Dan O'Connell, CEO

J.P. Morgan Healthcare Conference

January 11, 2024

Forward-Looking Statements

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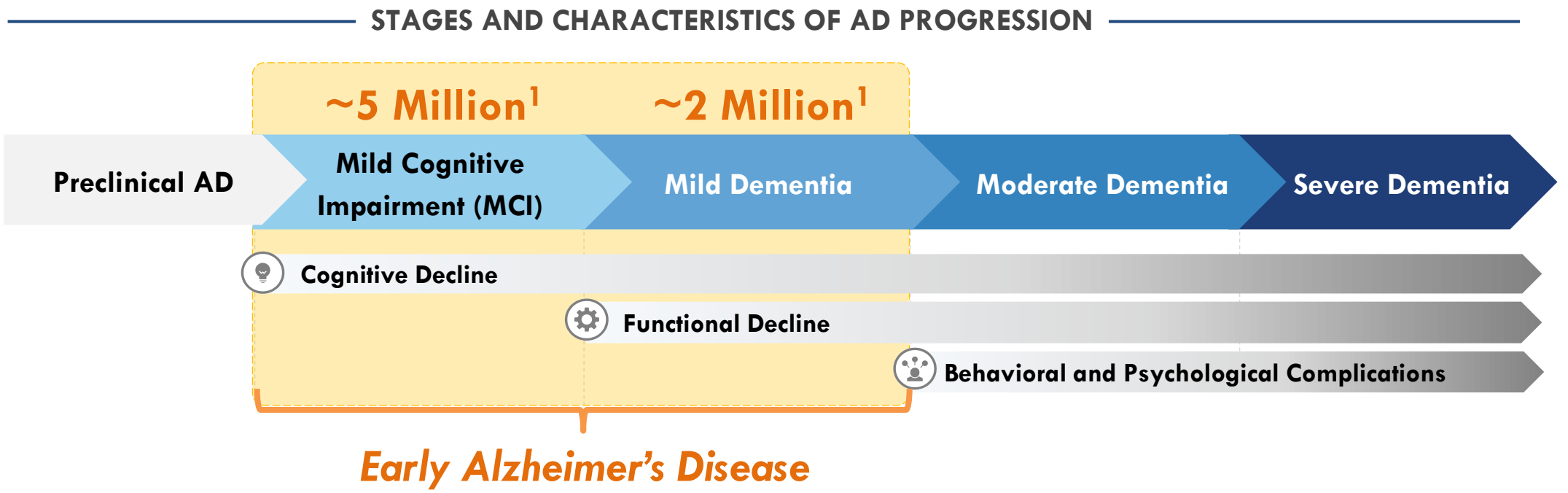
Advancing a Potential Best-In-Class Antibody Targeting Toxic Amyloid Beta Oligomers (AβOs) for Early Alzheimer's Disease (AD)

- Large market in need of additional treatment options
- 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 ACU193
- Expect to initiate Phase 2 (IV) and Phase 1 (subcutaneous) studies in 2024

Early AD Patient Population Represents Significant Market Opportunity

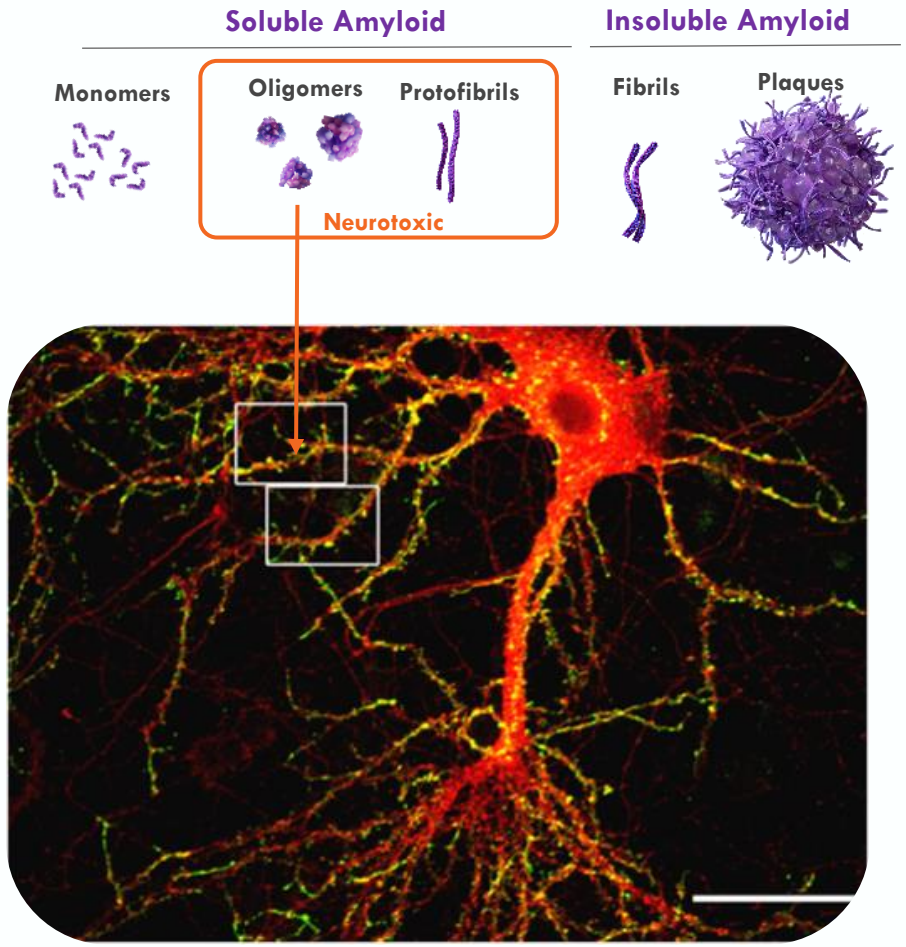


Uptake of first-generation, disease modifying, anti-amyloid beta treatment options is expected to increase, while significant unmet need and room for improvement will persist

1. 2021 Alzheimer's Association

Amyloid Beta Oligomers (AβOs) are Widely Recognized as Highly Toxic Agents in AD Pathophysiology

- ✖ Impair synaptic function[1]
- ✖ Contribute to impairment of memory and cognition[2]
- ✖ Induce tau hyperphosphorylation[3]



Mature hippocampal neuron and toxic AβOs bound to dendritic spines

Image Lacor et al., 2004.

