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# Corporate Presentation

August 2024



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The ACT-AD trial and the related open-label extension for ACT-AD participants was supported by a grant from the National Institute on Aging of the National Institutes of Health under Award Number R01AG06268. The information presented in this press release is solely the responsibility of Athira and does not necessarily represent the official views of the National Institutes of Health.

This presentation concerns drug candidates that are under clinical investigation and which have not yet been approved for marketing by the U.S. Food and Drug Administration. The drug candidates are currently limited by federal law to investigational use, and no representation is made as to their safety or effectiveness for the purposes for which they are being investigated.

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## OUR MISSION

Harnessing the power of the neurotrophic HGF system for the treatment of neurodegenerative diseases



# Investment highlights

**Leveraging deep knowledge, broad IP, and HGF biology to develop potential first-in-class and next-generation small molecules to protect and repair neuronal networks**

**Leadership team** with significant CNS product development and approval experience

**Neurotrophic HGF system is critical to normal brain function and plays a key role in neurodegenerative diseases**

**Fully enrolled late-stage clinical trial of fosgonimeton in Alzheimer's disease (AD) with data targeted in September 2024**

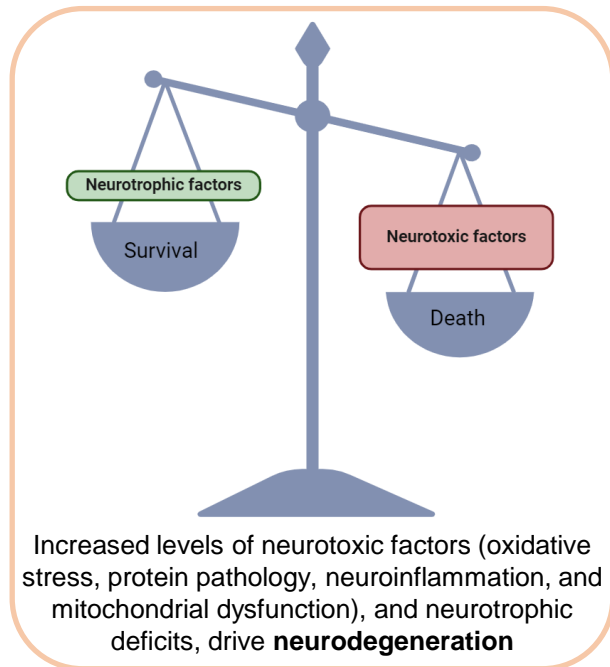
- Factors that support the potential success of the Phase 2/3 LIFT-AD trial
  - Exploratory ACT-AD trial showed improvement across key AD indicators and informed LIFT-AD design
  - Independent unblinded interim analysis of LIFT-AD trial cleared stringent go/no go criteria; DMC recommended that the study continue
  - Ongoing open label extension trial shows high participation rate and long duration of investigational treatment
  - Exploratory SHAPE trial showed potential improvements in cognition in a different patient population treated with the same dose as being tested in the LIFT-AD trial
  - Well-tolerated with a favorable safety profile
- Targeting the mild-to-moderate patient population representing an enormous opportunity – likely >3M in US alone

**Robust pipeline of proprietary small molecules targeting HGF biology**

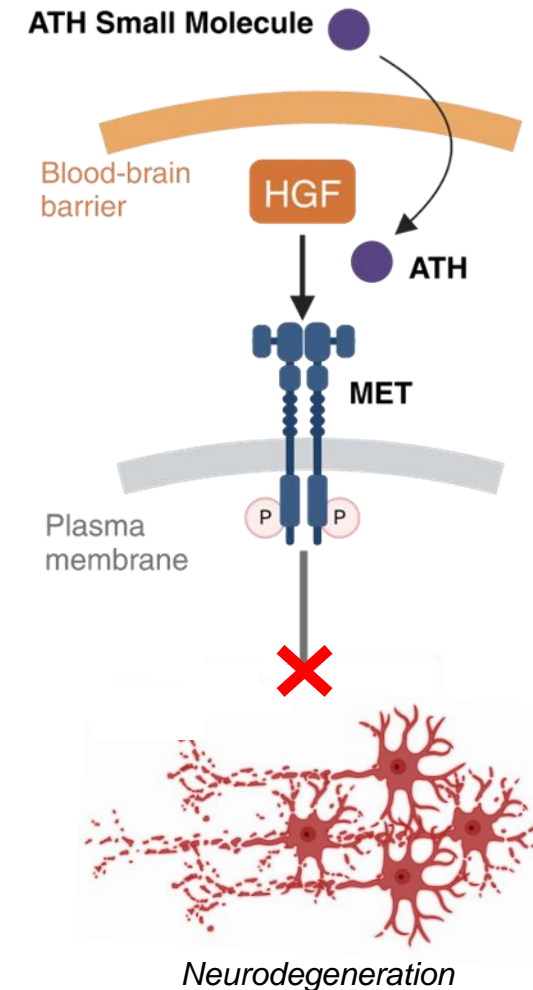
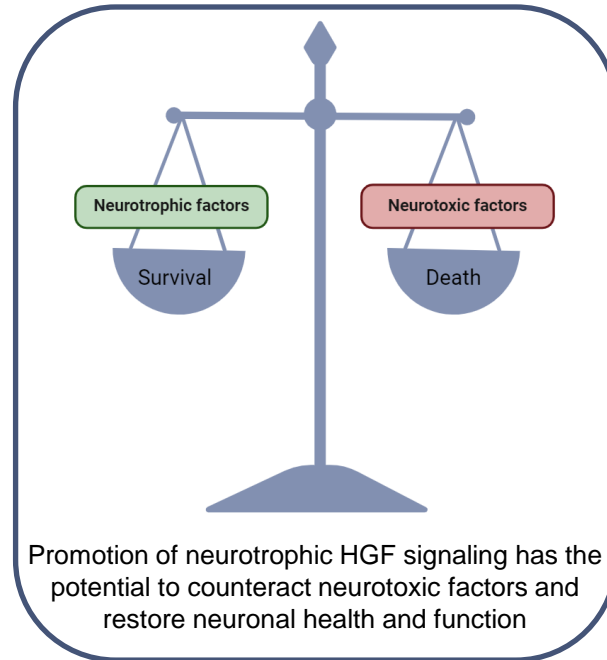
- Restoring the impaired HGF system in disease states has the potential to treat Alzheimer's, Parkinson's, ALS, neuropathic pain, and other neurological diseases
- We own or in-license worldwide IP rights to all of our drug candidates

# Neurotrophic factors, including HGF, are a less appreciated approach to addressing neurodegenerative disease

- We have developed a series of **small molecules** designed to enhance the activity of the neurotrophic HGF system
  - Our small molecule approach overcomes a major hurdle in evaluating the potential of therapies targeting neurotrophic factors
  - ATH small molecules can cross the BBB and distribute to relevant nervous system tissue



*ATH small molecules*



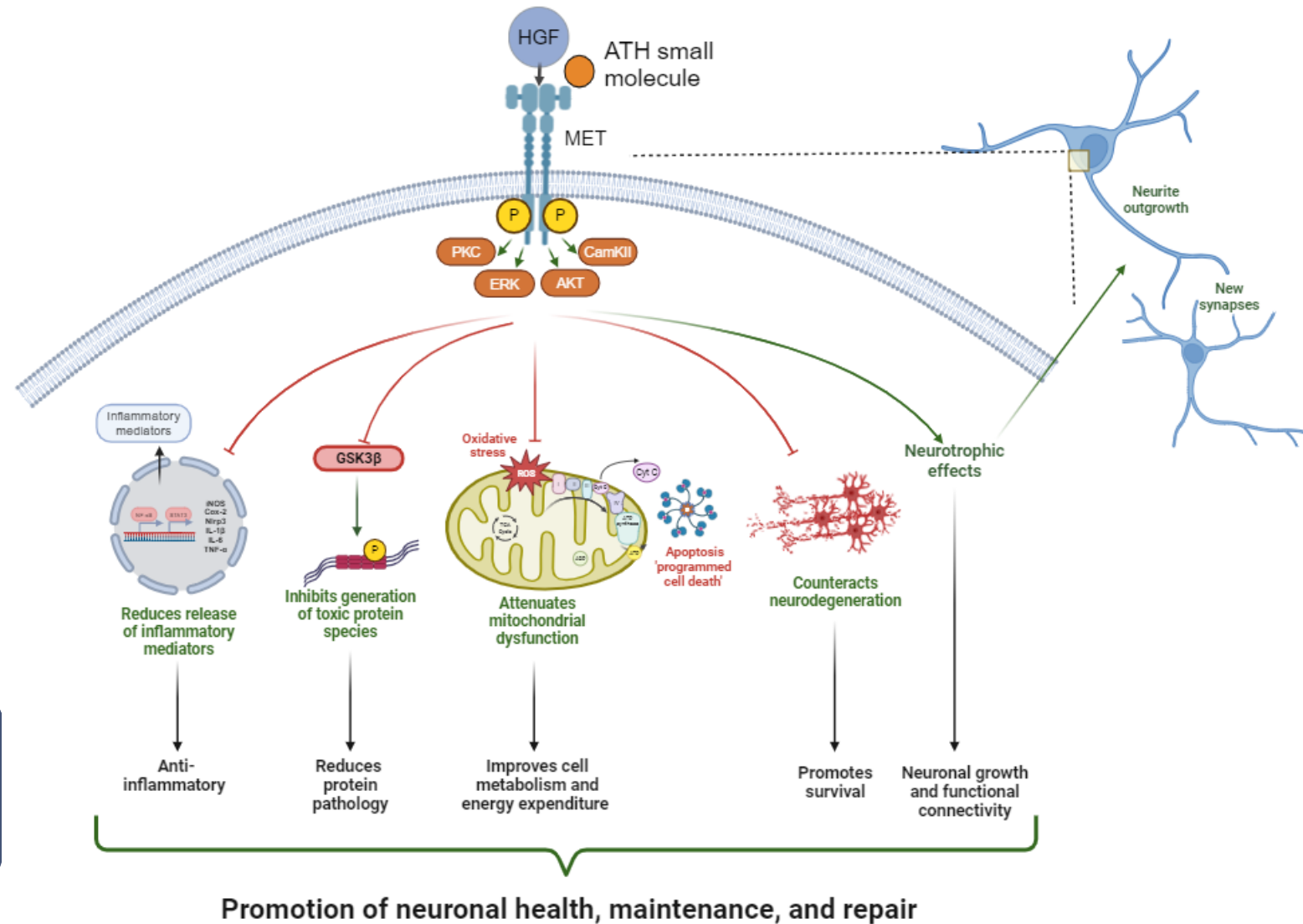
# HGF is a critical neuroprotective system

