# CATALYST BIOSCIENCES

**Corporate Overview**
**4 June 2019**

CATALYST BIOSCIENCES

# Forward looking statements

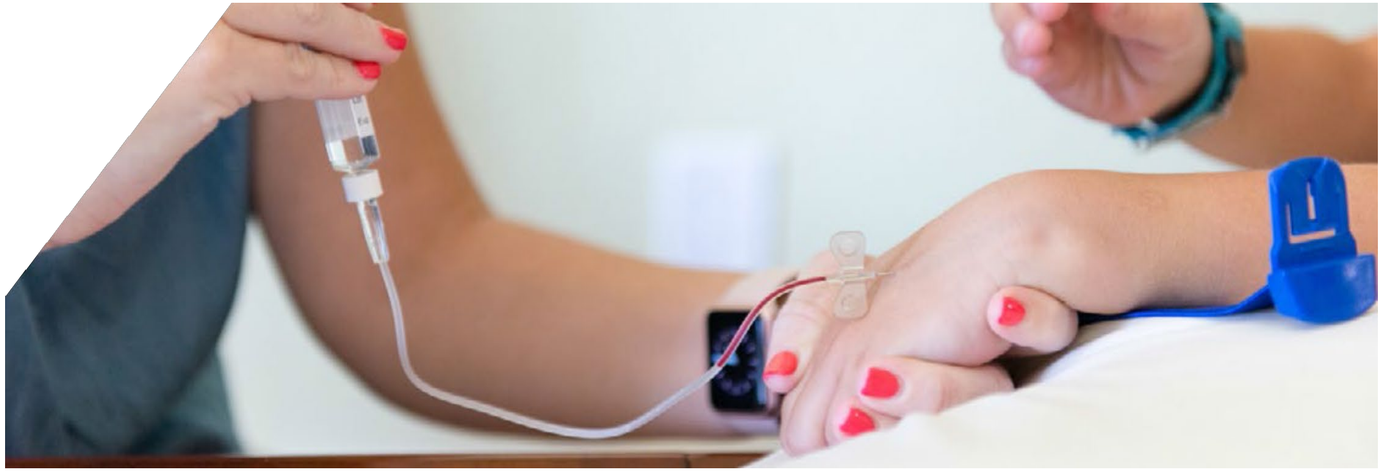


This presentation includes forward-looking statements that involve substantial risks and uncertainties. All statements, other than statement of historical facts, included in this presentation are forward-looking statements. Examples of such statements include, but are not limited to potential markets for MarzAA and DalcA, plans for clinical trials of MarzAA, presentation of MarzAA SQ Phase 2 data in Q3 2019 and initiation of a Phase 3 SQ trial of MarzAA in 2020, the potential benefits of SQ administration of MarzAA and DalcA, the potential for long-term dosing of DalcA to maintain FIX activity in the high-mild hemophilia range, plans for clinical trials of DalcA and presentation of Phase 2b clinical trial data in Q3 2019, and the potential uses and benefits of CB 2679d-GT for gene therapy. Actual results or events could differ materially from the plans, expectations and projections disclosed in these forward-looking statements.

Various factors could cause actual results or events to differ materially from the forward-looking statements, including, but not limited to, the risk that clinical trial initiation or enrollment may be delayed and that ongoing or future trials may not achieve their endpoints, that subsequent clinical trials will not replicate the results from earlier clinical studies on small numbers of patients, that potential adverse effects may arise from the testing or use of Catalyst's products, including the generation of antibodies or inhibitors, the risk that costs required to develop or manufacture Catalyst's products will be higher than anticipated, the risk of competition from other hemophilia treatments, including those in development, the risk of Catalyst's ability not to infringe third party intellectual property rights, and other factors described in the "Risk Factors" section of Catalyst's Annual Report on Form 10-K for the year ended December 31, 2018, which was filed with the Securities and Exchange Commission on March 8, 2019. Forward looking statements in this presentation speak only as of the date hereof. Catalyst does not assume any obligation to update any forward-looking statements, except as required by law.

# Catalyst Biosciences: CBIO

Nasdaq: CBIO



We are working to establish a new standard of care in hemophilia prophylaxis by developing highly potent subcutaneous treatments that improve the quality of life for patients with hemophilia A or B with inhibitors, factor VII deficiency, acquired hemophilia & hemophilia B

# Investment highlights




Novel subcutaneous factors with orphan drug designation, MarzAA & DalcA

$3.7B market opportunity

MarzAA & DalcA SQ clinical efficacy demonstrated

Experienced team

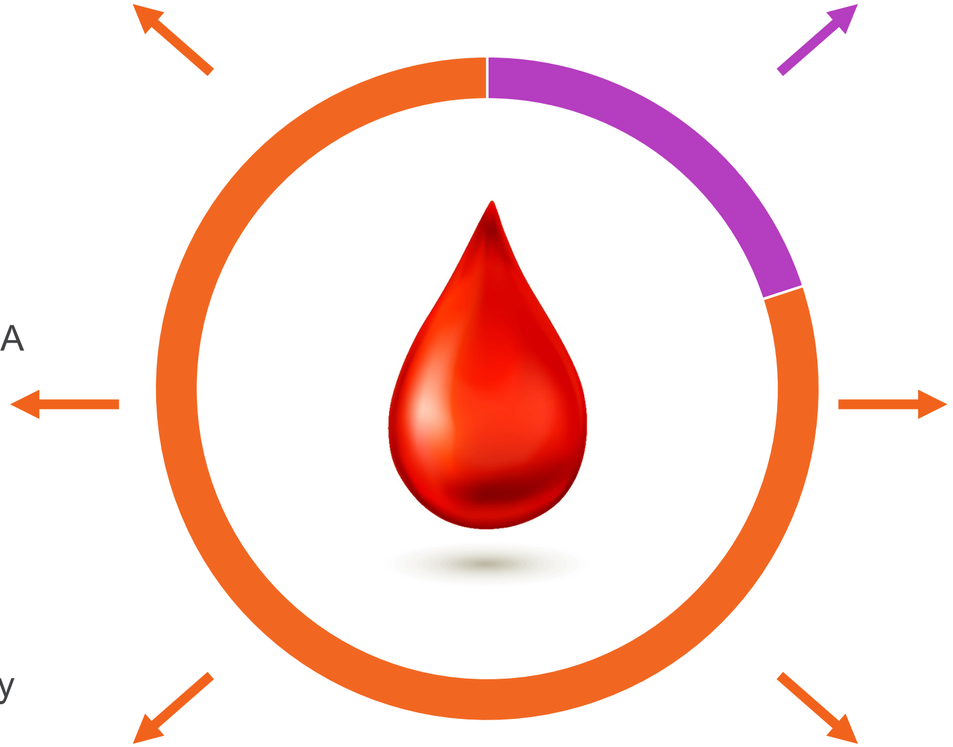
~134 worldwide patents – CBIO retains full ownership of all compounds


