Corporate Presentation

November 2024

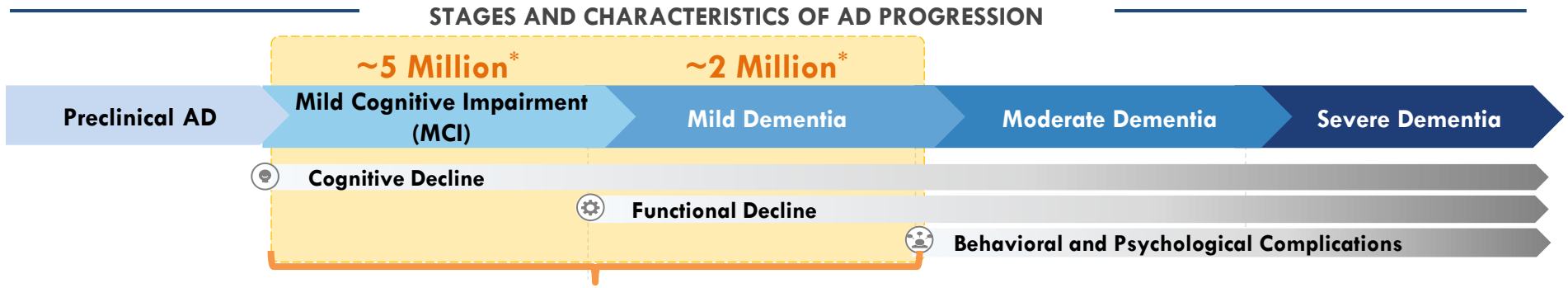
Forward-Looking Statements

This presentation contains forward-looking statements within the meaning of The Private Securities Litigation Reform Act of 1995. Any statement describing Acumen's goals, expectations, financial or other projections, intentions or beliefs is a forward-looking statement and should be considered an at-risk statement. Words such as "believes," "expects," "anticipates," "could," "would," "seeks," "aims," "plans," "potential," "will" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. Forward-looking statements include statements concerning Acumen's business, and Acumen's ability to achieve its strategic and financial goals, including its projected use of cash, cash equivalents and marketable securities and the expected sufficiency of its cash resources into the first half of 2027, the therapeutic potential of Acumen's product candidate, sabirnetug (ACU193), including against other antibodies, the anticipated timeline for announcing the top-line results from our Phase 1 trial of a subcutaneous dosing option of ACU193, and the anticipated timeline for the completion of enrollment of our Phase 2 ALTITUDE-AD trial. These statements are based upon the current beliefs and expectations of Acumen management, and are subject to certain factors, risks and uncertainties, particularly those inherent in the process of discovering, developing and commercializing safe and effective human therapeutics. Such risks may be amplified by the impacts of the COVID-19 pandemic. These and other risks concerning Acumen's programs are described in additional detail in Acumen's filings with the Securities and Exchange Commission ("SEC"), including in Acumen's most recent Annual Report Form 10-K and future filings and reports by Acumen. Copies of these and other documents are available from Acumen. Additional information will be made available in other filings that Acumen makes from time to time with the SEC. These forward-looking statements speak only as of the date hereof, and Acumen expressly disclaims any obligation to update or revise any forward-looking statement, except as otherwise required by law, whether, as a result of new information, future events or otherwise. In this presentation, references to cash also include cash equivalents.

Advancing a Next Generation Antibody Targeting Toxic Amyloid Beta Oligomers (AβOs) for Early Alzheimer's Disease (AD)

- Large market in need of additional treatment options
- Sabirnetug (ACU193): monoclonal antibody (mAb) highly selective for toxic AβOs
- Positive Phase 1 clinical trial results presented in 2H 2023
- Experienced leadership team with extensive AD drug development experience
- Strong balance sheet supporting clinical development plans for sabirnetug
- Phase 2 (IV) enrollment completion expected 1H25; Phase 1 (subcutaneous) TLR expected in 1Q25

Early AD Patient Population Represents Significant and Growing Market



Early Alzheimer's Disease in the U.S.

Higher prevalence due to aging population → More diagnosed cases driven by improved ability to diagnose in earlier stages of AD → More treated cases due to availability of treatment options and favorable shifts around adoption = **Growing Market**

*Alzheimer's Association

AD, Amyloid & Abeta Oligomers

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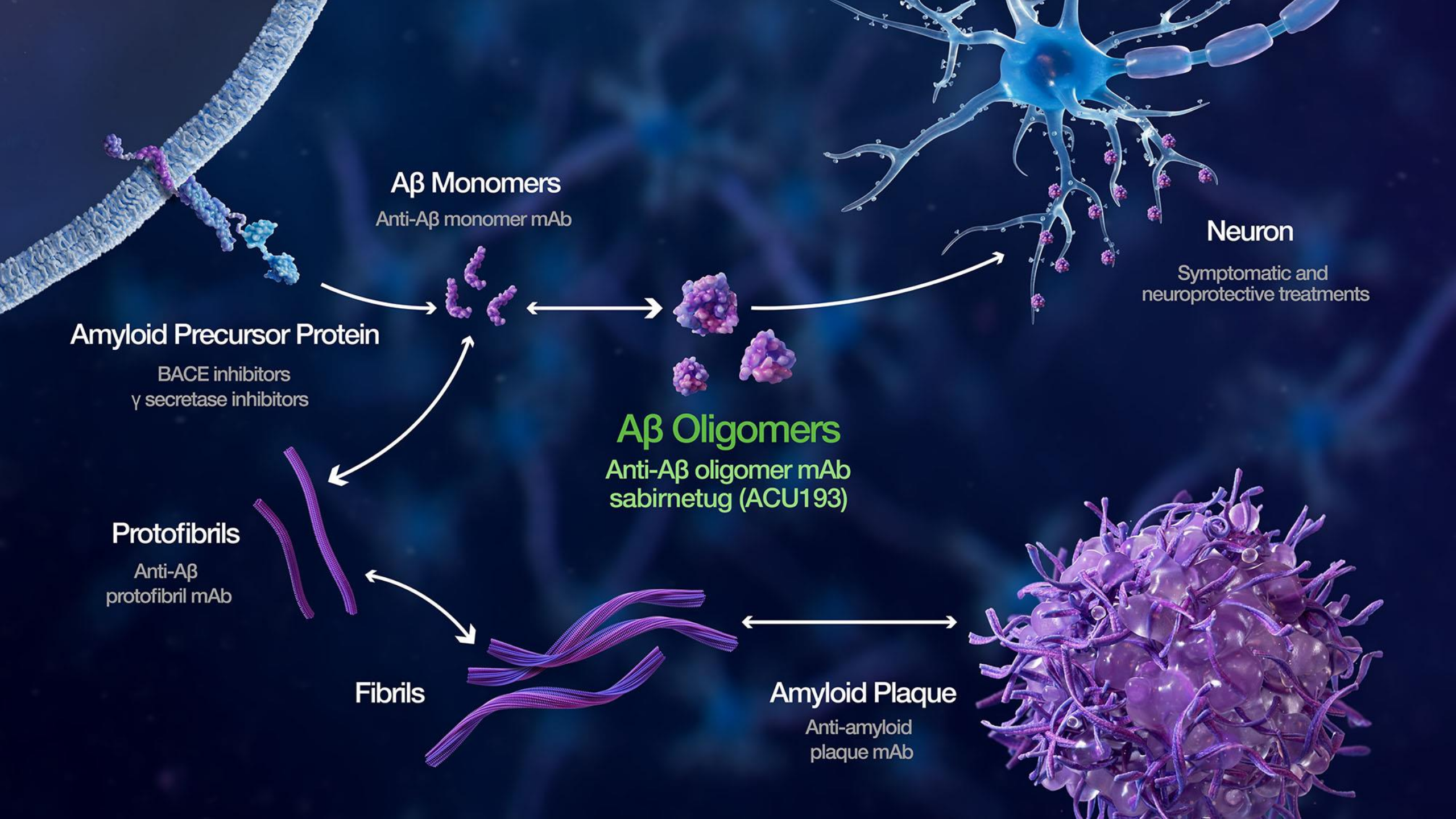
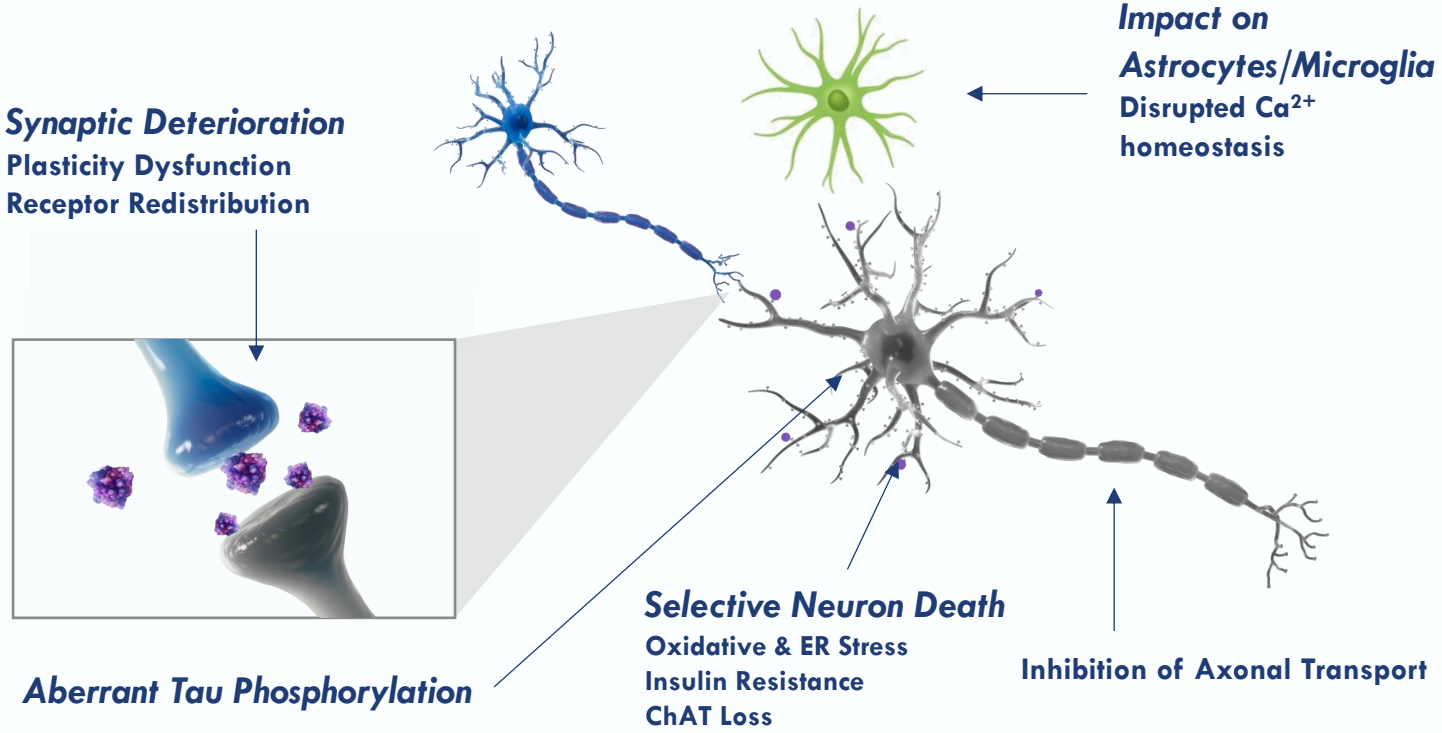

Aβ Monomers
Anti-Aβ monomer mAb
Neuron
Symptomatic and
neuroprotective treatments
Amyloid Precursor Protein
BACE inhibitors
γ secretase inhibitors
Aβ Oligomers
Anti-Aβ oligomer mAb
sabirnetug (ACU193)
Protofibrils
Anti-Aβ
protofibril mAb
Fibrils
Amyloid Plaque
Anti-amyloid
plaque mAb

Soluble AβOs Contribute to Pathophysiological Processes Associated with Alzheimer's Disease

- Soluble Aβ forms appear early in the course of disease pathophysiology
- Consequences of soluble Aβ oligomer production include synapse dysfunction and loss, tau hyperphosphorylation, immune cell activation and functional impairment
- Reduced neuronal toxicity and intervention at the synaptic level may prevent irreversible neuronal cell death
- Production of toxic soluble Aβ persists after plaque removal



Supported by extensive literature:

Synapse deterioration
Zhao et al, 2006
Lacor et al, 2007
Shankar et al, 2007
Wu et al, 2010
Brito-Moreira et al, 2017
Actor-Engel et al, 2021
Sackmann & Hallbeck, 2020
Limegrover et al, 2021

Plasticity dysfunction
Lambert et al, 1998
Walsh et al, 2002
Wang et al, 2002
Townsend et al, 2006
Yasumoto et al, 2019

Receptor Redistribution
Snyder et al, 2005
Roselli et al, 2005
Lacor et al, 2007
Zhao et al, 2008

Aberrant Tau phosphorylation
De Felice et al, 2008
Ma et al, 2009
Tomiyama et al, 2010
Zempel et al, 2010
Bloom, 2014
Forny-Germano et al, 2020
Wakeman et al, 2022
Darricau et al, 2023

Impact on astrocytes/microglia
Hu et al, 1998
Jimenez et al, 2008
Sondag et al, 2009
Tomiyama et al, 2010

Disrupted Ca^{2+} homeostasis
Demuro et al, 2005
De Felice et al, 2007
Alberdi et al, 2010
Wang et al, 2018

Selective neuron death
Lambert et al, 1998
Kim et al, 2003
Florent et al, 2006
Ryan et al, 2009
Lee et al, 2017
Komura, 2019

Insulin resistance
Zhao et al, 2008
Zhao et al, 2009
Ma et al, 2009
De Felice et al, 2009