THE ROLE OF HGF IN THE NERVOUS SYSTEM HAS BEEN EXPLORED THROUGH 30 YEARS OF RESEARCH\*

HGF signaling has pleiotropic downstream signaling effects

- Activation of MET (HGF receptor) leads to activation of multiple signaling cascades
- These signaling events influence the ability of the cell to counteract neurodegenerative hallmarks and undergo repair

Positive modulation of HGF signaling has the potential to promote neuronal health and repair by activating a range of pathways that alleviate key components of neurodegeneration



# HGF system impacts several of the complex pathologies that lead to neurodegeneration

## Neurotrophic HGF System

### KEY ASPECTS OF NEURODEGENERATIVE DISEASES

Inflammation

Protein Pathology

Oxidative Stress

Excitotoxicity

Synaptic Dysfunction

### HALLMARKS OF NEURODEGENERATION




Neuronal damage

Loss of network connectivity


Loss of function

Disease progression

# Therapeutic potential across a broad range of clinical indications

Program	Indication	PRECLINICAL		CLINICAL			Status
		Early Discovery	IND-Enabling Studies	Phase 1	Phase 2	Phase 3	
Fosgonimeton	Alzheimer's Disease (AD) 			Phase 2/3 Clinical Trial		Open-Label Extension	LIFT-AD enrollment complete; targeting topline data by the end of 3Q24
				Phase 2 Clinical Trial	Open-Label Extension		ACT-AD topline data reported 2Q22
	Parkinson's Disease Dementia and Dementia with Lewy Bodies 			Exploratory Phase 2 Clinical Trial			SHAPE topline data reported 4Q23
ATH-1105	Amyotrophic Lateral Sclerosis (ALS)			Phase 1 Clinical Trial			Phase 1 in healthy volunteers underway; completion expected by year-end 2024
ATH-1020	Neurodegenerative Diseases			Phase 1 Clinical Trial			Single-ascending dose completed in healthy volunteers; no safety findings
Early Compounds	Neurodegenerative Diseases	Discovery and Development					Ongoing





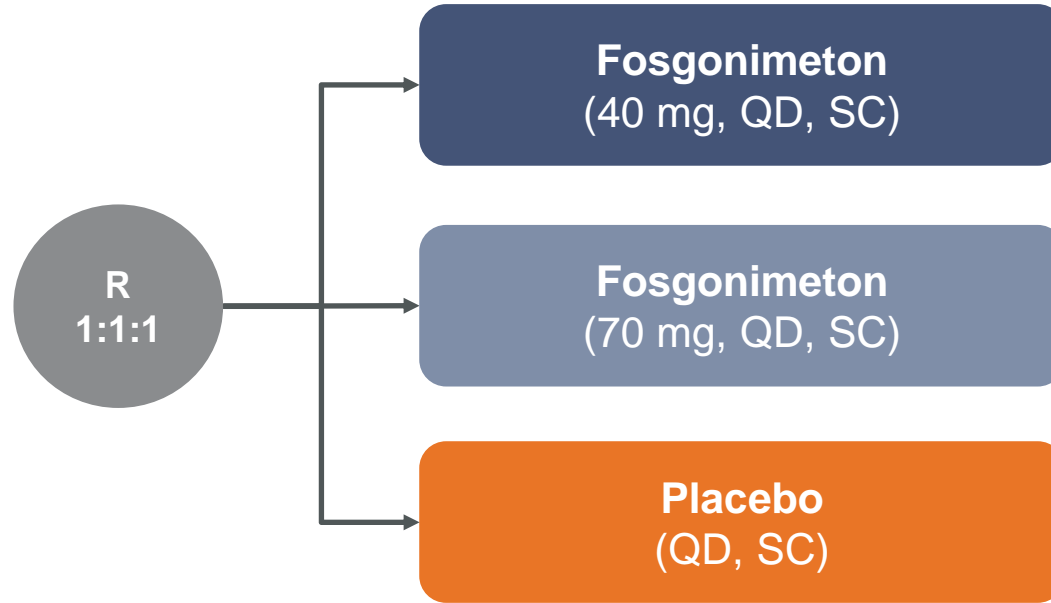
Fosgonimeton for the treatment of  
mild-to-moderate Alzheimer's disease

**Phase 2/3 LIFT-AD Trial Fully Enrolled with Topline Data Targeted  
In September 2024**



# Fosgonimeton exploratory phase 2 trial in mild-to-moderate Alzheimer's disease\*

**RANDOMIZED PLACEBO-CONTROLLED SIX-MONTH TRIAL (N=77)**



## Key Learnings from ACT-AD

- Fosgonimeton was well-tolerated with a favorable safety profile
- Unexpected potential pharmacodynamic interaction with AChEIs
- Greater than 85% enrollment into OLEX from both ACT-AD and LIFT-AD studies
- Congruent clinical effects and biological signals
- P300 not appropriate endpoint given variability

## ENDPOINTS

**Primary:** Change in ERP P300 latency, safety and tolerability

**Secondary:** ADAS-Cog11, ADCS-CGIC, ADCS-ADL23

**Exploratory:** Plasma biomarkers

# Functional improvements: Potential benefits in cognition and function from fosgonimeton treatment

SUPPORTS POTENTIAL TO BE A SAFE AND DIFFERENTIATED FUTURE THERAPY

74%

**-3.0**  
points n.s.

## IMPROVED COGNITION

Improvement over placebo over 6 months as measured by ADAS-Cog11 in patients without background therapy

41%

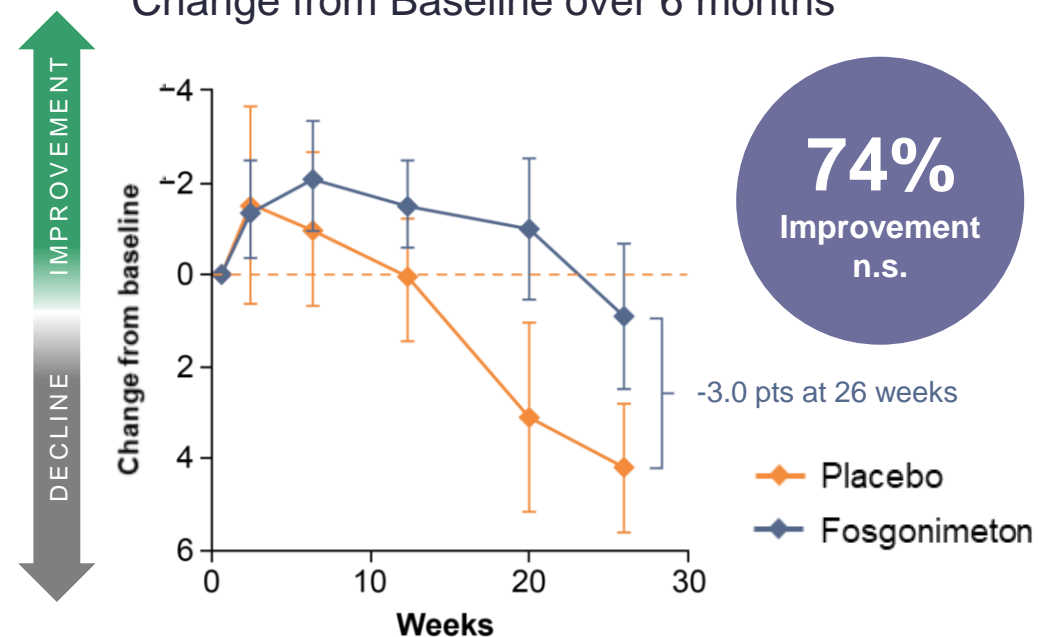
**+1.7**  
points n.s.

## IMPROVED FUNCTION

Improvement over placebo over 6 months as measured by ADCS-ADL23 in full study population

Favorable safety and tolerability profile, injection site reactions are most frequent AE

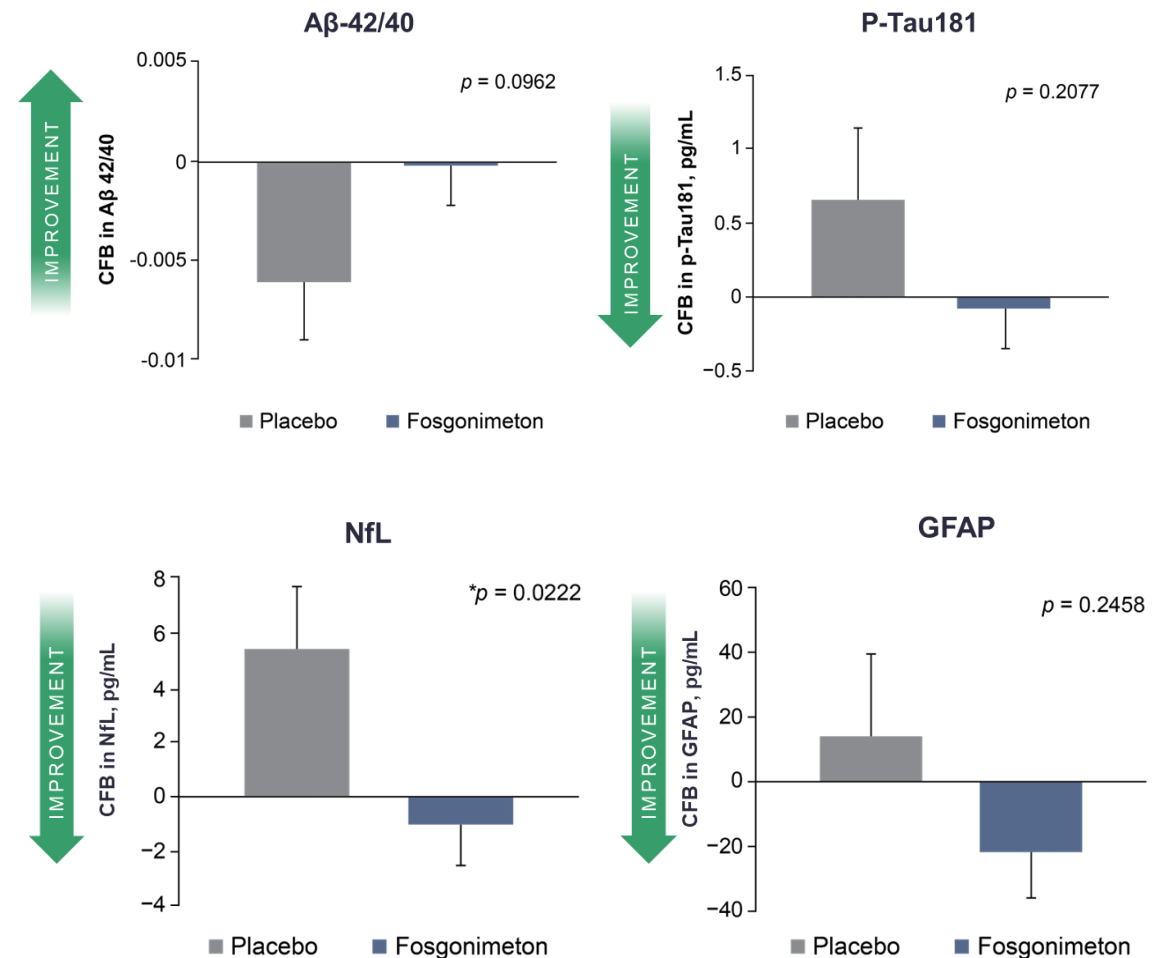
### ADAS-COG11 (Procognitive Effect) Change from Baseline over 6 months



