Alterity Therapeutics

(NASDAQ:ATHE, ASX:ATH)

David Stamler, MD
CEO

November 2022

Forward Looking Statements

This presentation may contain some statements that may be considered “Forward-Looking Statements”, within the meaning of the US Securities Laws. Thus, any forward-looking statement relating to financial projections or other statements relating to the Company’s plans, objectives, expectations or intentions involve risks and uncertainties that may cause actual results to differ materially. For a discussion of such risks and uncertainties as they relate to us, please refer to our 2022 Form 20-F, filed with US Securities and Exchange Commission, in particular Item 3, Section D, titled “Risk Factors.’’

Alterity is dedicated to creating an alternate future for people living with neurodegenerative diseases.

Alterity means **the state of being different**

Our goal is to **modify the course of disease**

We’re here to **disrupt the trajectory** of illness and improve quality of life

Investment Highlights

- Developing disease modifying therapies
- Novel drug candidate targeting proteins implicated in neurodegeneration of Parkinson's Disease and related disorders
  - First indication: Multiple System Atrophy (MSA), a devastating disease with no approved treatments
  - Orphan Drug designation in the U.S. and EU
  - Phase 2 clinical trial ongoing
- Strong patent portfolio
- Significant R&D experience including 3 neurology drug approvals by US FDA

Experienced Leadership Team with Multiple FDA Approvals in Neurology

David Stamler, M.D.

Chief Executive Officer

Auspex/Teva | Abbott | Prestwick Xenoport | Fujisawa

- **3 FDA Approvals in Neurology**
- Former CMO, Auspex
- VP, Clinical Development & Therapeutic Head, Movement Disorders, Teva Pharmaceuticals
- Part of Teva's US$3.5 billion acquisition of Auspex in 2015
- Led development of AUSTEDO® (deutetrabenazine) for treatment of Huntington disease and Tardive dyskinesia, both approved in 2017

Kathryn Andrews, CPA

Chief Financial Officer

Antisense Therapeutics | Rio Tinto | Consultant

- Extensive experience advising private and public CFOs, mainly in the biotechnology sector
- Prior CFO and Company Secretary of Antisense Therapeutics Limited
- 15+ years in finance and accounting roles at Rio Tinto Limited and BP Australia Limited

Margaret Bradbury, Ph.D.

VP, Nonclinical Development

Auspex/Teva | Neurocrine | Merck

- Auspex - led strategic planning and program management in Huntington Disease chorea from IND through NDA filing
- Teva - led non-clinical development of several neuroscience programs

Cynthia Wong, M.P.H.

Senior Director, Clinical Operations

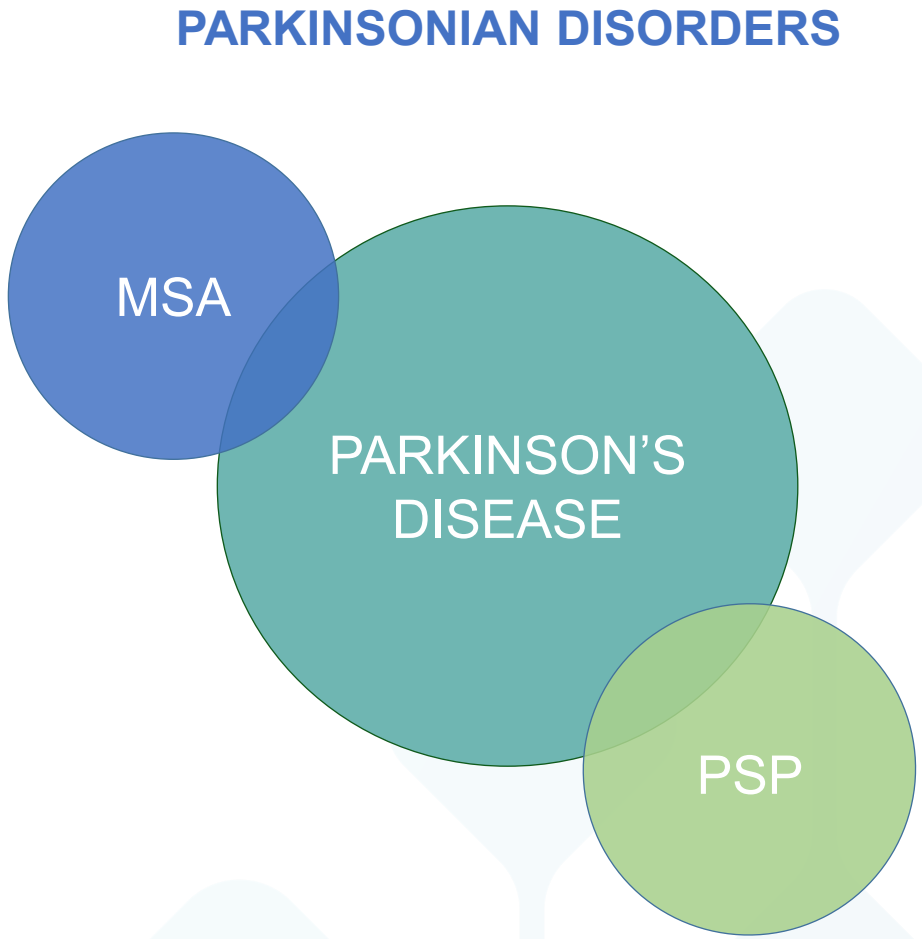
Auspex/Teva | Nextwave | Astex | Intermune | Impax Labs

- Clinical Operations leadership at Auspex/Teva.
- Led clinical trial activities for the registration study of AUSTEDO® in Huntington Disease chorea.
- Prior, led Phase 1-3 studies, including registration studies for marketing approval for Quillichew ER, Esbriet and Infergen.

Parkinsonian Disorders: A Significant Unmet Need

- Parkinsonism is a syndrome of motor symptoms that includes slowed movement, stiffness and tremor
  - A major source of disability
- Parkinsonian disorders also include atypical forms such as Multiple system atrophy (MSA) and Progressive supranuclear palsy (PSP)
  - “Atypical” as have prominent non-motor symptoms and a limited response to available treatments

Current therapies treat the symptoms and NOT the underlying pathology of disease

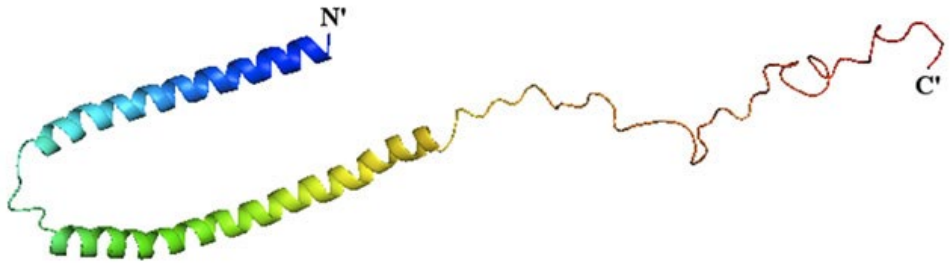


Discovery and Development Portfolio in Neurodegenerative Diseases

Program	Indication	Current Status	Future Plans
ATH434	Multiple System Atrophy	Phase 2 Ongoing	Expand enrollment globally
BioMUSE Natural History Study	Multiple System Atrophy	Ongoing Partner: Vanderbilt University Medical Center	Enrolling up to 20 patients
ATH434	Parkinson's Disease	Preclinical studies to optimize dosing Partner: The Michael J. Fox Foundation for Parkinson's Research	Proof of concept study in Parkinson's disease
Drug Discovery	Neurodegenerative diseases	Discovery ongoing	Generate new IND candidates