1. Cleary et al., 2005; Townsend et al., 2006; Poling et al., 2008; Reed et al., 2011; Batista et al., 2018.
2. Ferreira, S. T., and Klein, W. L., 2011.
3. De Felice et al., 2008; Zempel et al., 2010; Ochalek et al., 2017.

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ACU193: Potential Best-in-Class Immunotherapy for Early AD

ACU193's High Selectivity for Toxic AβOs May Provide Meaningful Cognitive Efficacy and Improved Safety

Rationally Designed for Improved Efficacy & Safety

Humanized, affinity matured mAb developed to target toxic Aβ oligomers

> 500-fold greater selectivity for AβOs over Aβ monomers

> 85-fold greater selectivity for AβOs over Aβ fibrils

IgG2 subclass mAb with reduced effector function

Large Pharma Discovery

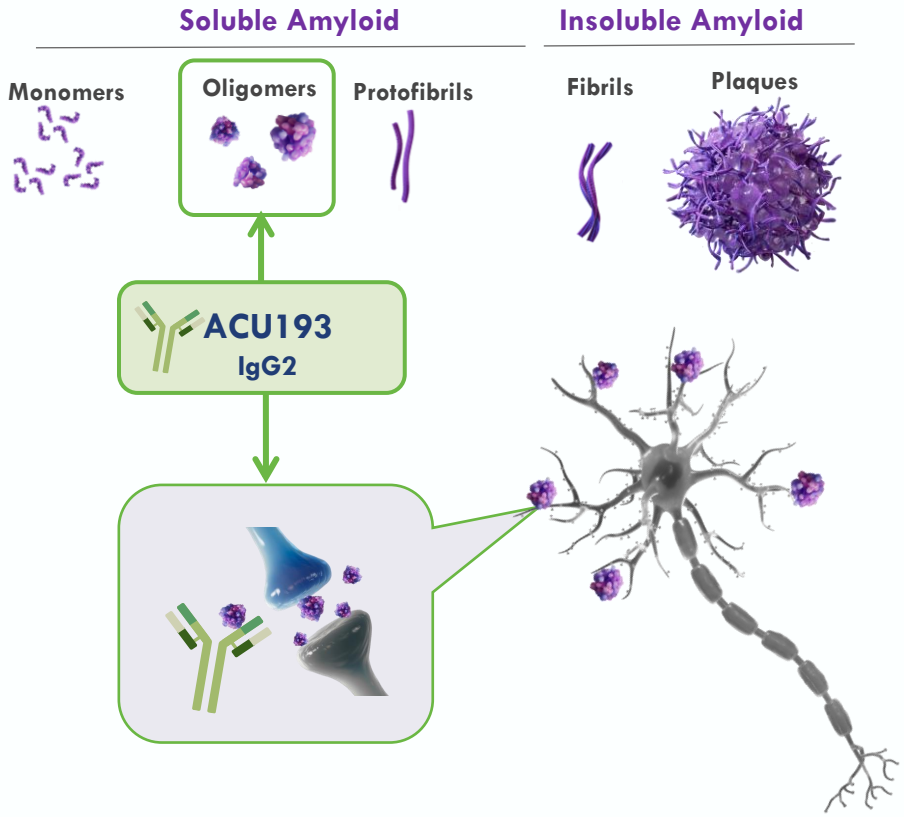
ACU193 discovered in collaboration with Merck & Co.

Acumen holds exclusive program rights with no future financial or other obligations due to Merck

Encouraging FDA Interactions

FDA Fast Track designation for the treatment of early Alzheimer's disease

FDA End of Phase 2 meeting in 4Q 2023



INTERCEPT-AD Phase 1 Data Support Potential for ACU193 to Offer Best-in-Class Efficacy and Safety