n at each visit	W2	W6	W12	W20	W26
Placebo	8	8	7	7	6
Fosgonimeton	19	19	17	16	17

# Fosgonimeton induces directional improvements in hallmarks of Alzheimer's disease

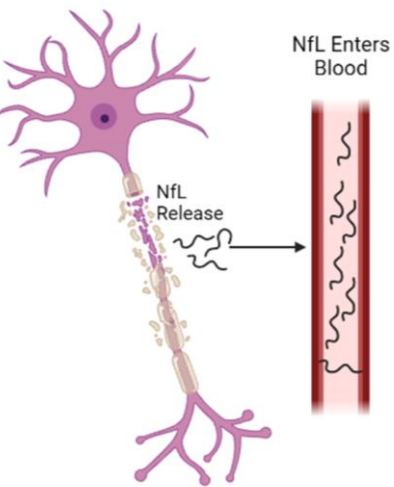
- Decreased A $\beta$  42/40 ratio and increased absolute p-Tau values are hallmarks of Alzheimer's disease
- NfL is an established, objective biomarker of neurodegeneration, and GFAP is a marker of neuroinflammation
- Changes support relevance of the HGF/MET pathway to Alzheimer's disease pathology
- Supports disease modifying potential of fosgonimeton



Data are least square means from an ANOVA model with change from baselines as the dependent variable with the following in the model: treatment group, AChEI use, baseline biomarker value and the interaction of treatment and AChEI use. Error bars are  $\pm$  SE. N=5 for placebo treatment; N=12 for fosgonimeton treatment without concomitant AChEI.

A $\beta$ , amyloid beta; CFB, change from baseline; GFAP, glial fibrillary acidic protein; HGF, hepatocyte growth factor; NfL, neurofilament light chain; p-Tau181, tau phosphorylated at threonine-181; SE, standard error

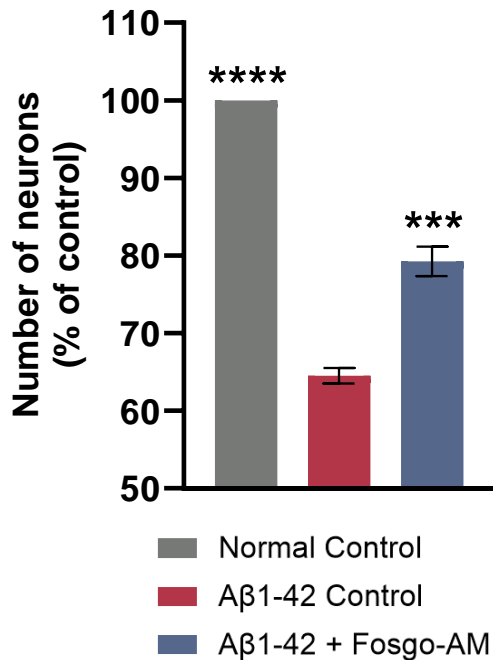
# Neuroprotective - Fosgonimeton reduces neurofilament light, an established marker of neurodegeneration



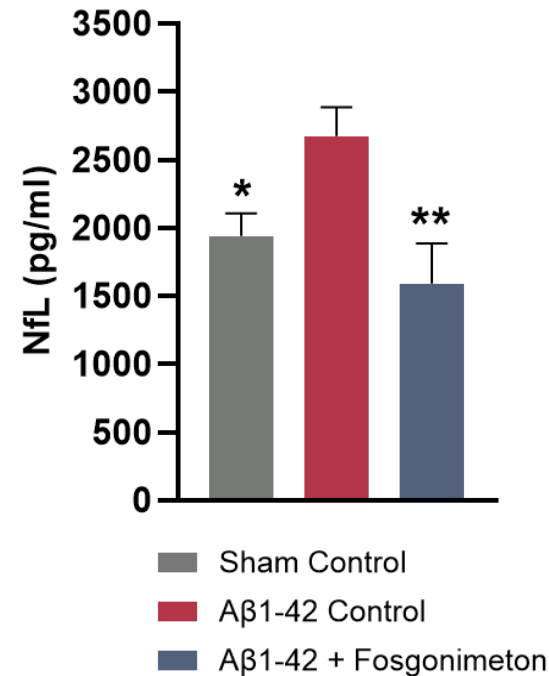
NfL is released into the blood following neuronal injury and neurodegeneration

## Preclinical

Cortical neuron survival following A $\beta$ 1-42 exposure

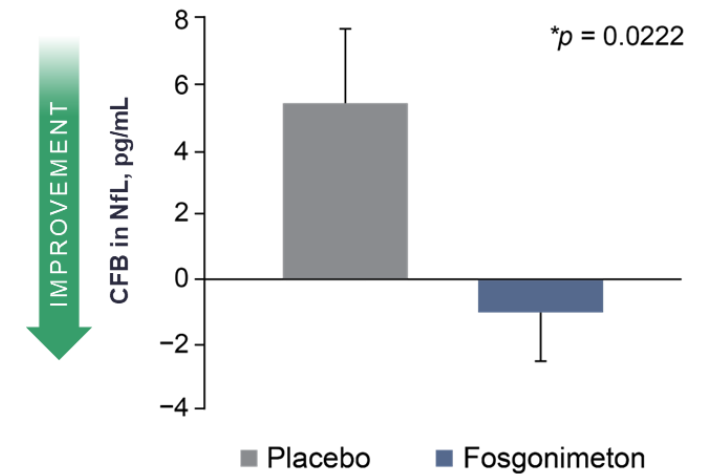


NfL in A $\beta$ 1-42 aged mouse model



## Clinical

NfL



- Neurofilament light (NfL) is an established, objective biomarker of neurodegeneration
- Decrease of NfL to below baseline levels is suggestive of repair in this continuously progressive disease

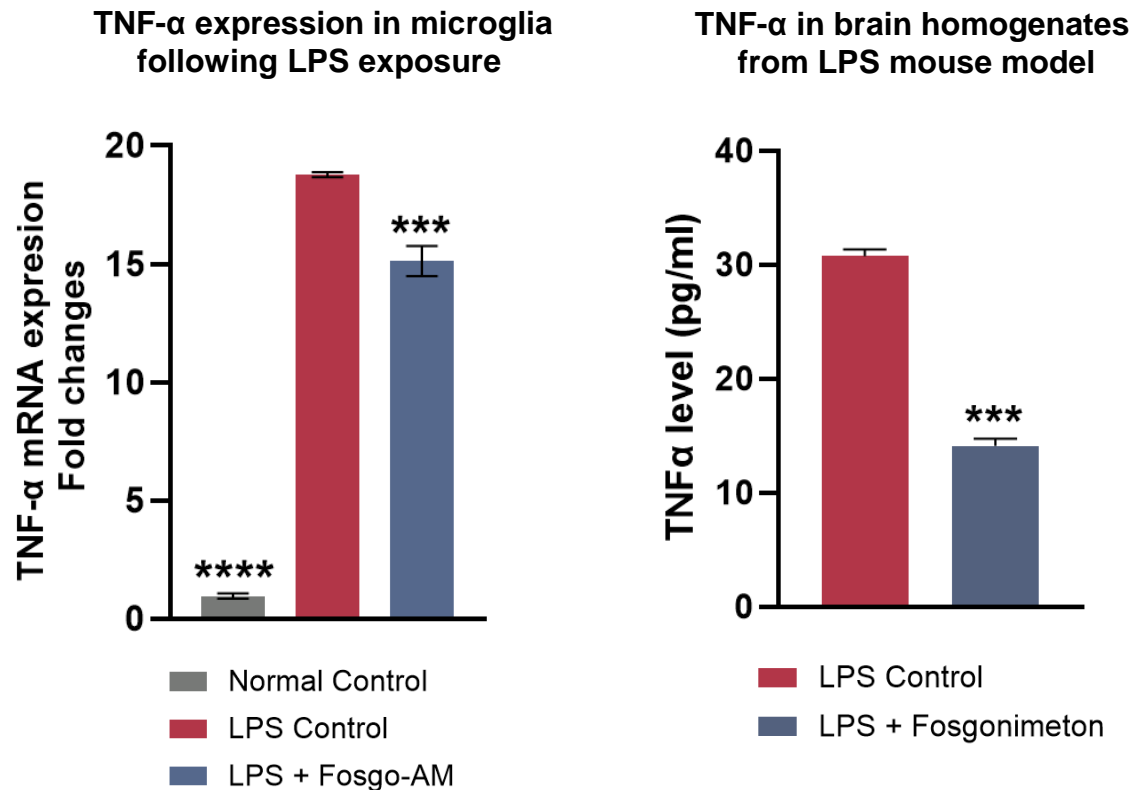
A $\beta$ , amyloid-beta; CFB, change from baseline; NfL, neurofilament light chain.

For in vitro assays, fosgonimeton was administered as the active metabolite, fosgo-AM; One-way ANOVA with Fisher's LSD; \*\*\*\*p<0.0001, \*\*\*p<0.001 vs. A $\beta$ 1-42 control; N = 3 biological replicates (n = 4-6 technical replicates). In vivo: NfL measured in CSF from intrahippocampal A $\beta$ 1-42 aged mouse model following 28-day fosgonimeton treatment. One-way ANOVA with Fisher's LSD; \*p<0.05, \*\*p<0.01 vs. A $\beta$ 1-42 control; n = 12 mice per group mean + SEM.

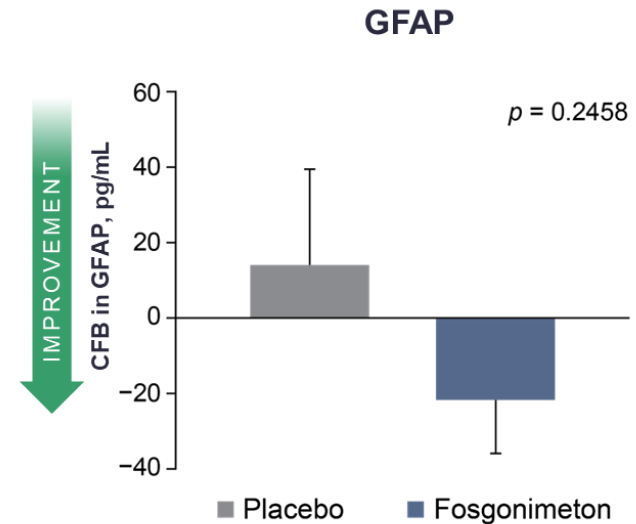
For clinical data, NfL data are least squares means from an ANOVA model with CFB as the dependent variable with the following in the model: treatment group, AChEI use, baseline biomarker value, and the interaction of treatment and AChEI use. Error bars are  $\pm$  SE. n = 5 (placebo); n = 12 (fosgonimeton - AChEIs).