The Role of Alpha-Synuclein and Iron in Parkinsonian Diseases

Alpha-Synuclein: Critical for Normal Neuron Function

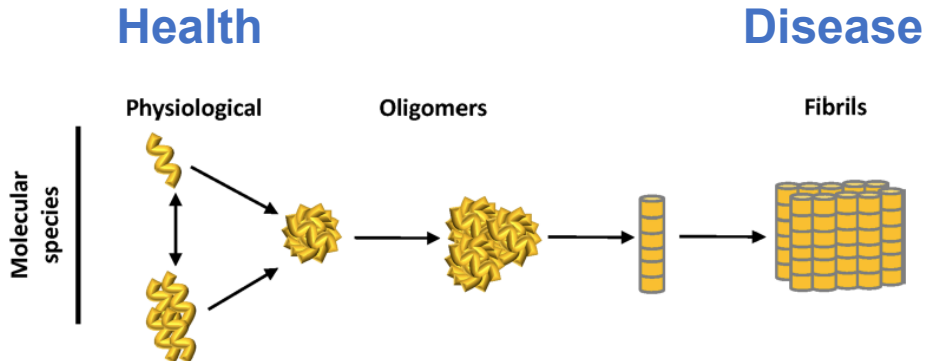


α-Synuclein

- α-Synuclein is an intracellular protein critical for normal function of neurons
- Native, unfolded protein enables neurotransmission
- α-Synuclein *aggregates* in Parkinson's Disease and Multiple System Atrophy

Our Strategy

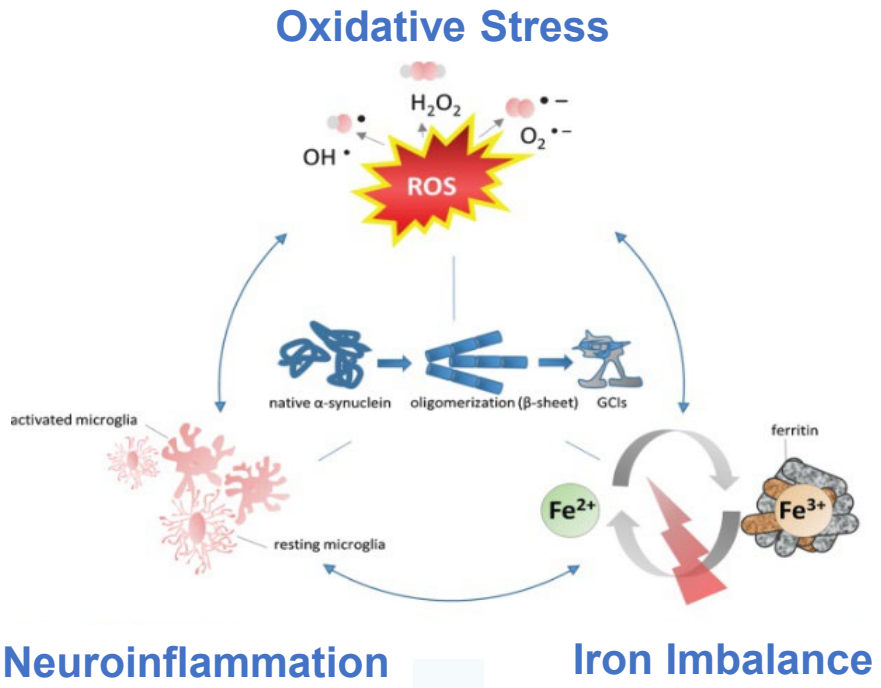
- Inhibit misfolding and aggregation of intracellular α-Synuclein
- Target misfolding α-synuclein by redistributing loosely bound excess iron in areas of pathology
- Address underlying pathology of disease



Sources: Ritchie et al, 2012; DOI:10.4236/health.2012.431175; Bengoa-Vergniory et al, 2017.DOI 10.1007/s00401-017-1755-1

Iron: Critical in Disease Pathogenesis

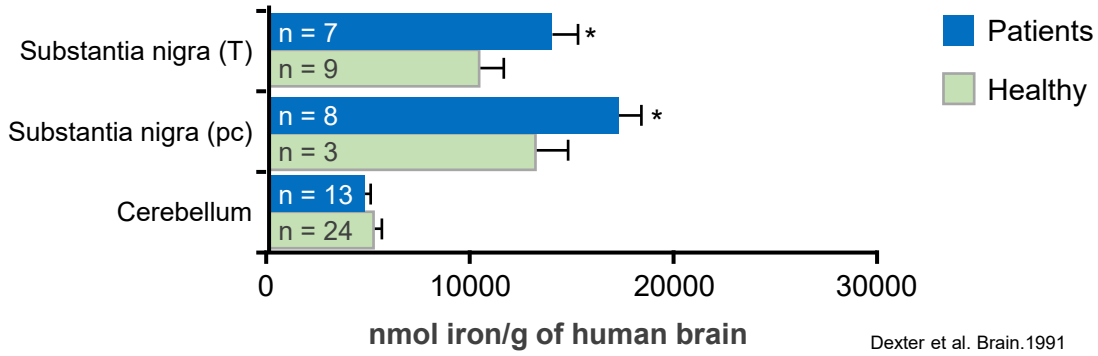
- **α-Synuclein and iron are strong contributors to MSA pathology**
- Hallmark of MSA pathology is the accumulation of α-synuclein in glial cells and neuron loss in multiple brain regions
- Adverse impact of increased labile iron
  - Promotes α-synuclein aggregation
  - Root cause of oxidative stress which damages intracellular structures and leads to neuroinflammation



Sources: Kaindlstorfer, J. Alzheimers Dis. 2018; Rodgers, J Neural Transm (Vienna). 2011

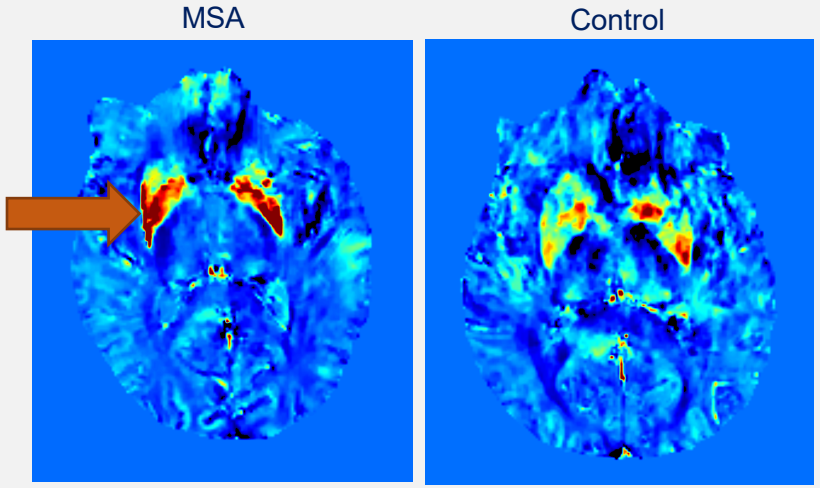
Increased Brain Iron in Synuclein-related Diseases

