent 3 subjects dosed
- In the 3e13 vg/kg cohort two subjects experienced a transient grade 1 alanine aminotransferase elevation (>1.5 x baseline) managed with a tapering course of oral steroids. Neither resulted in a loss of FVIII activity levels

Data cut-off date: 30 MAY 2019

Experience with AAV manufacturing and gene construct design can be translated across our gene therapy platform



Promoter module modifications

- Assembled different permutations of liver-specific promoter elements
- A systematic mutational design approach was used to improve regions of the promoter module

Transgene modifications

- Optimized the F8 cassette

Other modifications

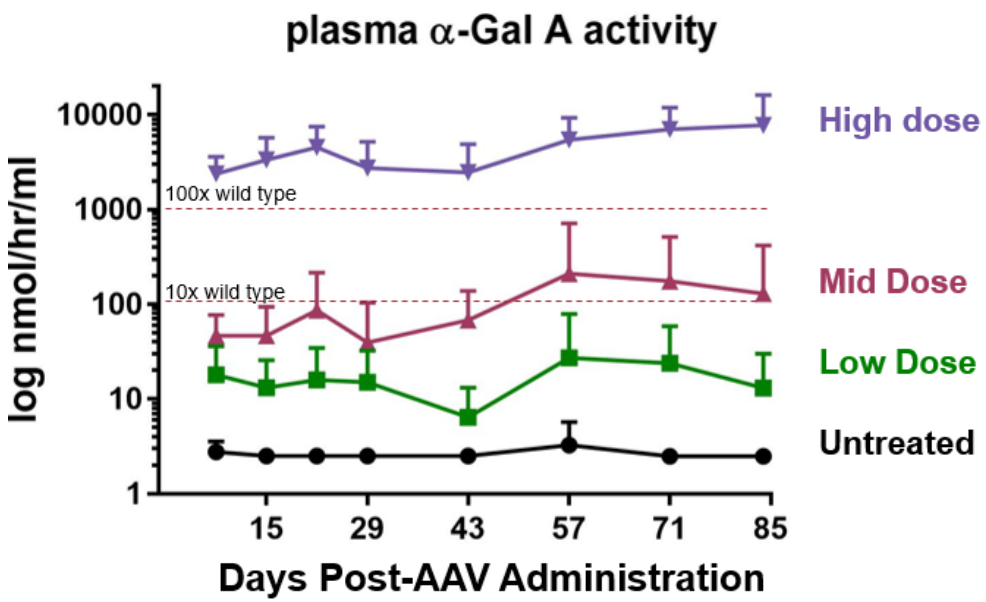
- Identified minimal synthetic polyA
- Removed unnecessary nucleic acids to reduce size
- Optimized sequences outside transgene

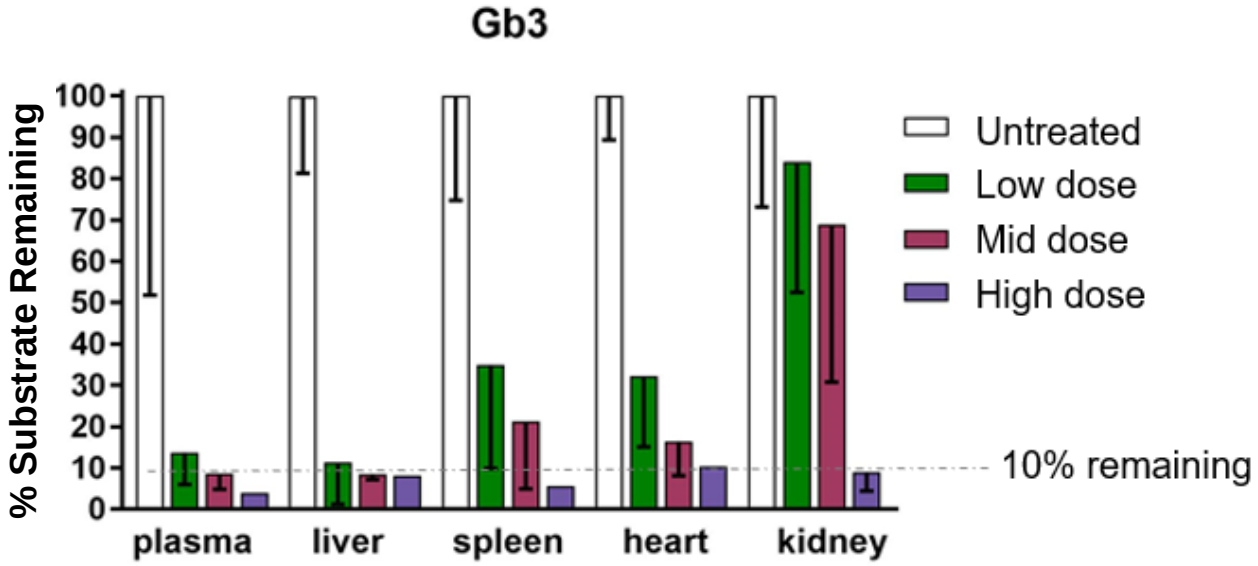
ST-920, gene therapy for Fabry disease
Designed to express α-Gal A enzyme

- 5,000 – 6,000 Fabry patients in US / EU; most diagnosed as adults
- Weekly and bi-weekly ERT infusions (standard of care) may not clear all substrate from secondary organs
- ST-920 clinical trial initiated (STAAR). First patient enrollment expected by year-end 2019

Data from preclinical studies in mice using a precursor to ST-920. AAV produced using clinical scale manufacturing methods

GLAKO





Sangamo's gene therapy demonstrated strong expression of α-Gal A and Gb3 substrate reduction across tissue types in GLAKO murine model

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Ex Vivo Gene-Edited Cell Therapy

ST-400: Beta thalassemia

BIVV003: Sickle cell disease

TX200: Solid Organ Transplant (CAR-Treg)

KITE-037: Allogeneic anti-CD19 CAR-T

ST-400, gene-edited cell therapy for beta thalassemia

Phase I/II Open Label Study (THALES)

April 2019

- First patient data presented (genotype β0/β0)

August 2019

- Four patients enrolled

Next steps

- Complete enrollment of all 6 patients
- Additional preliminary data in 4Q 2019

Potential Advantages

- Leverages naturally-occurring, protective mechanism to increase fetal-hemoglobin to reduce or potentially eliminate blood transfusions
- Highly efficient, precise gene editing
- Non-viral delivery of ZFNs

Goals

- Patient safety
- Successful engraftment
- Fetal hemoglobin (HbF) production
- Reduction / elimination of transfusions

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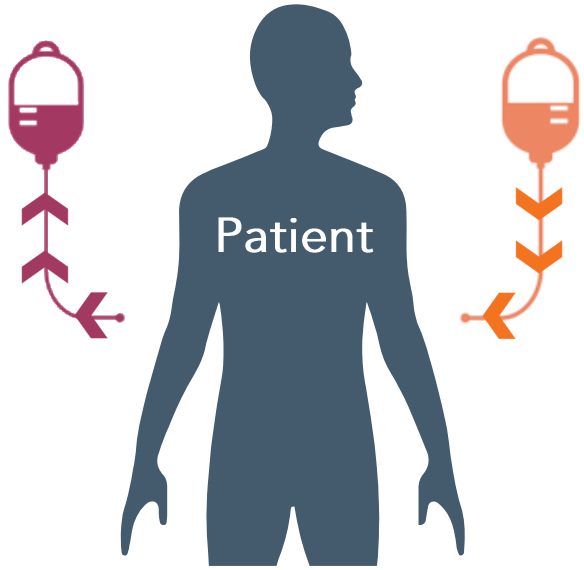
Autologous, *ex vivo* gene-edited cell therapy product candidates for beta thalassemia and sickle cell disease