Key Takeaways from INTERCEPT-AD

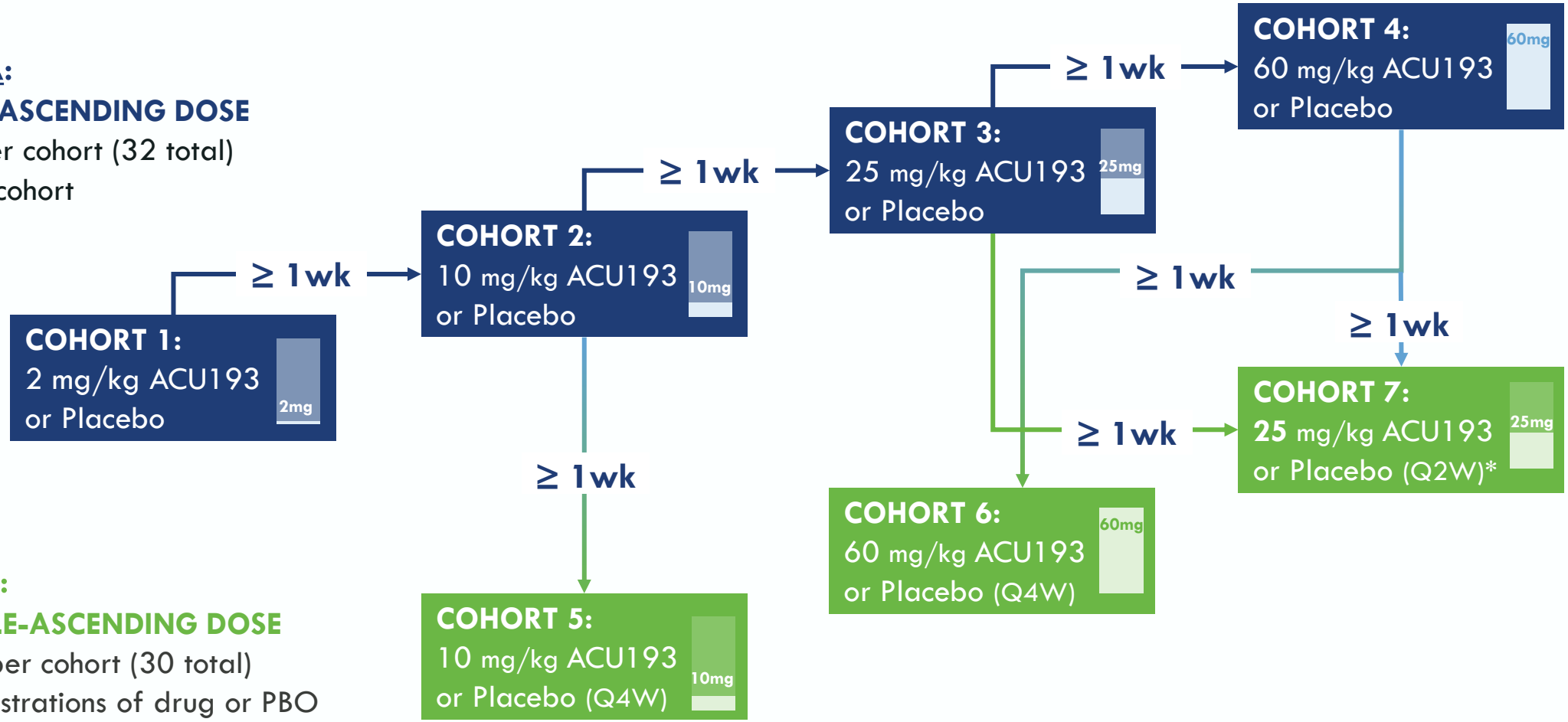
Potential for Differentiated Efficacy

- ✓ 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
- ✓ Movement of AD biomarkers in CSF and plasma are a strong indication of downstream effects – amyloid, tau, synaptic

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

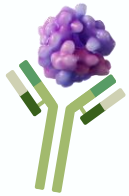
INTERCEPT-AD: A Randomized Placebo Controlled Phase 1 in Early AD Patients



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

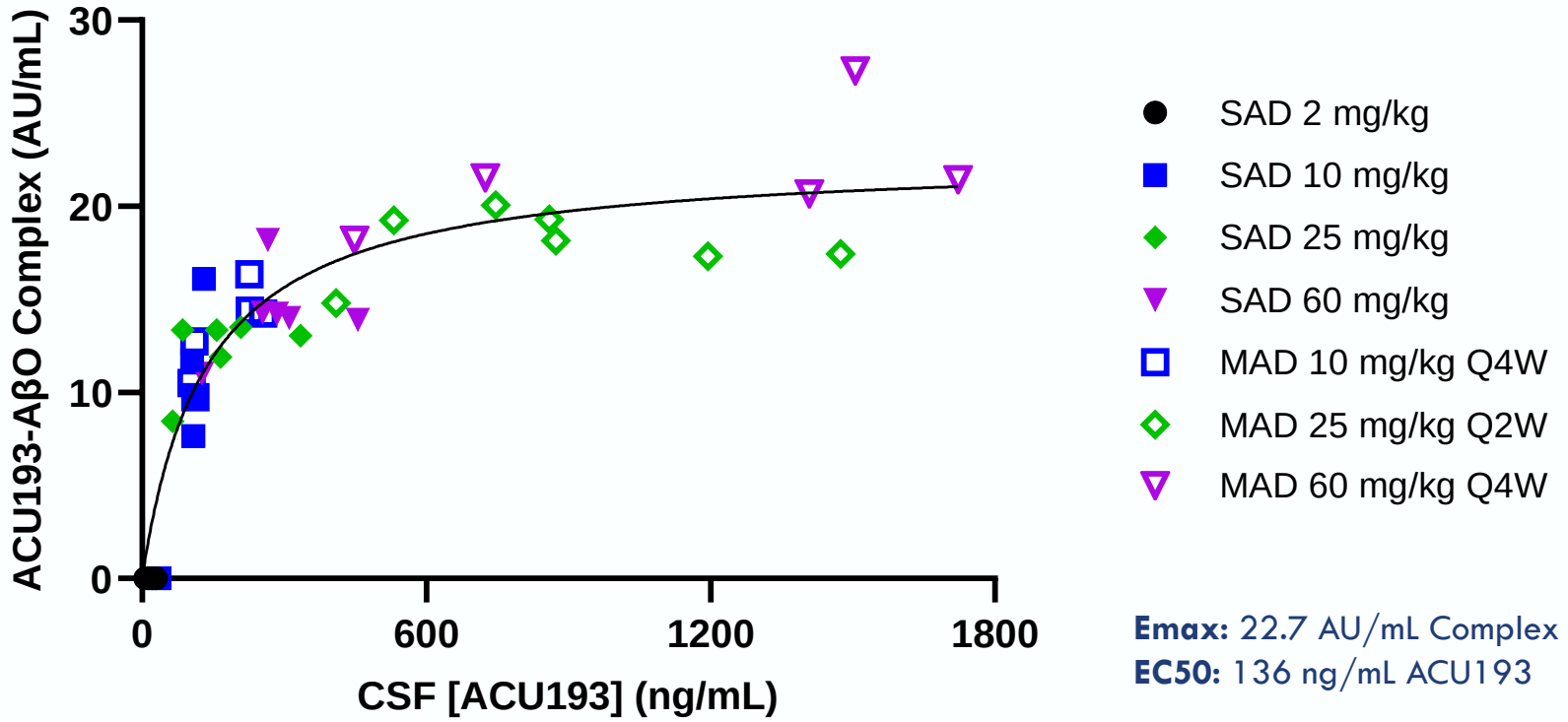
Doses Approaching Maximal Target Engagement Support ACU193 AβO Mechanism and Helped Guide Dose Selection for Next Study Phase