Parkinson's disease



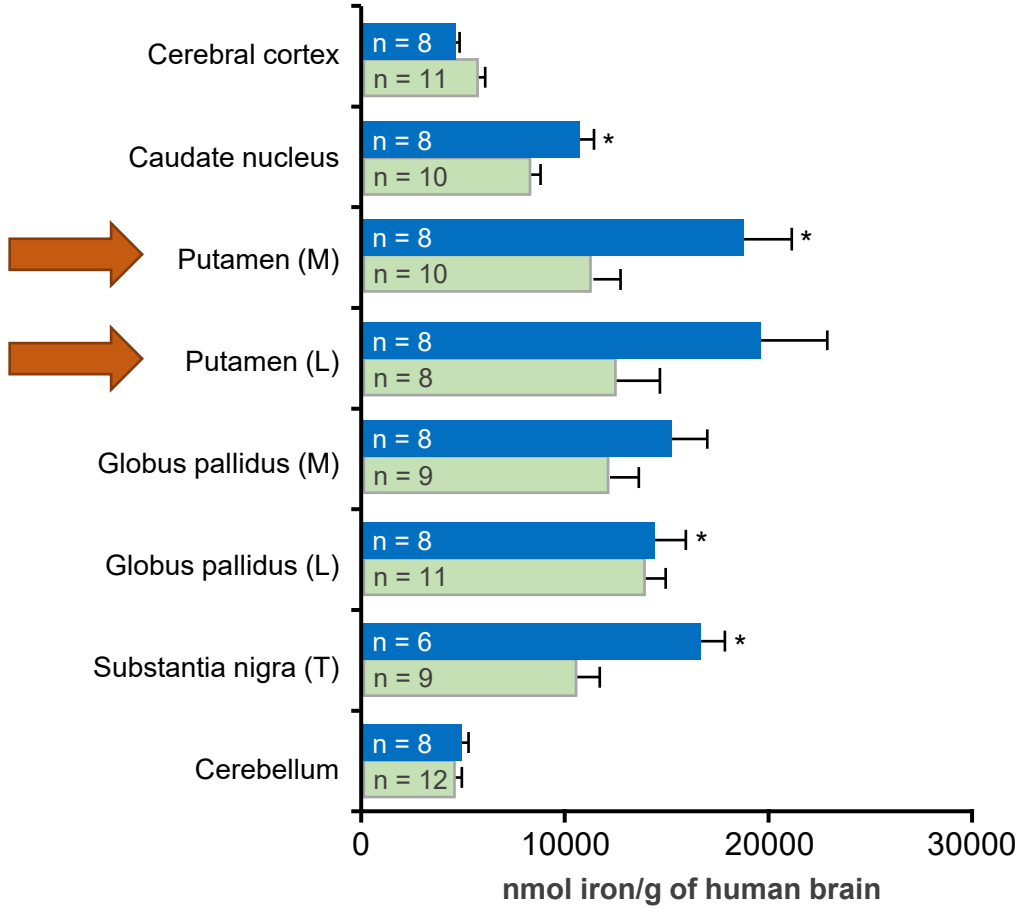
Dexter et al. Brain.1991

Advanced Quantitative MRI to measure brain iron



Courtesy of P. Trujillo, D. Claassen

Multiple System Atrophy



Our Approach: Dual Mode of Action to Address the Underlying Pathology of Disease

Redistribute **excess iron** in the CNS of patients with Parkinsonian disorders

Reduce **α-synuclein aggregation** and oxidative stress

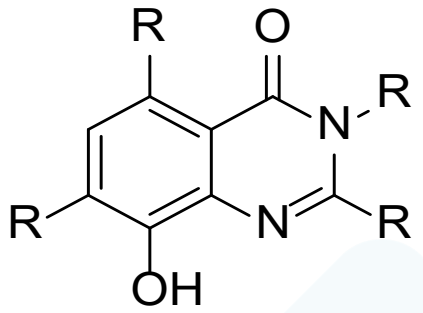
Rescue **neurons** in multiple brain regions to address underlying pathology

Targeting protein misfolding and aggregation by binding and redistributing iron

ATH434: Disease Modifying Drug Candidate

ATH434: Potential Use in Multiple Indications

- Small molecule drug that reduces α-synuclein aggregation
  - Iron chaperone which redistributes loosely bound excess iron
  - Readily crosses the blood brain barrier
  - Oral agent for ease of use
- Potential to treat various Parkinsonian disorders
- Orphan Drug Designation granted by FDA and EU for the treatment of Multiple System Atrophy
- Development pathway endorsed by FDA and EMA