Apheresis
Isolate CD34+ Hematopoietic stem cells from patient's blood

1

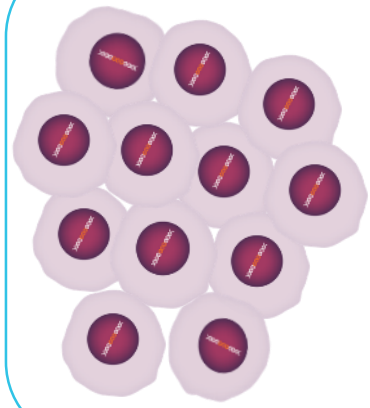


4

Infusion
ST-400 stem cells are infused back to the patient (with myeloablative pre-conditioning to promote engraftment)

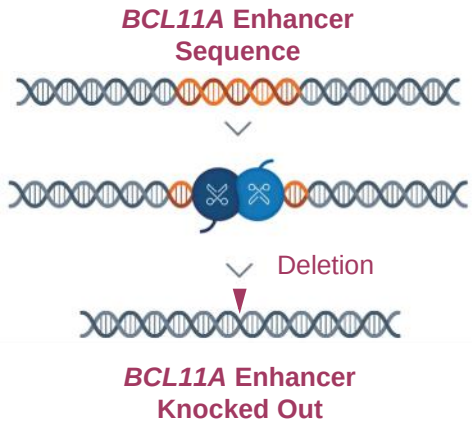
Functional RBCs with fetal hemoglobin produced from ST-400 stem cells

cGMP Manufacturing Facility



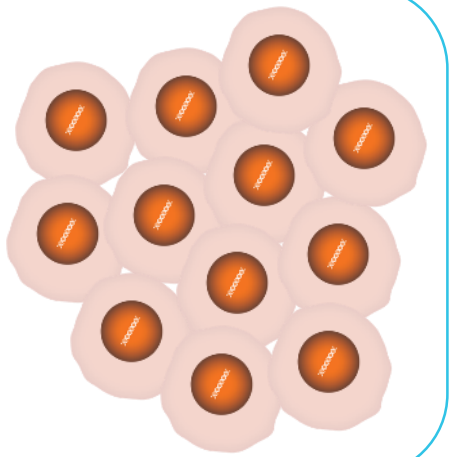
2

Gene editing
Manufacture ST-400 stem cells via transient, non-viral delivery of ZFN mRNA



3

Harvest
ST-400 stem cells are cryo-preserved and shipped to treatment center



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Cell therapy platform

ST-400: beta thalassemia

BIVV003: sickle cell disease

CAR-T therapy for oncology

CAR-Tregs for immunology

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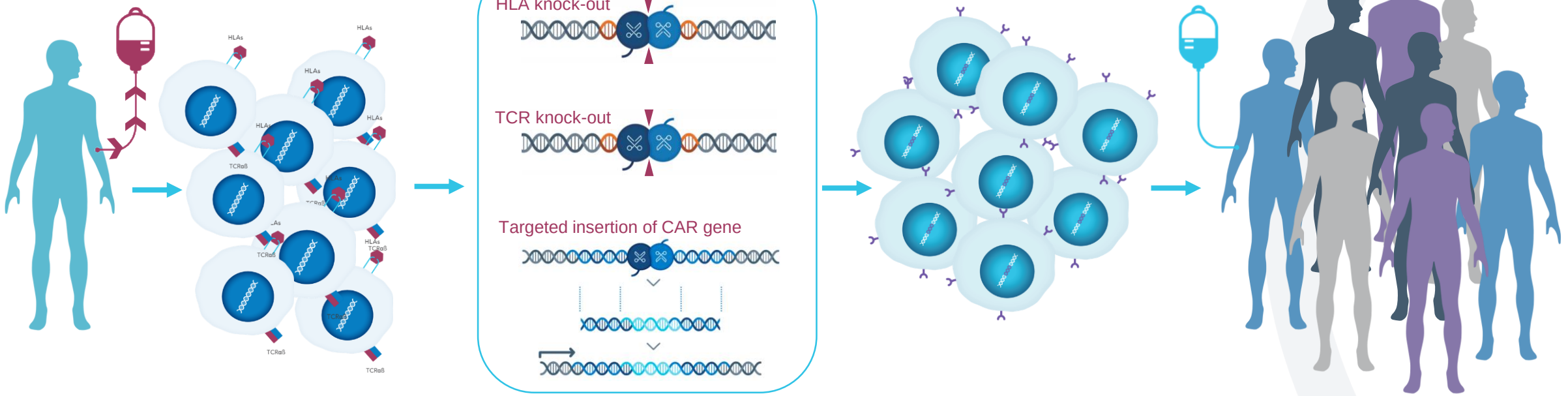
Manufacturing allogeneic T-cell therapies with ZFNs

cGMP Manufacturing Facility



1

Apheresis (Healthy Donor)

Isolate T-cells from a healthy donor's blood

2

T-cell Manufacturing

Transient, non-viral delivery of ZFN mRNA to manufacture universal CAR-T cells via single-step, multiplexed gene editing

3

Harvest & Storage

Universal CAR-T cells are harvested, cryo-preserved and stored in a secure cell bank

4

Infusion (Patients)

Universal, off-the-shelf CAR-T cells are infused into new patients, on-demand

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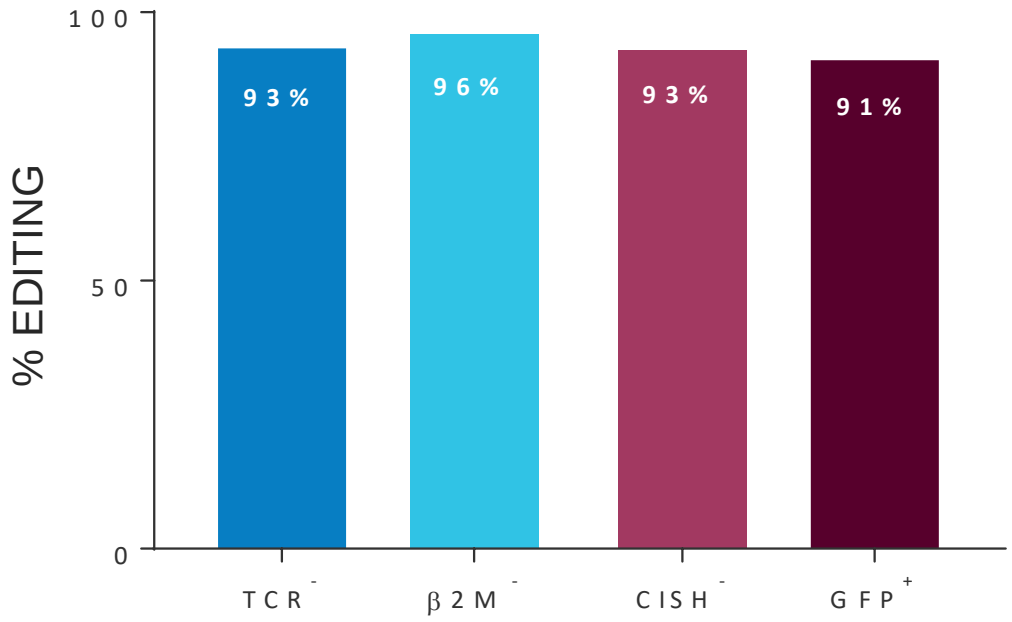
Simultaneous multiplex editing efficiencies with 3x ZFN KO and 1x targeted integration