Target Engagement



ACU193-AβO Complex

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

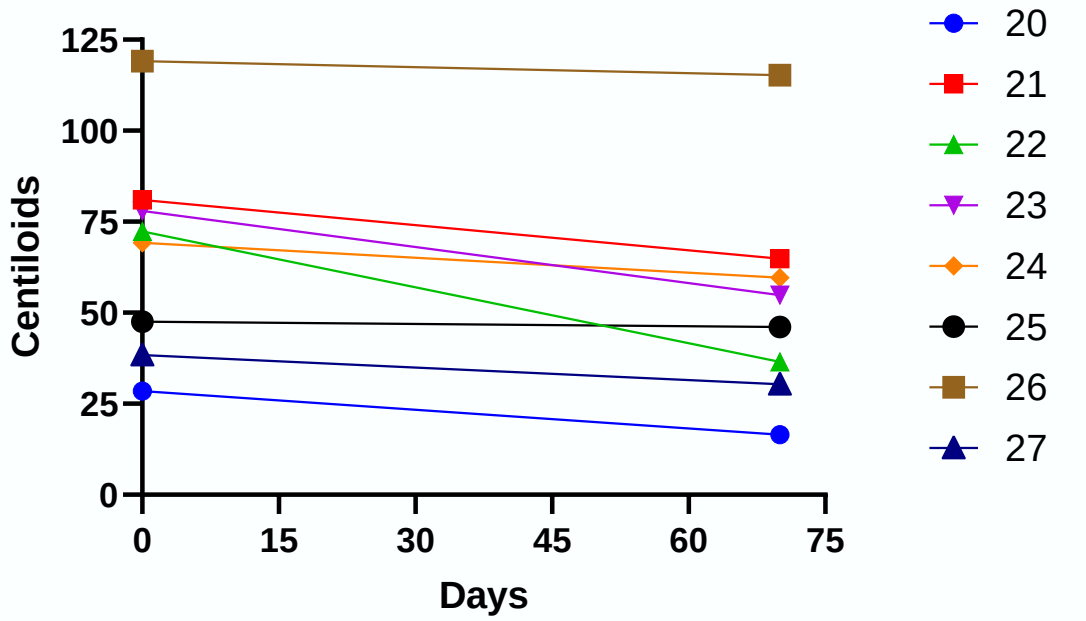


Emax: 22.7 AU/mL Complex
EC50: 136 ng/mL ACU193

*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 ACU193-Treated Patients in High Dose MAD Cohorts Showed Reductions in Plaque Load After Three Doses at 63 or 70 days