Well funded
~$105 M cash (Q1 2019)

# Addressing unmet needs in orphan bleeding disorders

Nasdaq: CBIO

**MarzAA & DalcA**



**Hemophilia B with inhibitors**

Anti-FIX antibodies that neutralize activity

– 5% of Hem B patients

– Treatments: IV FVIIa, FEIBA®

**SQ prophylaxis**

**Hemophilia A with inhibitors**

Anti-FVIII antibodies that neutralize activity

– 30% of Hem A patients

– Treatments: SQ Hemlibra, IV FVIIa, FEIBA

**SQ treatment of bleeds & Hemlibra non-responders**

**Factor VII deficiency – Glanzmann's Thrombasthenia**

Congenital lack of FVII – Platelet abnormality

– Treatments: IV plasma FVII or FVIIa

**SQ prophylaxis in severe patients**

**Hemophilia B**

Congenital lack of functional FIX

– Treated with IV FIX products

**SQ prophylaxis**

**Hemophilia A**

Congenital lack of functional FVIII

– Treatments: IV FVIII or SQ Hemlibra®

**SQ treatment of bleed**

**Acquired Hemophilia**

Rare disorder, caused by anti-FVIII nAbs

– Treated with immunosuppressants + IV FVIIa, FEIBA or Obizur®

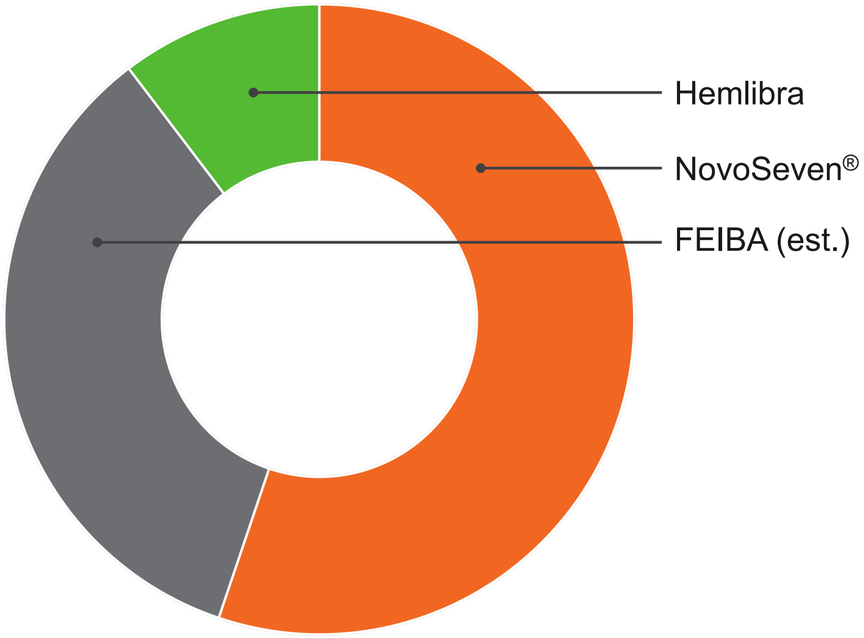
**SQ prevention of re-bleeds**

# Addressing multi-billion dollar markets – 2018 sales

Nasdaq: CBIO

## MarzAA

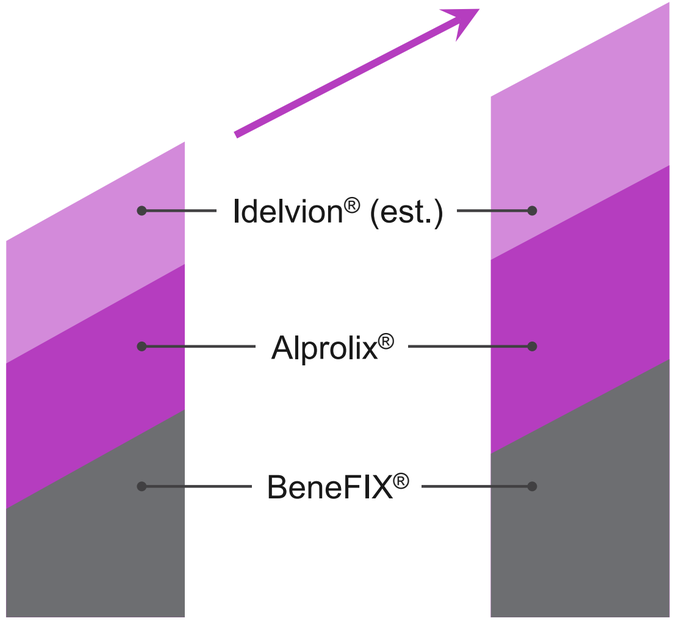
### FVIIa & Bypassing Agents: $2.2B market




## DalcA

### Hemophilia B, FIX: $1.5B market

25% YoY growth




Sources: WFH Annual Global Survey, GlobalData, Roche, Novo Nordisk, SOBI, Bioverativ, Sanofi, Pfizer

# The Catalyst Biosciences subcutaneous solution

Nasdaq: CBIO

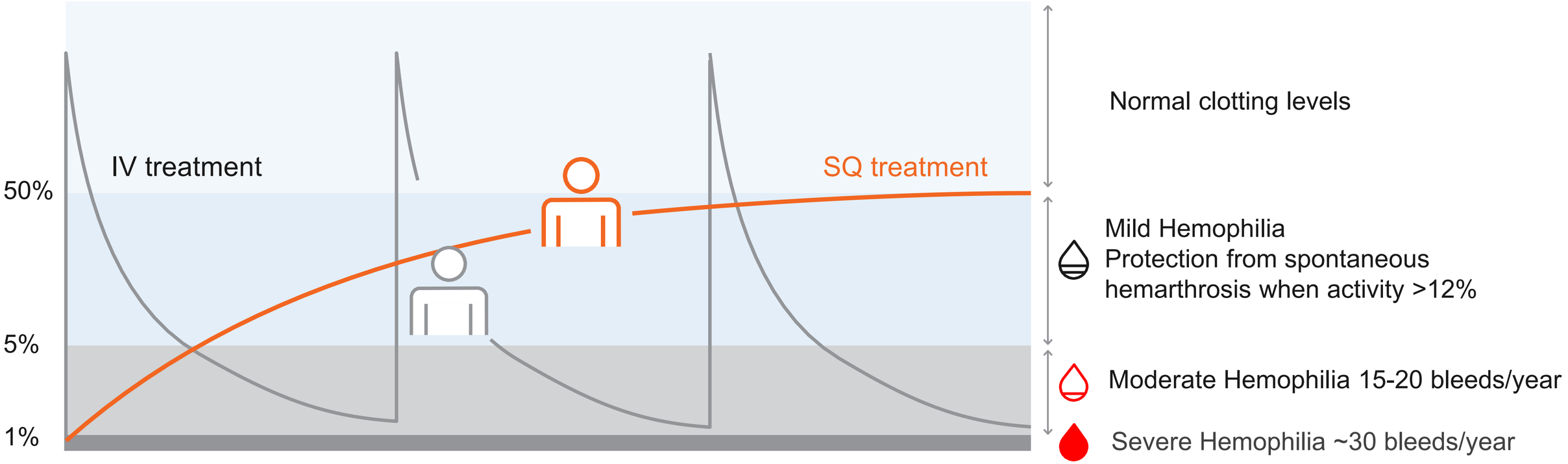
## Our highly potent candidates

+ Quick & simple SQ Injection
+ Allows for self-administration
+ Ideal for pediatric patients
+ Much higher & more stable factor levels
+ Keeps patients at protective levels continuously