POTENTIAL APPLICATION:
Universal T cells with checkpoint gene knock-out

SINGLE STEP EDITING

ZFN Knock-out
- TCR (TRAC)
- HLA-class I (β2M)
- CISH (checkpoint gene)

Targeted Insertion
- GFP (into TRAC)

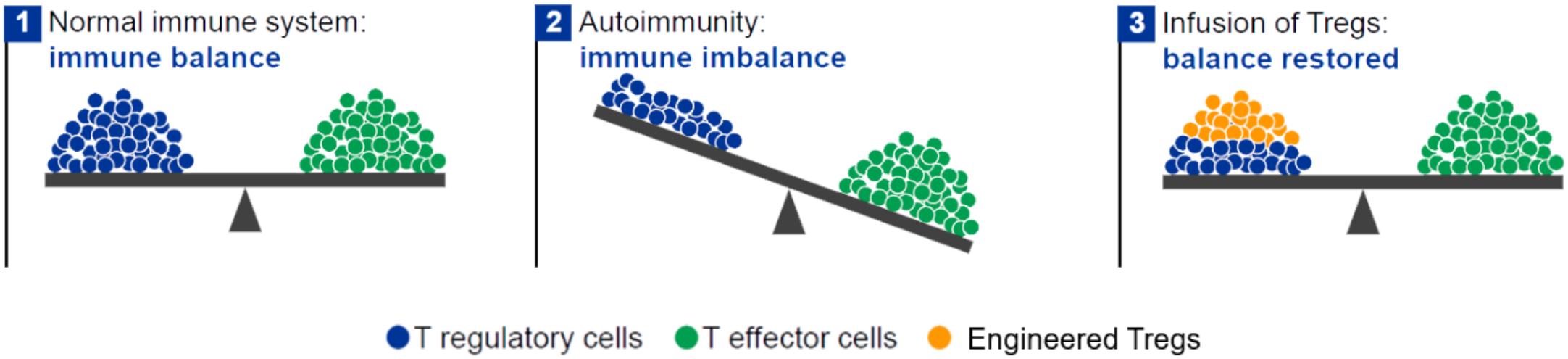


76% of cells have all 4 edits

*This work was conducted with a generic CAR-T sequence and is distinct from Sangamo's current collaboration with Kite, a Gilead company

Regulatory T cells (Tregs): a new class of cell-based therapeutics

- Tregs maintain immune homeostasis at various tissues
- The suppressive function of Tregs inhibits mounting inflammatory responses. i.e. Tregs confer tolerance
- Tregs can be used as a cell-based therapy across various applications where induction of immune tolerance can restore homeostasis and counter disease-state
  - e.g. prevention of transplant rejection, treatment of a multitude of autoimmune diseases



CAR-Tregs have the potential to generate antigen and tissue specific cell therapy products for immunology

Cell Product Characteristics

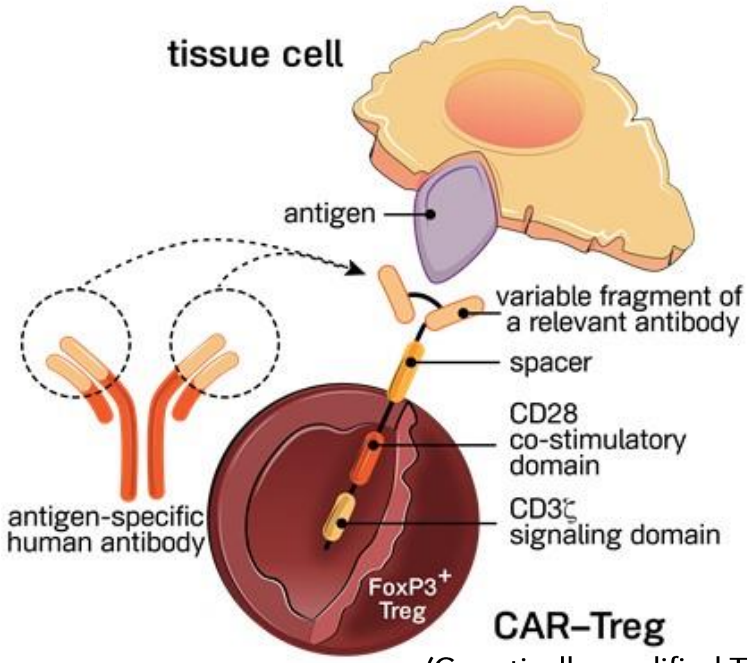
Engineered CAR-Tregs

Antigen localized: tissue-specific activity

Antigen activated: better controlled cell product and dosing

Robust and scalable processes

Antigen-specific CAR-Treg



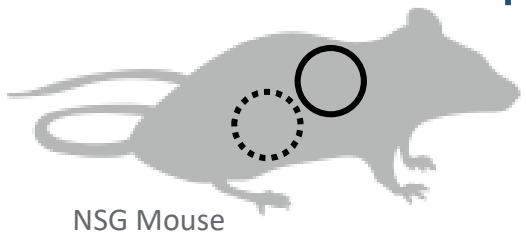
(Genetically modified Treg)

HLA-A2 CAR-Tregs achieve precise and durable targeting of skin graft in a mouse model

THE UNIVERSITY OF BRITISH COLUMBIA

CDRD

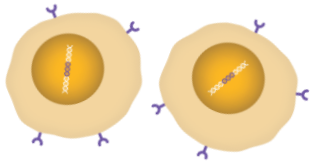
Skin Transplants



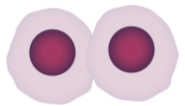
— HLA–A2(–)

····· HLA–A2(+)