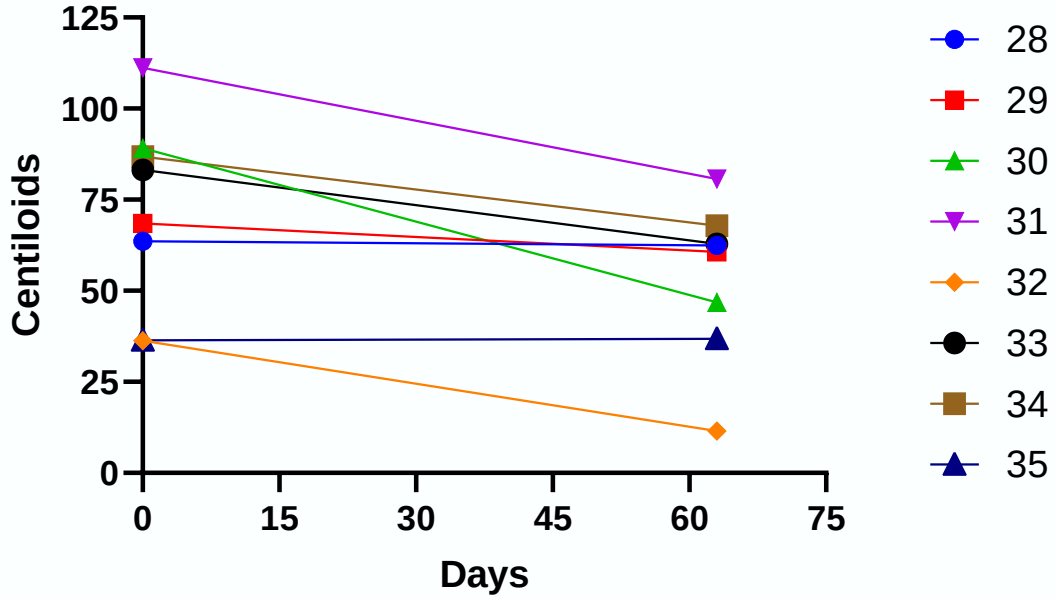
25 mg/kg Q2W MAD



Mean reduction in amyloid plaque

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

60 mg/kg Q4W MAD

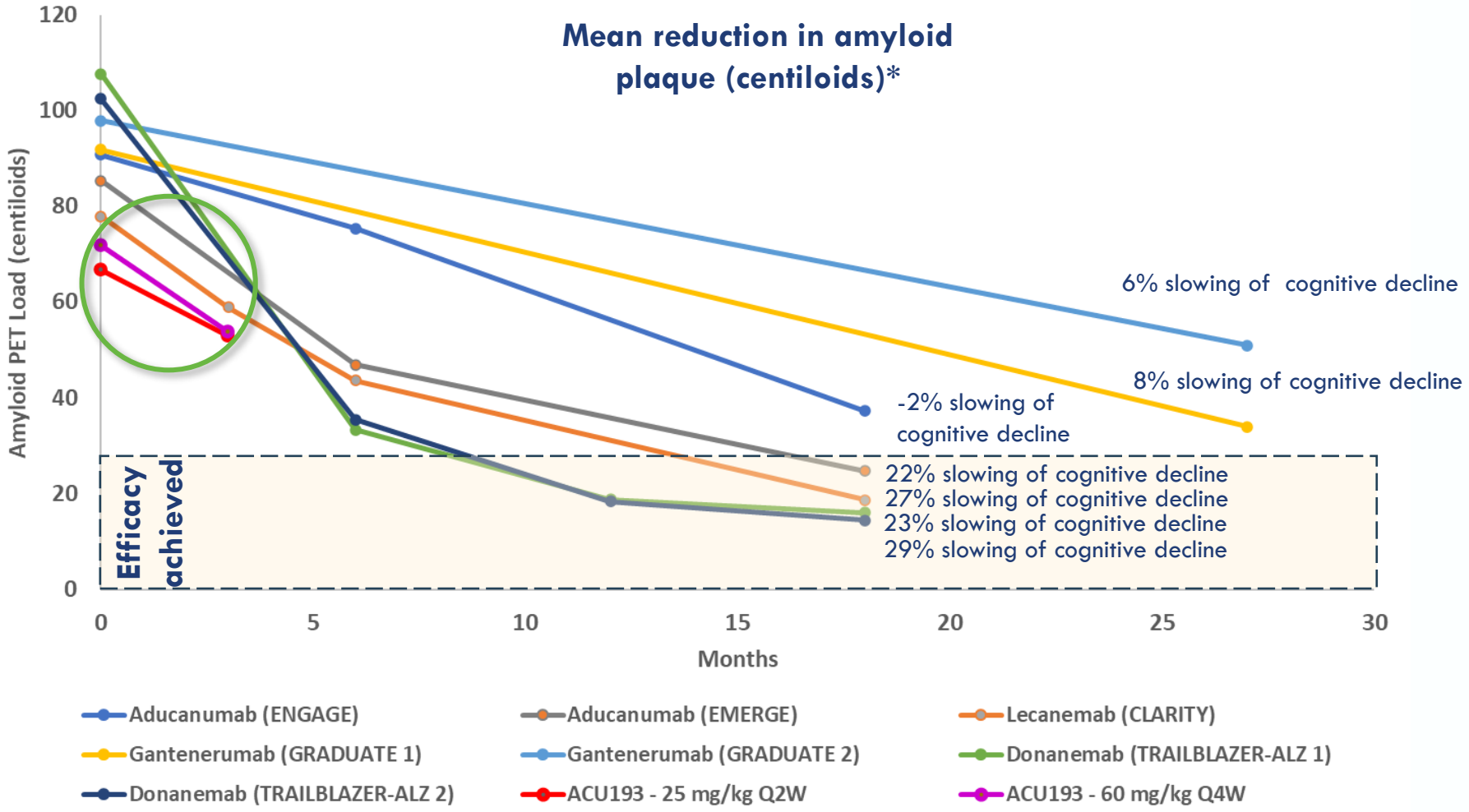


Mean reduction in amyloid plaque

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

Plaque load based on florbetapir PET

ACU193 Highest Doses Reduced Amyloid Plaque at Similar Rate and Magnitude to Lecanemab at Comparable Timepoints



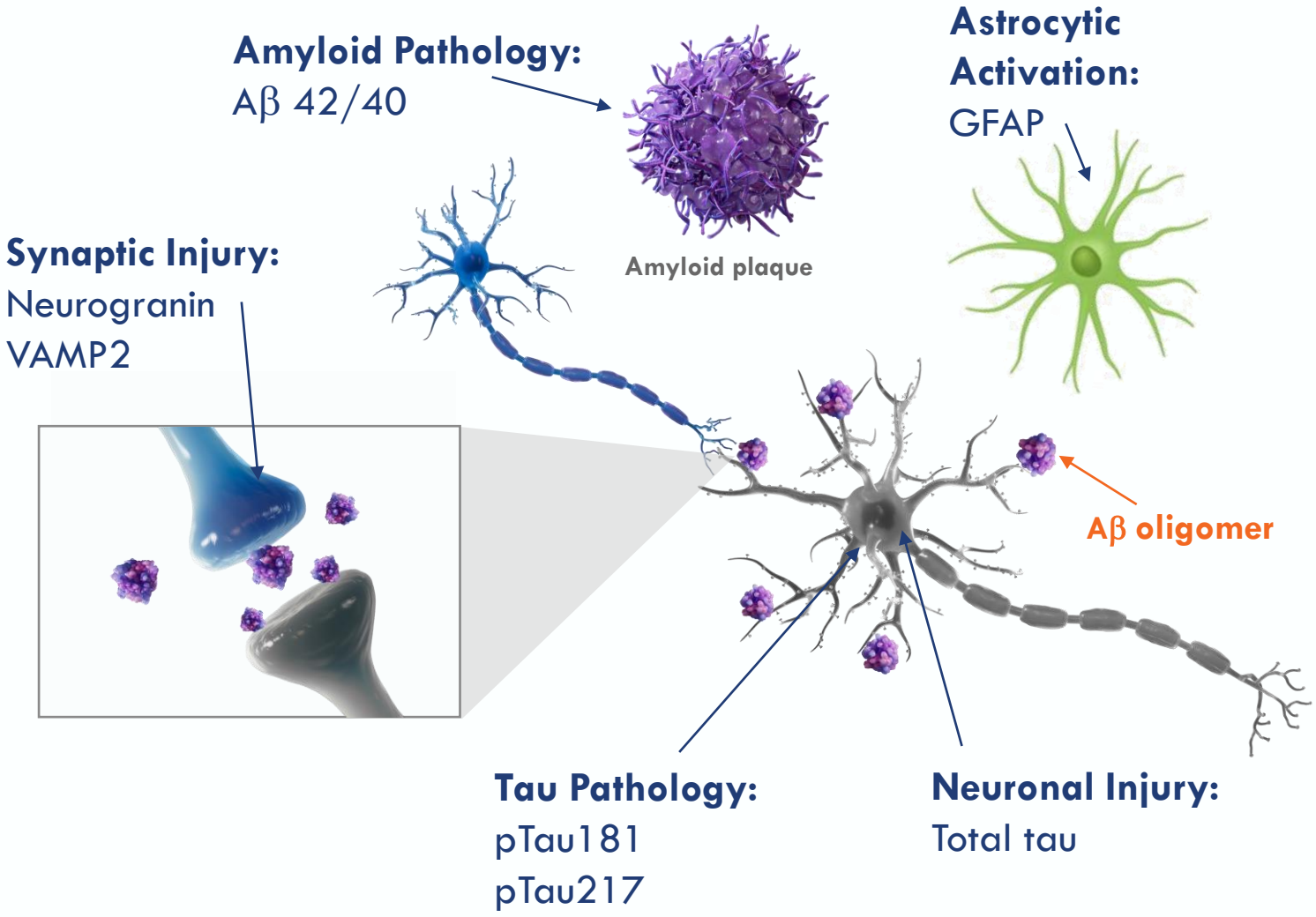
Acumen Pharmaceuticals, data on file; van Dyck (2023), NEJM (amyloid PET reduction estimated from graphs).