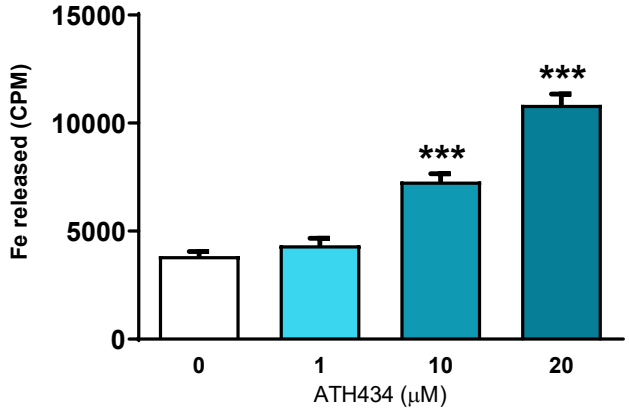


ATH434

Pharmacologic Actions of ATH434

Alterity THERAPEUTICS

Redistributes loosely bound, excess iron

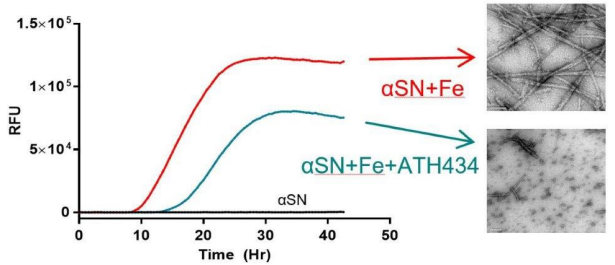


Ligand	Kd for Fe^{3+}
α-Synuclein	10^{-5}
ATH434	10^{-10}
Transferrin	10^{-23}

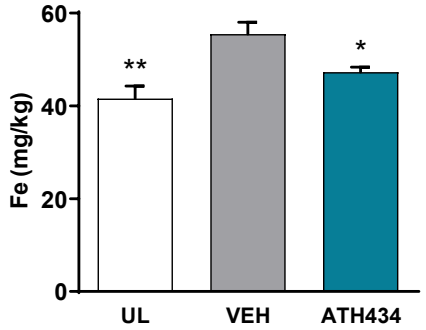
Stronger binding

ATH434 does not interfere with normal iron trafficking proteins

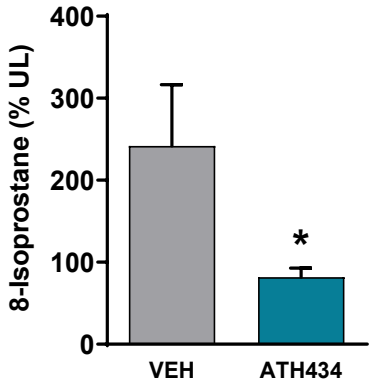
Reduces α-synuclein aggregation



Blocks increase in brain iron



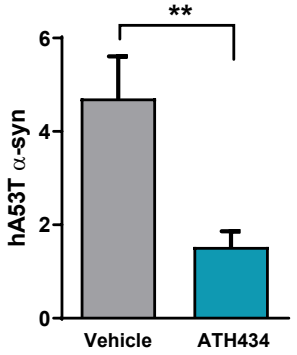
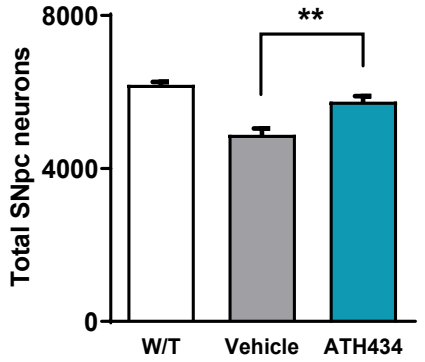
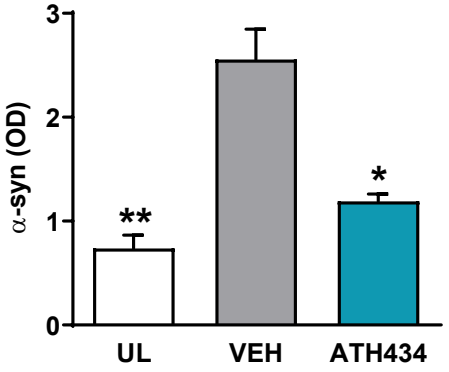
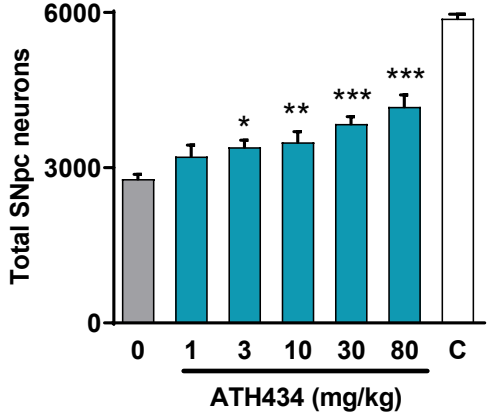
Inhibits oxidative stress in vivo



Sources: Davies et al, 2011; Finkelstein, et al, 2017; Harris WR, 2002.
* P < 0.05, ** P < 0.01, *** P < 0.001

ATH434 Reduces Alpha-Synuclein-related Neuropathology in Parkinson's Disease Animal Models

Alterity THERAPEUTICS

	↓ α-Synuclein	Preserves Neurons
***h*A53T Mouse**		
MPTP Mouse		

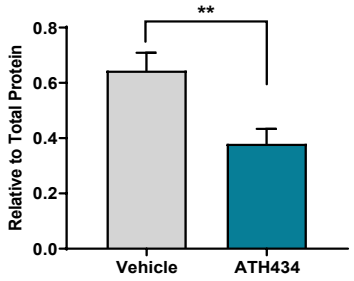
Sources: Finkelstein, et al. Acta Neuropath Comm. 2017 | TG: transgenic, W/T: wild type, UL: unlesioned, C: control |* P < 0.05, ** P < 0.01, *** P < 0.001

ATH434 Reduces α-Synuclein-related Neuropathology and Improves Motor Function in MSA Animal Model