I.V. Injection



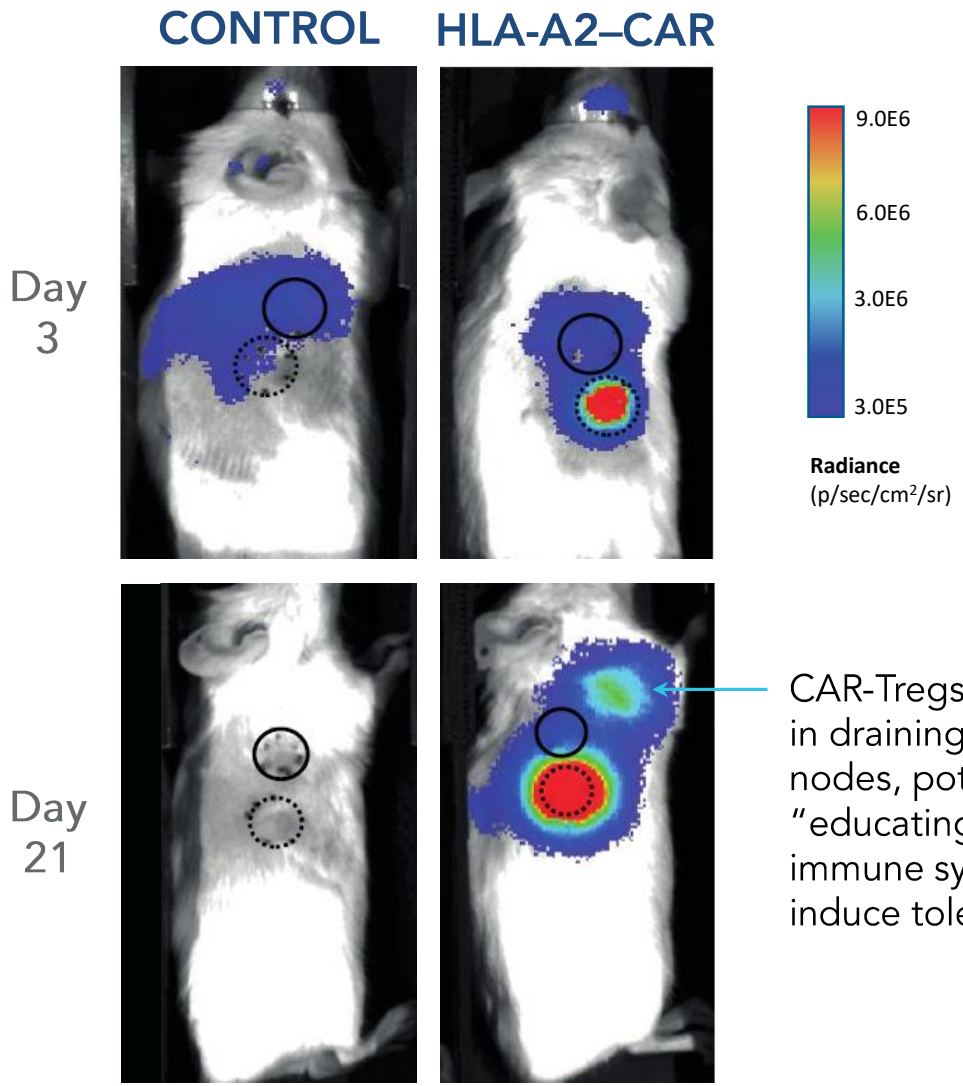
CAR(+) Luciferase(+) Treg Cells



Peripheral Blood Mononuclear Cells

Imaging

CAR-Tregs home to intended HLA-A2+ site only



CAR-Tregs present in draining lymph nodes, potentially "educating" the immune system to induce tolerization

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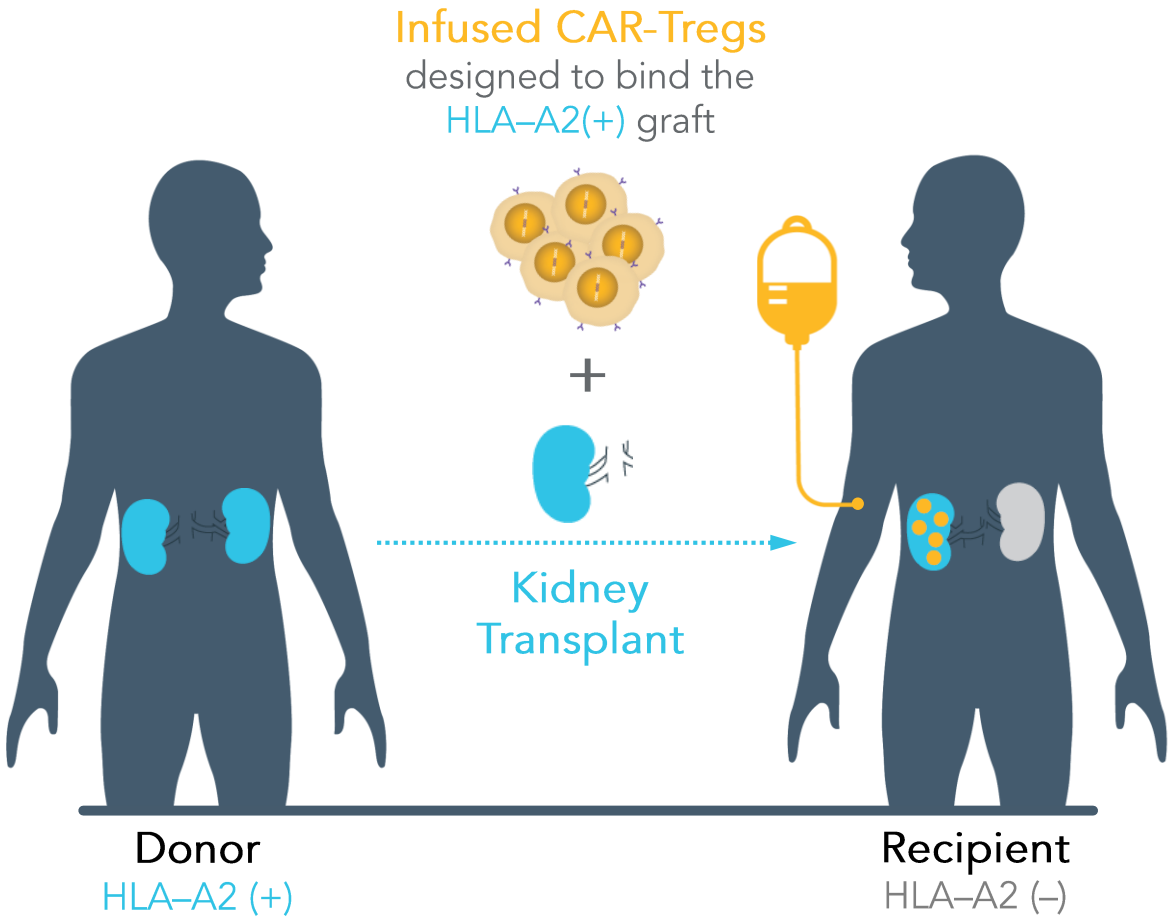
Data from Megan Levings, PhD, University of British Columbia