*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.

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]

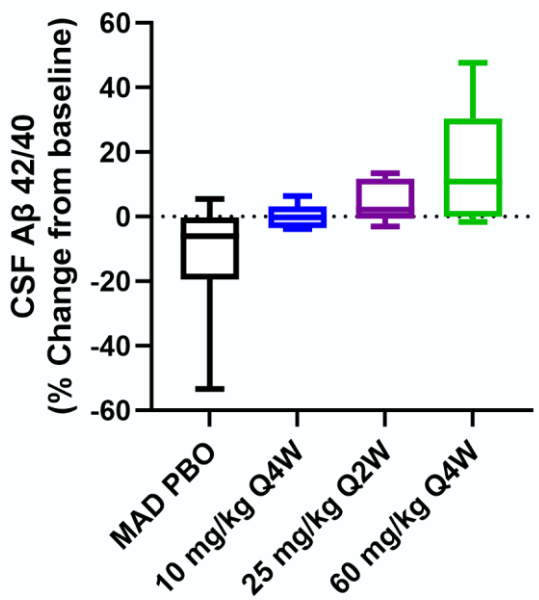
- **After just three administrations of ACU193, patients with early AD demonstrated improvements in biomarkers associated with AD pathology**



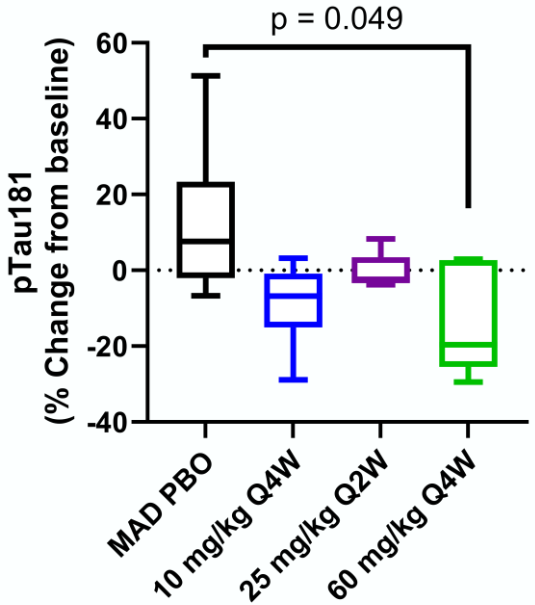
1. Tarawneh, R. Biomarkers: Our Path Towards a Cure for Alzheimer Disease. Biomarker Insights Volume 15: 1–15. 2020; 2. Blennow K, Zetterberg H. The Past and the Future of Alzheimer's Disease Fluid Biomarkers. J Alzheimers Dis. 2018;62(3):1125-1140.

Consistent Changes in CSF Amyloid, Tau and Synaptic Biomarkers Indicate Downstream Pharmacology of ACU193 After Only Three Doses