# Anti-inflammatory - Fosgonimeton reduces markers of neuroinflammation

## Preclinical



## Clinical

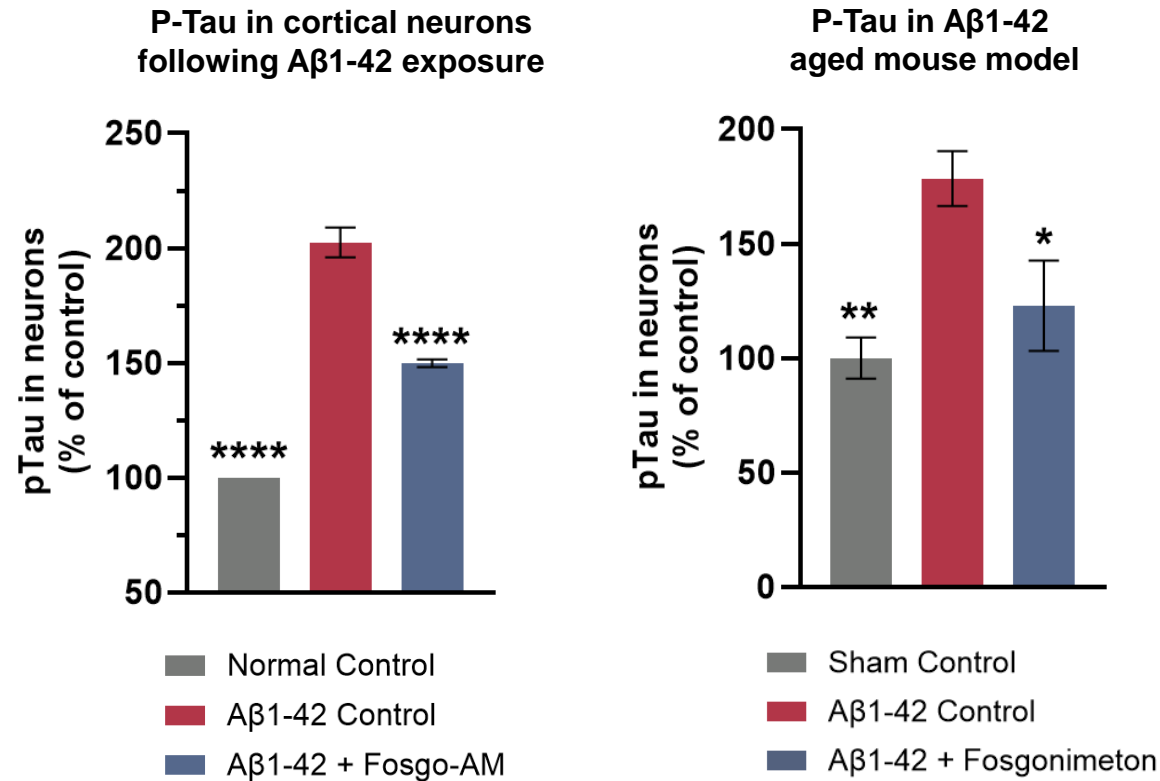


- GFAP is a marker of neuroinflammation
- Magnitude of decrease is encouraging in this continuously progressive conditions

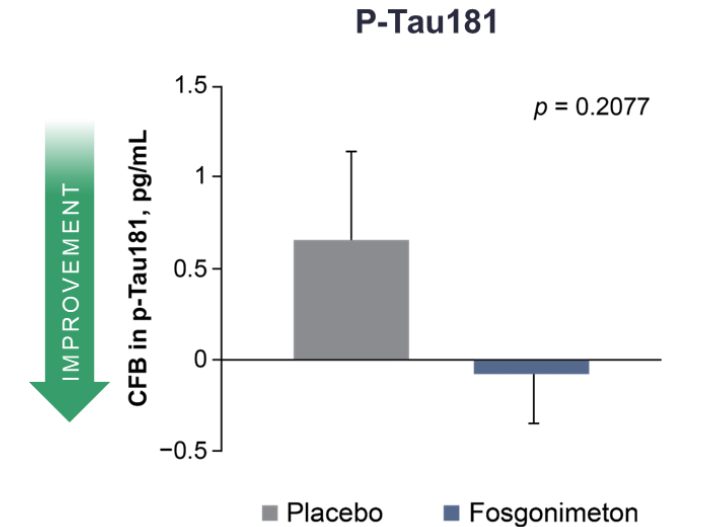
CFB, change from baseline; LPS, lipopolysaccharide; GFAP, glial fibrillary acidic protein; TNF $\alpha$ , tumor necrosis factor alpha  
 For in vitro assays, fosgonimeton was administered as the active metabolite, fosgo-AM; One-way ANOVA with Dunnett's post-test; \*\*\* $p < 0.001$ , \*\*\*\* $p < 0.0001$  vs. LPS control;  $n = 3$  technical replicates. In vivo: TNF $\alpha$  measured in brain homogenates 1.5h post LPS intraperitoneal administration. Fosgonimeton was administered 20 minute prior to LPS administration. One-way ANOVA with Dunnett's post-test; \*\*\* $p < 0.001$  vs. LPS control;  $n = 10$  mice per group mean + SEM.  
 For clinical data, data are least squares means from an ANOVA model with CFB as the dependent variable with the following in the model: treatment group, AChEI use, baseline biomarker value, and the interaction of treatment and AChEI use. Error bars are  $\pm$  SE.  $n = 5$  (placebo);  $n = 12$  (fosgonimeton - AChEIs),

# Protein Pathology - Fosgonimeton reduces tau phosphorylation (pTau)

## Preclinical



## Clinical



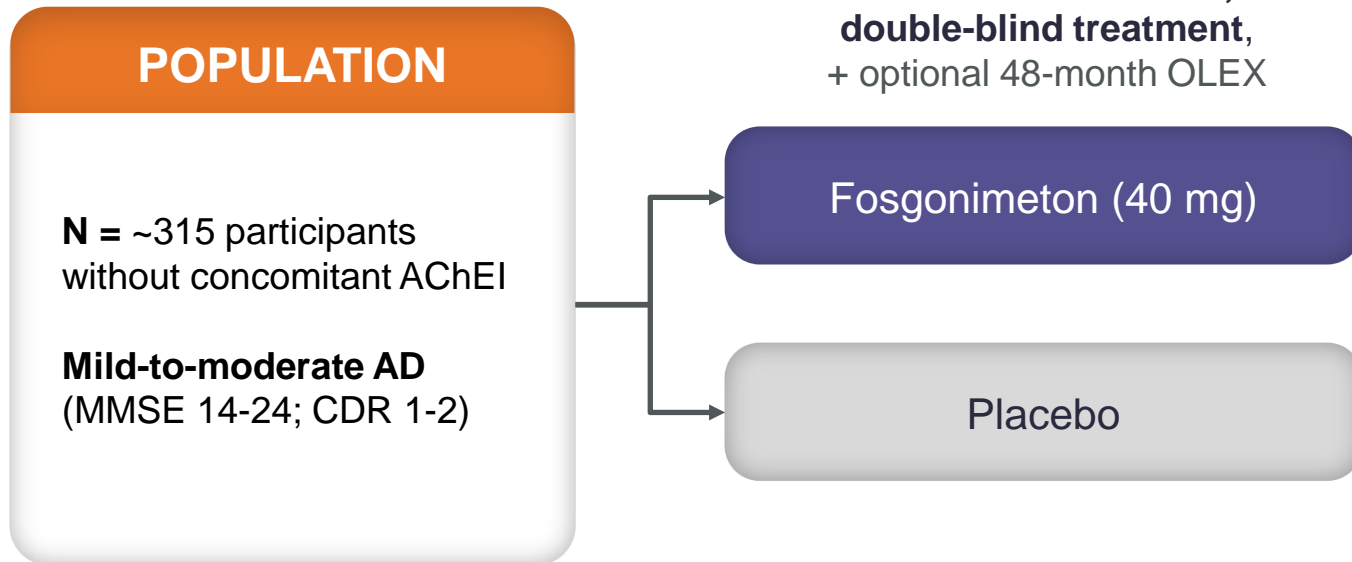
- Increase p-Tau levels are a hallmark of Alzheimer's disease
- Changes in levels of pTau support relevance of HGF/MET pathway to Alzheimer's specific protein pathology and are suggestive of disease modification

Aβ, amyloid-beta; CFB, change from baseline; P-Tau, phospho-Tau; p-Tau181, tau phosphorylated at threonine-181  
 For in vitro assays, fosgonimeton was administered as the active metabolite, fosgo-AM; One-way ANOVA with Fisher's LSD; \*\*\*\*p<0.0001 vs. Aβ1-42 control; N = 3 biological replicates (n = 4-6 technical replicates). In vivo: P-Tau measured in hippocampal slices from intrahippocampal Aβ1-42 aged mouse model following 28-day fosgonimeton treatment One-way ANOVA with Fisher's LSD; \*p<0.05, \*\*p<0.01 vs. Aβ1-42 control; n = 12 mice per group mean ± SEM.  
 For clinical data, data are least squares means from an ANOVA model with CFB as the dependent variable with the following in the model: treatment group, AChEI use, baseline biomarker value, and the interaction of treatment and AChEI use. Error bars are ± SE. n = 5 (placebo); n = 12 (fosgonimeton - AChEIs), n = 22 (fosgonimeton + AChEI).