ChAT loss
Heinitz et al, 2006
Nunes-Tavares et al, 2012

Oxidative stress
Longo et al, 2000
Sponne et al, 2003
Tabner et al, 2005
De Felice et al, 2007

ER stress
Resende et al, 2008
Nishitsuji et al, 2009

Inhibition of axonal transport
Pigino et al, 2009
Poon et al, 2009
Decker et al, 2010

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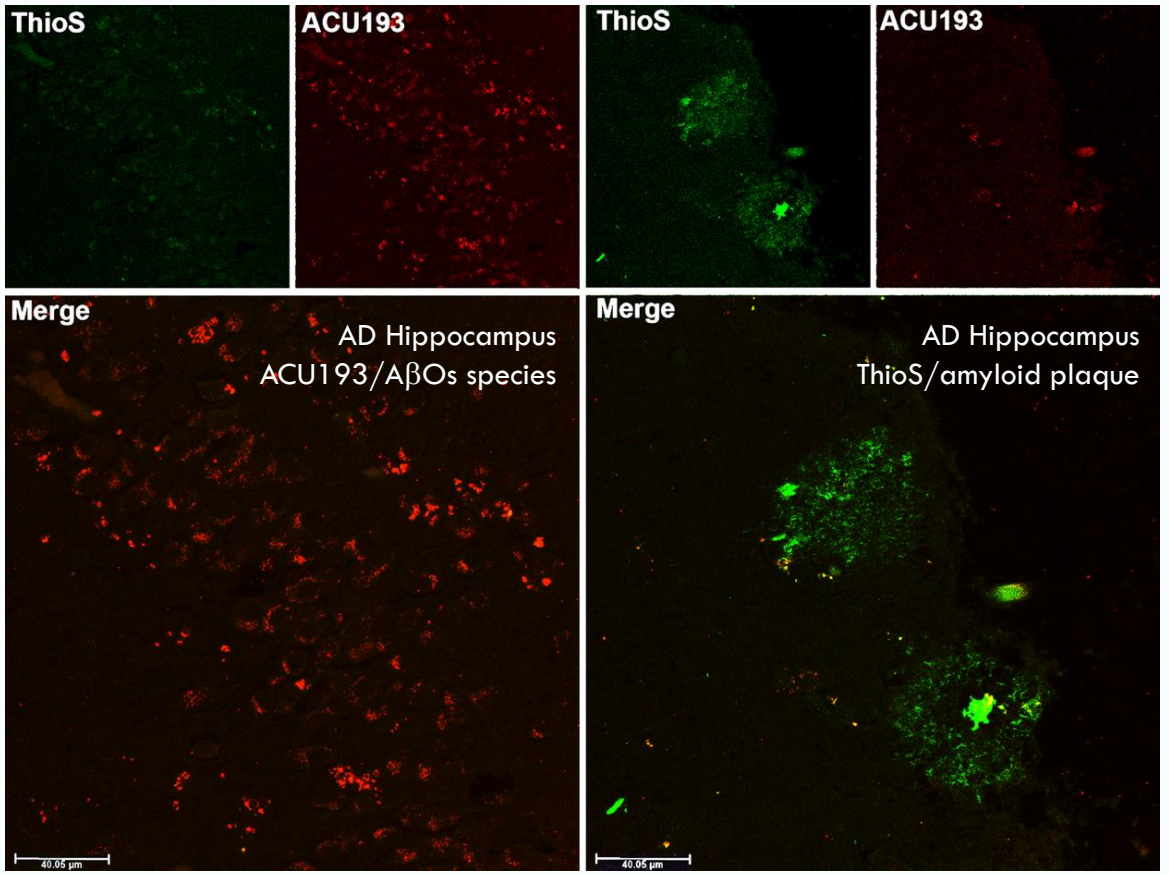
Sabirnetug is Highly Selective for AβOs Versus Aβ Plaques

Sabirnetug staining in human AD brain slices

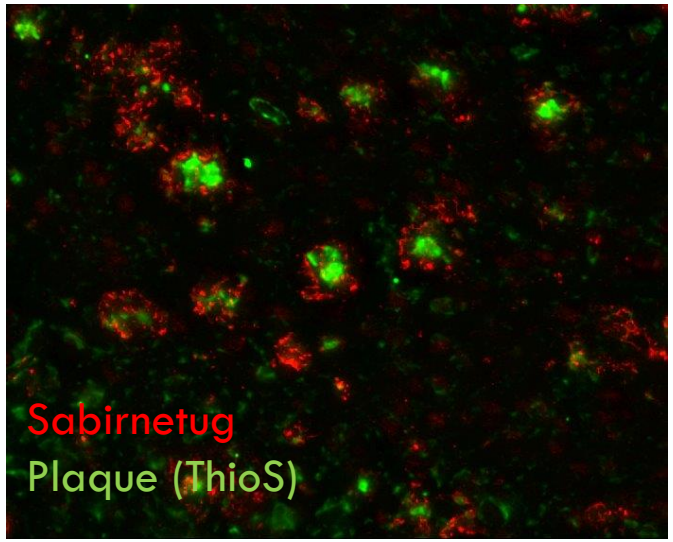


Sabirnetug
Thioflavin S

Adapted from Krafft et al. 2022

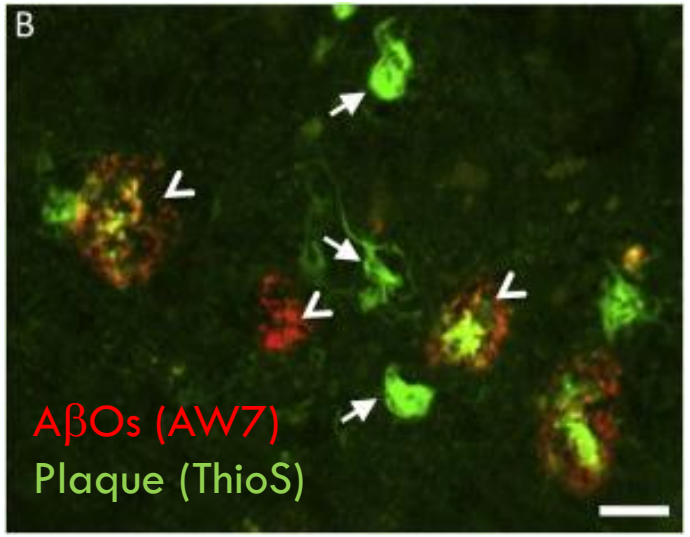
Amyloid Plaques are Surrounded by a Halo of AβOs

Transgenic mouse model of AD



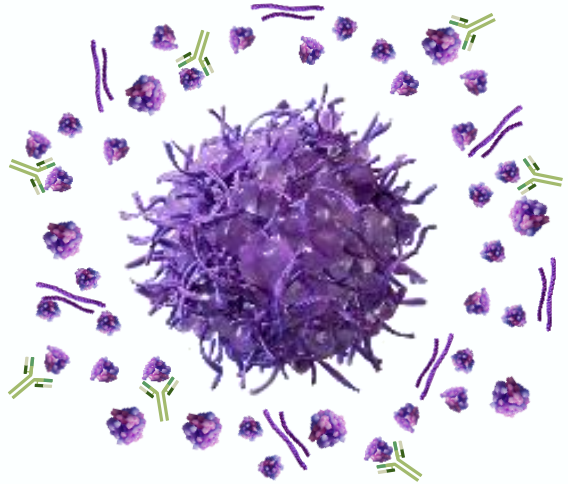
Lab of William Klein, NU, 2017

AD brain tissue



Spires-Jones et al. 2016

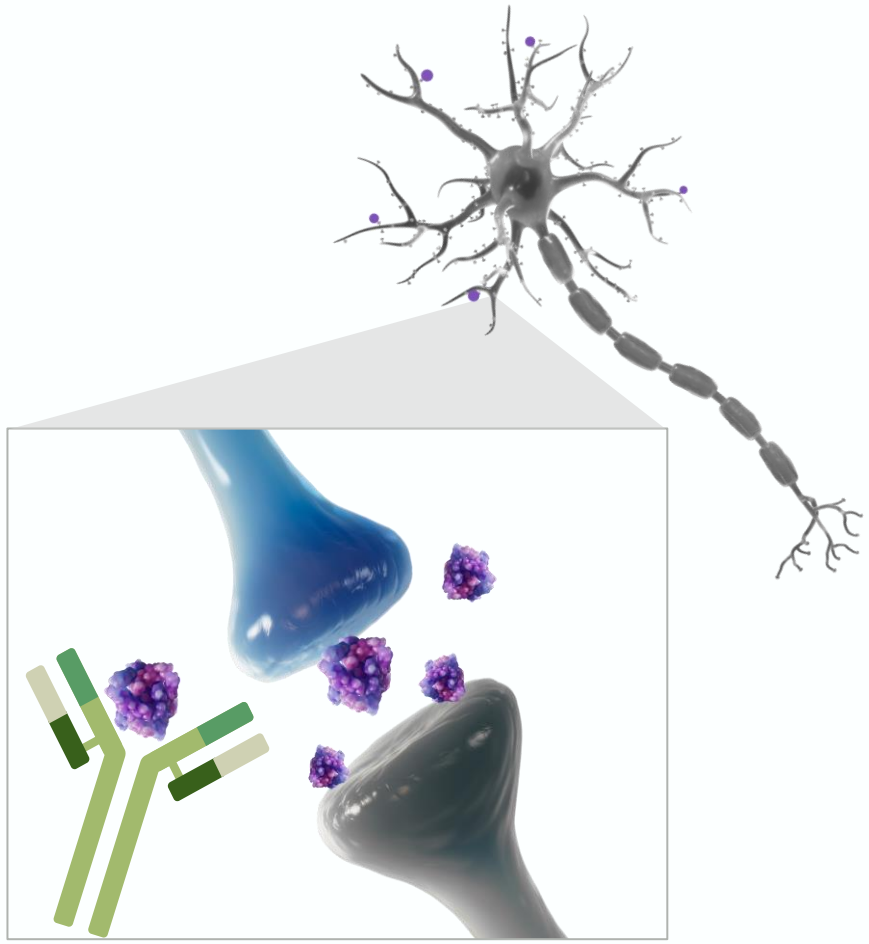
Sabirnetug targets AβOs that form halos of soluble aggregates around dense core of plaques



Sabirnetug binding to soluble AβOs

Sabirnetug: Potential Next Generation Immunotherapy for Early AD

Large Pharma Collaboration	• **Discovered in collaboration with Merck & Co.** Acumen holds exclusive program rights with no future financial or other obligations due to Merck
Designed for Improved Efficacy & Safety	• **Humanized, affinity matured mAb developed to target toxic Aβ oligomers** • **IgG2 subclass mAb with reduced effector function**
Encouraging FDA Interactions	• **FDA Fast Track designation for the treatment of early Alzheimer's disease** • **FDA End of Phase 2 meeting in 4Q 2023**
Positive Phase 1 in AD	• **Successful Phase 1 exclusively in early AD patients** • **Phase 2 initiated in 2Q24 with ~540 participants** • **Expect to complete Phase 2 enrollment in 1H25**



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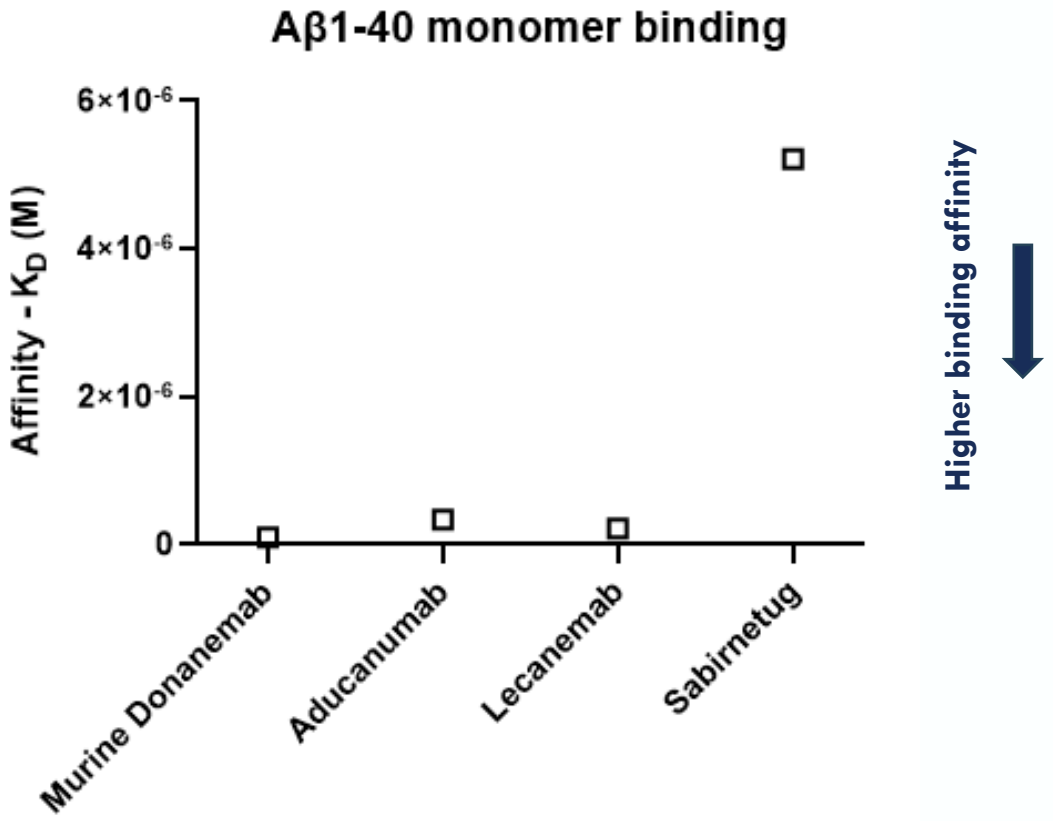
Sabirnetug was Developed to Selectively Target AβOs