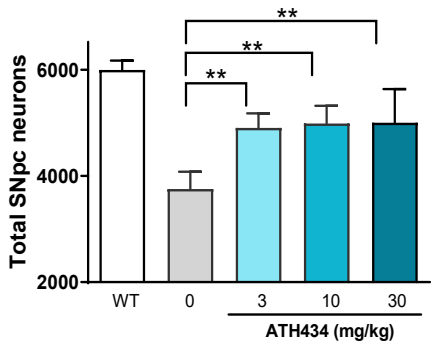
Alterity THERAPEUTICS

Exp. #1

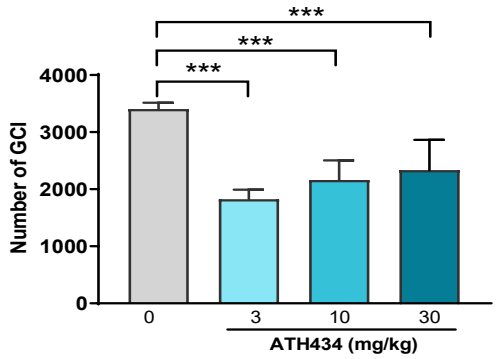
α-Synuclein



SN neurons

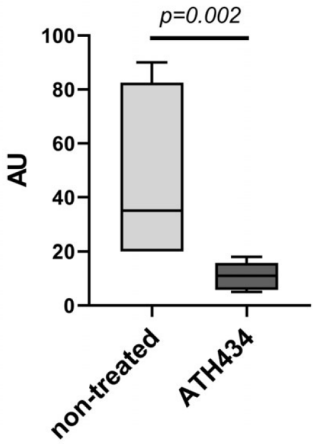


Glial inclusions

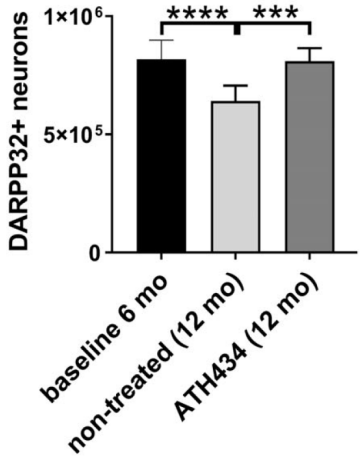


Exp. #2

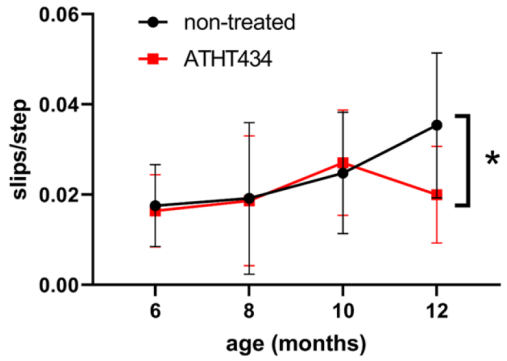
Iron in SN



Striatal neurons



Motor Function

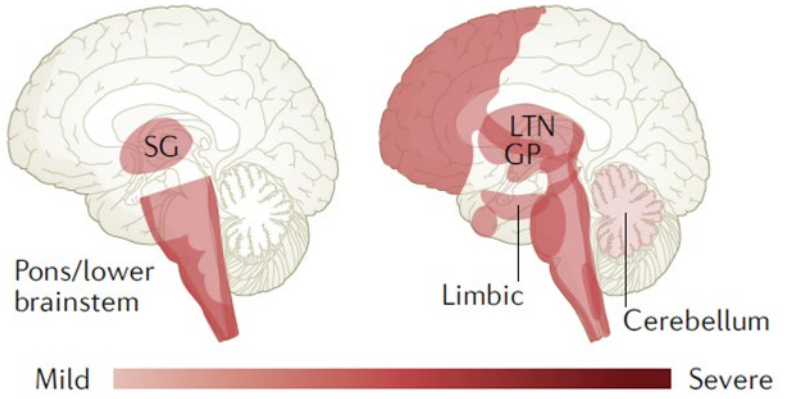


Sources: Finkelstein, et al. J. Parkinson's Disease 2022; Heras-Garvin, et al. Mov. Disorders 2021
* P < 0.05, ** P < 0.01, *** P < 0.001

Multiple System Atrophy Clinical Development Program

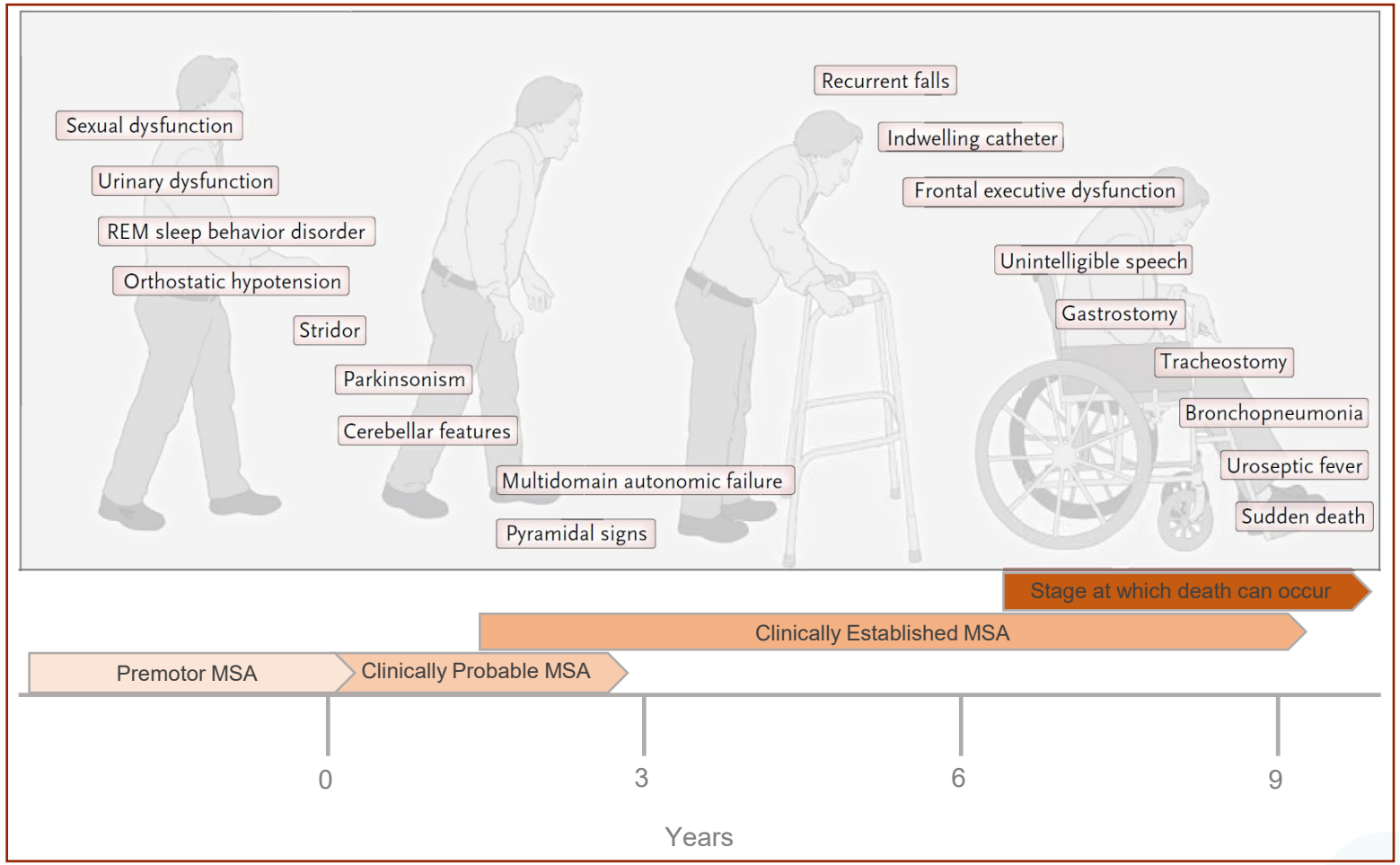
Multiple System Atrophy (MSA) is a Rare, Neurodegenerative Disorder

- Characterized by Parkinsonism, uncoordinated movements, and/or impairment of the body's involuntary (autonomic) nervous system
  - Blood pressure maintenance, bladder control, impaired balance and/or coordination that predisposes to falls
- Development Strategy
  - Target early-stage MSA patients
  - Explore the effect of ATH434 treatment on biomarkers and clinical measures



Sources: Poewe, et al, Nature Reviews, Disease Primer, 2022 8:56

MSA is Highly Debilitating and Rapidly Progressive



60% require wheelchair confinement within 5 years

Sources: Fanciulli, Wenning. NEJM 2015;372:249-63 | Wenning et al, Movement Disorders, vol 37, No 6 2022