# Fosgonimeton phase 2/3 LIFT-AD trial after amendments



## LEARNINGS FROM ACT-AD INFORM TRIAL DESIGN OPTIMIZATION



**TIMELINE:** Enrollment Complete; Topline results targeted for end of September 2024

### ENDPOINTS

#### PRIMARY

- GST, which combines results of co-key secondary endpoints of cognition and function
- Safety

#### SECONDARY

- Cognition: ADAS-Cog11
- Function: ADCS-ADL23

#### EXPLORATORY

- Additional clinical endpoints and plasma biomarkers



# Independent unblinded analysis by DMC supports the potential clinically meaningful activity of fosgonimeton



## DMC ANALYSIS

- Efficacy and futility analysis performed on first 100 patients who completed the six-month trial of fosgonimeton compared with placebo
- DMC Recommendation (Oct 2022): **Continue LIFT-AD Study**

		ADCS-ADL23					
		0	+1	+2	+2.5	+3	+4
ADAS-Cog11	0	Stop for Futility	Stop for Futility	Stop for Futility	Stop for Futility	Exceeds maximum enrollment constraint	Exceeds maximum enrollment constraint
	-1	Stop for Futility	Stop for Futility	Exceeds maximum enrollment constraint	Exceeds maximum enrollment constraint	Continue Study	Continue Study
	-2	Stop for Futility	Exceeds maximum enrollment constraint	Exceeds maximum enrollment constraint	Continue Study	Continue Study	Continue Study
	-2.5	Exceeds maximum enrollment constraint	Exceeds maximum enrollment constraint	Continue Study	Continue Study	Continue Study	Continue Study
	-3	Exceeds maximum enrollment constraint	Continue Study	Continue Study	Continue Study	Continue Study	Continue Study
	-4	Continue Study	Continue Study	Continue Study	Continue Study	Continue Study	Continue Study
	-4	Continue Study	Continue Study	Continue Study	Continue Study	Continue Study	Continue Study

**DMC analysis suggests greater potential of LIFT-AD success**

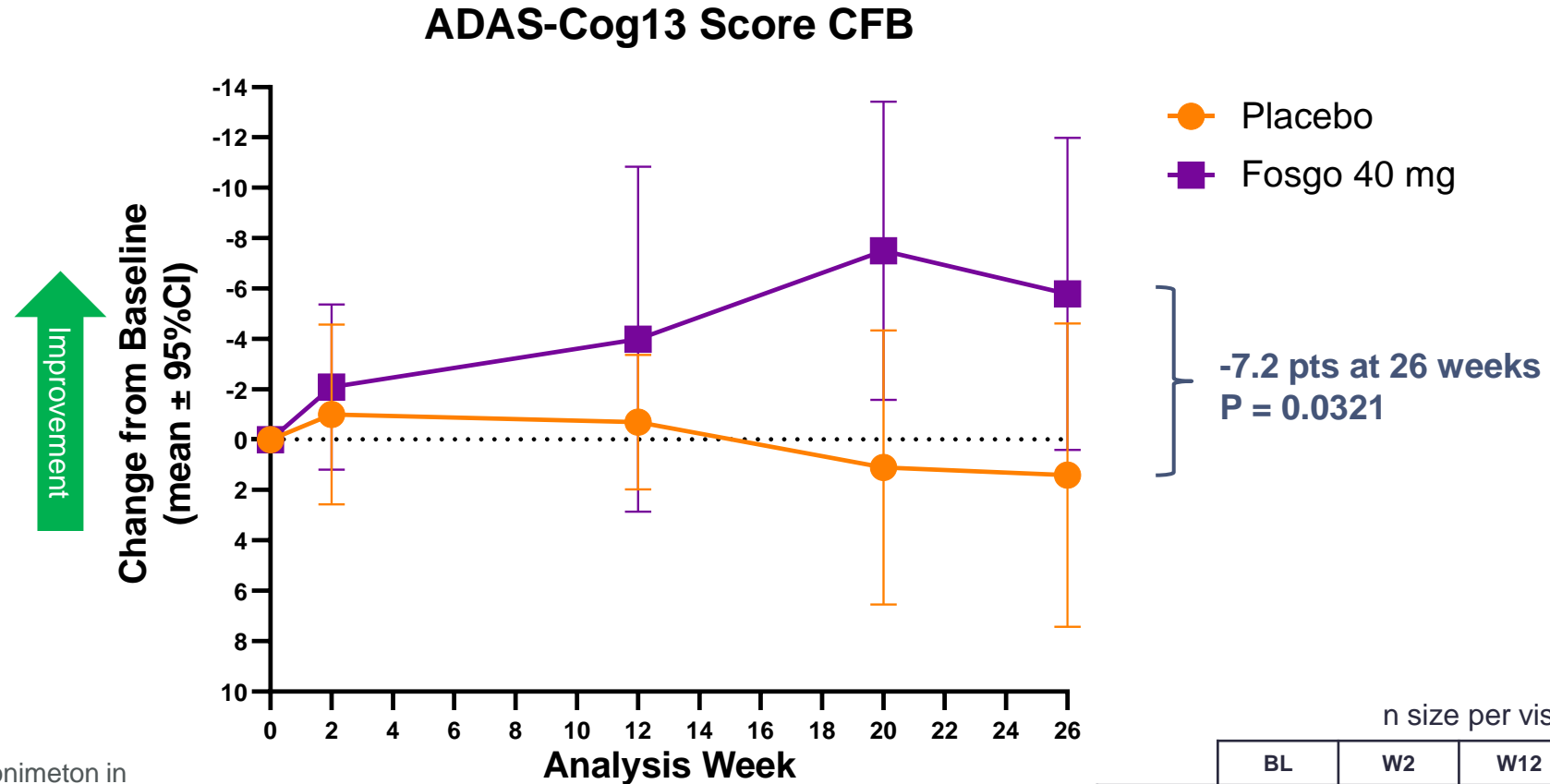


<sup>1</sup>Conducted by DMC: Chair neurologist (MD) and two biostatisticians (PhD); <sup>2</sup>Primary endpoint is the global statistical test, an unweighted composite of ADAS-Cog11 and ADCS-ADL23.  
AD, Alzheimer's disease; ADAS-Cog11, Alzheimer's Disease Assessment Scale–Cognitive Subscale; ADCS-ADL23, Alzheimer's Disease Cooperative Study–Activities of Daily Living; DMC, data monitoring committee.

# In a different disease setting\* fosgo improved cognition with 40mg dose compared to placebo



## ADAS-COG13 SCORE CHANGE FROM BASELINE MEAN AND 95% CI – MODIFIED INTENT TO TREAT POPULATION



	n size per visit				
	BL	W2	W12	W20	W26
Placebo	9	9	9	8	7
40 mg	7	7	7	6	5

\* The SHAPE trial investigated fosgonimeton in Parkinson's disease dementia and dementia with Lewy bodies; trial did not meet its primary endpoint.



ADAS-Cog13: Alzheimer's Disease Assessment Scale – Cognitive Subscale 13-item version; CI: Confidence Interval; Baseline is defined as the mean of the pre-dose measurements. Multiple efficacy assessments are averaged if they fall at the same visit. P-value is one-sided

# New Treatment Options Needed for Mild-to-Moderate Alzheimer's Disease

## Medical need:

The point of most accelerated disease progression<sup>1,2</sup>

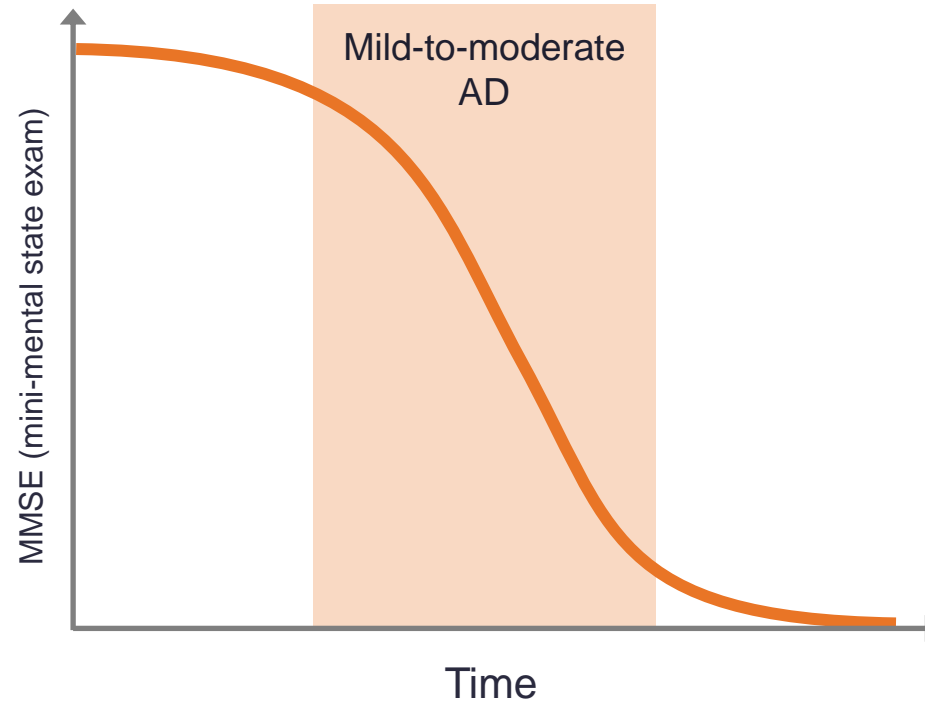
Few treatment options with only modest effects<sup>3</sup>

Higher financial burden than pre-dementia<sup>4</sup>

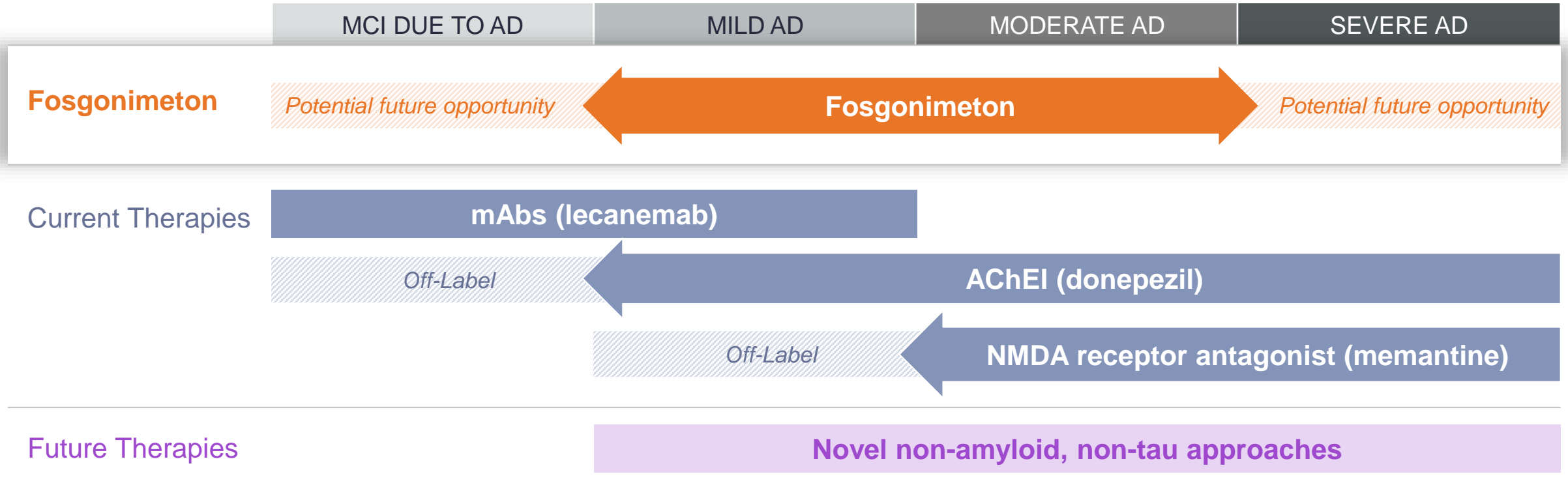
## Reduced development risk:

Clinical, syndromal diagnosis is possible<sup>5</sup>

Increased likelihood of tangible placebo decline



# Significant opportunity in Alzheimer's disease



**81% of all patients diagnosed with Alzheimer's disease are mild-to-moderate**

2.1 million mild-to-moderate Alzheimer's patients diagnosed in 2021 in the US

**Few available options**

75% of patients in the US move to a second-line treatment in less than a year

# Significant opportunity in Alzheimer's disease



**55 million**

People living with Alzheimer's dementia today<sup>1</sup>



**Multi-Billion \$ Market**

Despite generic entries



**Only Two**

New drugs launched since 2003 - two anti-amyloid antibodies

**Over 100 million globally by 2050**

~900,000 new patients diagnosed annually in the US alone<sup>1,2</sup>

**6.2 million treatment eligible patients in the US in 2021 based on prevalence data**

Growing at 3% per year<sup>2</sup>

**Mild to Moderate comprises 81% of all patients with Alzheimer's Disease**

78.5% of these patients receive Rx therapies<sup>3</sup>

**Significant opportunity for fosgonimeton**

Market research suggests favorable reaction and receptivity to fosgonimeton base case target product profile<sup>4</sup>

<sup>1</sup> <https://www.alzint.org/about/dementia-facts-figures/>

<sup>2</sup> <https://www.alz.org/media/documents/alzheimers-facts-and-figures.pdf>

<sup>3</sup> <https://www.nia.nih.gov/news/half-alzheimers-disease-cases-may-be-mild>

<sup>4</sup> ClearView Healthcare Partners Market Research Analysis

# Strong rationale to advance fosgonimeton

**SIGNIFICANT OPPORTUNITY TO TRANSFORM THE TREATMENT PARADIGM FOR NEURODEGENERATIVE DISEASES**

**Disease modifying**

**Improves cognition**

**Improves function**

**Reduces inflammation**

**Prevents nerve cell death**

**Favorable safety and tolerability profile**

**Risk mitigated Ph 2/3 LIFT-AD following interim analysis**

**Differentiated  
and Risk Mitigated**



**High unmet need**

**Enormous potential market**

**Favorable external  
landscape**

**Amyotrophic  
Lateral Sclerosis**

**ATH-1105**



# Positive modulation of HGF as a potential treatment for ALS

## ALS is a devastating progressive neurodegenerative disease

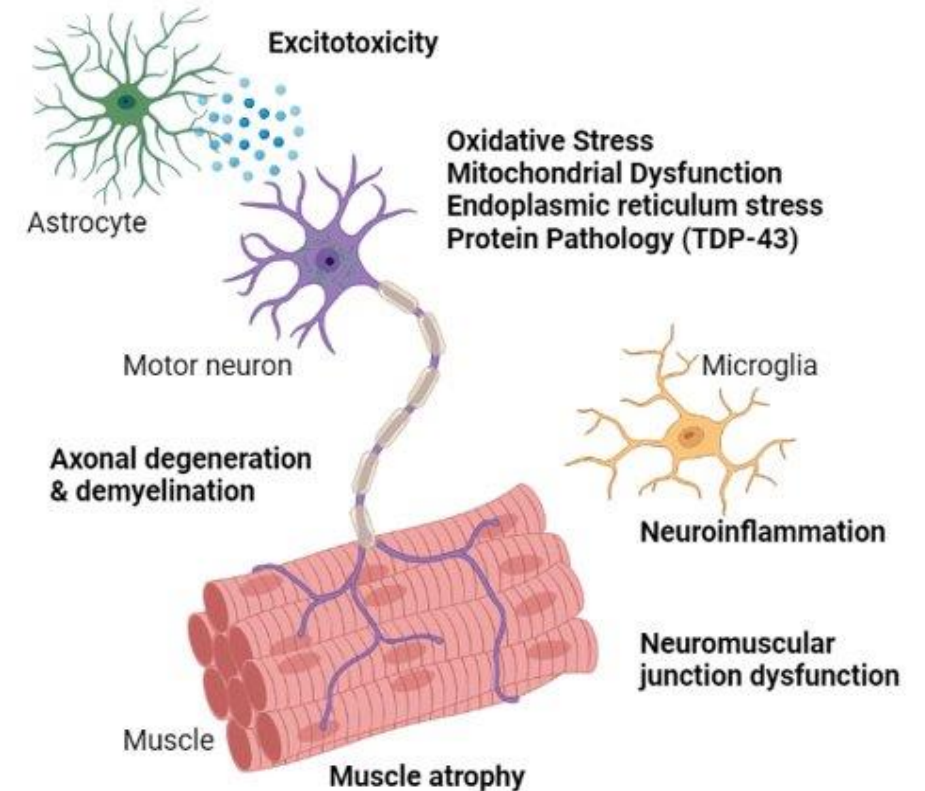
- Characterized by degradation of motor neurons due to several factors including glutamate excitotoxicity, TDP-43 protein pathology, and systemic inflammation

## Approximately 97% of ALS patients have TDP-43 pathology<sup>1</sup>

- TDP-43 is a nuclear protein under normal conditions but in ALS forms toxic aggregates in the cytoplasm of motor neurons
- TDP-43 mouse models have been developed that exhibit TDP-43 pathology and ALS-like symptoms

## Promotion of HGF/MET activity has been reported to have beneficial effects in preclinical models of ALS

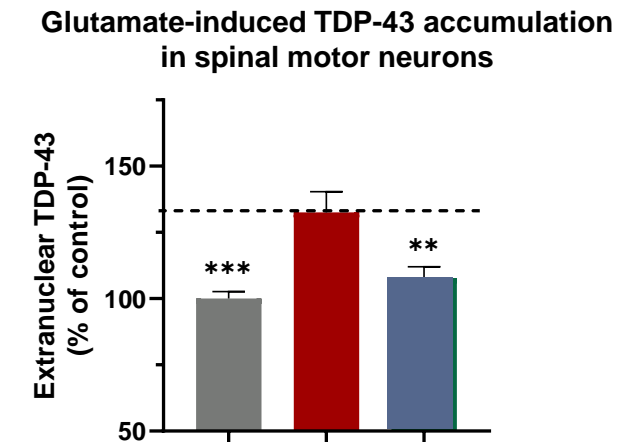
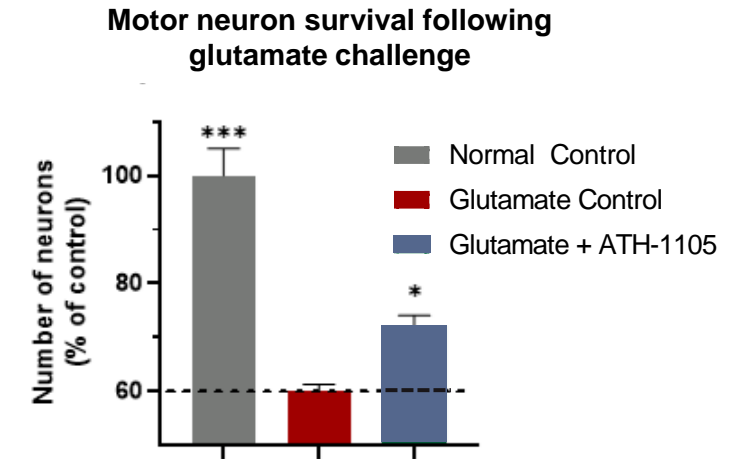
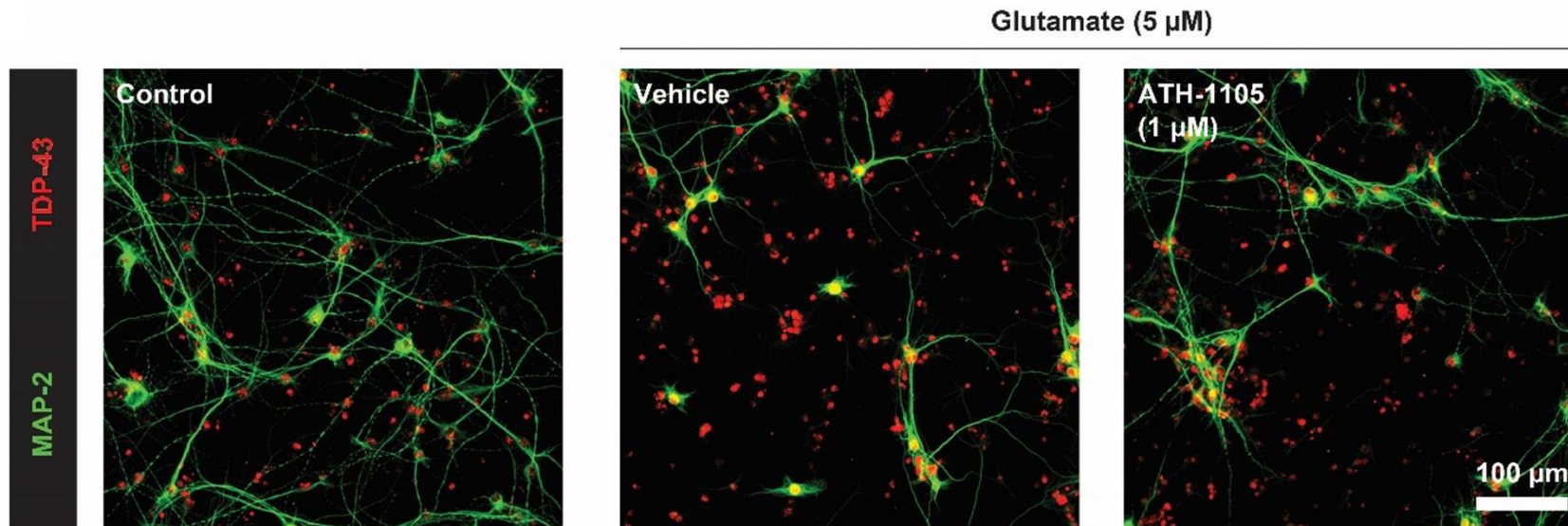
- HGF delays disease progression in ALS animal models<sup>2,3</sup>
- HGF reduces muscle impairment and motor neuron loss in an ALS mouse model<sup>4</sup>