High selectivity for AβOs versus monomeric Aβ



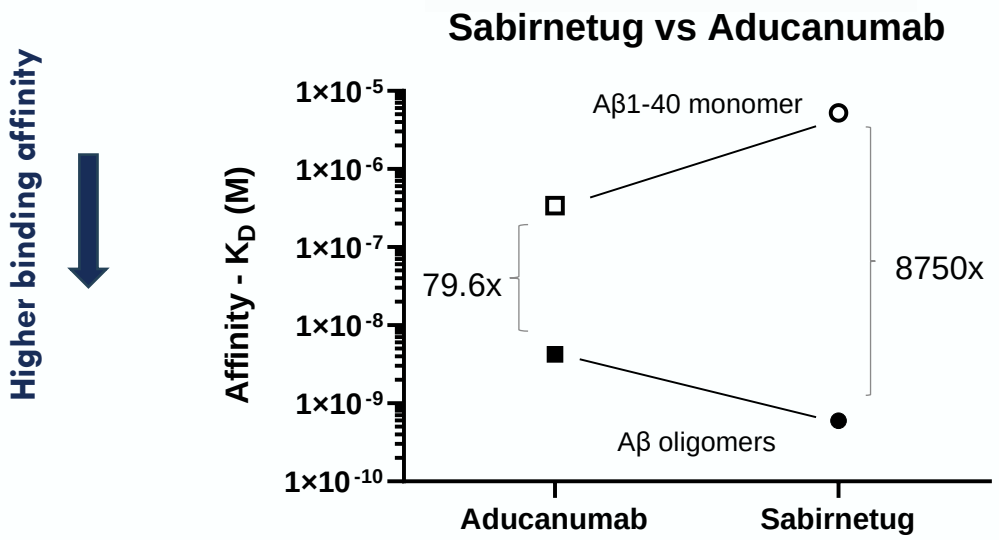
Internal data, 2024

- Aβ monomers are ~7000x fold higher concentration than AβOs in AD CSF
- Higher affinity for monomeric Aβ will reduce functional selectivity due to high monomer levels
- Sabirnetug has much lower affinity than other mAbs for Aβ monomers

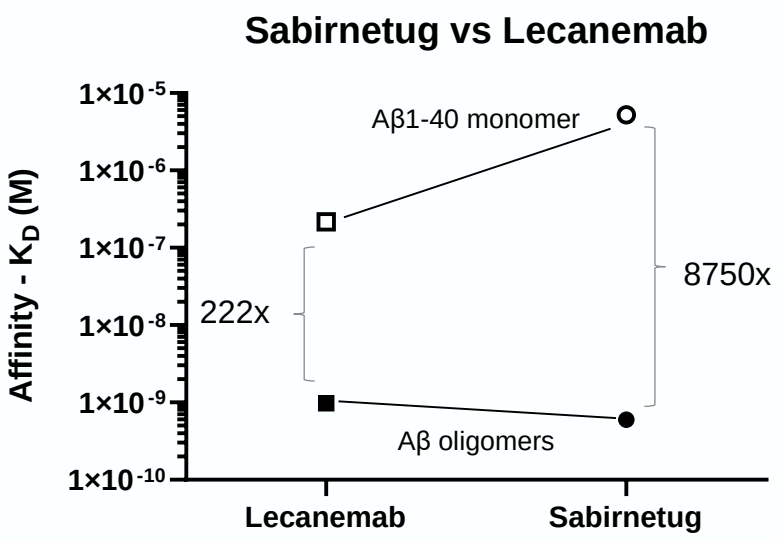
Sabirnetug is Highly Selective for Aβ Oligomers

Relative selectivity for AβO versus monomeric Aβ measured with SPR

Sabirnetug is more selective for AβOs than aducanumab



Sabirnetug is more selective for AβOs than lecanemab



Internal data, 2024

Sabirnetug: Value Proposition

The Alzheimer's disease market is at a **key inflection point** with **recent and expected approvals** paving a new path for the treatment of AD …

… and **sabirnetug** is well-positioned to emerge as a potential next generation **treatment of choice**.

Market will likely remain consolidated with Aβ therapies emerging as the primary treatment option over the next few years

Stakeholders are encouraged about the advancements in the AD treatment landscape and are working together to enable broader patient access

With potential clinical and safety benefits conferred by AβO selectivity, sabirnetug has the opportunity to be a treatment of choice in the broader early AD population

Positive INTERCEPT-AD Phase 1 Results for Sabirnetug

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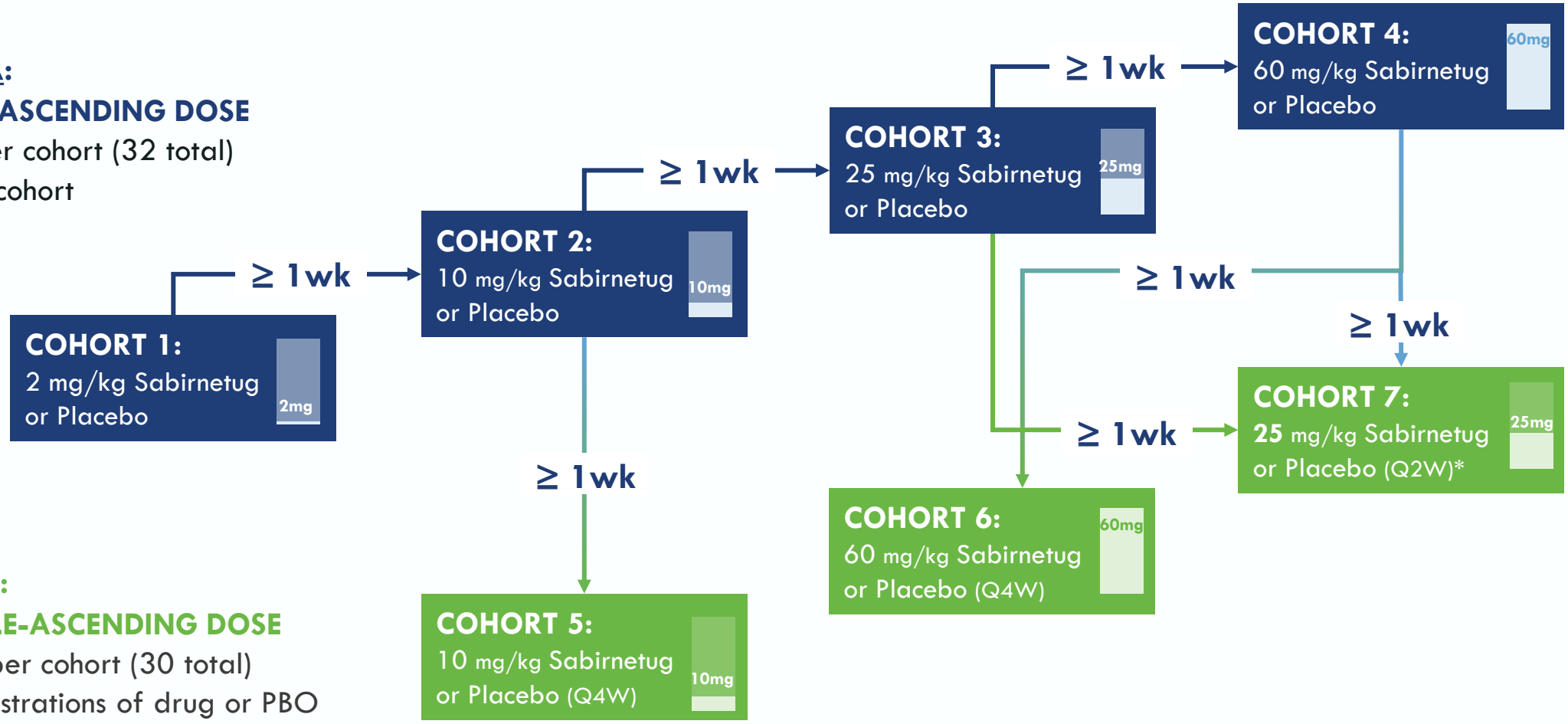
INTERCEPT-AD: A Randomized Placebo Controlled Phase 1 in Early AD Patients

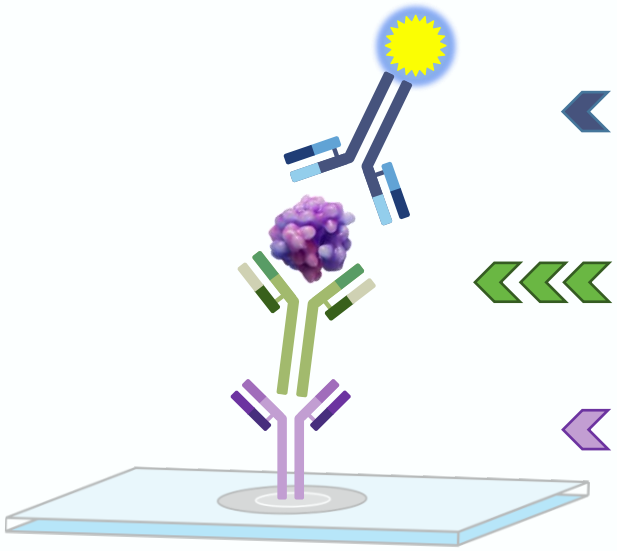


Q2W: Dosing every two weeks; Q4W: Dosing every four weeks.

Target Engagement Assessed by Measuring Sabirnetug-AβO Complex in CSF

- Novel assay configuration tailored to selectively detect sabirnetug-AβO complex in CSF as direct measure of target engagement
- Translated for clinical use from a preclinical assay developed by Merck that showed sabirnetug engages target AβOs in transgenic mouse brain (tg2576) in dose dependent manner

MSD S-Plex (Turbo) Immunoassay



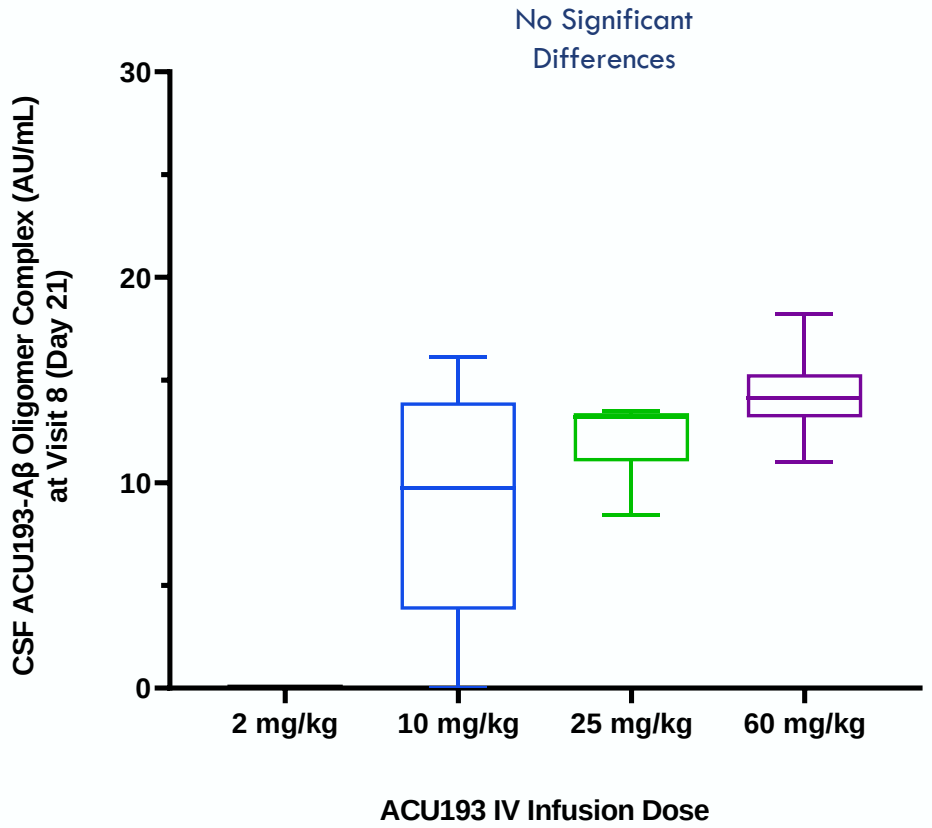
AβO selective detection
(anti-AβO mAb)

Only Sabirnetug-AβO complex is measurable

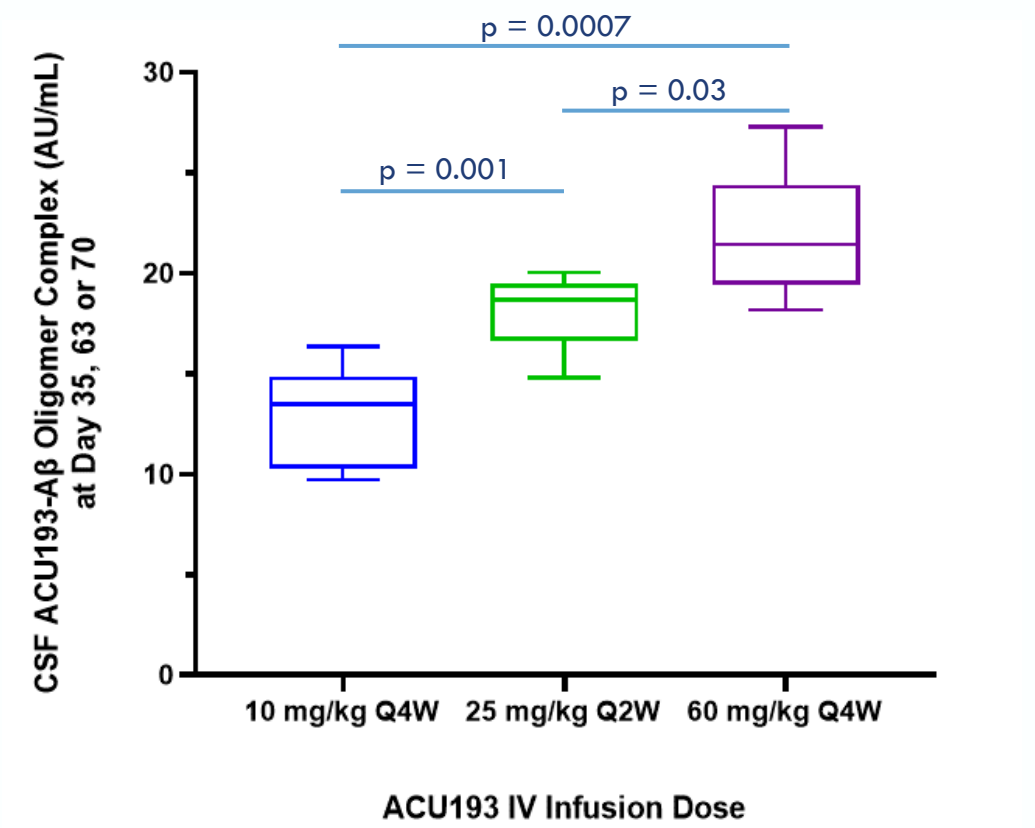
Sabirnetug drug specific capture
(anti-sabirnetug idiotype mAb)

Target Engagement of Sabirnetug with AβOs is Dose Proportional

Single Dose Cohorts



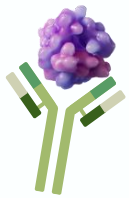
Multiple Dose Cohorts*



*One patient from Cohort 5 (10 mg/kg Q4W) excluded because only received one administration of drug (study drug discontinued after lacunar infarct).

