

A large, circular graphic on the left side of the slide. Inside the circle is a silhouette of a person standing on a rock, pointing their right arm towards the sky. The background of the circle is a vibrant image of the Milky Way galaxy, with a mix of purple, blue, and orange hues. The circle is set against a white background with a large, curved purple shape on the left.

Astria Therapeutics Q3 2021

November 10, 2021

Forward Looking Statements

This presentation and various remarks we make during this presentation contain forward-looking statements of Astria Therapeutics, Inc. (“Astria,” the “Company,” “we,” “our” or “us”) within the meaning of applicable securities laws and regulations, including statements with respect to: our future expectations, the potential benefits of the merger between the Company and Quellis Biosciences, Inc. (the “Merger”); our cash runway; the potential timing for the filing of an IND for STAR-0215; the status and anticipated plans and timelines for the early stage clinical trials of STAR-0215, including the anticipated timing of the initial results from the Phase 1 clinical trial and that such results may establish clinical proof of concept for STAR-0215; the potential for STAR-0215 being the best-in-class and most patient friendly preventative treatment option for HAE, and its potential attributes and differentiated profile as a potential treatment option for HAE; the potential commercial opportunity for STAR-0215; advancing a second program; and the Company’s broader goal to meet the unmet needs of patients with rare and niche allergic and immunological diseases. We use words such as “aims,” “anticipate,” “believe,” “estimate,” “expect,” “goals,” “hope,” “intend,” “may,” “opportunity,” “plan,” “predict,” “project,” “target,” “potential,” “would,” “vision,” “can,” “could,” “should,” “continue,” and other words and terms of similar meaning to help identify forward-looking statements, although not all forward-looking statements contain these identifying words. Actual results may differ materially from those indicated by such forward-looking statements as a result of various important factors, including risks and uncertainties related to our ability to recognize the anticipated benefits of the Merger; changes in applicable laws or regulations; the possibility that we may be adversely affected by other economic, business, and/or competitive factors, including the COVID-19 pandemic; risks inherent in pharmaceutical research and development, such as: adverse results in our drug discovery, preclinical and clinical development activities, the risk that the results of pre-clinical studies may not be replicated in clinical studies, the risk that we may not be able to enroll sufficient patients in our clinical trials on a timely basis, and the risk that any of our clinical trials may not commence, continue or be completed on time, or at all; decisions made by, and feedback received from, the U.S. FDA and other regulatory authorities, investigational review boards at clinical trial sites and other review bodies with respect to STAR-0215 and any other future development candidates; our ability to manufacture sufficient quantities of drug substance and drug product for STAR-0215 and any other future product candidates on a cost-effective and timely basis; our ability to obtain, maintain and enforce intellectual property rights for STAR-0215 and any other future product candidates; our potential dependence on collaboration partners; competition with respect to STAR-0215 or any of our other future product candidates; the risk that survey results and market research may not be accurate predictors of the commercial landscape for HAE and the anticipated position of STAR-0215 in HAE based on its pre-clinical profile; our ability to manage our cash usage and the possibility of unexpected cash expenditures; our ability to obtain necessary financing to conduct our planned activities and to manage unplanned cash requirements; the risks and uncertainties related to our ability to recognize the benefits of any additional acquisitions, licenses or similar transactions; and general economic and market conditions; as well as the risks and uncertainties discussed in the “Risk Factors” section of our Annual Report on Form 10-K for the period ended December 31, 2020, subsequent Quarterly Reports on Form 10-Q, and in other filings that we may make with the Securities and Exchange Commission. These forward-looking statements should not be relied upon as representing our view as of any date subsequent to the date of this presentation, and we expressly disclaim any obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

This presentation contains estimates and other statistical data made by independent parties and by us relating to market size and other data about our industry. This data involves a number of assumptions and limitations, and you are cautioned not to give undue weight to such data and estimates. In addition, projections, assumptions and estimates of our future performance and the future performance of the markets in which we operate are necessarily subject to a high degree of uncertainty and risk.

Introducing Astria Therapeutics



astriaTM
THERAPEUTICS

Our **mission** is to bring hope with life-changing therapies to patients and families affected by rare and niche allergic and immunological diseases.