# Neuroprotection and protein pathology: ATH-1105 reduces extranuclear TDP-43 accumulation and enhances neuron survival

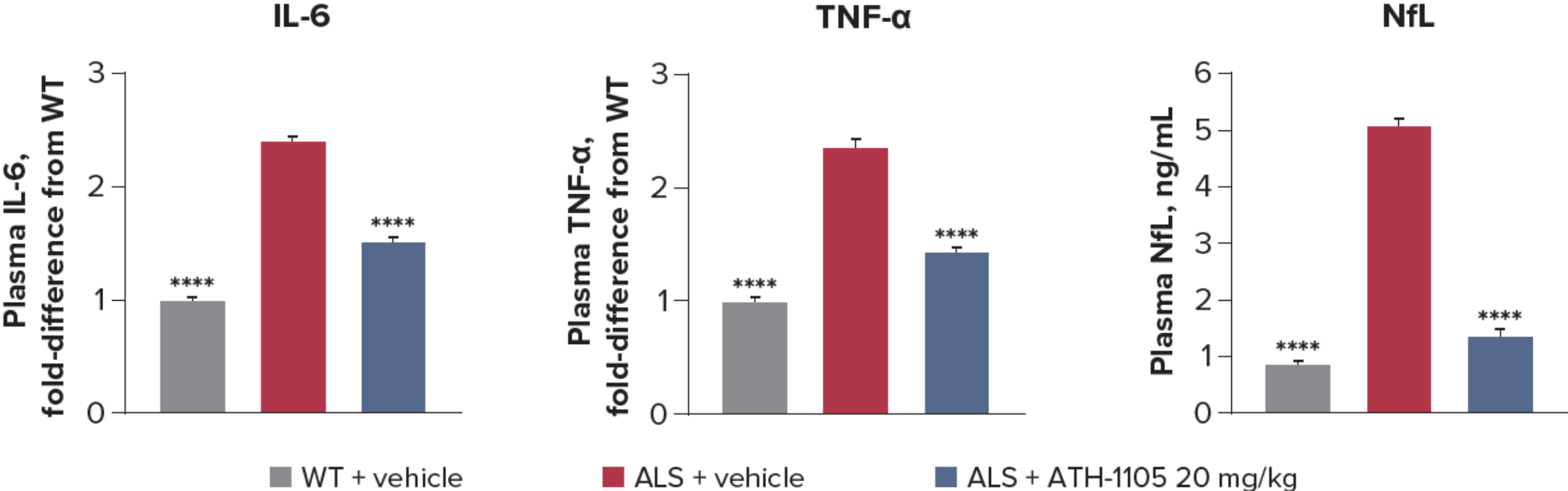
## GLUTAMATE CHALLENGE MODEL IN MOTOR NEURON CULTURES



Primary rat spinal motor neurons. Cultures treated with vehicle control or 5 μM glutamate. Data presented as mean ± SEM. Statistics applied: 1-way ANOVA with Fisher least significant difference test. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$  versus Glutamate Control;  $n = 6$ . Scale bar: 100 μm, applies to all images. MAP-2, microtubule-associated protein-2; TDP-43, TAR DNA-binding protein 43.

# Anti-inflammatory and neuroprotective: ATH-1105 reduces markers of inflammation and neurodegeneration

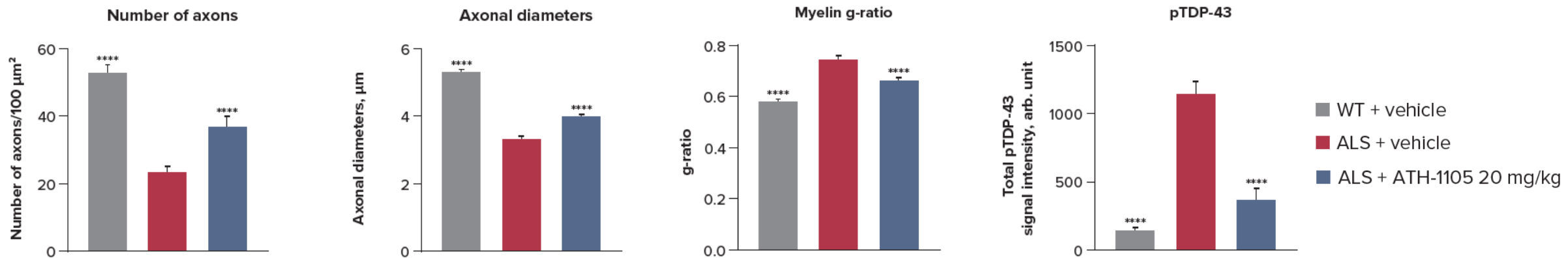
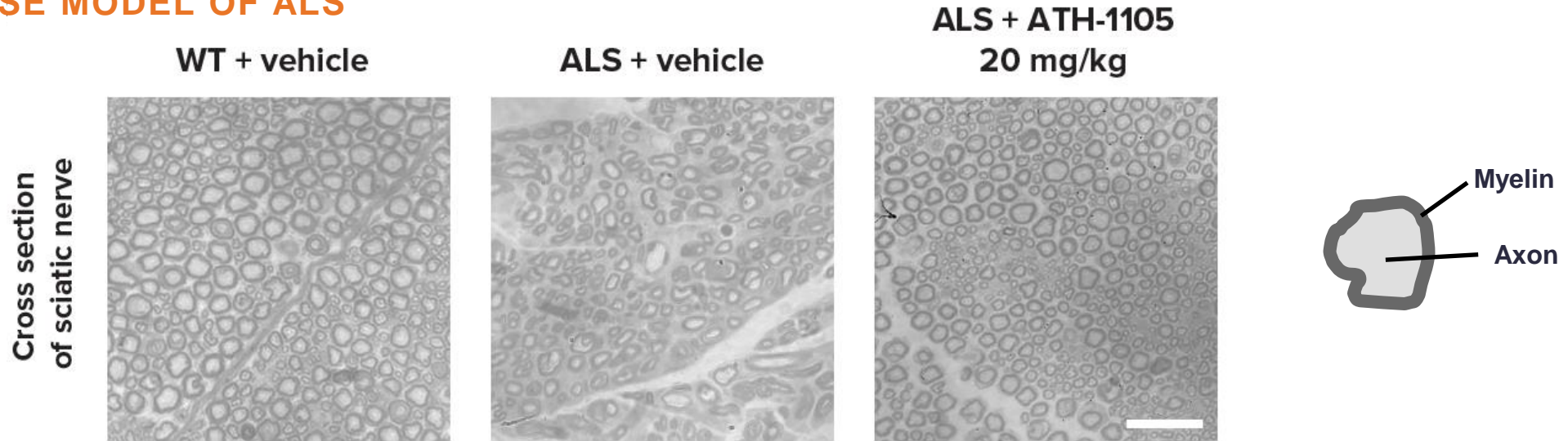
## TDP-43 MOUSE MODEL OF ALS



Data shown is from plasma collected following 2 months of ATH-1105 or vehicle treatment. Data presented as mean ± SEM. Statistical significance was determined by 1-way ANOVA with Dunnett's test versus ALS + vehicle. \*\*\*\*p < 0.0001. ALS, amyotrophic lateral sclerosis; IL-6, interleukin 6; NfL, neurofilament light chain; TDP-43, TAR DNA-binding protein 43; TNF-α, tumor necrosis factor alpha; WT, wild-type.

# Neuroprotective: ATH-1105 protects against axon degeneration and demyelination, and reduces pTDP-43

## TDP-43 MOUSE MODEL OF ALS



Graphical representation of the number of axons (per 100  $\mu\text{m}^2$ ), axonal diameter (in micrometers), and mean of myelin g-ratio, defined as the ratio of the inner axonal diameter to the total axonal diameter, following 2 months of treatment. Data presented as mean + SEM. Statistical significance was determined by 1-way ANOVA with Dunnett's test versus ALS + vehicle. \*\*\*\*p < 0.0001.

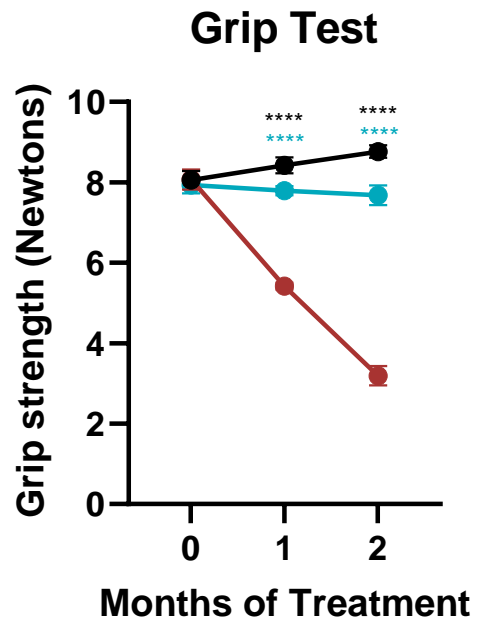
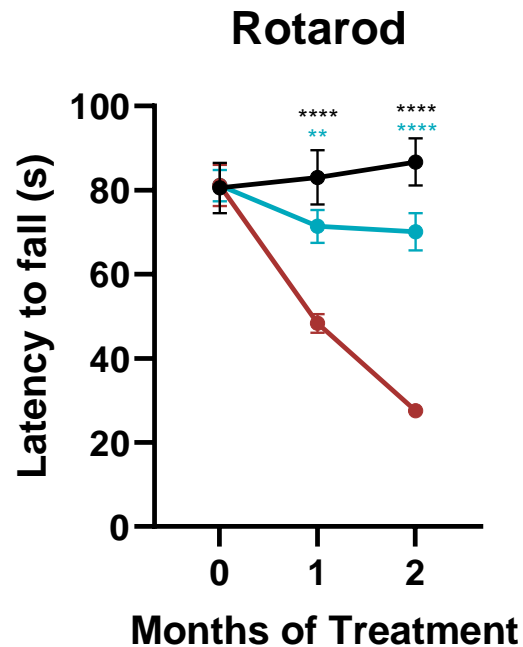
Scale bar: 10  $\mu\text{m}$ , applies to all images.

ALS, amyotrophic lateral sclerosis; pTDP-43, phosphorylated TDP-43; TDP-43, TAR DNA-binding protein 43; WT, wild-type.