TX200: HLA-A2 CAR-Treg for solid organ transplant

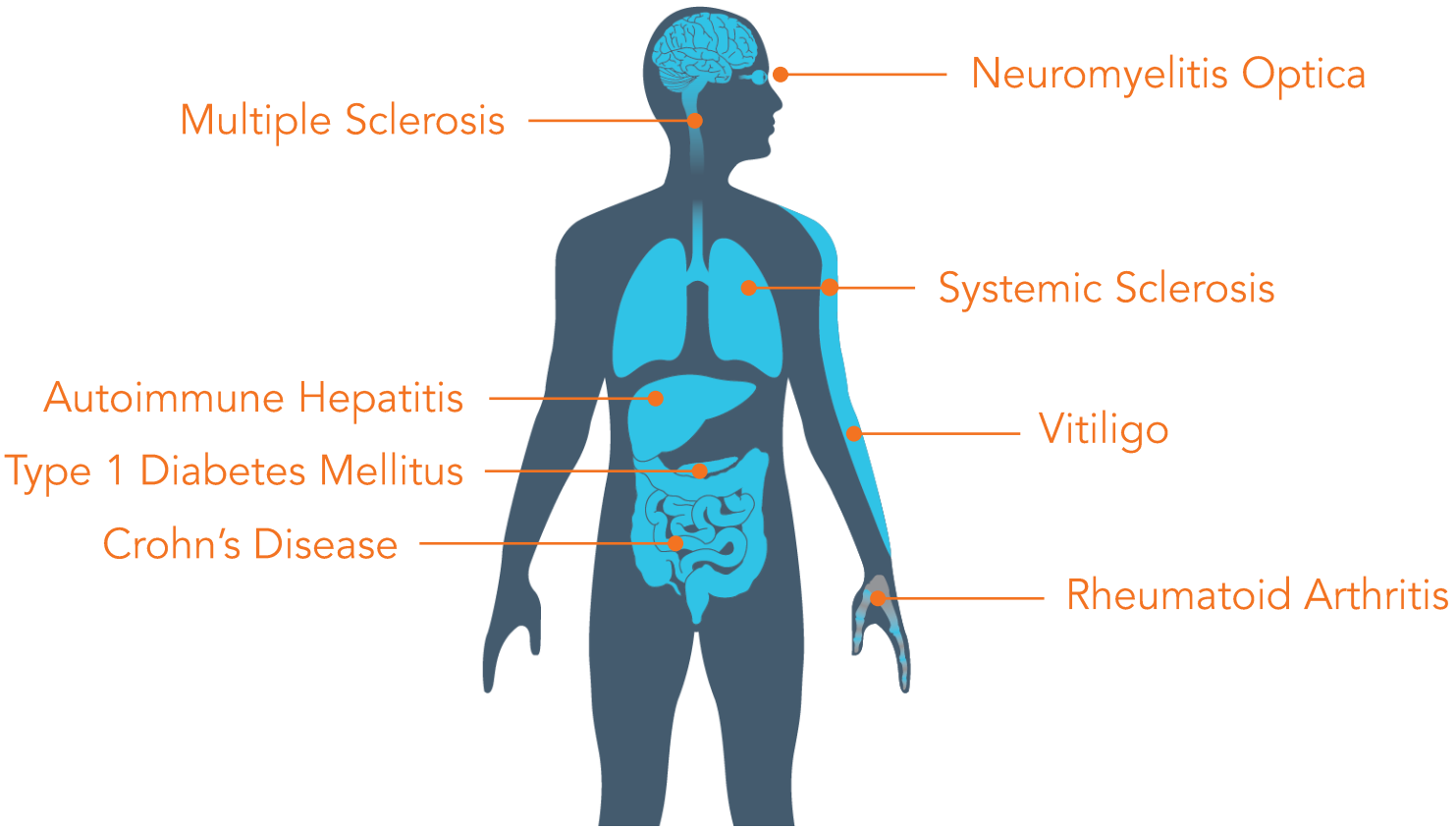
Induction of site-specific immune tolerance



- HLA-A2 antigen on graft is recognized by CAR-Treg cells
- Activated CAR-Treg cells exert **site specific** suppressive function
- Goal: Achieve tolerance and long-term protection of graft

Phase 1/2 clinical trial initiation expected in 2019

Significant unmet medical need in autoimmune diseases



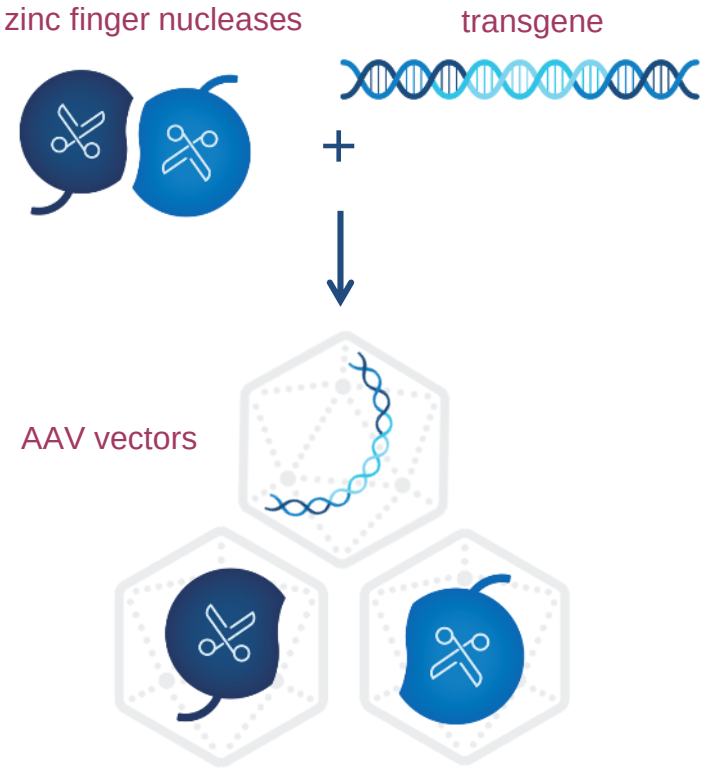
CAR-Treg cell therapies could address several autoimmune diseases with large patient populations and high unmet need

In Vivo Genome Editing

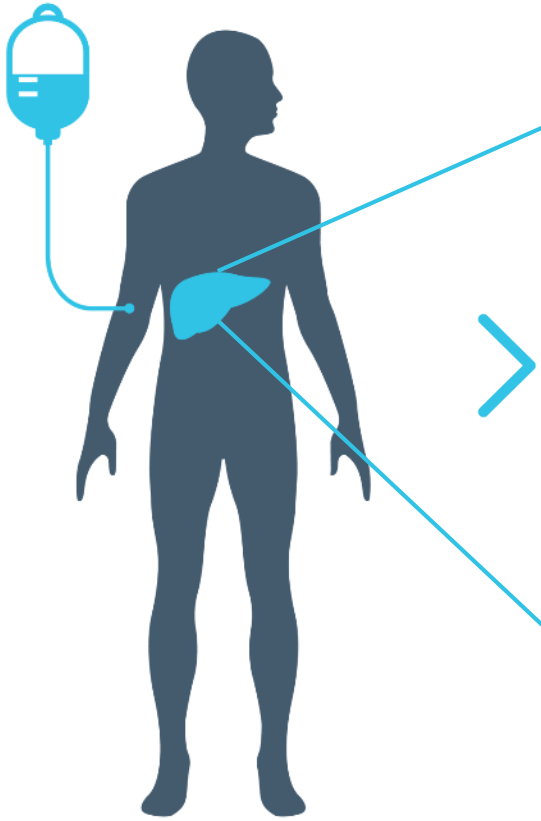
- SB-913: MPS II
- SB-318: MPS I
- SB-FIX: hemophilia B

In Vivo genome editing: harnessing the albumin locus in the liver

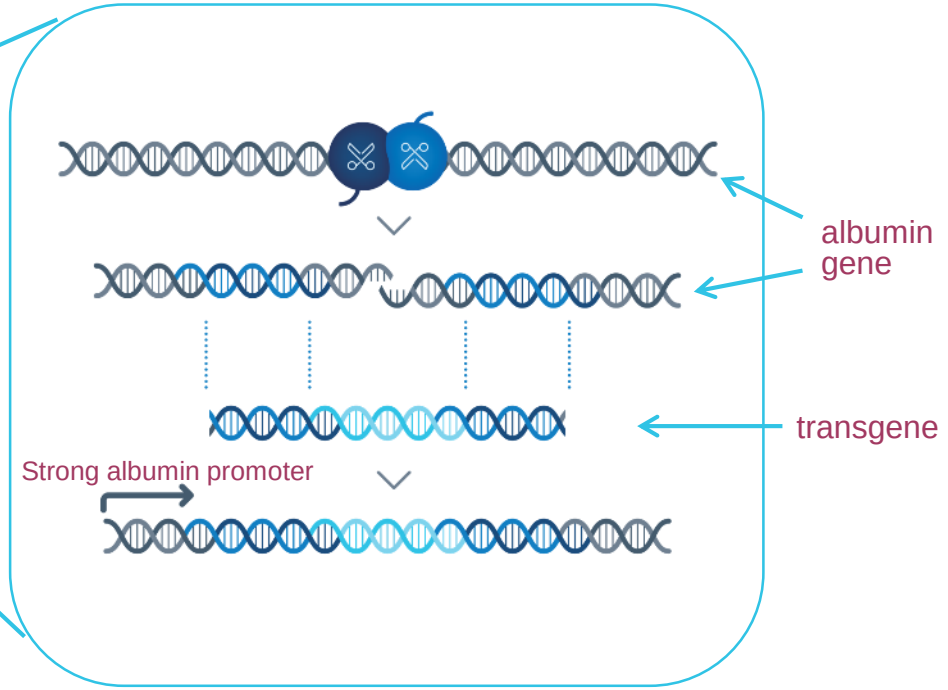
Packaging into AAV vectors



Delivery



In the liver



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In Vivo genome editing: SB-913 (MPS II), SB-318 (MPS I) and SB-FIX (hemophilia B)