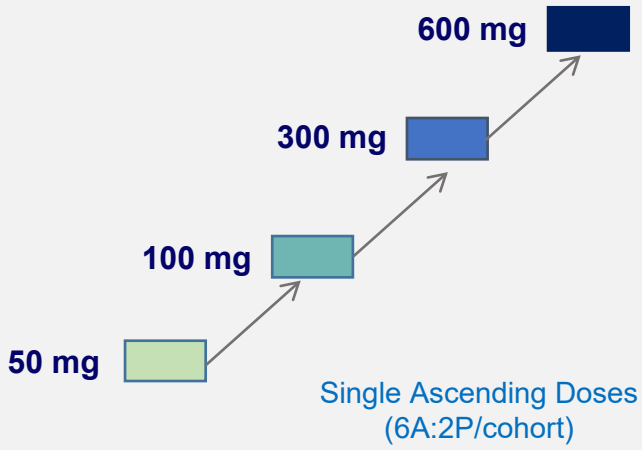
Phase 1 Clinical Trial Design

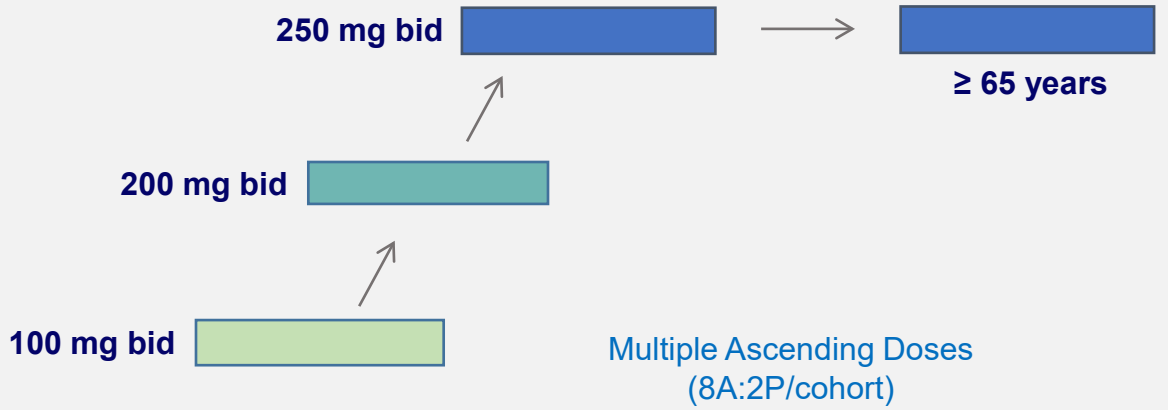
Design: Randomized, double blind, placebo-controlled, healthy adult and older adults (≥65 years)

Objectives: Assess safety and pharmacokinetics of ATH434

Pharmacokinetics: Plasma, cerebrospinal fluid (CSF) in two top multiple dose levels

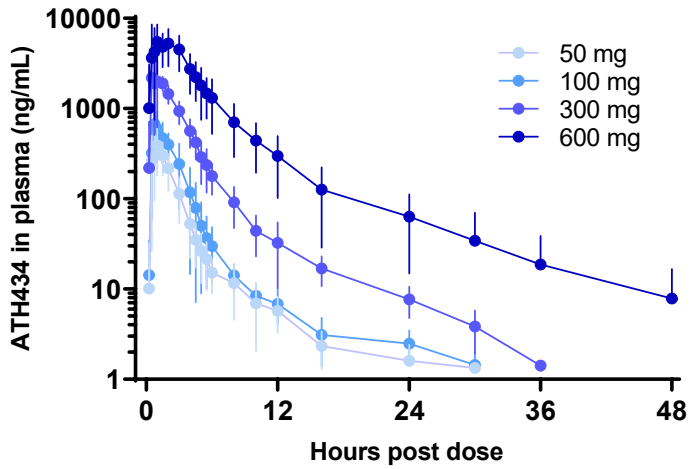
Safety: Adverse events, clinical labs, vital signs including orthostatics, 12-lead ECGs





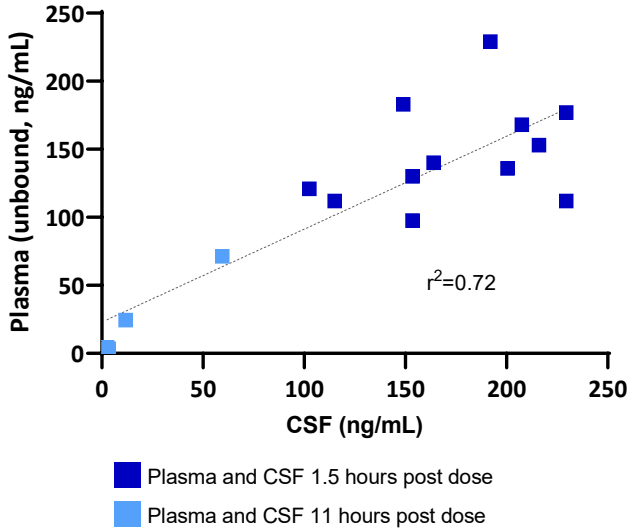
Phase 1 Achieved Target Drug Concentrations Associated with Efficacy in Animal Models

Plasma Profile after Single Dose Administration



- Rapid absorption after oral administration
- Dose dependent pharmacokinetics
  - Single doses up to 600 mg
  - Multiple doses up to 250 mg bid
- Mean elimination half-life up to 9.3 hrs

Plasma and CSF Levels at Steady-State



- CSF and free plasma levels strongly correlated and within 2-fold of each other
- CSF concentrations at steady state exceed those associated with efficacy in animal models of PD and MSA

Source: Stamler et al. Neurology 2019; 92 (15 Suppl.)

Well-Tolerated with No Serious Adverse Events

Single Doses	Placebo (N=8)	50 mg (N=6)	100 mg (N=6)	300 mg (N=6)	600 mg (N=6)
Patients with ≥ 1 AE	3 (38%)	0	0	1 (17%)	1 (17%)
Patients with AEs leading to Withdrawal	0	0	0	0	0
Patients with Serious AEs	0	0	0	0	0

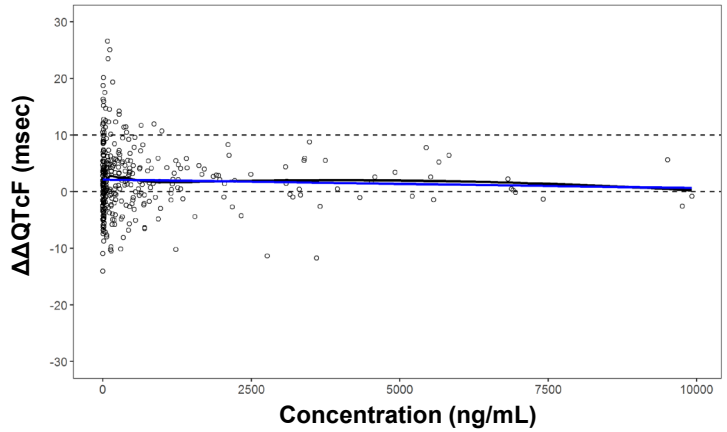
Multiple Doses	Placebo (N=8)	100 mg BID (N=8)	200 mg BID (N=8)	250 mg BID (N=8)	250 mg BID ≥65 (N=8)
Patients with ≥ 1 AE	5 (63%)	3 (38%)	6 (75%)	4 (50%)	5 (63%)
Patients with AEs leading to Withdrawal	0	0	0	0	0
Patients with Serious AEs	0	0	0	0	0