# The new standard in hemophilia prophylaxis

Nasdaq: CBIO

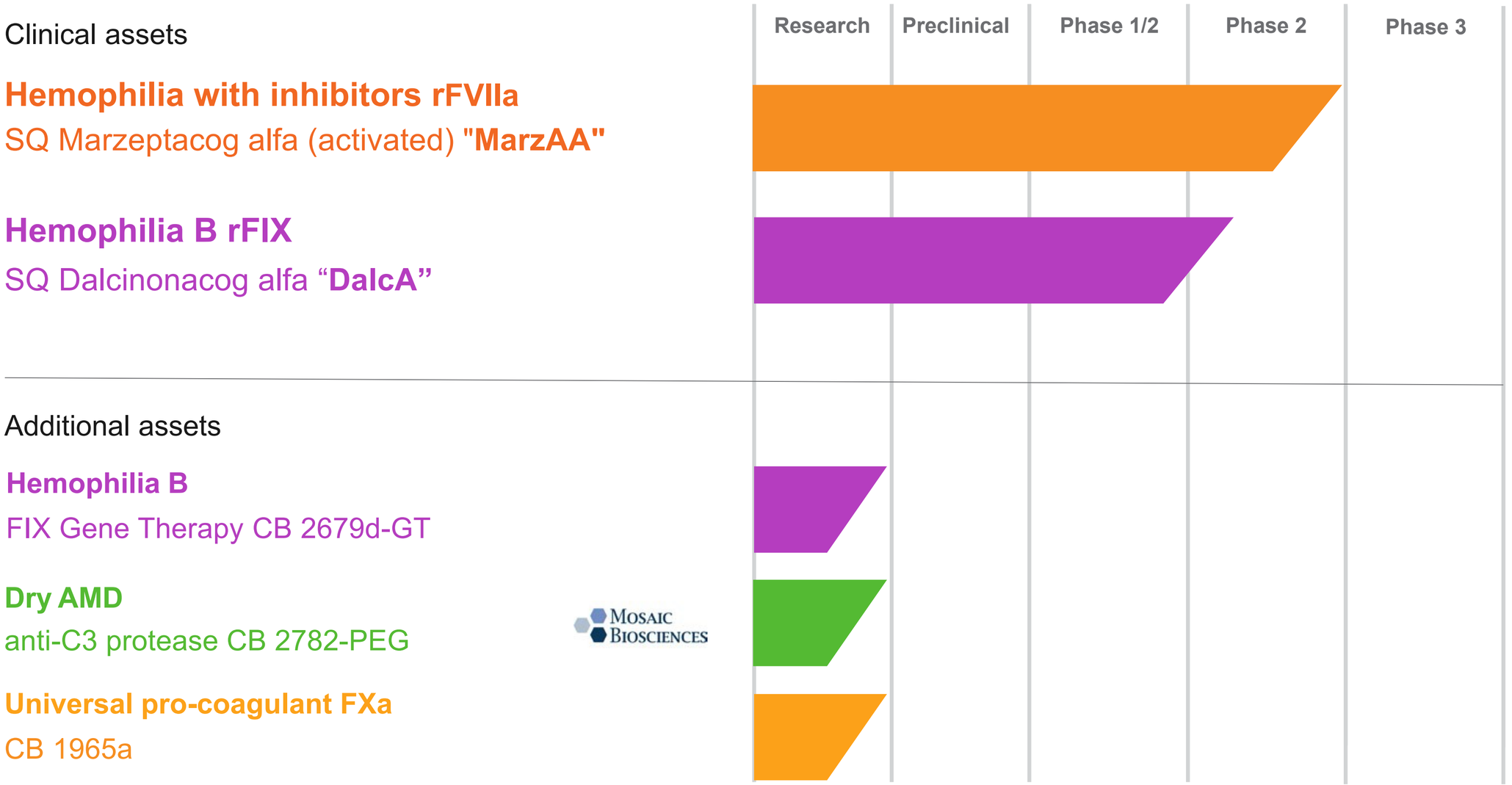
## Patients in high mild range are protected from spontaneous bleeds




- Our concept of prophylactic treatment is to keep severe & moderate hemophilia patients in the high mild range
- Subcutaneous factor treatments build up over time, offering long-term stability in clotting levels