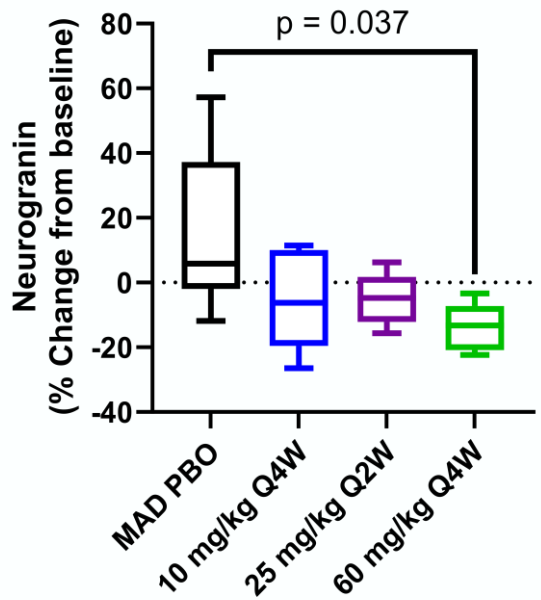
Aβ 42/40 Ratio



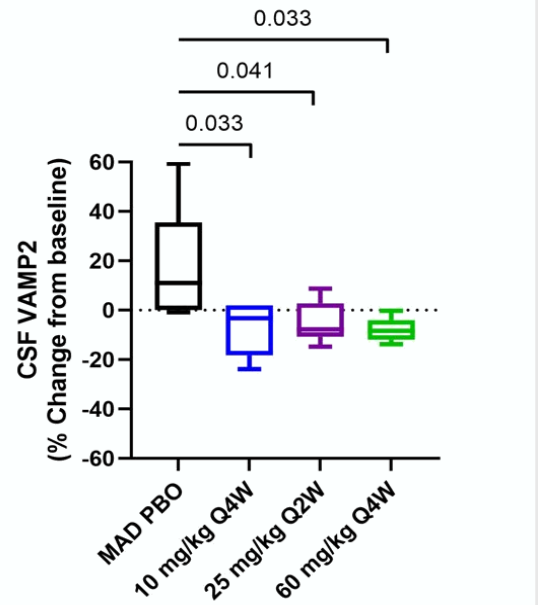
pTau181



Neurogranin



VAMP2



Amyloid pathology

Tau pathology

Synaptic injury

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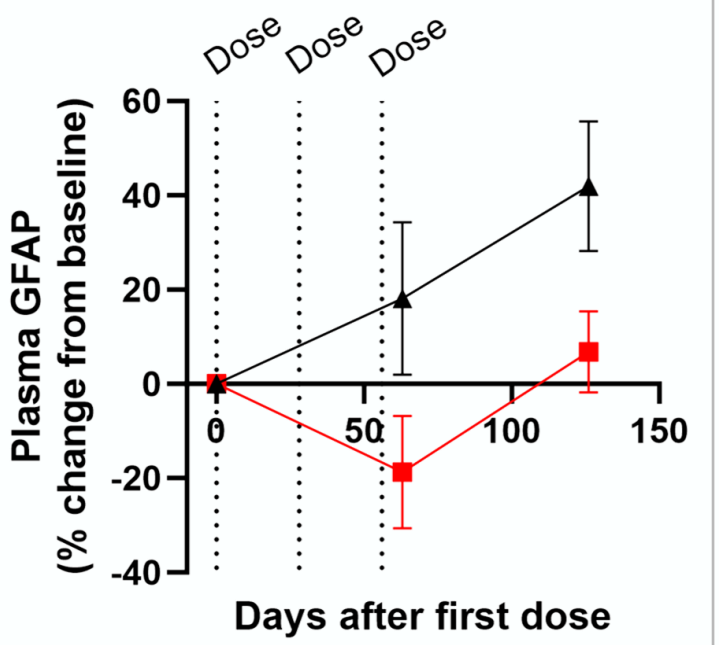
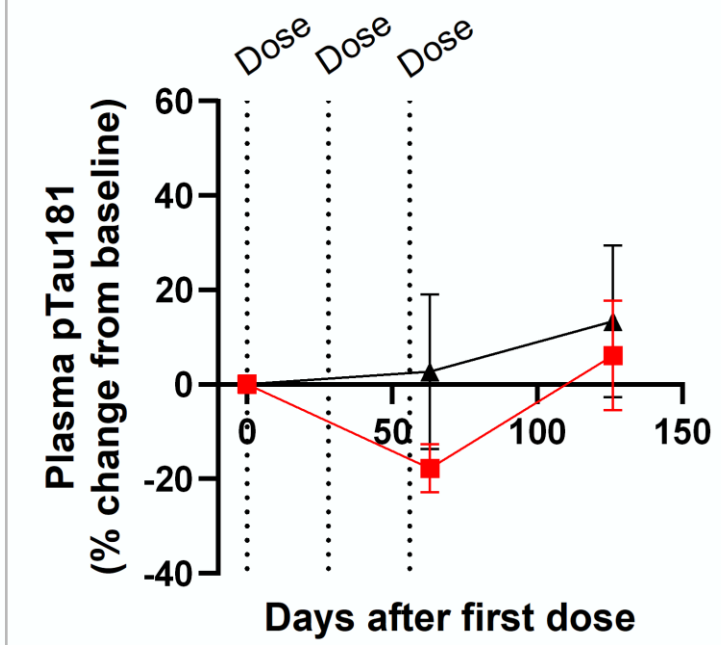
Consistent Drug Effects Observed in Plasma Biomarkers in 60 mg/kg MAD Cohort

After Dosing Completed, Biomarkers Rebounded, Supportive of ACU193 Drug Effect

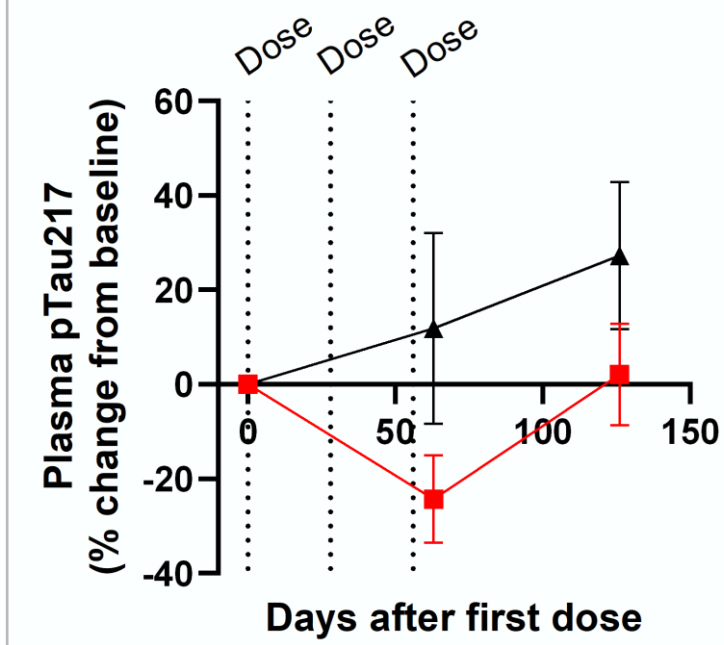
GFAP



pTau181



pTau217



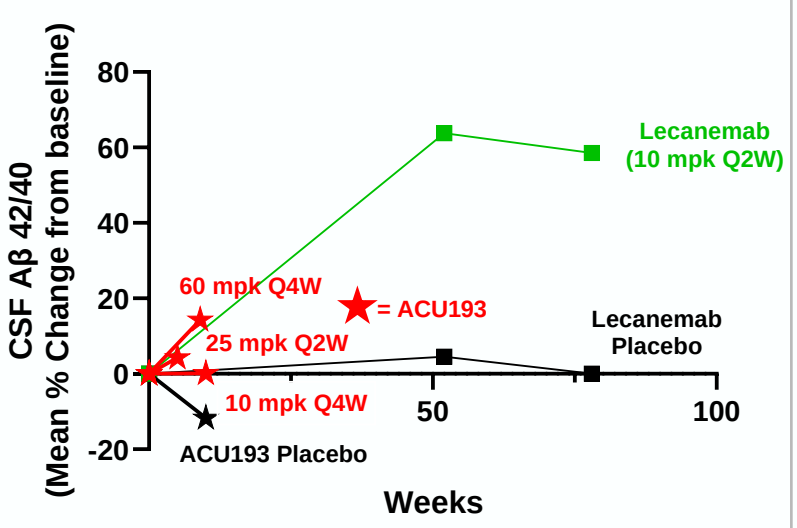
Q4W Placebo (n = 4) 60 mg/kg Q4W (n = 8)