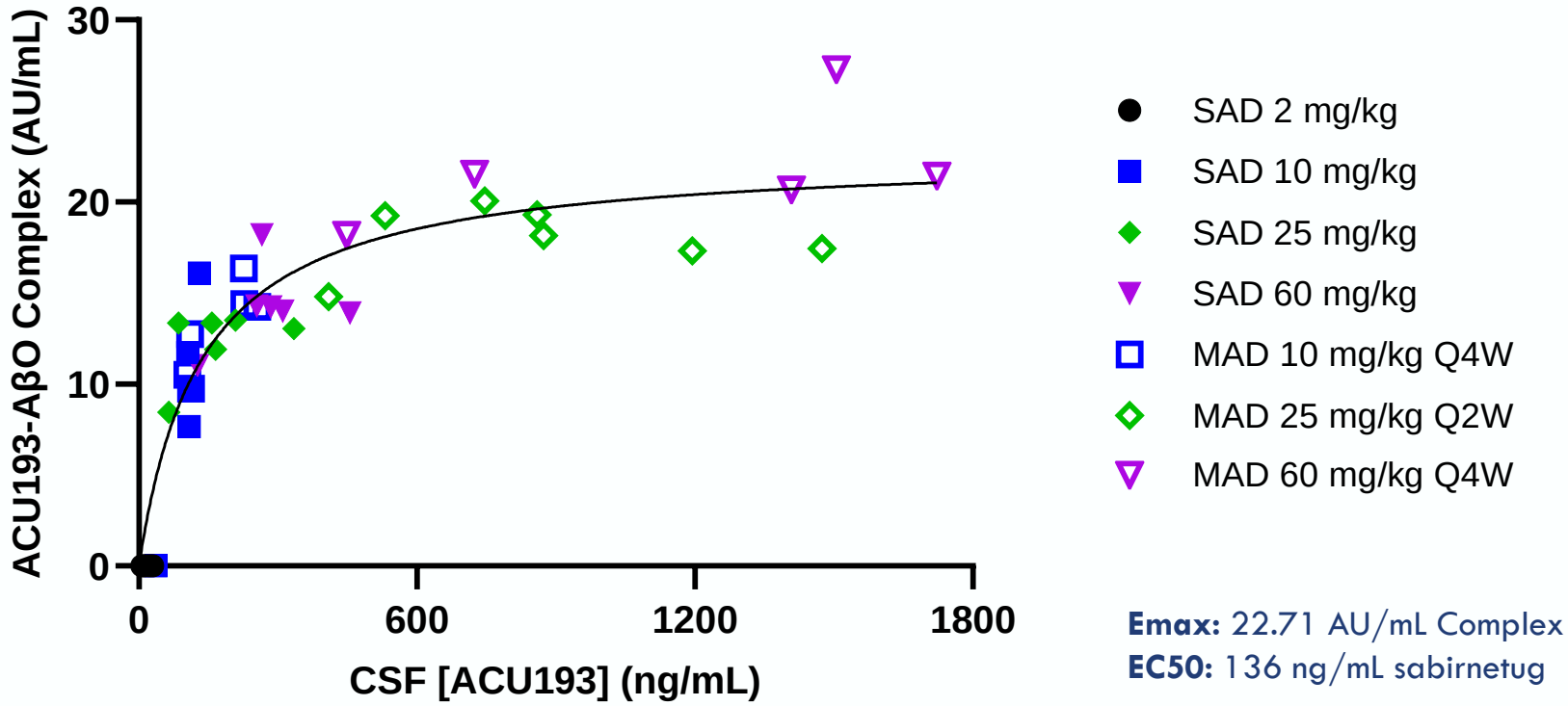
Doses Approaching Maximal Target Engagement Support Sabirnetug AβO Mechanism and Helped Guide Dose Selection for Next Study Phase

Target Engagement



Sabirnetug-AβO Complex

Single & Multiple Dose Cohorts - Exposure Response Relationship (Emax Model)

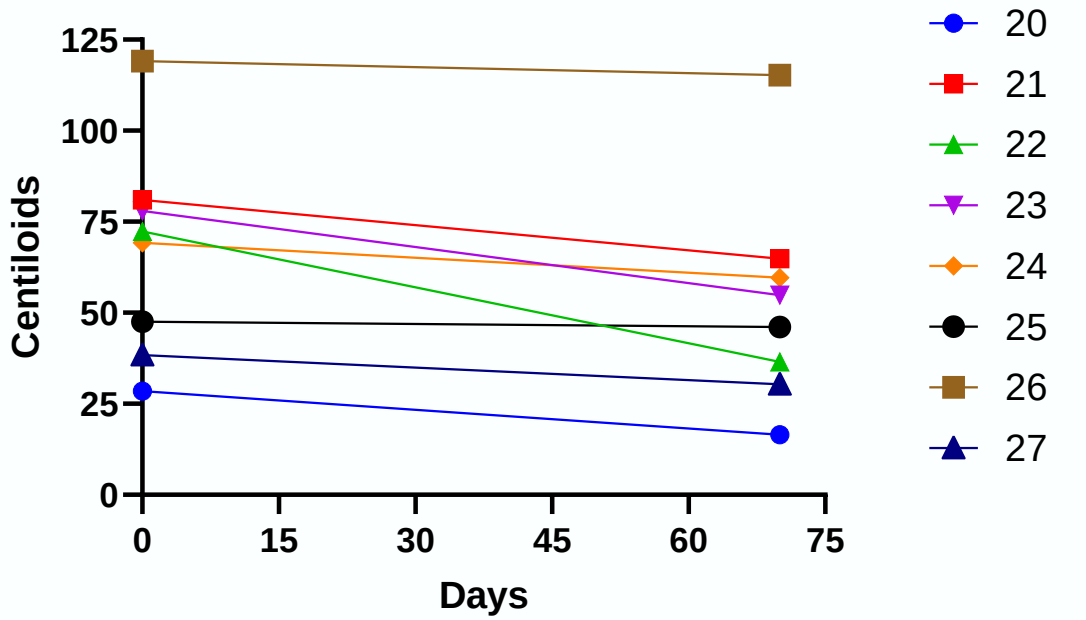


Emax: 22.71 AU/mL Complex
EC50: 136 ng/mL sabirnetug

*One patient from Cohort 5 (10 mg/kg Q4W) excluded because only received one administration of drug (study drug discontinued after lacunar infarct).

Nearly All Sabirnetug-Treated Patients in High Dose MAD Cohorts Showed Reductions in Plaque Load After Three Doses at 63 or 70 days

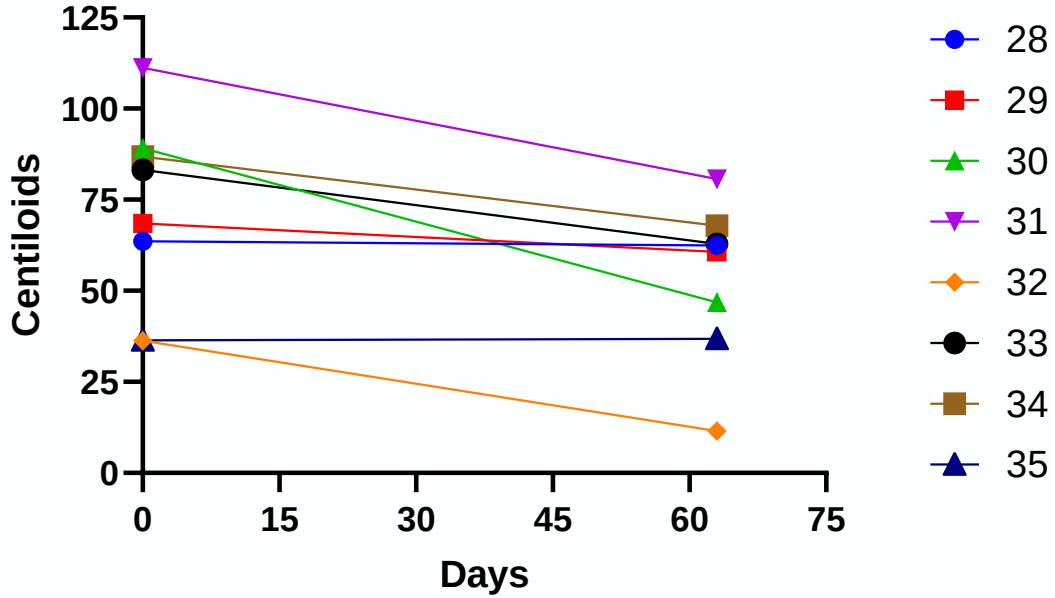
25 mg/kg Q2W MAD



Mean reduction in amyloid plaque

Δ (absolute value, centiloids)	13.7
Δ (%, centiloids)	20.6%

60 mg/kg Q4W MAD



Mean reduction in amyloid plaque

Δ (absolute value, centiloids)	18.1
Δ (%, centiloids)	25.6%

Plaque load based on florbetapir PET

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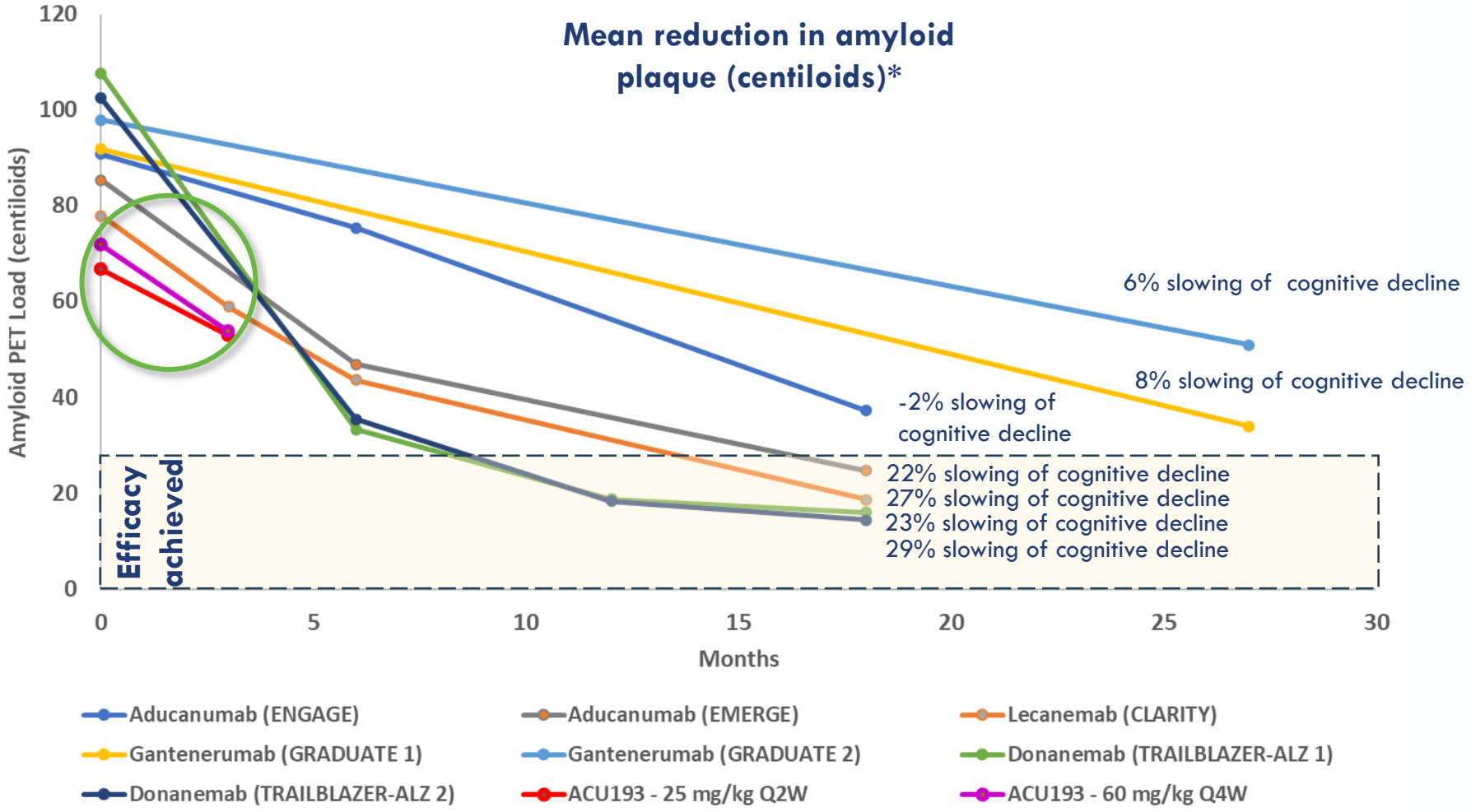
Highest Doses of INTERCEPT-AD Reduced Amyloid Plaque at Similar Rate and Magnitude to Lecanemab at Comparable Timepoints