- As previously announced, Phase 1/2 clinical trials evaluating these programs are ongoing and data will continue to accumulate throughout 2019. No additional patients will receive first-generation ZFNs

- Next *in vivo* genome editing clinical trial is expected to be initiated by year-end 2020
  - Next-generation albumin locus construct with updated ZFNs to improve precision, efficiency, and specificity
  - Delivery enhancements to increase intra-cellular concentration of ZFNs

Gene regulation

C9ORF72-linked ALS/FTLD

Tauopathies and Huntington’s disease

Sangamo's zinc finger protein transcription factors (ZFP-TFs): gene regulation technology for CNS diseases

Potential CNS applications of ZFP-TFs

Pan-Allele	ZFP-TFs can be engineered for potent and specific single gene repression	• Tauopathies • α-synuclein
Allele-Selective	Repeat-targeted ZFP-TFs repress disease isoforms while preserving normal protein expression	• Huntington's Disease • C9ORF72-linked ALS
X Reactivation	Target DNA demethylase domain locally to precisely and specifically reverse X inactivation	• Rett Syndrome • Fragile X

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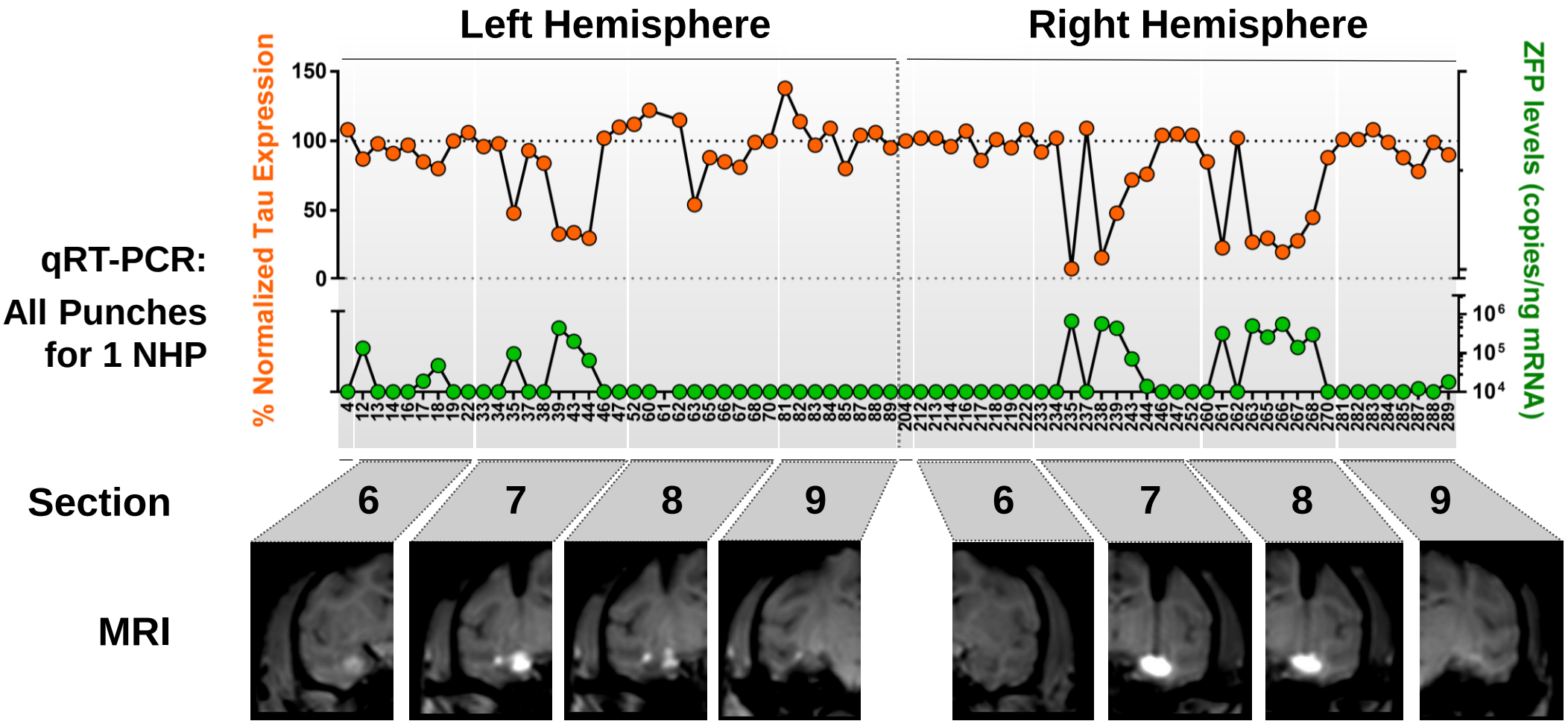
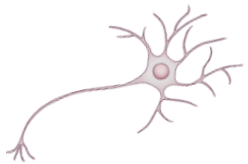
>80% tau reduction achieved in regions of non-human primate brain with AAV coverage



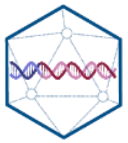
ZFP expression and tau reduction are closely correlated