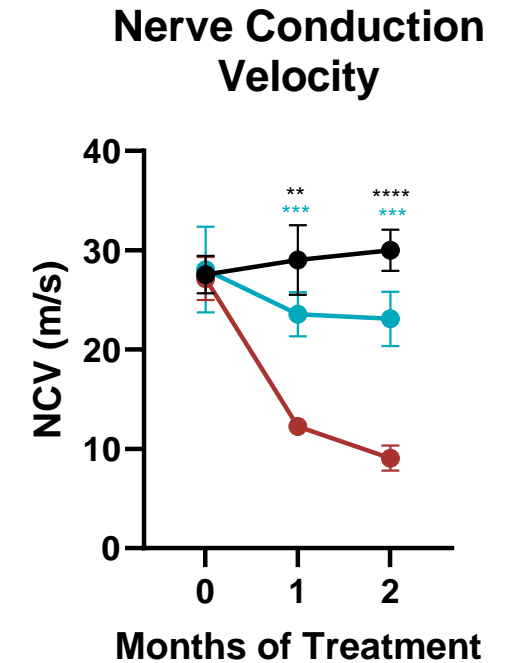
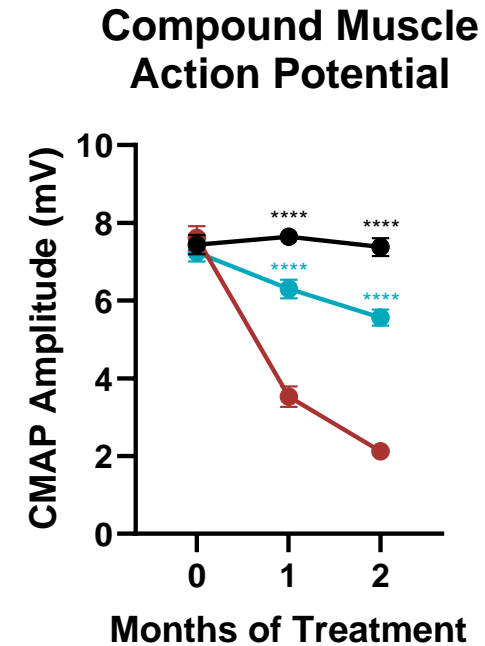
# Function: ATH-1105 prevents nerve and motor function decline

## TDP-43 MOUSE MODEL OF ALS

### Motor Function



### Nerve Function



● WT + vehicle    ● ALS + vehicle    ● ALS + ATH-1105 20 mg/kg

Model: Prp-TDP43A315T mouse model of ALS

Data presented as mean  $\pm$  SEM

Statistics applied: 2-way ANOVA with the Dunnett test versus ALS + vehicle. \* $p < 0.05$ , \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ ; \*\*\*\* $p < 0.0001$ .  $n = 10$  mice per group

ALS, amyotrophic lateral sclerosis; CMAP, compound muscle action potential; NCV, nerve conduction velocity; TDP-43, TAR DNA-binding protein 43; WT, wild-type.

# Survival: ATH-1105 prolongs survival and delays time to first mortality

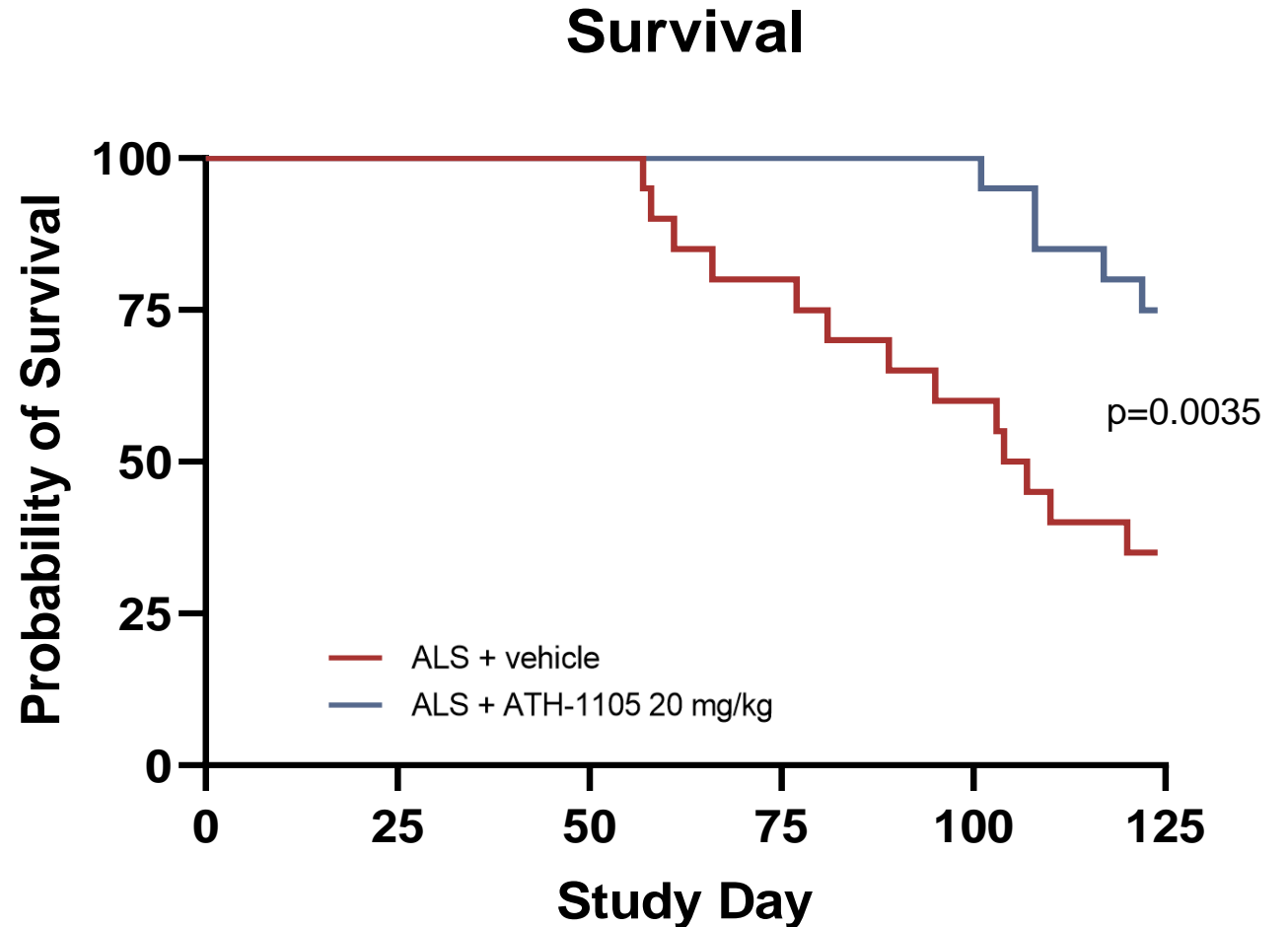
## TDP-43 MOUSE MODEL OF ALS

### Time to first mortality

- Day 57 in ALS + vehicle group
- Day 101 in ALS + ATH-1105 20 mg/kg

### Percent survival at 5 months of age

- 35% in ALS + vehicle group
- 75% in ALS + ATH-1105 20 mg/kg



# ATH-1105 preclinical data summary

**In the TDP-43 mouse model of ALS, daily oral treatment of ATH-1105 resulted in:**

- Improvement in motor function and protection against body weight reduction
- Preservation of nerve function and structure
- Reduction of plasma biomarkers of systemic inflammation and neurodegeneration
- Prolonged survival and delayed time to first mortality

These results highlight the therapeutic potential of ATH-1105 in ALS and support further development

# Significant unmet need: Amyotrophic Lateral Sclerosis (ALS)



**~75,000<sup>1</sup>**

People globally affected by ALS with 40% of those cases in the US



**Six<sup>1</sup>**

Approved drugs specifically indicated for the treatment of ALS



**Zero<sup>1</sup>**

ALS drugs targeting neurotrophic factor systems with a multimodal mechanism of action

## Global Market Size for ALS<sup>1</sup>

2019:

**\$197M**

2029 Projected:

**\$781M**

## Drugs in Development<sup>1,2</sup>

Limited differentiated and multifactorial approaches

Tofersen addresses a familial form of ALS accounting for <3% of all cases (recently received accelerated approval on the basis of NfL)

## Significant Opportunity for ATH-1105

Limited approved treatment options exist for ALS patients

Multimodal mechanism of action – neuroprotective, anti-inflammatory and potentially disease modifying

Positive modulation of a naturally occurring repair mechanism

Corporate





# Athira management team with significant CNS product development and approval experience

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# Moving forward

- ✓ Independent, unblinded interim analysis of fosgonimeton Phase 2/3 LIFT-AD
- ✓ LIFT-AD completed enrollment

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- ✓ First-in human, dose-escalation Phase 1 clinical trial underway of ATH-1105 in development for potential treatment of ALS

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- ✓ Enrolled 28 patients in exploratory fosgonimeton SHAPE trial in PD and dementia with Lewy bodies



- Topline results targeted in September 2024



- Trial completion expected by year end 2024

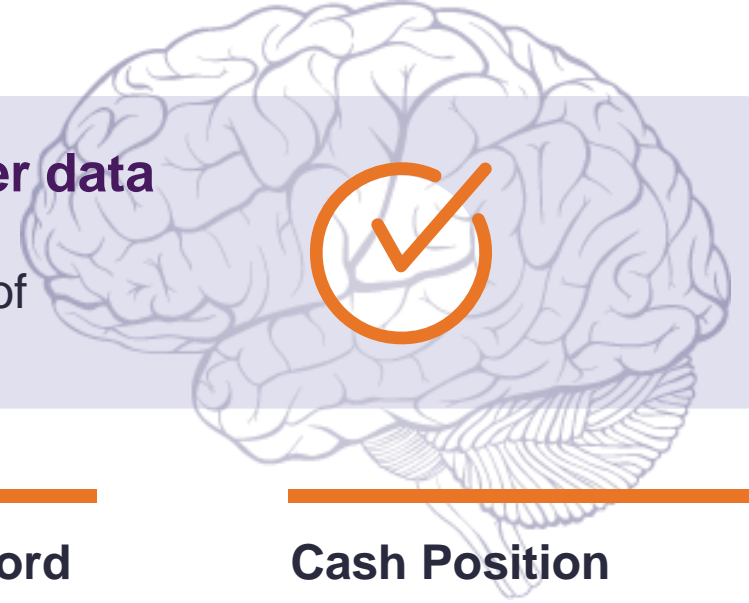


- Topline results reported 4Q2023; evaluating next steps

# Well positioned to lead with innovative approach to battling neurodegenerative diseases

## **Consistent and correlative preclinical, clinical and biomarker data**

showing that enhancing HGF neurotrophic system has potential to be neuroprotective, anti-inflammatory and disease modifying in a number of neurodegenerative diseases



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**Mitigated development risk**  
through independent, unblinded interim analysis of Phase 2/3 LIFT-AD trial

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**Evolving regulatory environment and favorable competitive landscape**

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**Strong track record of execution** and leadership team with significant CNS product development and approval experience

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**Cash Position**  
\$91.8M at the end of 2Q2024

Thank You