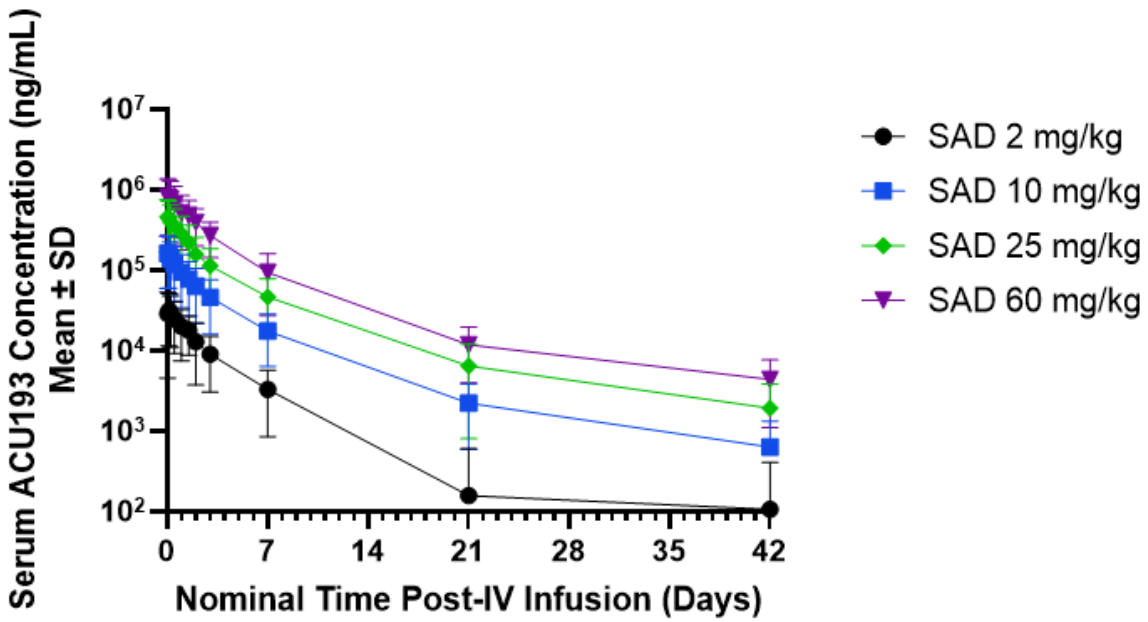


Acumen Pharmaceuticals, data on file; van Dyck (2023), NEJM (amyloid PET reduction estimated from graphs).

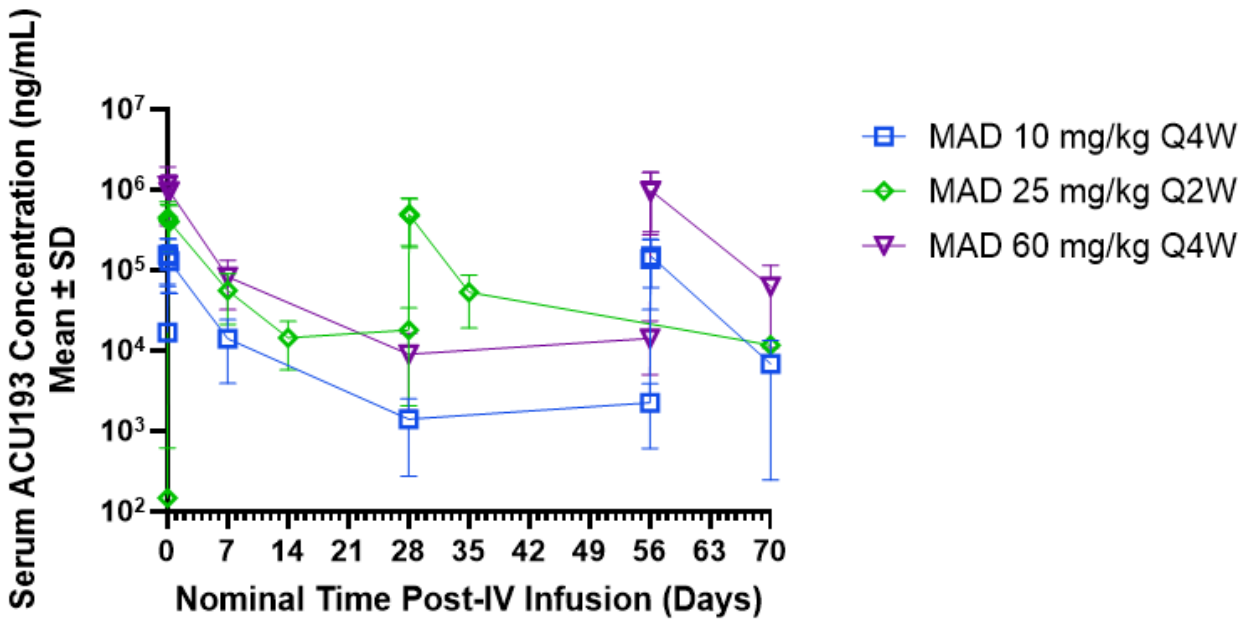
*There have been no head-to-head clinical trials between the product candidates listed above. Study designs and protocols for each product candidate were different, and as a result, results may not be comparable between product candidates.

Sabirnetug Serum Exposure is Dose Proportional Without Accumulation

Single Dose Cohorts



Multiple Dose Cohorts



Estimated serum terminal $T_{1/2}$ of 5-7 days

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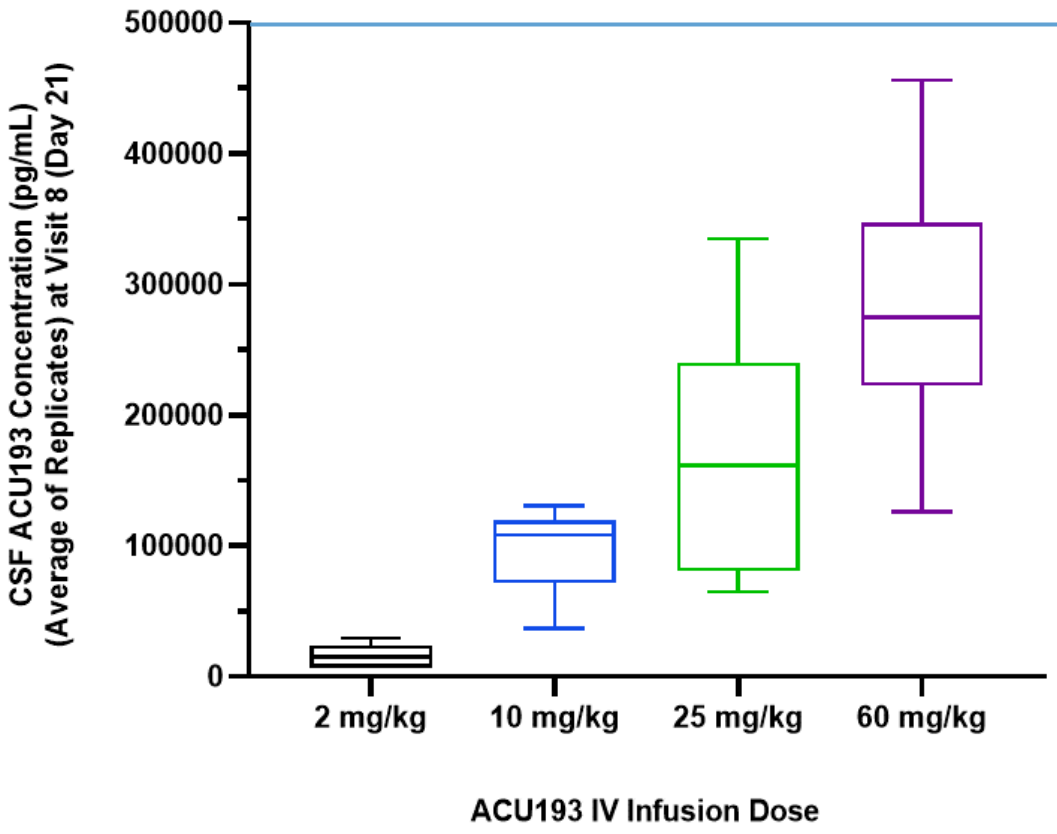
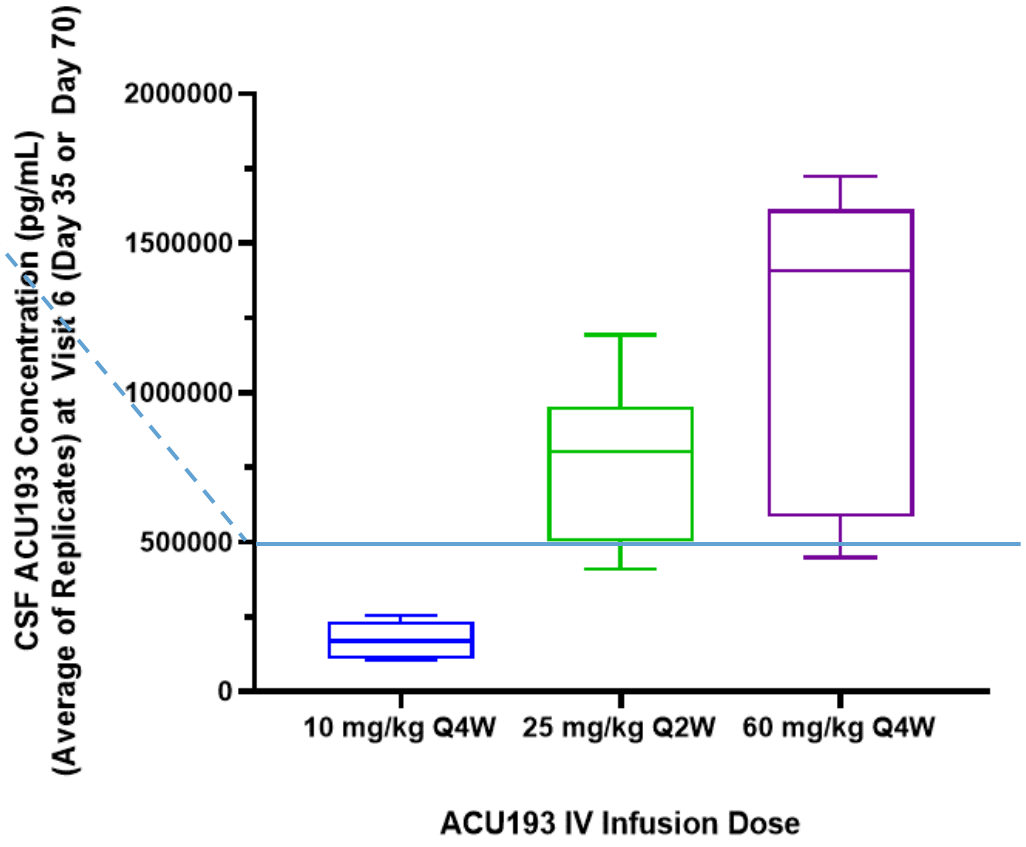
Sabirnetug CSF Exposure is Dose and Dose-Regimen Proportional

Single Dose Cohorts



Multiple Dose Cohorts*



*One patient from Cohort 5 (10 mg/kg Q4W) excluded because only received one administration of drug (study drug discontinued after lacunar infarct).