Our **name** comes from the Greek word for star, and at Astria, patients are the stars that guide us. Their stories inspire us, their successes energize us, and their challenges give us purpose.

Our **stars** illuminate our work, creating an environment of transparency and openness that allows us to build trust with our partners and collaborators.

Investment Highlights

1

Astria is developing differentiated therapeutics for patients with rare and niche allergic and immunological diseases

2

Our lead program, **STAR-0215** (formerly QLS-215), is a monoclonal antibody inhibitor of plasma kallikrein for the preventative treatment of Hereditary Angioedema (HAE)

- Clinically validated mechanism with potential to be the most patient-friendly preventative therapy for HAE
- On track for STAR-0215 IND filing in mid-2022 and key initial proof of concept clinical data by year end 2022

3

Evaluating opportunities to expand our pipeline in allergic and immunological diseases

4

Experienced management team and Board backed by leading life science investors including top shareholders **Perceptive, RA Capital, Fairmount, Cormorant and Venrock**

5

Cash and cash equivalents of **\$131.8M¹** with expected cash runway through 2023 based on the current operating plan

6

18.3M total common shares outstanding (common shares and Series X Preferred) on an as-converted basis

Astria and STAR-0215 Program Updates

- **STAR-0215 is on track for initial Phase 1 clinical results expected by year end 2022**
- **Preclinical data presented at the American College of Allergy, Asthma and Immunology (ACAAI) Annual Scientific Meeting show:**
 - Plasma kallikrein binding affinity and plasma half-life are key drivers to prevent HAE attacks¹
 - STAR-0215 binds to plasma kallikrein *in vitro* with high affinity and inhibits its activity
 - STAR-0215 binds to a different site on plasma kallikrein than lanadelumab
 - YTE modifications in STAR-0215 extend the antibody plasma half-life in non-human primates
- **Findings on burdens of disease and treatment in HAE presented at the National Organization for Rare Disorders (NORD) Summit support substantial need to decrease patient burden**

Hereditary Angioedema: A Rare Disease with Unmet Need



DISEASE DESCRIPTION

- Hereditary angioedema (HAE) is a rare, autosomal dominant genetic disorder¹
- HAE is characterized by severe, unpredictable, painful, and sometimes life-threatening edema²



DISEASE PATHWAYS

- In HAE overproduction of bradykinin is the key mediator of vasodilation and angioedema
- Types I & II comprise the majority of HAE cases and are caused by defects in the C1 inhibitor gene¹



PATIENT DEMOGRAPHICS

- 1 in 10,000-50,000 people; <8,000 people in the US^{1,3}
- Average age of onset 11 years⁴; estimated more than 8 years until definitive diagnosis,⁵ typically by allergist/immunologist

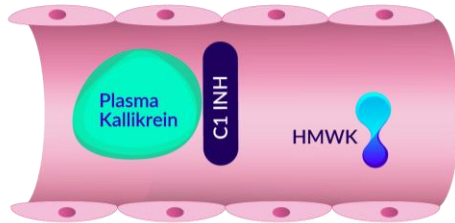


TREATMENT AND UNMET NEED

- HAE is treated with preventative therapies to reduce the frequency of attacks and on-demand therapies to reduce attack severity
- Unmet need exists for effective preventative therapies with lower treatment burden
- Global market for HAE treatment is estimated to grow from \$2B in 2020 to over \$4.5B by 2026⁶

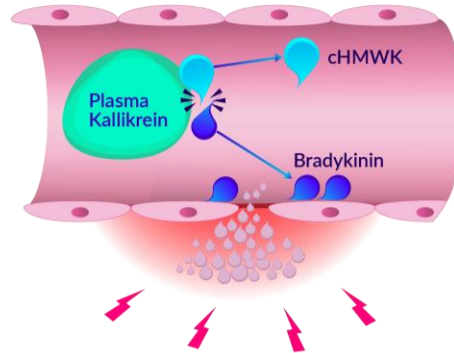
STAR-0215 Aims to Prevent Attacks in HAE

Healthy Blood Vessel



C1 Inhibitor blocks function of plasma kallikrein.