# Pipeline

Nasdaq: CBIO



# Marzeptacog alfa (activated) – MarzAA



**Marzeptacog alfa (activated), a novel best in class SQ FVIIa product candidate**

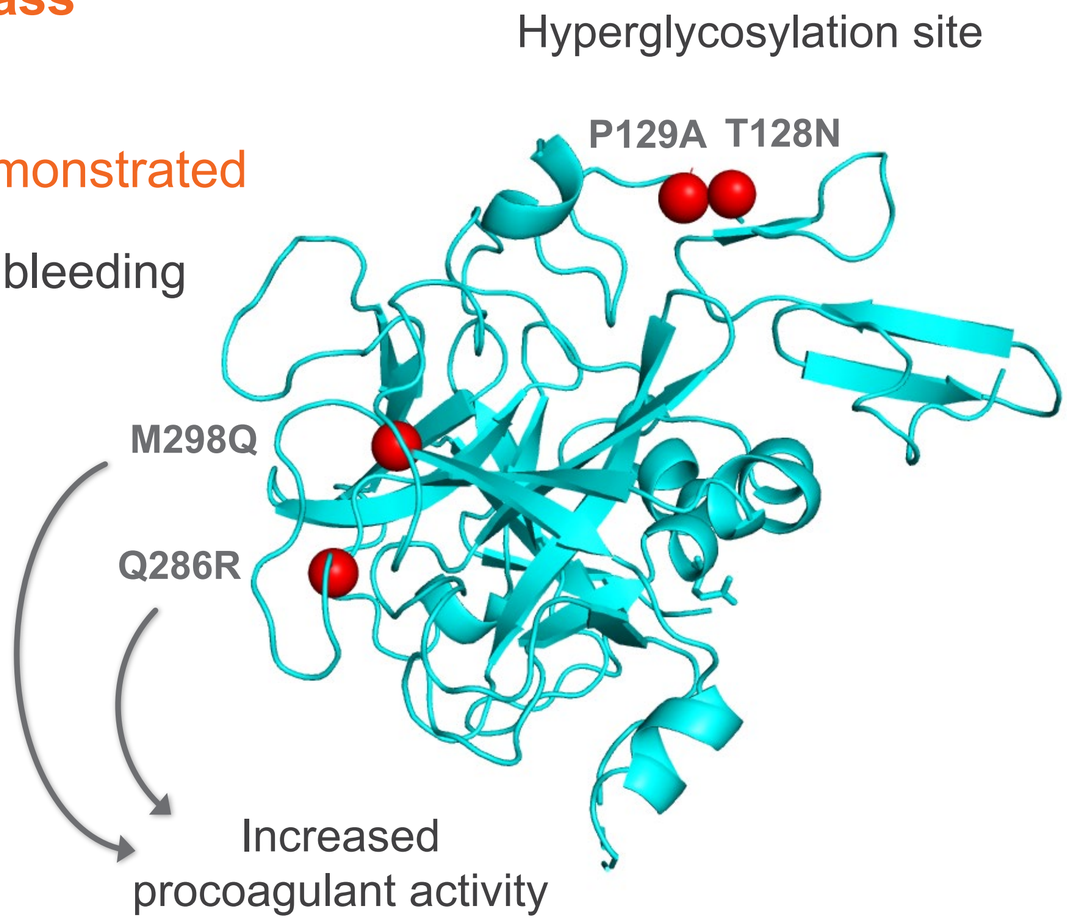
P2 completed – efficacy, safety and tolerability demonstrated

+ One drug solution for prophylaxis and treatment of bleeding
+ Maintains continuous protective levels
+ Disruptive to current intravenous bypass products
+ Especially well suited for children

Four engineered substitutions

+ Catalytic activity & half-life increased
+ 9-fold more potent than NovoSeven RT

Orphan Drug Designation in US & EU

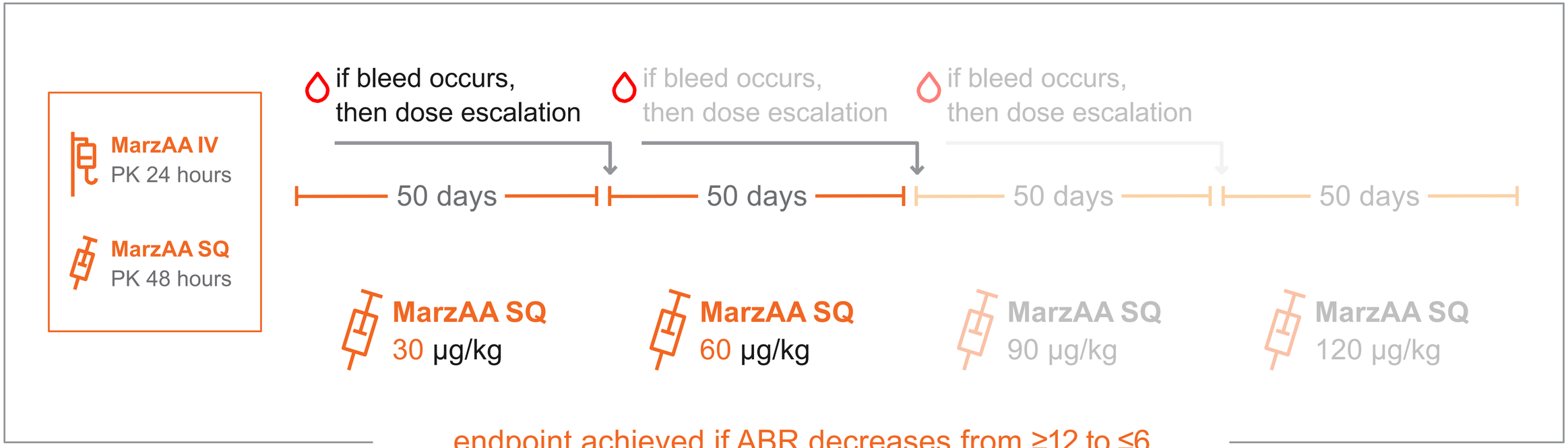


# MarzAA phase 2/3 SQ clinical trial design



+ Individualized dose escalation if needed

+ Enrollment & dosing completed




endpoint achieved if ABR decreases from ≥12 to ≤6

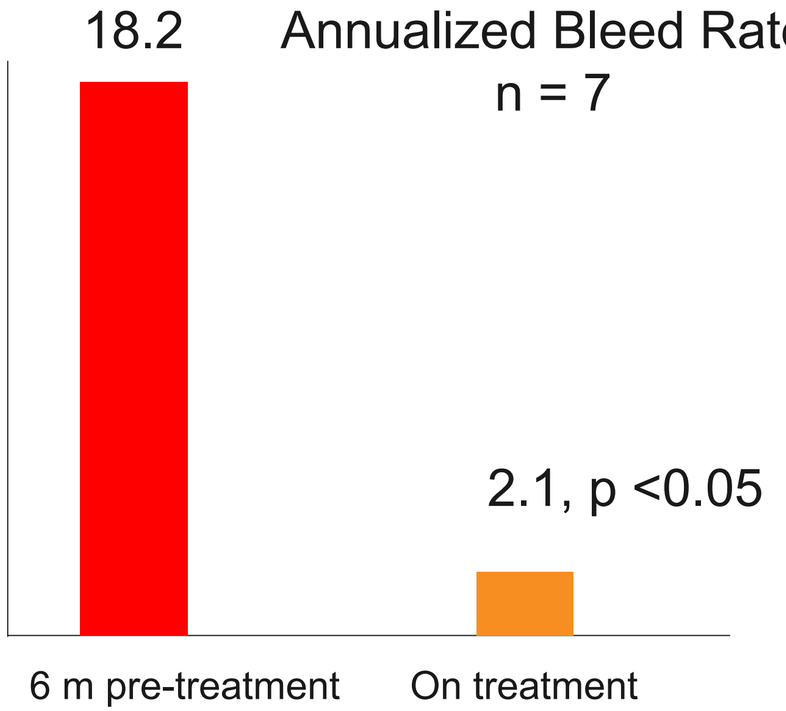
+ Open label SQ study with individual dose escalation if needed
+ Hemophilia A or B with inhibitors
+ Patients with documented annual bleeding rate (ABR) >12