Source: Phase 1 clinical trial; Alterity data on file

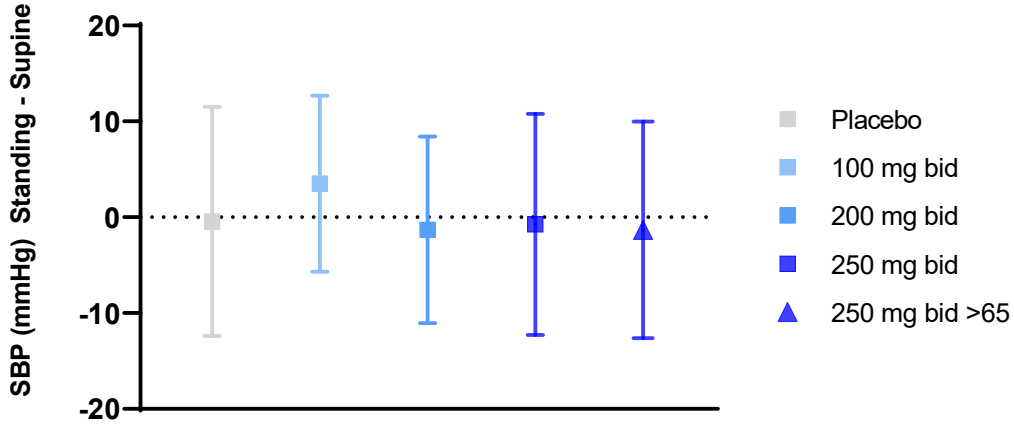
Favorable Safety Profile

- All AEs were mild to moderate in severity
- Most common AE reported in ATH434 subjects was headache
- Similar AE profile for adults and older adults (≥ 65 years)
- No significant findings observed in vital signs, clinical labs or 12-lead ECGs
- Favorable cardiovascular safety profile

No evidence of QT prolongation



No effect on BP with Standing



Source: Phase 1 clinical trial; Alterity data on file

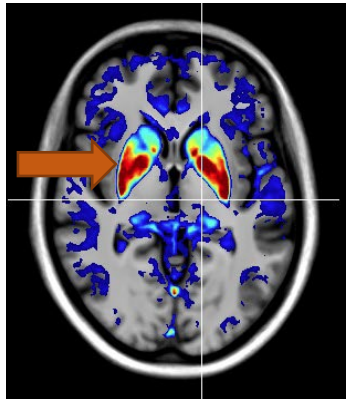
bioMUSE: Biomarkers of Progression in MSA Natural History Study

Design	• Observational
Objectives	• Inform and de-risk Phase 2 • Identify biomarker endpoint(s) for treatment study • Evaluate the change in biomarkers and clinical manifestations
Population	• Early-stage MSA patients similar to Phase 2 population • ~20 participants
Observation Period	• 12 months
Biomarkers	• MRI: Iron (QSM/R2*), neuromelanin, regional blood flow (ASL) • Fluid: NfL protein (CSF, plasma), Aggregating α-synuclein (CSF), phos-α-synuclein (skin) • Wearable movement sensors
Clinical Endpoints	• Clinical: Motor exam, autonomic function, activities of daily living inventory, global measures of severity and change (clinician, patient) • Functional: Timed Up and Go, 2 min Walk Test

bioMUSE Natural History Study: Characterizing Early-Stage MSA

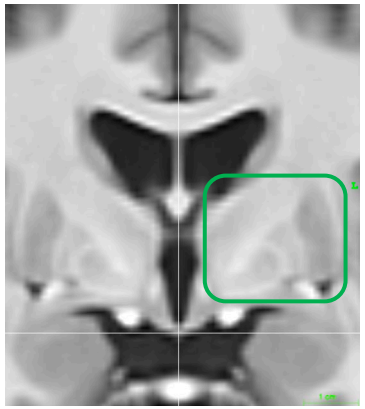
Alterity THERAPEUTICS

Advanced MRI methods



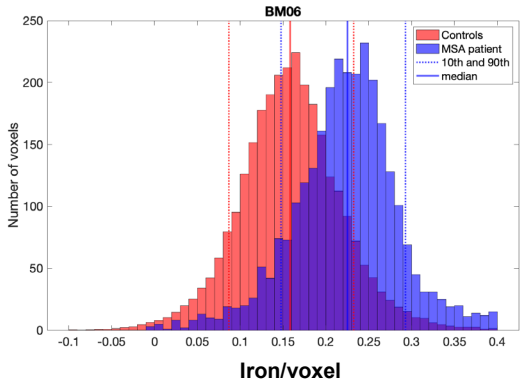
Identify "iron signature" in early MSA to differentiate from Parkinson's disease

New MRI Template



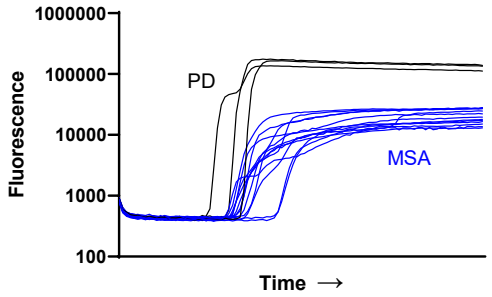
Improve precision of MRI biomarker quantification

Iron distribution in MSA



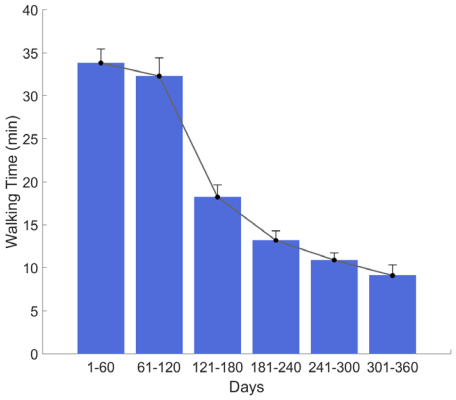
Novel strategies for measuring brain iron in individual regions

Alpha-synuclein Profiles



Clear distinction of early MSA from Parkinson's disease

Wearable Sensors



Quantitative assessment of motor performance

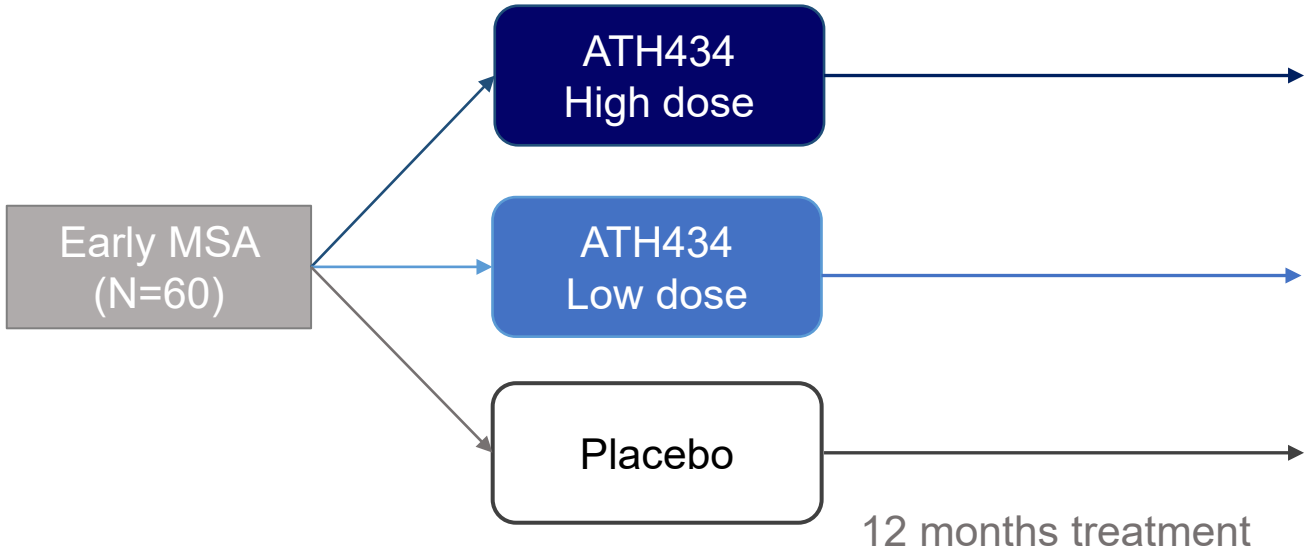
Generating Robust Data to De-risk the Phase 2 Trial