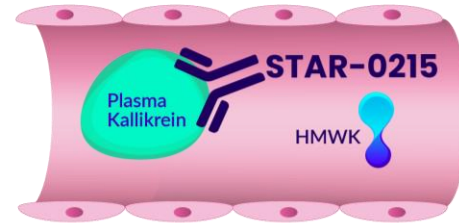
HAE Mechanism of Disease



Missing C1 Inhibitor allows plasma kallikrein to process HMWK, generating cleaved HMWK (cHMWK) and releasing bradykinin.

Bradykinin then binds to receptors allowing fluid to leak through blood vessel walls and causing edema/pain.



STAR-0215 Goal



STAR-0215 inhibits/blocks plasma kallikrein, even in the absence of C1 Inhibitor, reducing bradykinin production and preventing edema/pain.

Inhibition of Plasma Kallikrein is a Validated Therapeutic Approach for HAE

Plasma Kallikrein Inhibitors for the Preventative Treatment of HAE

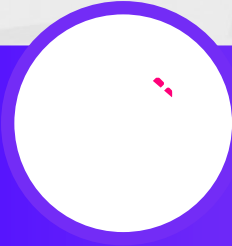
Product	Administration	Mean attack reduction ¹	% of attack-free patients	Peak sales projections
Lanadelumab	1-2x/month 	73-87%	31-44% ² (26 weeks)	\$1.8-2B ⁴ (by 2024)
Berotrastat	1x/day 	30-44%	2-8% ³ (24 weeks)	>\$500M ⁵

STAR-0215: Our Lead Asset



OUR LEAD ASSET

STAR-0215:
potential to be most
patient-friendly
preventative treatment
option for HAE



OUR APPROACH

Developing **STAR-0215** to
be a long-acting
monoclonal antibody
inhibitor of plasma
kallikrein dosed once every
3 months or longer

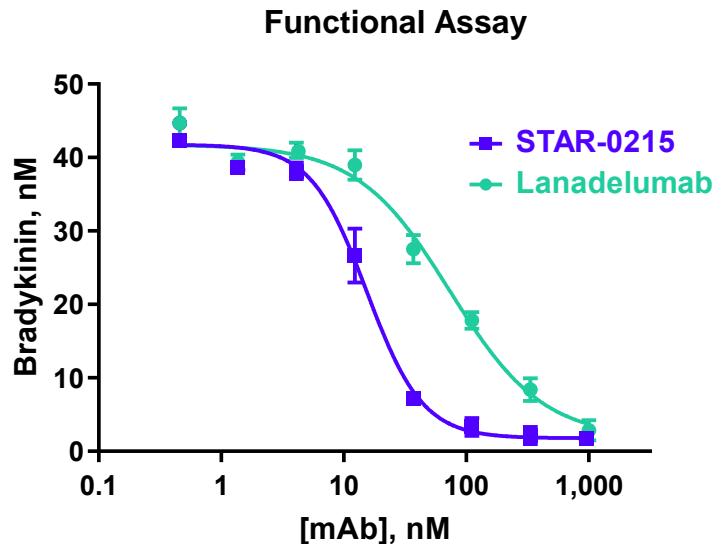


OUR NEAR-TERM VALUE DRIVERS

Opportunity for clinical
proof of concept for
differentiated product
in Phase 1 with initial
results anticipated by
year end 2022