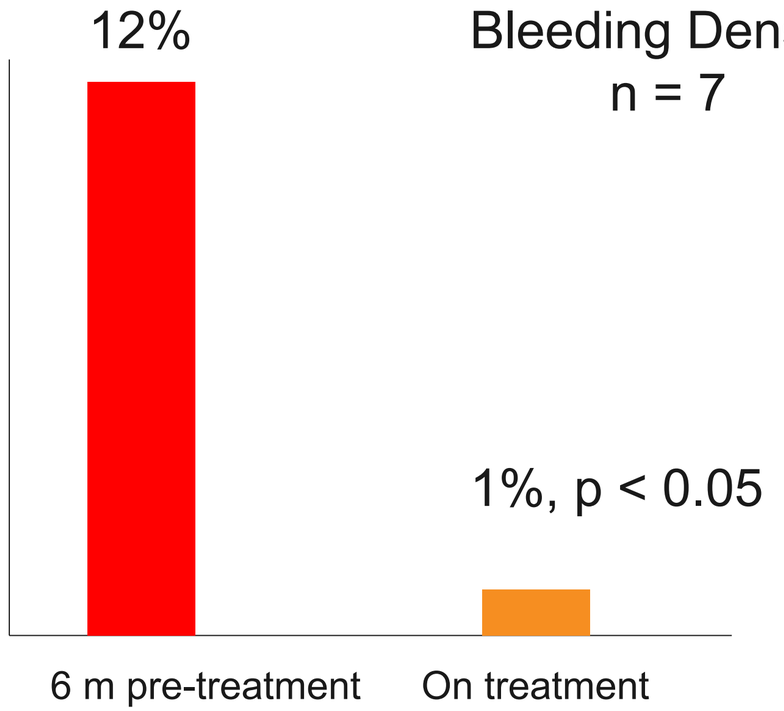
+ Primary endpoint: reduction in annualized bleed rate **at final dose level**
+ Secondary endpoints: safety and tolerability, no inhibitor formation

# MarzAA P2 clinical efficacy: >90% reduction in bleeding

Nasdaq: CBIO

+ Annualized bleeding rates (ABR) **reduced from 18.2 to 2.1 (5 of 7, no bleeds for 50 days)**
+ Bleed density significantly **reduced from 12% to 1%**
+ Safe & well tolerated, **~1% ISRs (>450 doses) & no ADAs or nAbs**
+ Top dose = 60 μg/kg (2/7 subjects)




Levy *et al.* EAHAD 2019

# MarzAA revenue forecast >$400M worldwide



## Target Product Profile Resonates Strongly Across Multiple Indications with US & EU KOLs

| | |
|---|---|
| Hemophilia B with Inhibitors | “I would use SQ MarzAA in all of my Hemophilia B Inhibitor patients” |
| Hemophilia A with Inhibitors | “IV or SQ MarzAA would be ideal for Hemlibra bleeds and non-responders” |
| Factor VII Deficiency | “I would use SQ MarzAA in my severe FVIID patients today” |
| Acquired Hemophilia | “SQ MarzAA may be ideal to treat the bleed and then provide prophylaxis” |

# Marzeptacog alfa (activated)



## Phase 3 registration study to initiate in 2020

- Clinical efficacy & tolerability demonstrated
- Final clinical data at ISTH, July 2019
- Subcutaneous dose escalation PK study initiated, final data in Q4
- Pivotal trial guidance obtained from EMA & MHRA – FDA end-of-phase 2 meeting in late 2019

# Dalcinonacog alfa – DalcA



## Novel clinical stage SQ FIX product candidate differentiated from IV market leaders

### Phase 1/2 completed

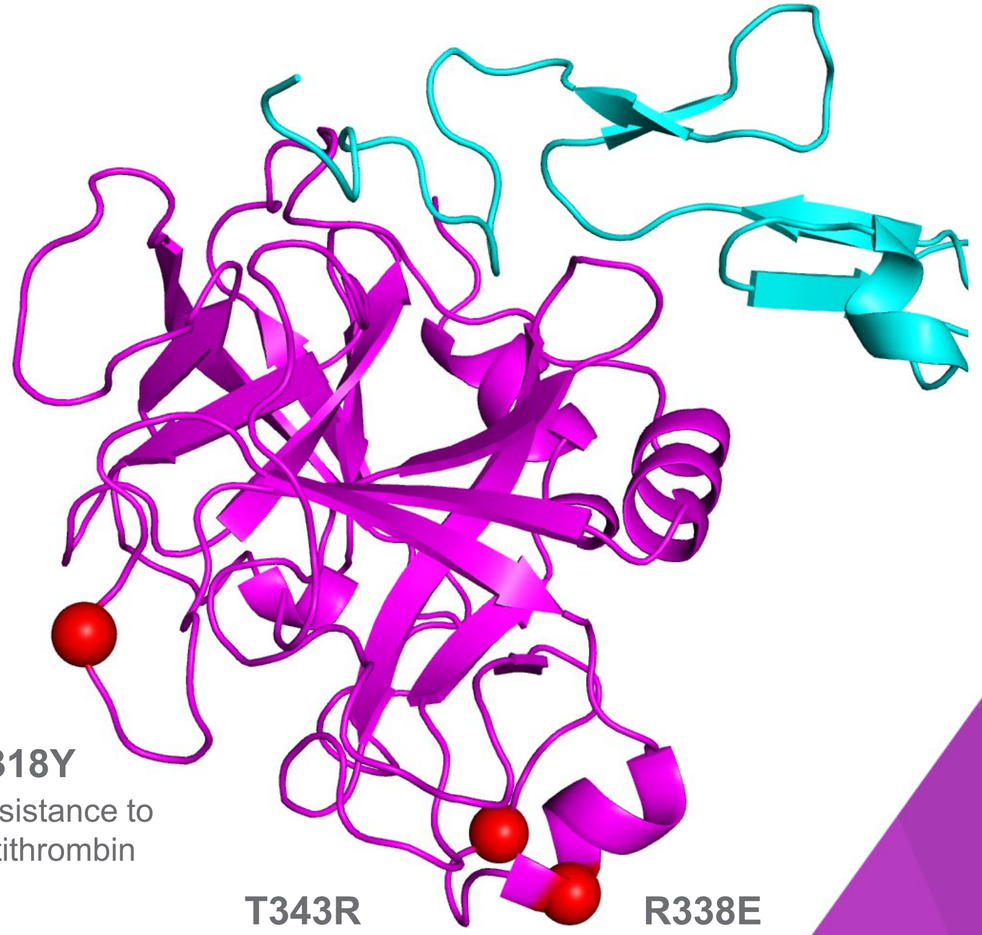
+ 22-fold more potent than BeneFIX in man
+ Maintains continuous protective FIX activity levels of 12 – 30%
+ 2 nAbs observed that are non-cross-reactive to FIX, both returned to previous FIX therapy, no safety issue
+ Disruptive to all intravenous products