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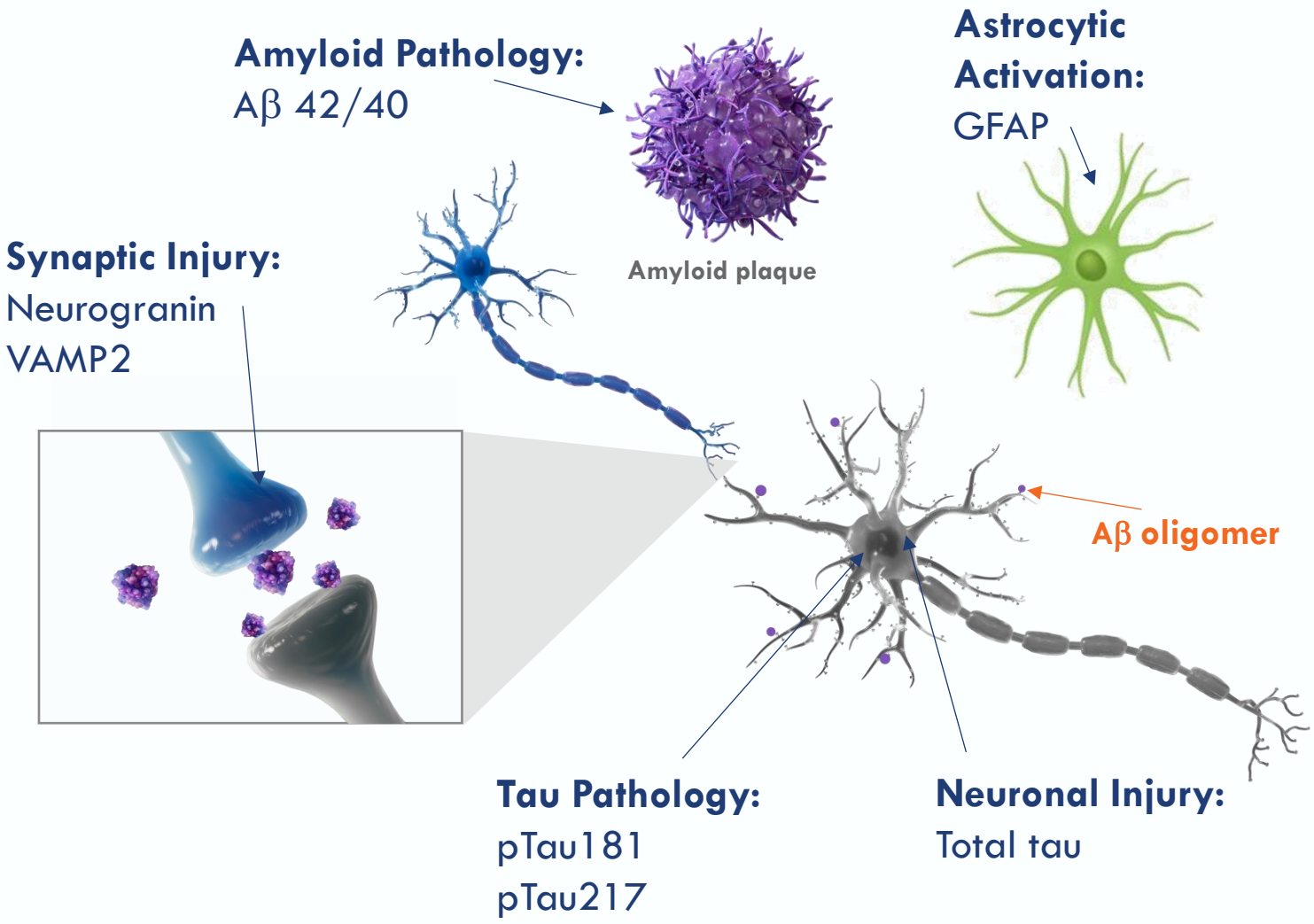
Importance of Key Fluid Biomarkers Associated with AD Pathology

- Biomarkers from cerebrospinal fluid and plasma capture neuronal, synaptic, and axonal injury and reflect the cumulative outcome of different pathological substrates in AD[1]
- Evidence suggests that biomarkers are likely to be better predictors of the underlying pathology of AD than imaging alone[2]

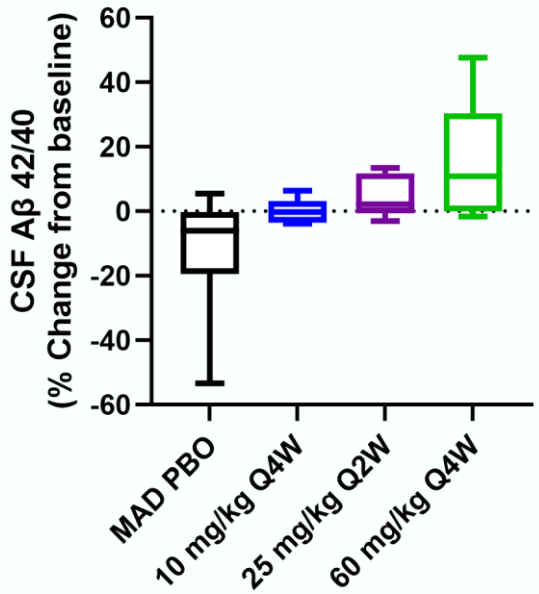
- **After just three administrations of sabirnetug, patients with early AD demonstrated improvements in biomarkers associated with AD pathology**



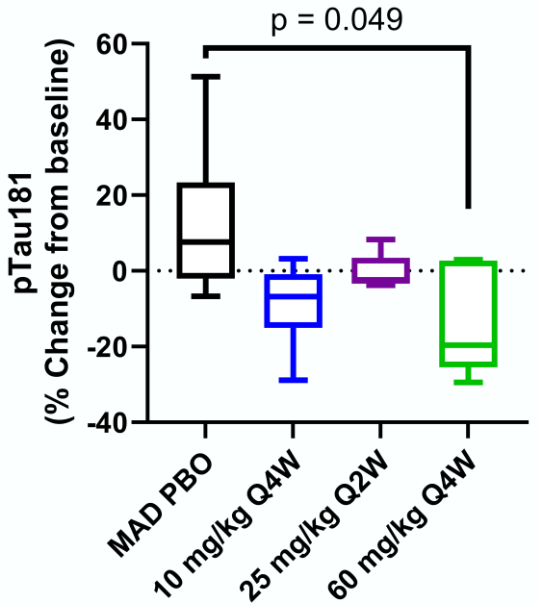
1. Tarawneh, R. Biomarkers: Our Path Towards a Cure for Alzheimer Disease. Biomarker Insights Volume 15: 1–15. 2020; 2. Blennow K, Zetterberg H. The Past and the Future of Alzheimer's Disease Fluid Biomarkers. J Alzheimers Dis. 2018;62(3):1125-1140.

Consistent Improvement in CSF Amyloid, Tau and Synaptic Biomarkers Indicate Downstream Pharmacology of Sabirnetug After Only Three Doses

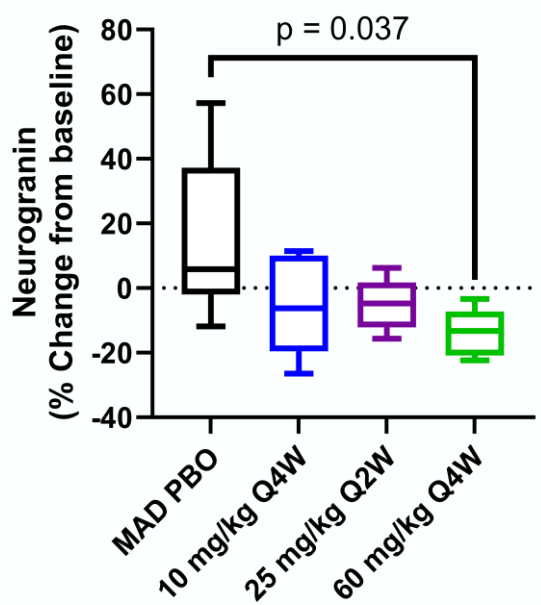
Aβ 42/40 Ratio



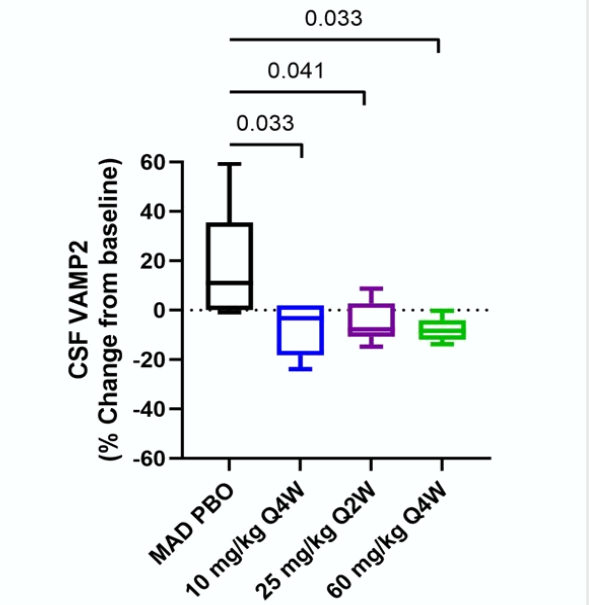
pTau181



Neurogranin



VAMP2



Amyloid pathology

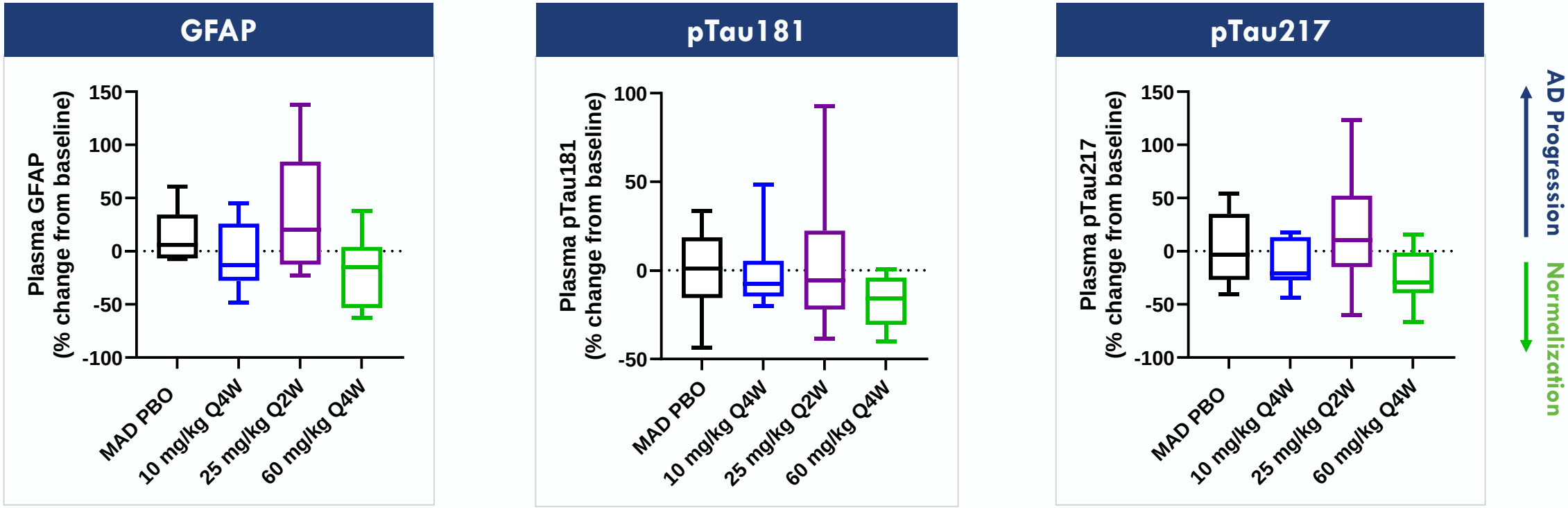
Tau pathology

Synaptic injury

n = 8 subjects/treated group; 6 subjects in pooled placebo (PBO); p-values from unpaired, 2-sided Student's t test

Trend Toward Normalizing Plasma Biomarkers with 10 mg/kg and 60 mg/kg Q4W

1-6 wk post-dosing



- Plasma measurements of glial fibrillary acidic protein (GFAP), pTau181, and pTau217 in 10 mg/kg Q4W & 60 mg/kg Q4W groups were lower than placebo
- More impact to fluid biomarkers was observed with longer dosing duration
  - The 25 mg/kg Q2W cohort differed in dose and sample timing, with drug on board for less time than the 10 mg/kg & 60 mg/kg Q4W cohorts

n = 8 subjects/treated group; 6 subjects in pooled placebo (PBO); p-values from unpaired, 2-sided Student's t test

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Sabirnetug Demonstrates Potential for Best-in-Class Safety

Compelling Overall Safety Profile, with Low Incidence of ARIA-E

INTERCEPT-AD Phase 1 Safety Data

5 Total ARIA-E cases, or ~10%

0 Cases of ARIA-E in ApoE4 homozygotes N=6

0 Deaths, SAEs Related to Study Drug

✓ **Limited incidence of ARIA-E**

- 10 mg/kg Q4W: 1 asymptomatic case
- 25 mg/kg Q2W: 1 asymptomatic case
- 60 mg/kg Q4W: 2 asymptomatic cases; 1 symptomatic case

✓ **No ARIA-E observed in ApoE4 homozygotes (n=6), despite comprising 13% of study**

- Differentiated from other antibodies that have ARIA-E rates ~30% to ~40% in participants who are E4-homozygotes

✓ **Broad therapeutic index** with convenient monthly dosing

- Safety profile may support attractive benefit/risk option for large portion of patients

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INTERCEPT-AD Phase 1 Data Support Potential for Sabirnetug to Offer Best-in-Class Efficacy and Safety

Key Takeaways from INTERCEPT-AD

Potential for Differentiated Efficacy

- ✓ First mAb to demonstrate selective target engagement of AβOs (most toxic form of Aβ)
- ✓ Rapid, significant plaque reduction comparable to the current market front-runners at similar timepoints
- ✓ Improvement of AD biomarkers in CSF and plasma are a strong indication of downstream effects

Potential for Differentiated Safety

- ✓ Compelling safety profile with low incidence of ARIA-E
- ✓ Absence of ARIA-E observed in ApoE4 homozygotes
- ✓ Broad therapeutic index with convenient monthly dosing

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Clinical Development Plans & Strategic Considerations

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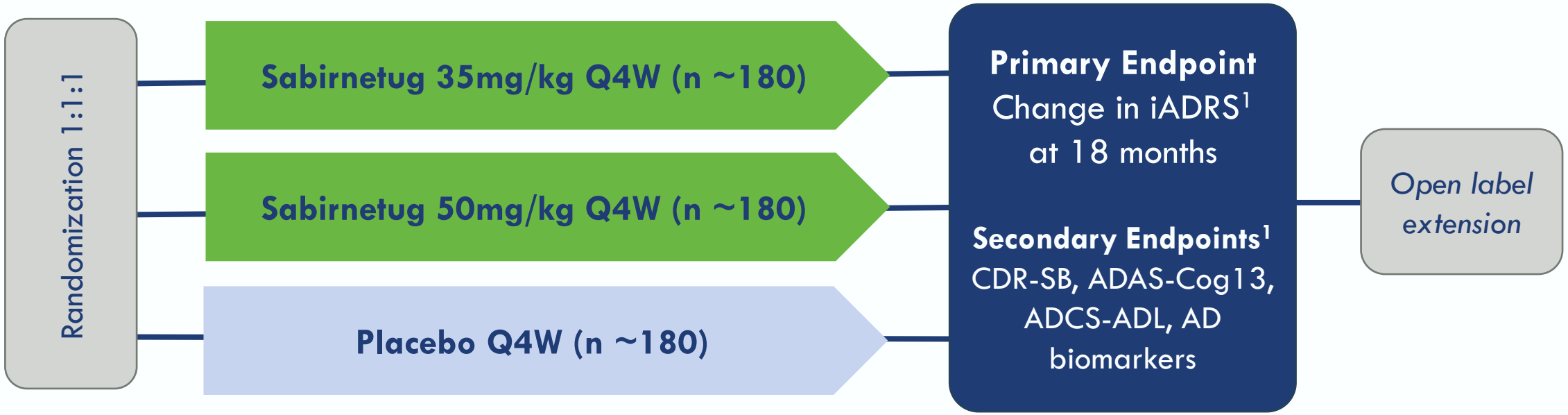
ALTITUDE-AD Study