Highly-specific, >98% human tau reduction in iPS neurons



iPS Neurons

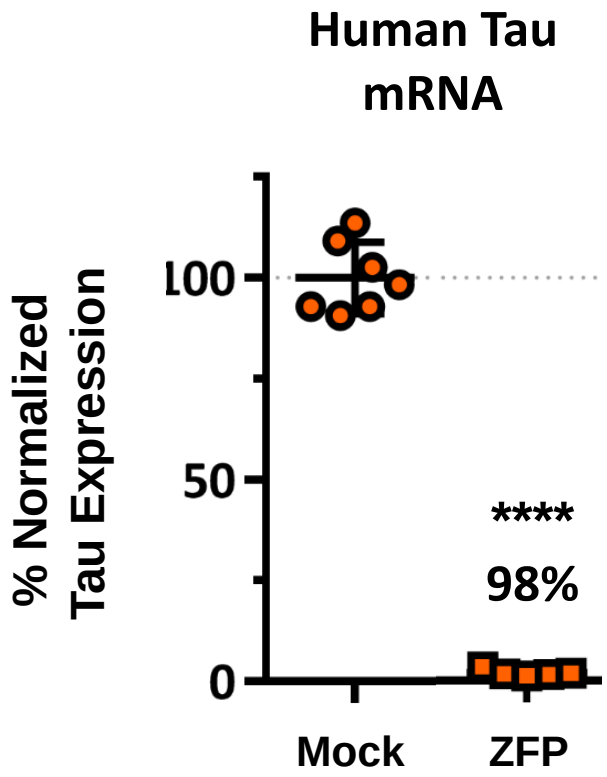
+

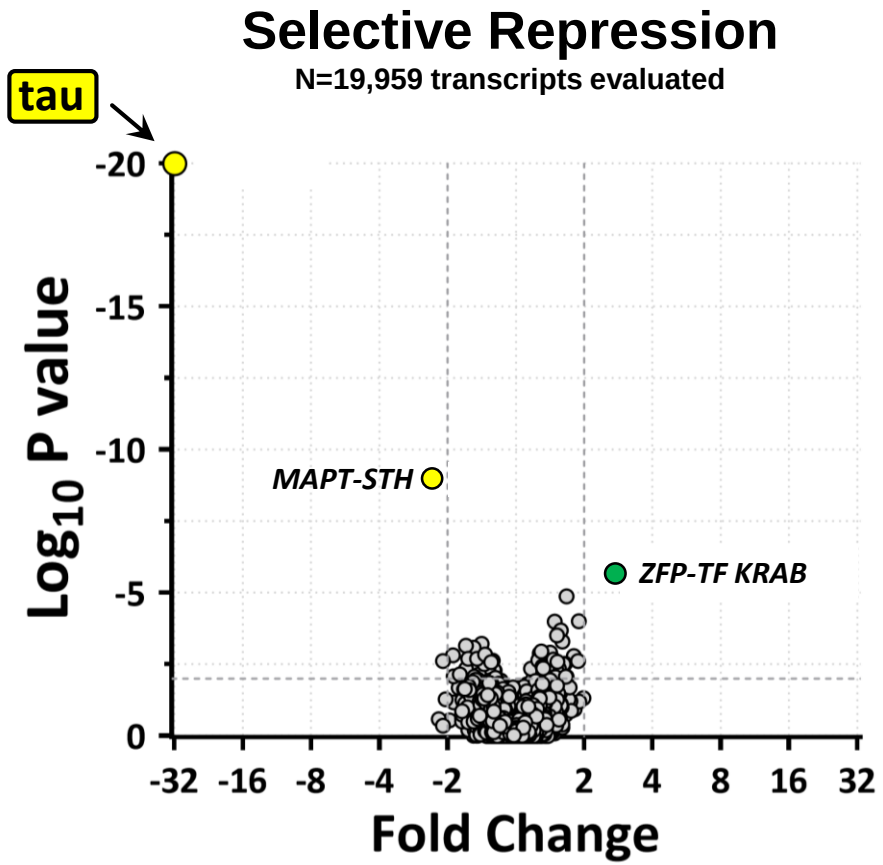


AAV6 + ZFP

19d

qRT-PCR
microarray





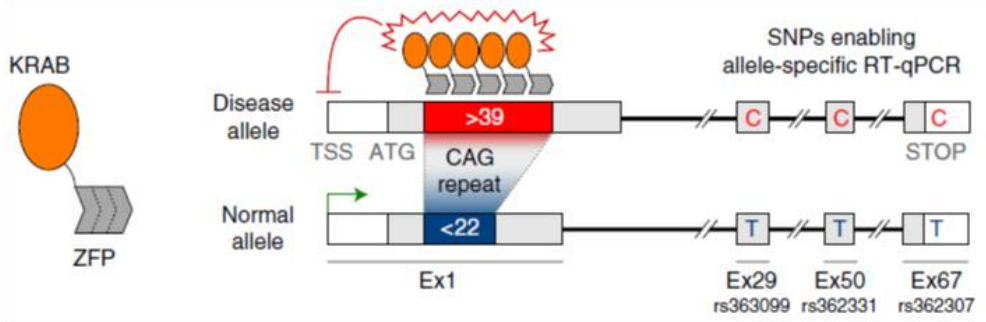
**** P < 0.0001, n = 5-7 biological replicates. Dose: 1E5 VG per cell. Human Clariom S Genechip.

Engineered allele-selective ZFP-TFs for treatment of Huntington's Disease (HD)

- HD - caused by a CAG trinucleotide expansion coding the mutant HTT (mHTT) protein
- Therapeutic strategy: Allele-selective ZFP-TFs targeting pathogenic CAG repeats without disrupting normal HTT expression
- In patient-derived fibroblasts and neurons, ZFP-TFs repressed >99% of mutant alleles while preserving expression of >86% of normal alleles
- Virally delivered ZFP-TFs are well tolerated and active in neurons >100 days in culture and at least nine months in the mouse brain
- Improvements in molecular, histopathological, electrophysiological and functional endpoints

nature medicine
ARTICLES
https://doi.org/10.1038/s41591-019-0478-3

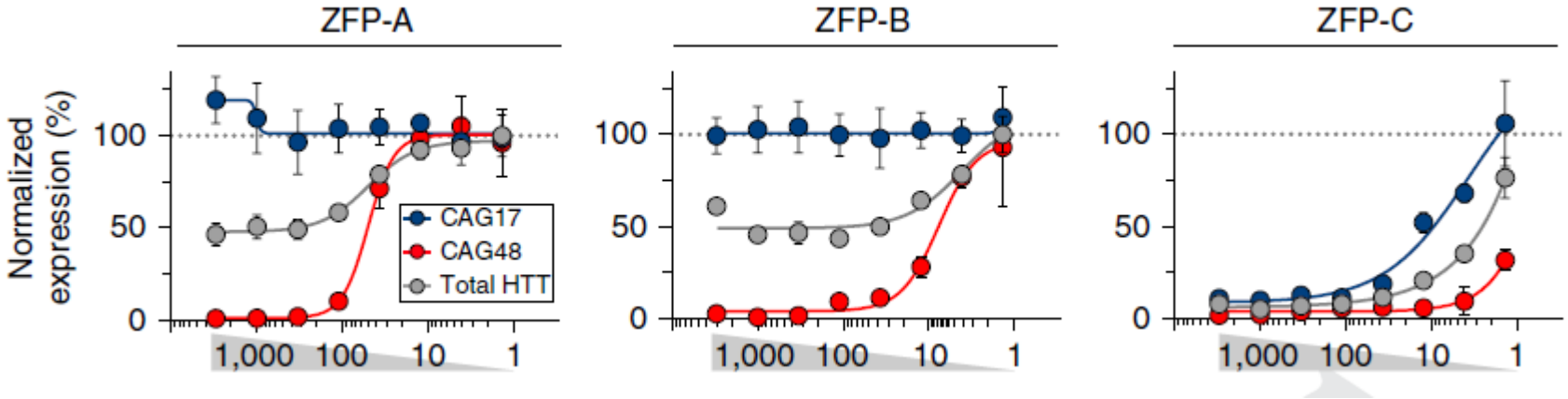
Allele-selective transcriptional repression of mutant *HTT* for the treatment of Huntington's disease