STAR-0215 Shows High Potency Inhibition of Plasma Kallikrein

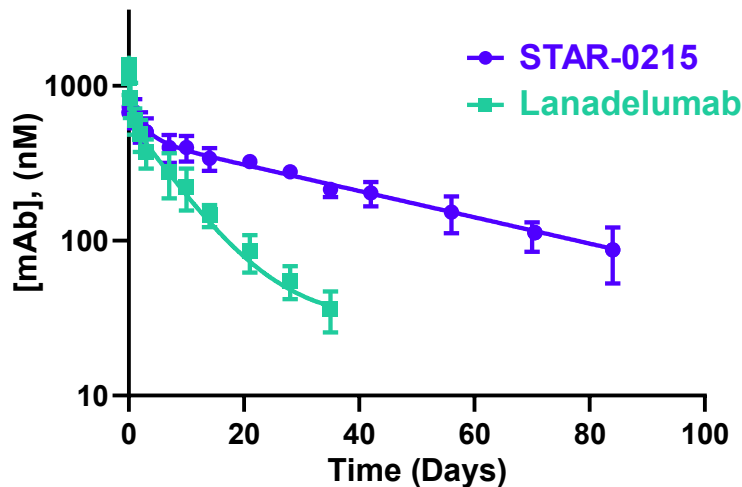
- **STAR-0215** binding affinity for plasma kallikrein is ~10-fold greater than lanadelumab
- **STAR-0215** binds a different site on plasma kallikrein than lanadelumab
- **STAR-0215** is ~10-fold more potent at inhibiting enzymatic activity by 90% than lanadelumab
 - ~90% inhibition of plasma kallikrein is estimated to be required to optimally reduce HAE attack rate and maximize attack free duration
- Lanadelumab potency consistent with plasma levels required for clinical efficacy



STAR-0215 was more potent than lanadelumab in inhibiting bradykinin production in an *in vitro* assay

STAR-0215 Has Shown Substantially Prolonged Plasma Half-Life Compared to Lanadelumab in Non-Human Primates

PK in Non-Human Primates

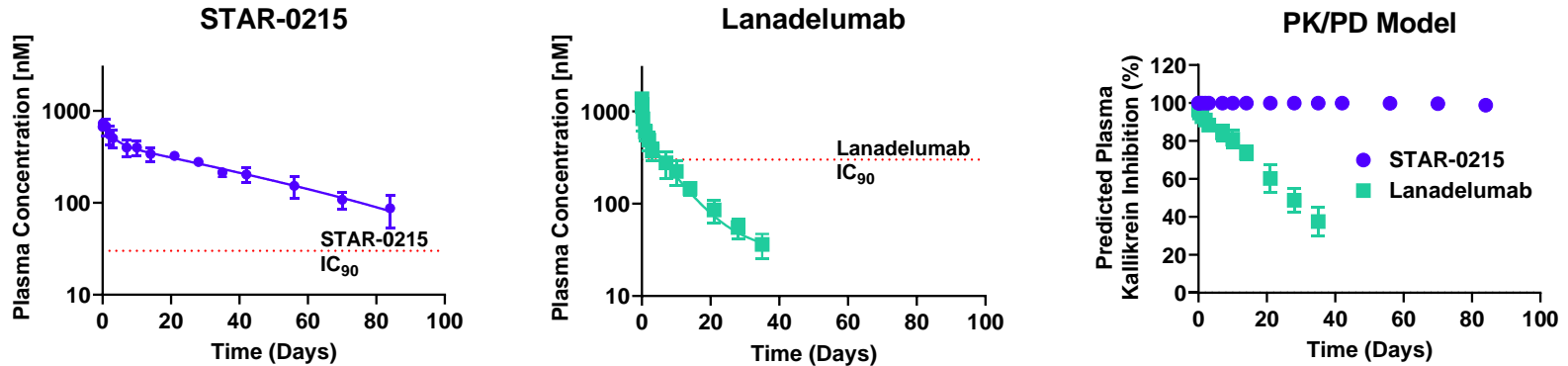


STAR-0215 engineered with YTE half-life extension technology

- Enhanced FcRn binding translated to a more than three-fold increase in plasma half-life with STAR-0215 compared to an antibody without YTE modifications
- Half-life of other mAbs with YTE modifications
 - Non-human primates: 20 – 40 days
 - Humans: 70 – 120 days

	Lanadelumab	STAR-0215
Mean non-human primate half-life in days (SD)	10.5 (1.6)	33.6 (8.3)

Preclinical PK/PD Model Predicts Longer Duration of Action for **STAR-0215**



- Model based on plasma concentrations from cynomolgus monkey pharmacokinetic studies and human plasma kallikrein inhibition determined in *in vitro* functional assay

Planned STAR-0215 Phase 1 Study Design

On Track for Initial Proof of Concept Data YE 2022

Goals for initial Proof of Concept trial:

- Demonstrate safety
- Establish prolonged half-life
- Demonstrate prolonged inhibition of plasma kallikrein activity
- Refine dose and dosing regimen for future studies in HAE patients

- **Population:**
 - Normal Healthy Volunteers (NHVs)
- **Study Design:**
 - Single ascending dose in NHV cohorts
 - Multiple doses to be explored
- **Endpoints:**
 - Safety and tolerability
 - Pharmacokinetics – antibody half-life
 - Pharmacodynamics – inhibition of plasma kallikrein

STAR-0215

Opportunity for Most Patient-Friendly Preventative Treatment Option

STAR-0215 Goals	Potential Benefits	Status
High potency for plasma kallikrein	<ul style="list-style-type: none">Long duration without breakthrough attacksSmall injection volume	✓
Extended plasma half-life	<ul style="list-style-type: none">Infrequent dosing once every 3 months or longer, without breakthrough attacks	✓
Clinical proof of concept	<ul style="list-style-type: none">Establish differentiated product profile	Initial results expected by year end 2022
Differentiated, best-in-class new preventative therapy for HAE	<ul style="list-style-type: none">Trusted modality to provide patients with improved quality of life	

Potential for most patient-friendly preventative treatment option based on data generated to date and the existing HAE treatment landscape

Recent Publications Highlight Unmet Need for Improved HAE Treatments

Published Findings



HAE Patients

Patient-reported burden of hereditary angioedema: findings from a patient survey in the United States

Aleena Banerji, MD^{*}; Kimberly H. Davis, MS, RPh[†]; T. Michelle Brown, PhD[‡]; Kelly Hollis, MBA[§]; Shannon M. Hunter, MS[§]; Janet Long, MSLIS[§]; Gagan Jain, PhD[§]; Giovanna Devercelli, PhD[§]

Ann Allergy Asthma Immunol 124 (2020) 600–607

- Despite availability and use of preventative treatments, HAE patients continue to have a high frequency of attacks and high rate of anxiety and depression.
- The burden of disease impacts healthcare resource use and interferes with patients' daily lives



HAE Treators

Current medical management of hereditary angioedema
Follow-up survey of US physicians

Marc A. Riedl, MD^{*}; Aleena Banerji, MD[†]; Richard Gower, MD[‡]

Ann Allergy Asthma Immunol 126 (2021) 264–272

- Although patient satisfaction with treatment options has increased in recent years, most physicians consider their patients to be “somewhat satisfied” and interested in participating in future clinical trials.

STAR-0215's Target Efficacy and Dosing Has Potential to Address Unmet Need

Our Findings



HAE Patients

- On average, patients had tried 2-3 preventative treatments, most often switching for more convenient administration
- All patients interviewed would be compelled to switch from their current therapy if a new therapy offered similar efficacy with less frequent dosing



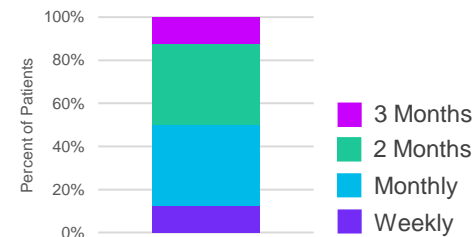
Patient Interview Results presented at the NORD Virtual Summit Oct 18-19, 2021



HAE Treaters

- Clinicians reported that 65-75% of their HAE patients are “moderate” or “severe” and are prescribed preventative therapy
- Many clinicians considered STAR-0215's profile as the next generation of HAE treatment and most would discuss it with all of their HAE patients

Dosing Frequencies That Would Compel a Therapy Switch



“[if this were available], this would be my first choice. I’ve looked through all the products [in development], this is the first one which is really exciting. This is a generation leap; anybody who is on medication now either daily, every three days, or every two or four weeks, why wouldn’t they want to do this?”