Currently Enrolling

Objective: To evaluate the clinical efficacy, safety and tolerability of sabirnetug

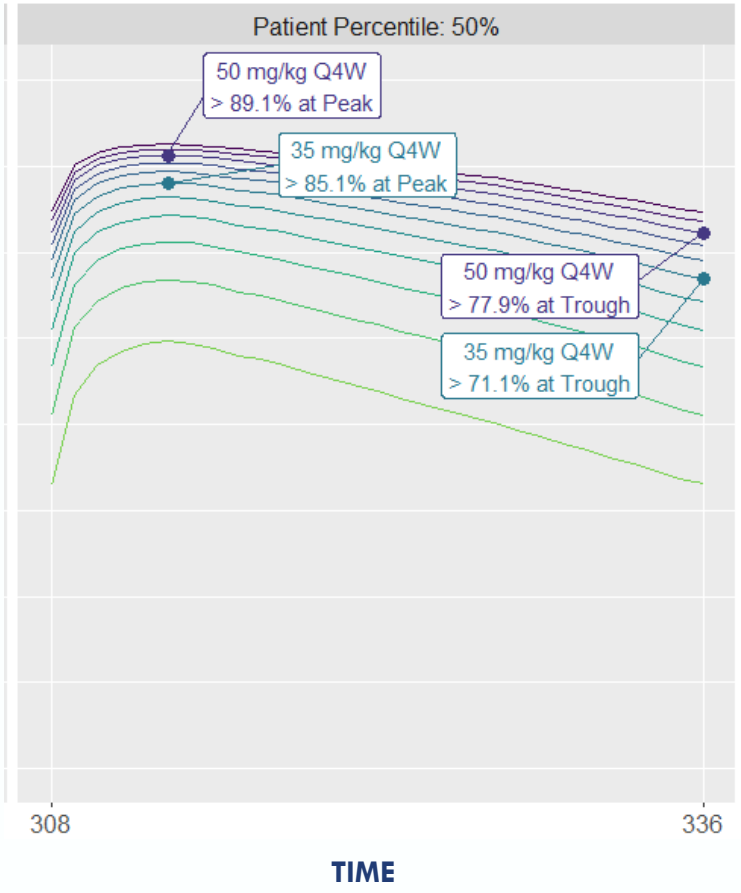
Patient population: ~540 participants with early AD (MCI or mild dementia due to early AD)



1. iADRS: Integrated Alzheimer's Disease Rating Scale; CDR-SB: Clinical Dementia Rating – Sum of Boxes; ADAS-cog: Alzheimer's Disease Assessment Scale – Cognitive Subscale; ADCS-ADL: Alzheimer's Disease Cooperative Study – Activities of Daily Living

Simulated CSF Target Engagement at Steady-State for ALTITUDE-AD Doses

CSF target engagement was simulated at a candidate list of doses given Q4W at steady-state



Ph2 Dosing Strategy (ALTITUDE-AD)

lower dose: 35 mg/kg Q4W

upper dose: 50 mg/kg Q4W

- Notable **diminishing differentiation** as dose increases
- Doses were selected with **peak-trough** variation in mind: select doses based on trough (end of dosing interval) CSF engagement

30

Sabirnetug Subcutaneous Formulation Under Development in Collaboration with Halozyme

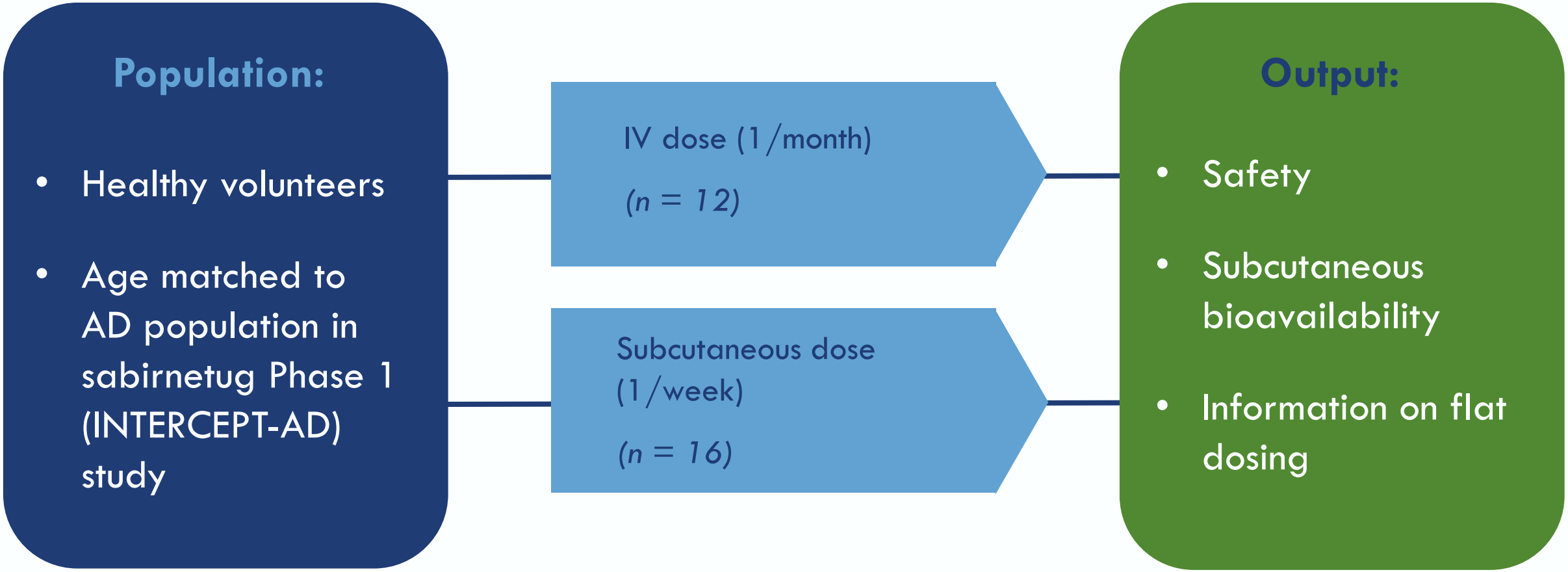
Potential to Broaden Patient Access and Increase Treatment Convenience

- Announced partnership with Halozyme in November 2023 to develop subcutaneous dosing option for sabirnetug
- Halozyme's drug delivery technology, ENHANZE®, is commercially validated in eight approved therapies available in 100+ countries, with >800,000 patients treated
- Current sabirnetug potential target product profile inclusive of no more than single weekly injection

Phase 1 bioavailability study ongoing to compare the pharmacokinetics of subcutaneous form of sabirnetug to the IV form

Ongoing Phase 1 Subcutaneous Healthy Volunteer Study

Topline Results Expected in Q1 2025



Acumen Leadership Team

Experienced in AD/Neuro Drug Development

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Chief Development Officer
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Chief Financial Officer &
Chief Business Officer
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JULIE BOCKENSTETTE
Executive Vice President,
Head of HR
ACUMEN
Roche · Lilly

Acumen team has decades of experience in Alzheimer's drug discovery and development

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Sabirnetug IP & Market Exclusivity

- Exclusive, perpetual, irrevocable, worldwide, royalty-free license from Merck to its Amyloid Derived Diffusible Ligand (ADDL) IP including issued sabirnetug patents
- Sabirnetug Global IP estate:
  - ✓ Issued patents in 19 countries
  - ✓ Composition of matter patents and methods of use run into July 2031
  - ✓ Patent term extensions may be available, 3-5 years depending on jurisdiction
- Biologics market exclusivity is expected for sabirnetug as a novel biologic drug
  - ✓ US provides 12 years market exclusivity for novel biologics
  - ✓ Europe provides 10 years of market exclusivity for novel biologics

Milestones Achieved in 2024 and Anticipated in 2025

MILESTONES	STATUS/ EXPECTED TIMING
Initiation of ALTITUDE-AD Phase 2 trial	✓
Initiation of Phase 1 subcutaneous trial	✓
Expected Phase 1 subcutaneous topline results	1Q25
Expected completion of enrollment of ALTITUDE-AD	1H25

~$259M

Cash, cash equivalents and marketable securities as of Sept. 30, 2024

We believe that Acumen has the expertise and resources to advance sabirnetug into the first half of 2027

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Summary

Key Takeaways

- ✓ Significant and growing Alzheimer's population in need of additional treatment options
- ✓ Sabirnetug demonstrates high selectivity for toxic AβOs in AD patients
- ✓ Positive Phase 1 data strengthen potential for sabirnetug to offer best-in-class efficacy and safety
- ✓ Phase 2 IV study and Phase 1 subcutaneous study ongoing

Next Steps

- → Anticipate Phase 1 subcutaneous healthy volunteer topline results in Q1 2025
- → Anticipate completion of enrollment in Phase 2 ALTITUDE-AD study in H1 2025

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Appendix

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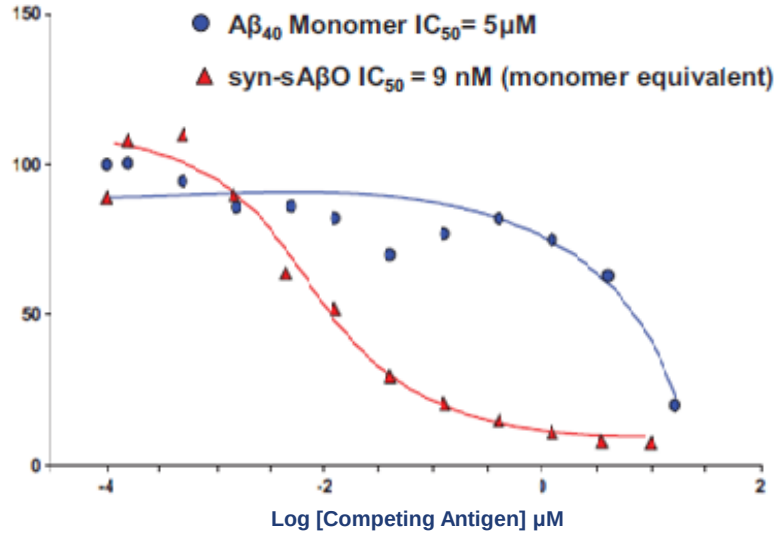
Sabirnetug is the First mAb Developed to Selectively Target AβOs

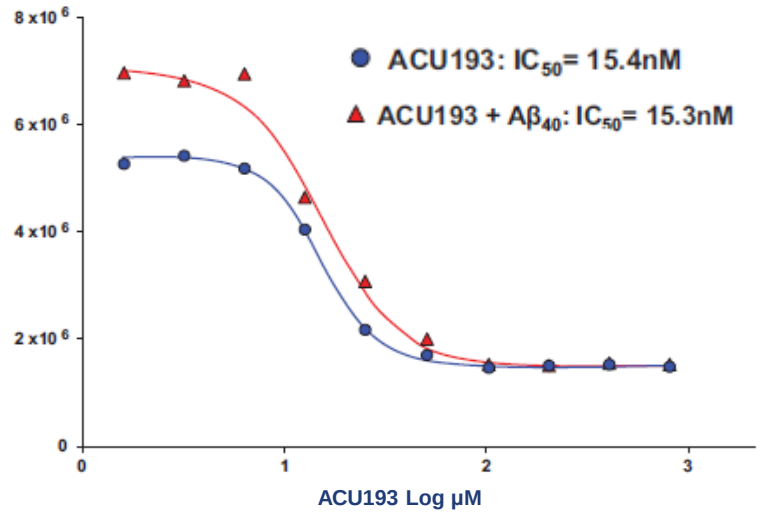
Highly selective for Aβ oligomers versus Aβ monomers