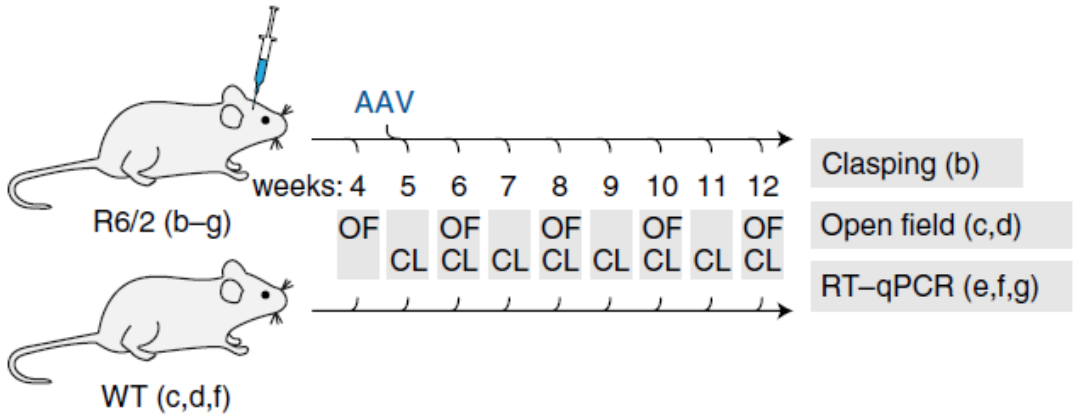
Source: Nature Medicine, July 2019 https://doi.org/10.1038/s41591-019-0478-3

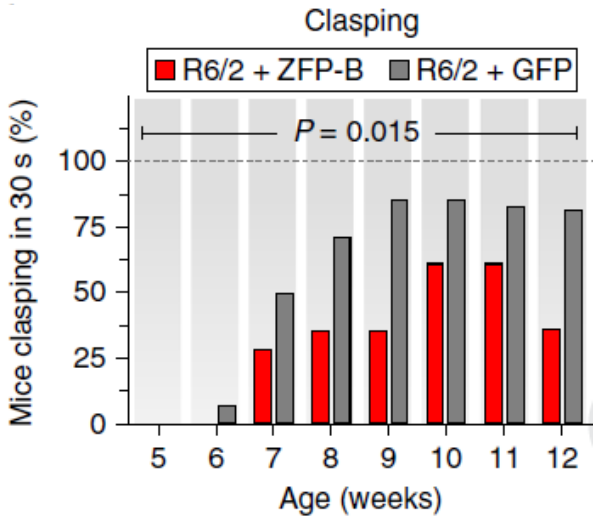
ZFP-TFs repressed mHTT expression in neurons and improved motor abnormalities in mice

Three ZFPs tested in neural stem cells: two repress the disease allele only; a third represses both



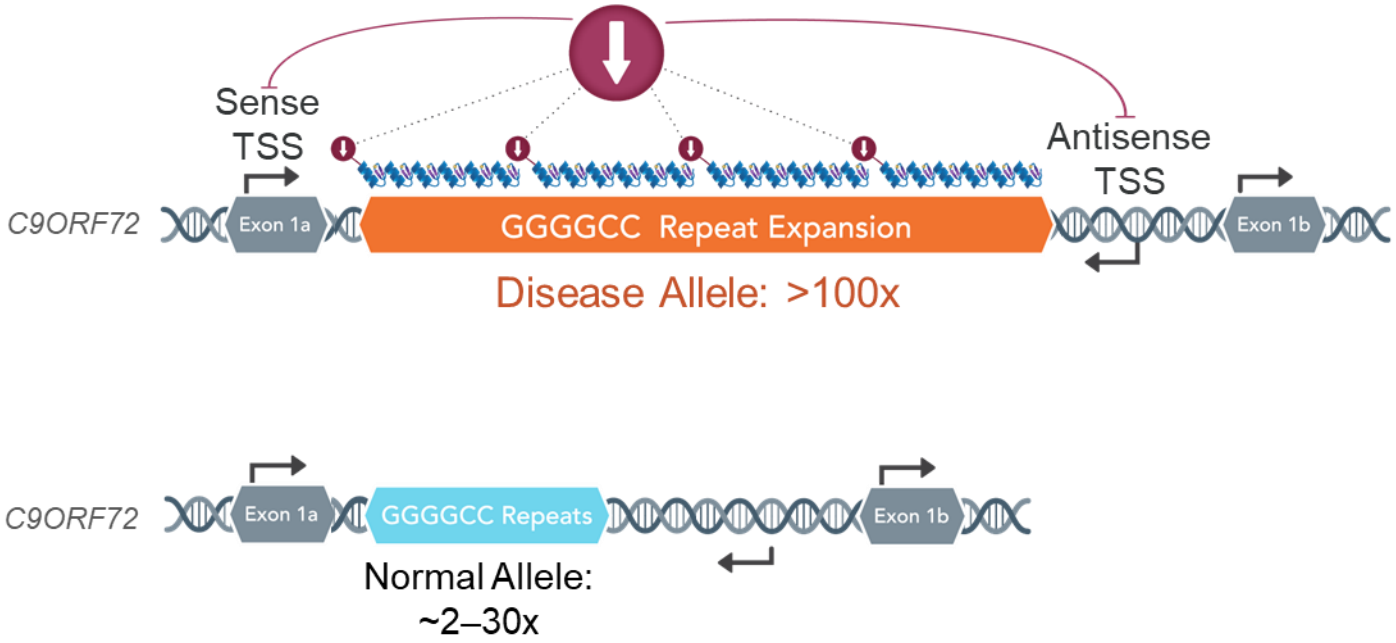
Reduced clasping in mice suggests potential for improvements in HD motor abnormalities





Source: Nature Medicine, July 2019 https://doi.org/10.1038/s41591-019-0478-3

Allele-selective repression of C9ORF72 with ZFP-TFs exemplifies Sangamo's differentiated therapeutic approach to CNS diseases



- Expansion of the GGGGCC six base pair repeat causes neuronal degeneration.
- Cooperative inhibition by ZFP-TFs represses mutant C9 transcripts in an allele-specific fashion.

Operations

Manufacturing

In-house cGMP facility and dedicated external manufacturing capacity provide scale for clinical research and commercial supply

*Digital rendering of Sangamo cGMP facility

Ensuring control of quality, cost and timelines

- Construction of in-house phase 1/2 cGMP manufacturing facility at Sangamo is underway
  - Expected to be operational in 2020
- Expanded Brammer agreement provides access to dedicated AAV manufacturing capacity up to 2000-L bioreactor scale for late-stage clinical and large-scale commercial grade supply
  - Allows Sangamo to leverage Brammer AAV manufacturing know-how in Brisbane facility
  - Enables seamless transition from early to late stage development and manufacturing
  - Sangamo and Brammer have worked together for more than a decade

Conclusions

Milestones and catalysts

Gene therapy	SB-525: hemophilia A	– present longer-term patient data (4Q 2019) – complete regulatory and manufacturing preparations for Phase III
	ST-920: Fabry disease	– first patient enrolled by year end 2019
Ex Vivo gene-edited cell therapy	ST-400: beta thalassemia	– complete patient enrollment – present additional preliminary data (4Q 2019)
	BIVV003: sickle cell disease	– complete patient enrollment (Sanofi)
	TX200: solid organ transplant	– file CTA in 2019
	KITE-037: Allo-CD19 CAR-T	– initiate clinical study in 2020 (Kite-Gilead)
In Vivo genome editing	SB-913: MPS II SB-318: MPS I SB-FIX: hemophilia B	– initiate next *in vivo* genome editing clinical study before year end 2020

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Key takeaways

- Genomic medicine company building value with gene therapy, *ex vivo* gene-edited cell therapy, *in vivo* genome editing and gene regulation
- Precise, efficient and specific gene editing technology (ZFNs) backed by a robust patent estate
- Broad portfolio of rare and large indications across inherited metabolic diseases, immunology, CNS, hematology and oncology
- Flow of clinical data readouts in 2019 and 2020 following enrollment progress of last twelve months
- Strong balance sheet, four validating biopharma partnerships (Kite, Pfizer, Sanofi, Takeda), and manufacturing capabilities

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