### Immunogenicity assessment completed

+ Similar low potential risk as for BeneFIX
+ Drug product quality is comparable to commercial FIX products
+ KoL & regulatory agreement on proceeding to Phase 2b

### Phase 2b study initiated

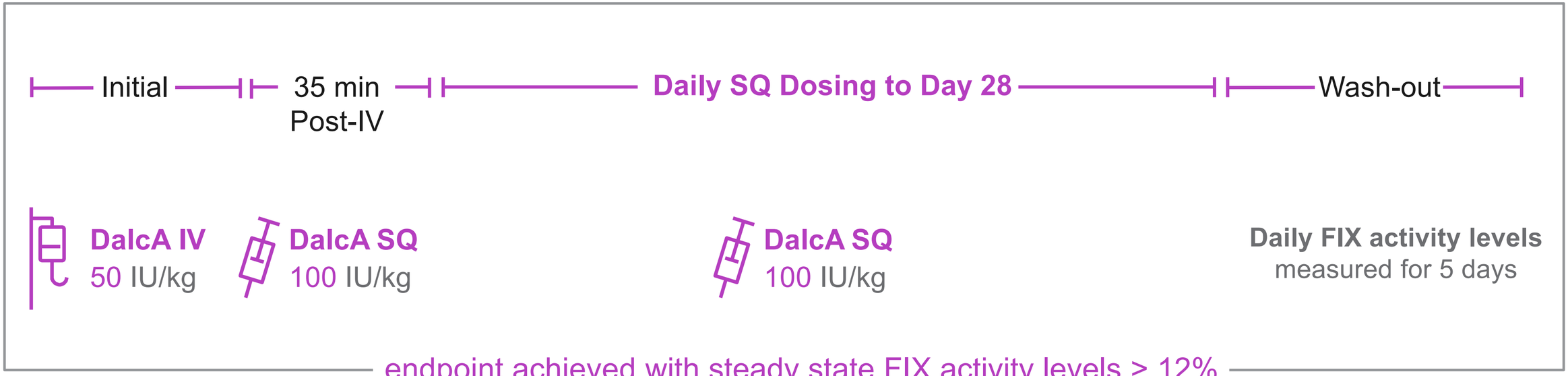
### Orphan Drug Designation in US & EU



# Dalcinonacog alfa phase 2b SQ clinical trial design

Nasdaq: CBIO

## DLZ-201 enrolling




+ Enrollment: 6 patients
+ Single IV dose followed by 28 day SQ dosing
+ Primary endpoint: Steady state FIX activity level above 12% with daily dosing
+ Secondary endpoints: safety, lack of neutralizing antibody formation, pharmacokinetics, pharmacodynamics

# CB 2679d-GT for gene therapy in hemophilia B

Nasdaq: CBIO

## Strategic asset for long-term portfolio development

## Superior preclinical efficacy of CB 2679d-GT *vs* Padua

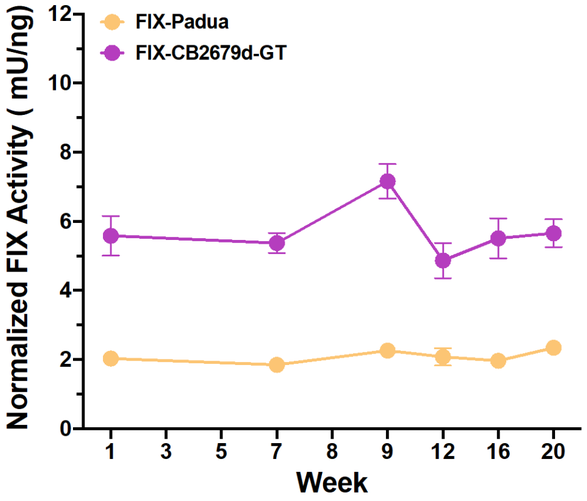
Compared AAV gene therapy efficacy of CB 2679d-GT *vs* FIX-Padua in hemophilia B mice

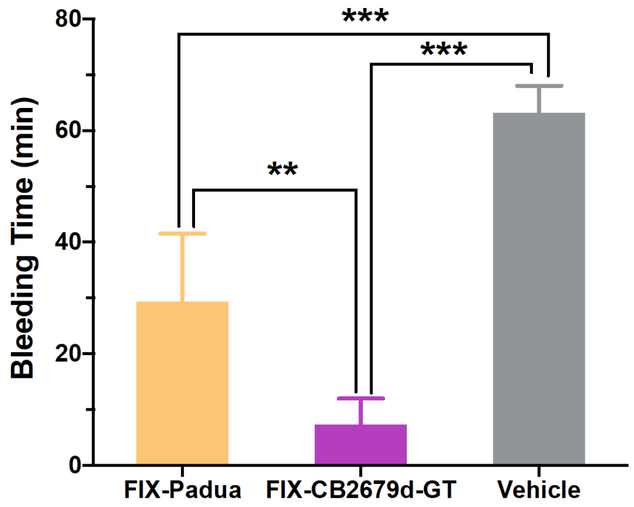
+ Antigen and activity levels elevated throughout the study, no nAbs
+ 3-fold superior FIX activity
+ 4-5 fold reduction in bleeding time, more rapid and robust hemostatic correction of bleeding with reduction in bleeding time
+ Potential for higher activity levels & lower vector dose could improve efficacy, safety & manufacturing cost

Wholly-owned & issued patents

Optimizing construct in 2019

+ AAV license from and sponsored research at Stanford University School of Medicine




Bleeding time +/- SD (*** P<0.001, ** P<0.01)
High vector dose group: $1x10^{10}$ vg/mouse