Sabirnetug Selectivity



Binding of sabirnetug to AβOs >500x binding to Aβ monomer

Sabirnetug Selectivity in presence of 5μM monomeric Aβ

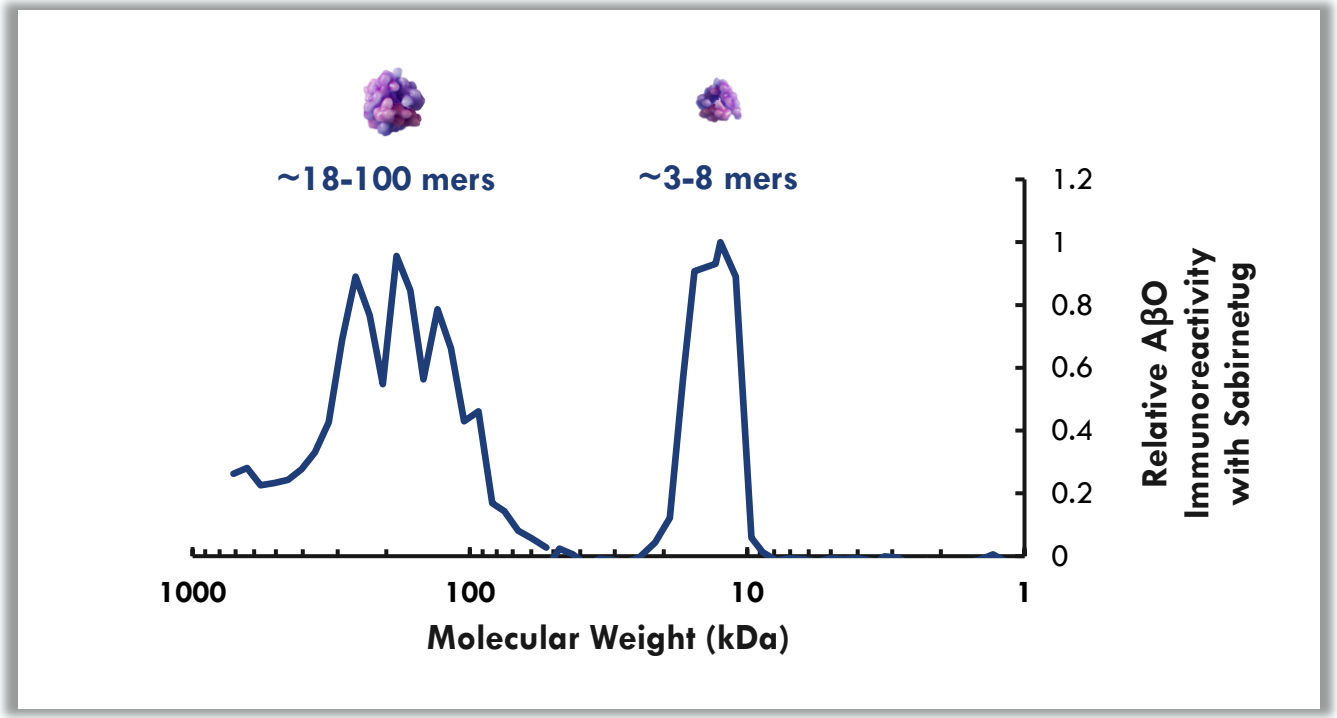


Even in the presence of a large excess of Aβ monomer, binding of sabirnetug to AβOs is unchanged

Sabirnetug selective for binding to AβOs is preserved even in the presence of a large excess of Aβ monomers – such as what is present in the brain, thus limiting 'target distraction'

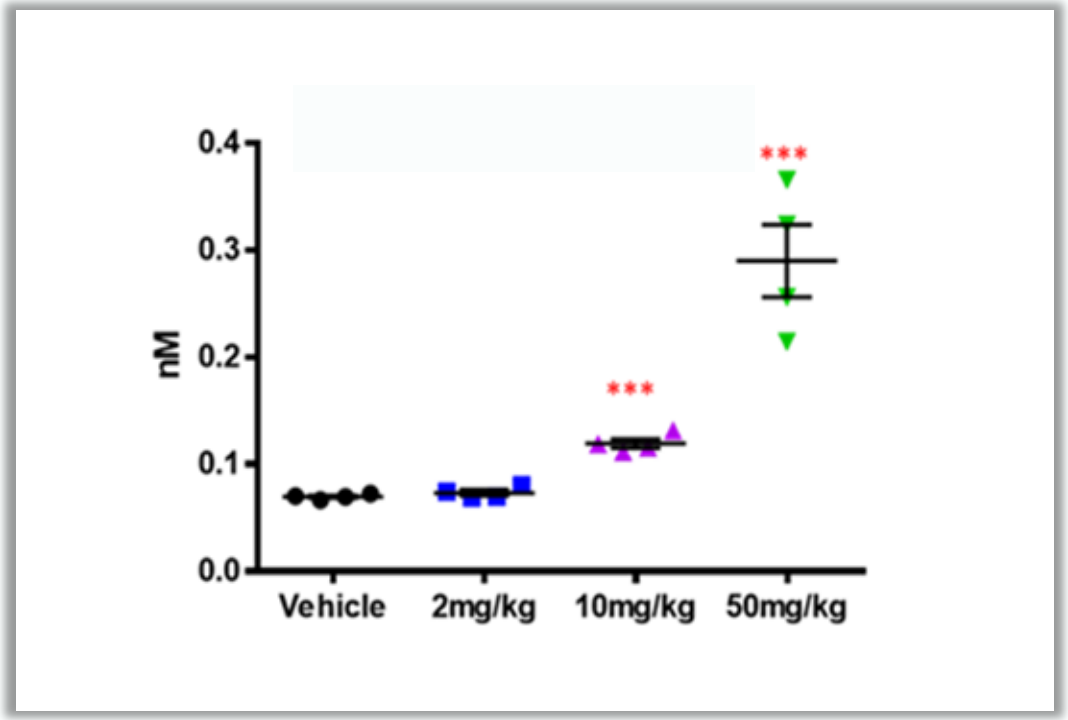
Sabirnetug Recognizes a Wide Range of Oligomeric Species of Aβ

Broad AβO size distribution recognized by sabirnetug in human AD brain



Data from lab of William Klein, NU, 2018

Sabirnetug dose dependently binds to AβOs in brain tissue from Tg2576 mice



Merck internal data, 2011

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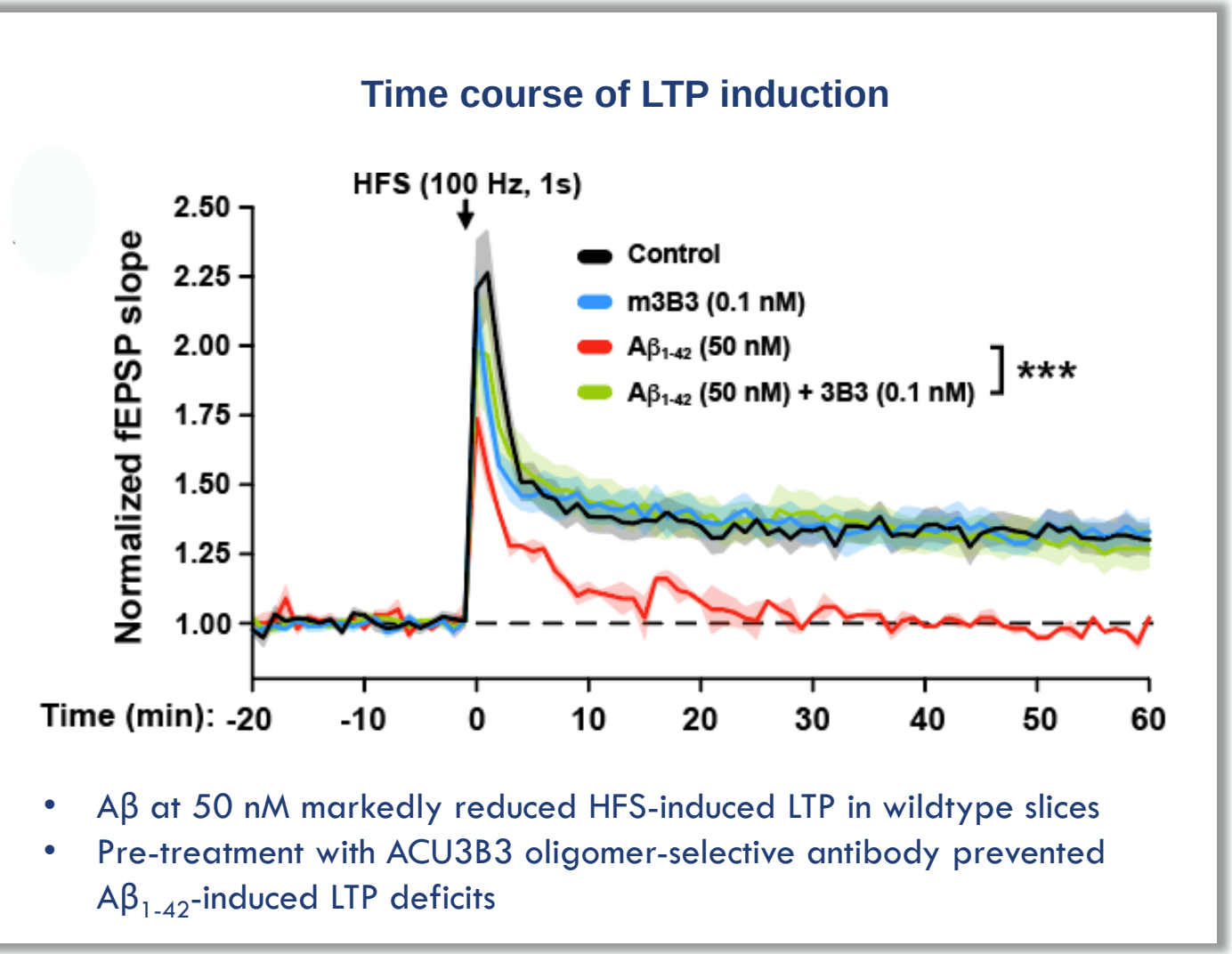
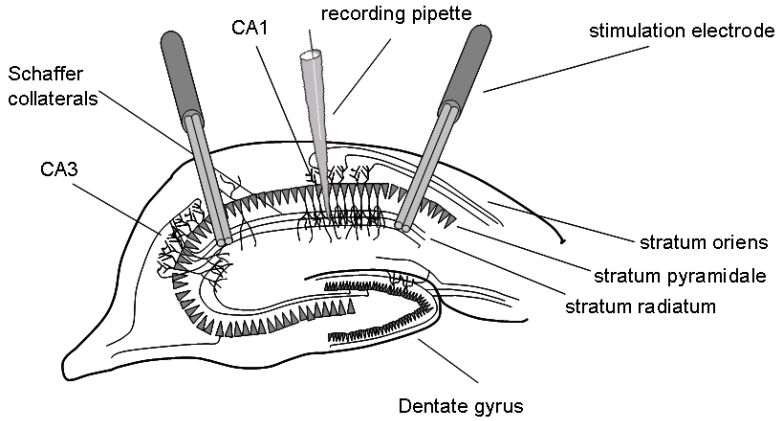
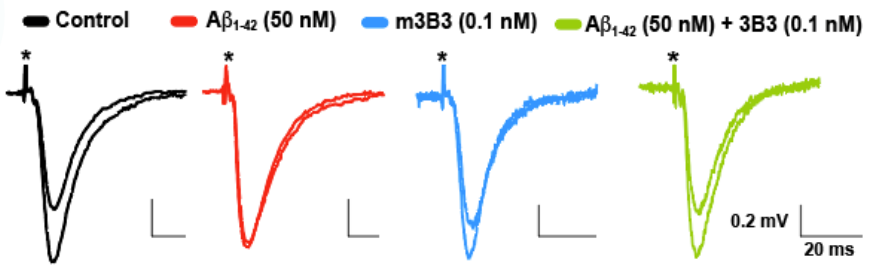
Functional Consequences of AβO Clearance: Restoring Plasticity

1. Prevention of hippocampal LTP impairment



- Aβ at 50 nM markedly reduced HFS-induced LTP in wildtype slices
- Pre-treatment with ACU3B3 oligomer-selective antibody prevented $A\beta_{1-42}$-induced LTP deficits

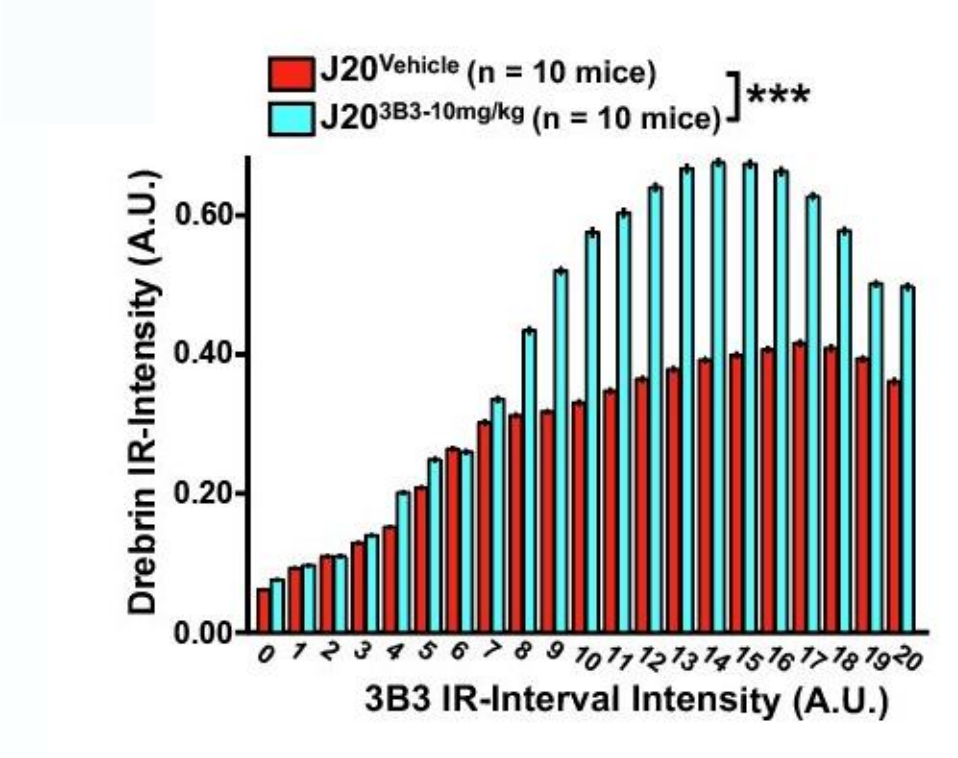




From manuscript in prep; data collected by lab of Gerhard Rammes, University of Regensburg, Max-Planck Institute of Psychiatry, Germany

Functional Consequences Following ACU3B3 Treatment

2. Reduced amyloid deposition and increased spine density



From manuscript in prep; data collected by lab of Jorge Palop, Gladstone Institute

- ACU3B3 (murine oligomer selective antibody) treatment ***prior*** to plaque pathology leads to reduced amyloid deposition in J20 Tg model (5-7 months)
- Treatment effects are less prominent in aged animals (16-23 months)
- Evidence of synaptic recovery in advanced stages of pathology in contrast to minor effects on plaque deposition