– HAE Prescriber⁴

Astria (Nasdaq ATXS) Well-Positioned for the Future

STRONG FINANCIAL FOUNDATION

- As of 9/30/2021, the Company had \$131.8 million in cash and cash equivalents which is expected to fund the current operating plan through 2023

CAPITALIZATION STRUCTURE

Company Capitalization Structure As of September 30, 2021 (split-adjusted)

Converted Common Shares

Common stock outstanding

13,009,477

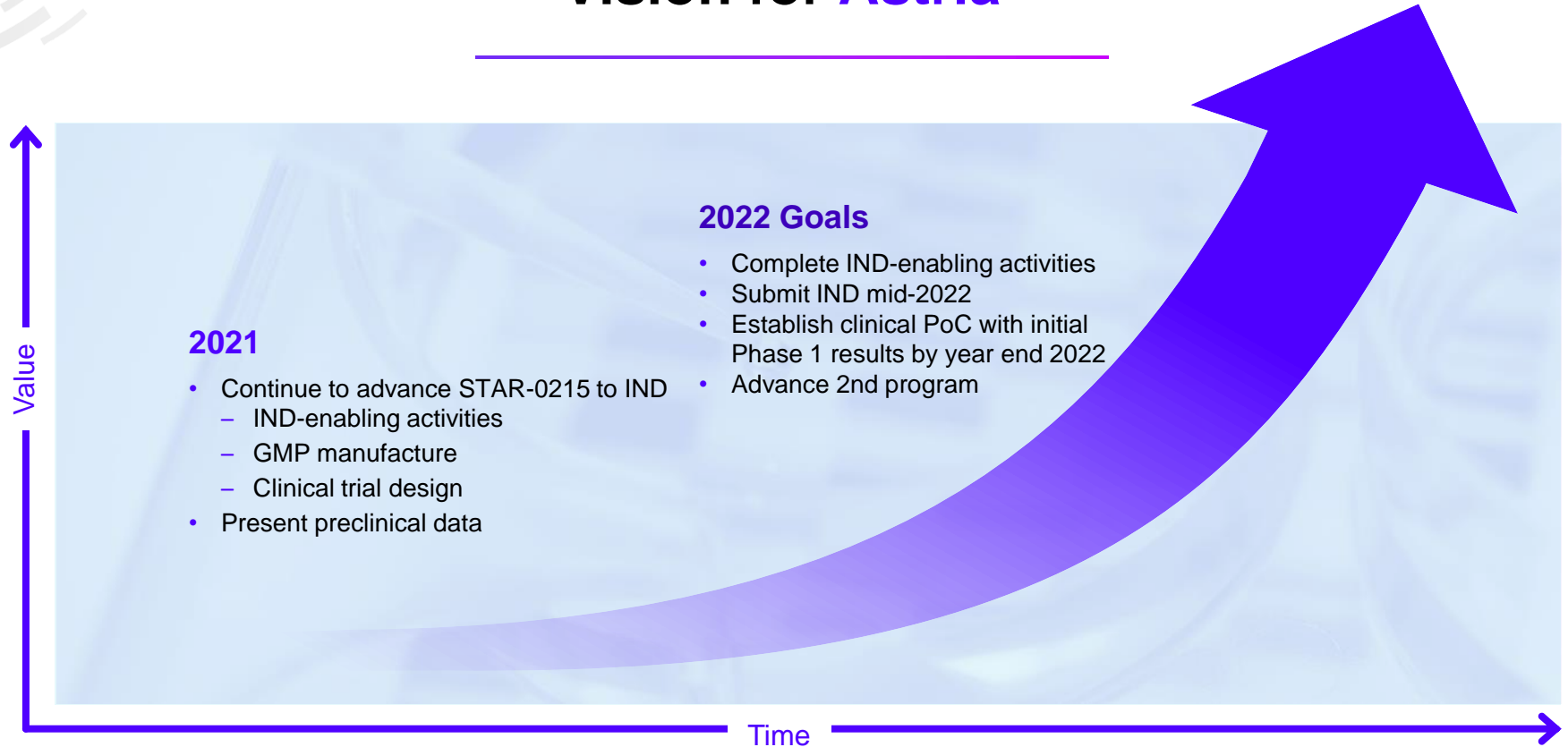
Common stock underlying outstanding Series X Preferred
Stock

5,242,501

Adjusted Common stock outstanding ⁽¹⁾

18,251,978

Vision for Astria





astria
THERAPEUTICS