Blouse *et al.* EAHAD 2019

# Dalcinonacog alfa – DalcA



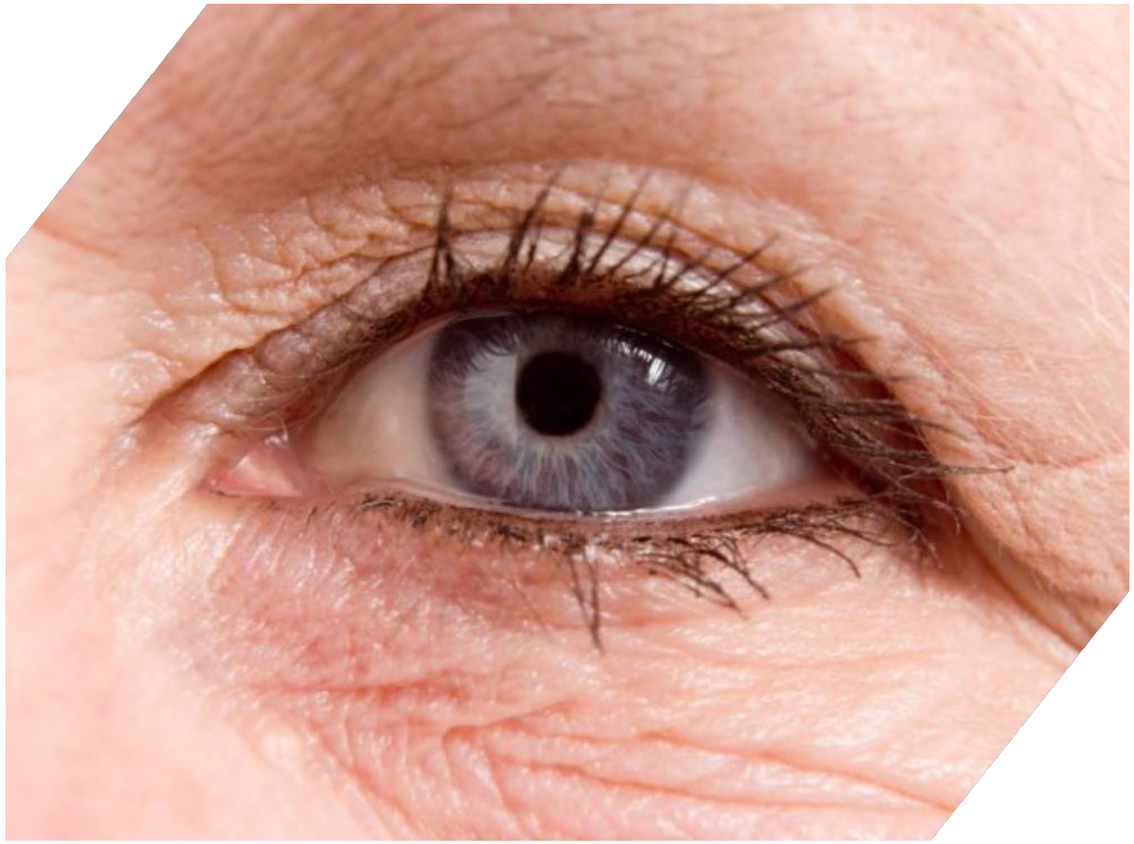
## Phase 2b clinical development initiated

- P1/2 clinical efficacy & tolerability demonstrated
- Interim Phase 2b data in Q3 2019
- KOLs & subject experts agree with low immunogenicity risk assessment
- No nAbs in gene therapy expression of the DalcA sequence

# CB 2782-PEG anti-complement factor 3 (C3) protease

Nasdaq: CBIO

## Geographic Atrophy in Dry AMD



- Geographic atrophy is an advanced stage of dry age-related macular degeneration that results in the irreversible loss of retina and leads to blindness;
- Dry AMD affects a million people in the United States and over five million people worldwide
- Global market is estimated at >$5B with no approved drugs
- C3 is the only clinically validated target for the treatment of Dry AMD

Sources: National Eye Institute. Facts About Age-Related Macular Degeneration, Tufail 2015, The Eye Diseases Prevalence Research Group 2004, GlobalData

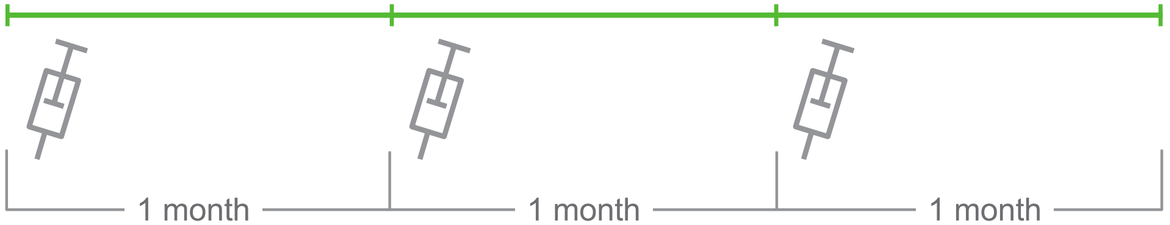
# CB 2782-PEG long acting anti-C3 protease