Sources: Presentations/Posters on file, including Claassen et al, MDS Conference 2021 and 2022;

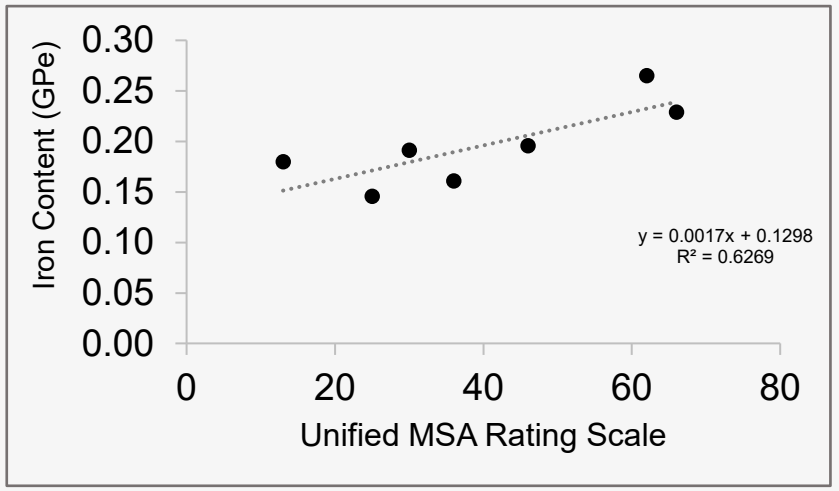
Phase 2 Clinical Trial in Early-Stage MSA Patients

Design	• Randomized, double-blind, placebo controlled
Objectives	• Assess efficacy and safety of ATH434 in participants with MSA • Assess target engagement based on imaging and fluid biomarkers
Population	• Early-stage MSA participants who are ambulatory and have biomarker evidence of MSA
Sample Size	• N=60 at ~30 sites in Australia, New Zealand, Europe and the U.S.
Treatment	• 12 months • Three arms: Two dose levels of ATH434 or placebo
Primary Endpoint	• Change in iron content as measured by brain MRI
Secondary Endpoints	• Clinical: Activities of daily living inventory (UMSARS I), motor exam, autonomic function • Additional imaging biomarkers, fluid biomarkers (aggregating α-synuclein, NfL protein), wearable sensor data

Phase 2 Design and Primary Endpoint



Primary Endpoint:
Change in Brain Iron on MRI



Brain iron correlates with disease severity in MSA

Source: Claassen,et al; MDS 2021

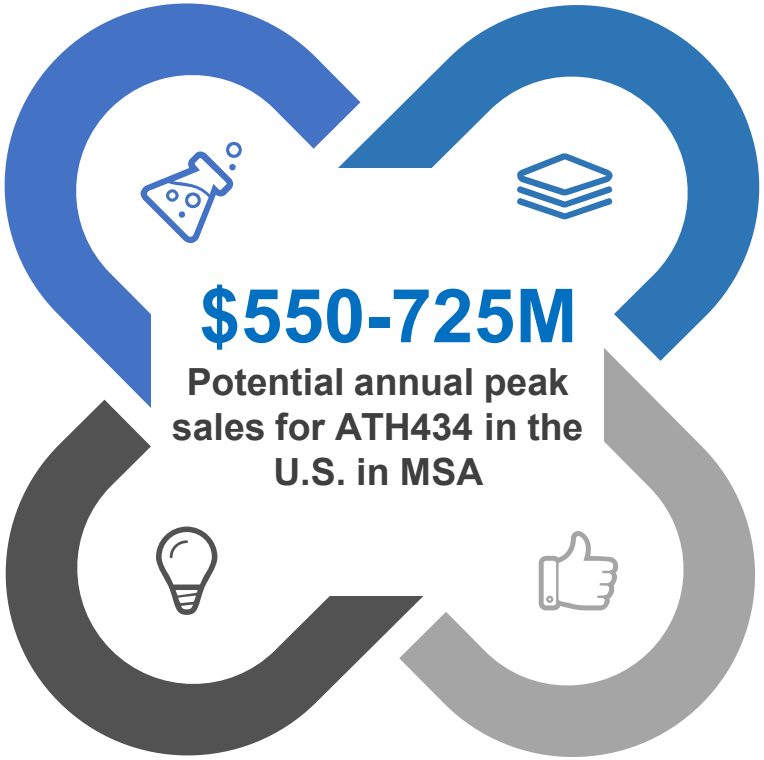
Significant Commercial Opportunity in Treating Multiple System Atrophy

Substantial Unmet Need

Severely debilitating illnesses with no current treatments are ripe for new entrants targeting what may be the actual cause of the disease.

Unique MOA

Inhibition of protein aggregation is a novel mechanism of action that may prove to impact more than motor symptoms.



Strong Intent to Prescribe

Motivated by efficacy of treating the underlying disease and not just the symptoms, clinicians intend to offer ATH434 to most of their patients with MSA.

Ease of Use

Twice daily oral administration of ATH434 preferred by physicians

Source: Survey of U.S. neurologists

Alterity: Poised for Progress

- Targeting Orphan disease with no approved treatments
- bioMUSE Natural History Study de-risking Phase 2
- Phase 2 trial ongoing with lead drug candidate ATH434
- Development team with proven track record and multiple FDA approvals
- Drug discovery generating patentable compounds as next generation therapies
- Cash balance of 31.9 M AUD as of 30 Sept 2022

Milestones

- ✓ Q1 2022: Submit ATH434 European Clinical Trial Application (CTA)
- ✓ Q2 2022: Launch ATH434 Phase 2 Clinical Trial in New Zealand
- ✓ Q3 2022: Launch ATH434 Phase 2 in Europe
- ✓ Q3 2022: Present bioMUSE Natural History biomarker data
- ✓ 2H 2022: Submit ATH434 U.S. IND
- • Q4 2022: Launch ATH434 Phase 2 in U.S.


Alterity
THERAPEUTICS