Nasdaq: CBIO

## Best-in-class anti-C3 profile for the treatment of geographic atrophy in dry AMD

**CB 2782-PEG** intravitreal injection


**APL-2** intravitreal injections



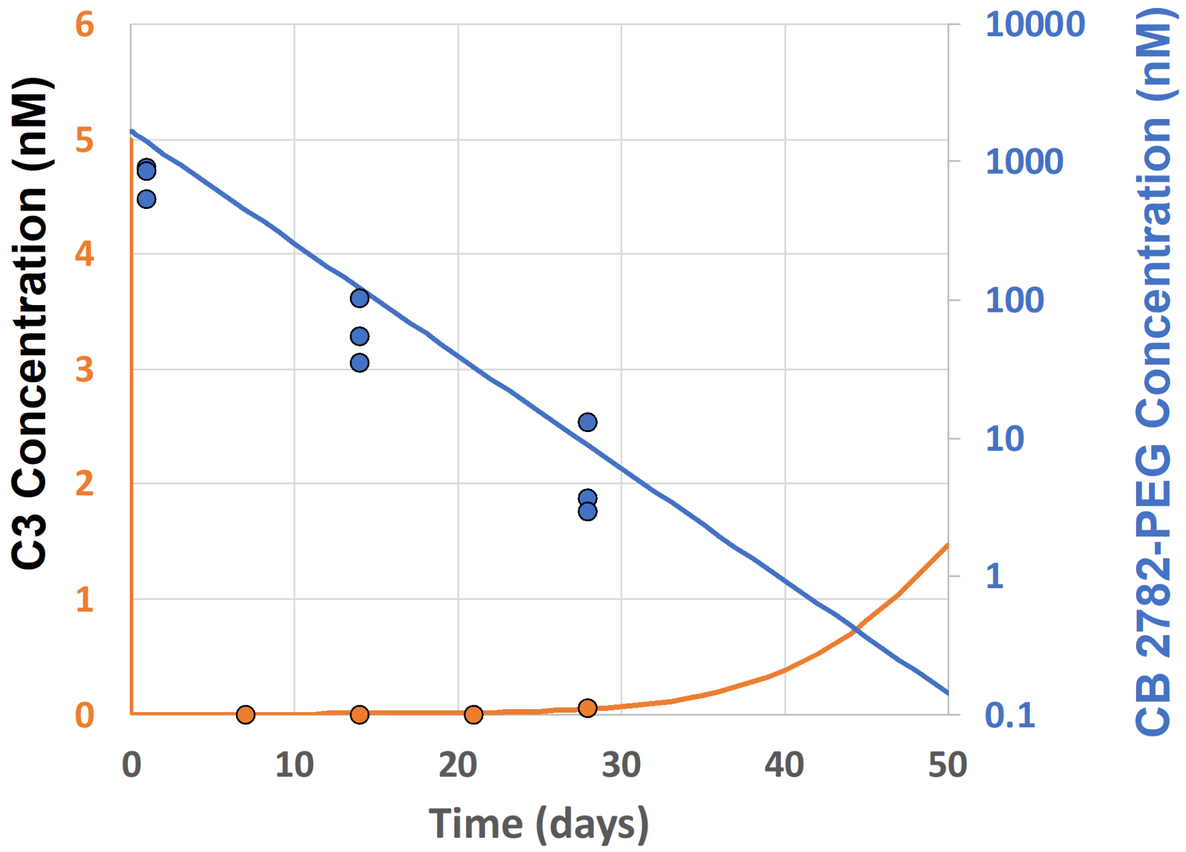

- Potent, selective and long acting anti-C3 protease that degrades C3 into inactive fragments
- Single 125 µg intravitreal injection of CB 2782-PEG achieved complete, rapid and sustained pharmacodynamic inhibition (>99%) of vitreous humor C3 for at least 28 days in non-human primates
- Preclinical PK and PD data predict best-in-class human intravitreal dosing three or four times a year

# CB 2782-PEG long acting anti-C3 protease

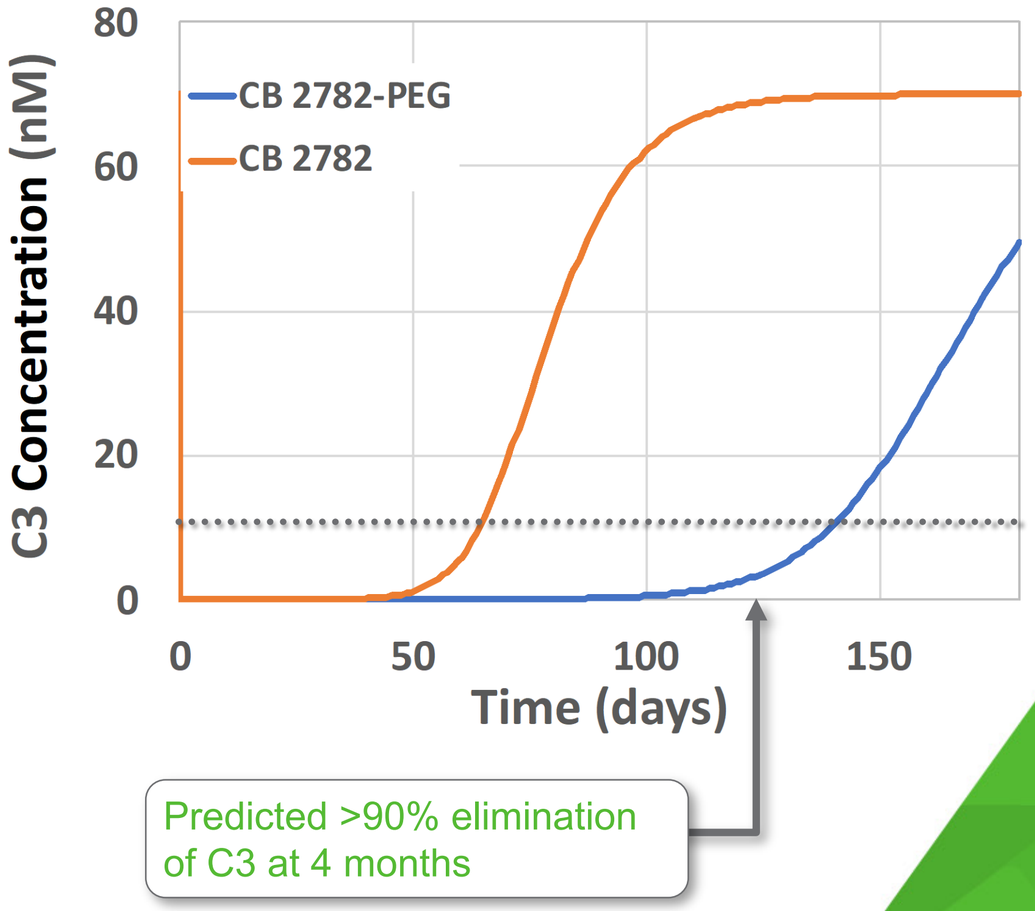
Nasdaq: CBIO

## Best-in-class anti-C3 profile for the treatment of geographic atrophy in dry AMD

### Non-Human Primates




### Human Modeling



# 2019 Milestones



| | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| **MarzAA** (FVIIa) | **P2 efficacy Enrollment complete** | **Initiate P1 PK/PD** | **Final P2 Data** | **P1 PK/PD data**<br>**FDA EoP2 A/B Inhibitors** |
| **DalcA** (FIX) | **Initiate P2b** | | **P2b data** | **Final P2b data** |
| **CB 2679d-GT** (FIX) | **Preclinical efficacy** | | | |
| **CB 2782-PEG** (dAMD) | | **Ocular EHL PK/PD** | | |

# Financial information

Nasdaq: CBIO

## Selected data

| Financial results | Q1 2019 |
|---|---|
| Cash & Cash Equivalents | $105.3 M |
| Operating Expense | $15.7 M |
| Net Loss | ($15.1M) |
| Net Loss per share | ($1.26) |

| YE 2019 Full Year Estimate |
|---|
| ~$70M |
| ~$56M |

### Share data

| | |
|---|---|
| Common Stock Outstanding | 11,974,104 |
| Officer & Director ownership | 8.1% |
| Fully Diluted Shares* | 14,628,625 |
| Average Volume | 212,900 |
| Market Capitalization as of 31 May 2019 | $95 M |

* Includes ~1M options available for issuance

# Summary



## Disruptive approach to a $3.7 billion market

Subcutaneous prophylactic dosing of novel factors is less painful, more convenient and potentially more efficacious, especially for children – **Clinical efficacy demonstrated for both MarzAA & DalcA**

### FVIIa: MarzAA ~$2.2 Billion market

>90% reduction in ABR & bleed density in P2

No ADAs or nAbs observed to date

+ Final P2 data available at ISTH, July 2019
+ Pivotal trial guidance obtained from EMA
+ FDA EoP2 in 2019, P3 in 2020

### Anti-C3 dAMD: CB 2782-PEG >$5B market

Preclinical long acting anti-C3 protease with best-in-class profile; anticipated intravitreal dosing 3 to 4 times per year

### FIX: DalcA >$1.5 billion market

High mild, >30% activity levels achieved

Most advance SQ FIX in the clinic

+ Phase 2b initiated
+ Phase 2b safety & efficacy data in Q3/Q4 2019

### FIX: CB 2679d-GT

Preclinical gene therapy asset with superior activity *vs* current clinical constructs

**Strong financial position, ~2 years cash runway**

# THANK YOU

**Nasdaq: CBIO**

**catalystbiosciences.com**

CATALYST BIOSCIENCES