Mean ± SEM

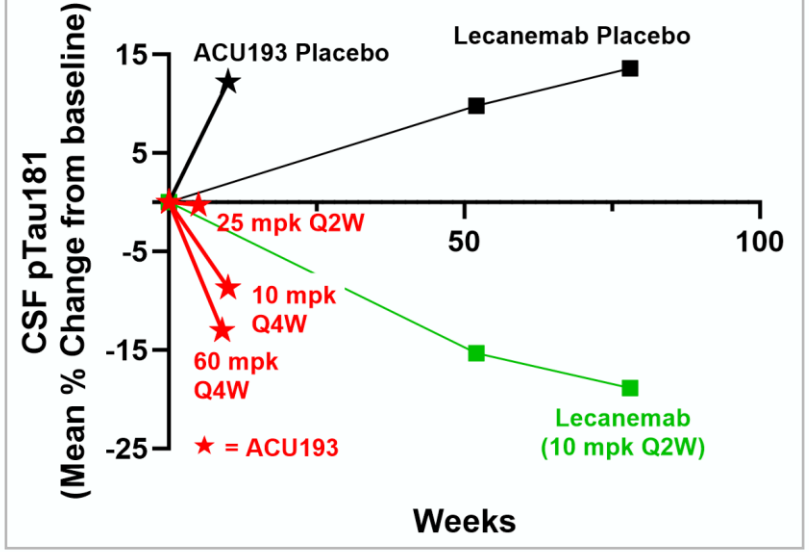
No trends observed for plasma Aβ 42/40 (drug interference testing pending); no consistent trends observed in 10 mg/kg Q4W or 25 mg/kg Q2W

ACU193 Compares Favorably on CSF Aβ 42/40 Ratio, pTau181 and Neurogranin at Early Timepoints to Lecanemab*

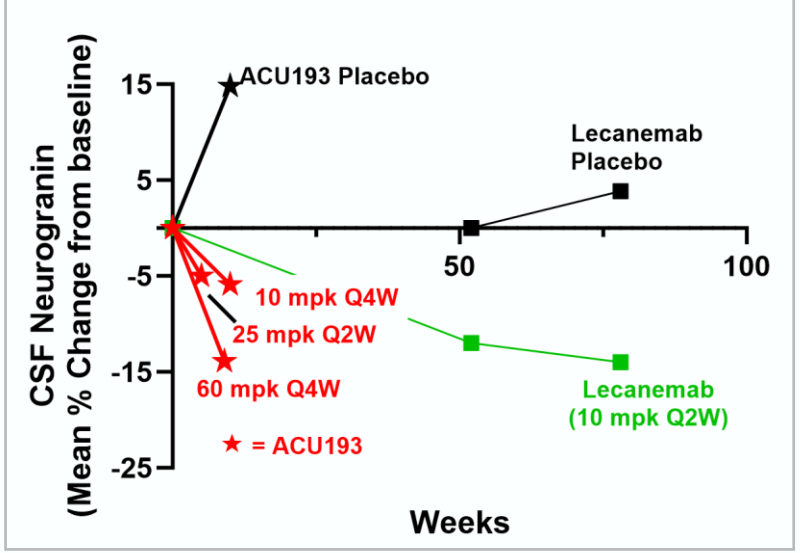
Aβ 42/40 Ratio



pTau181



Neurogranin



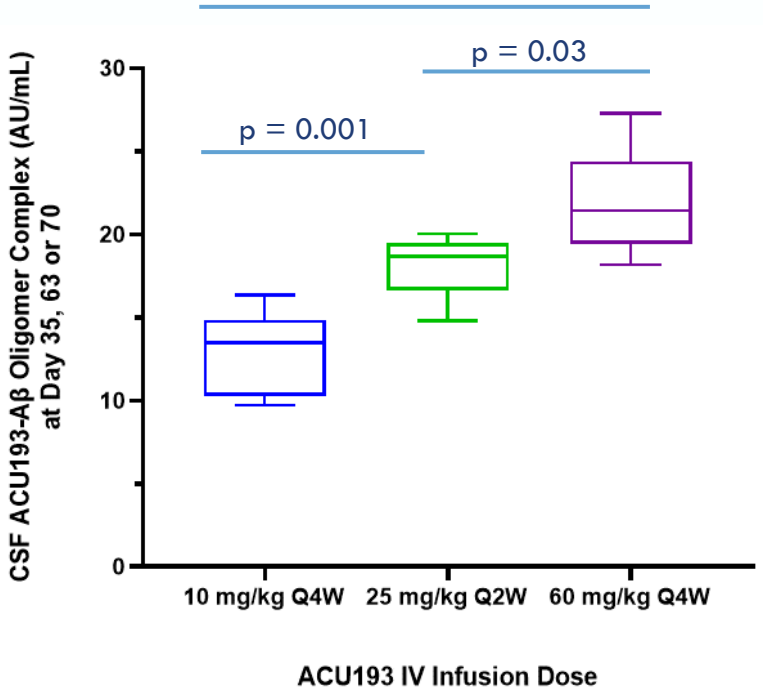
Lacanemab values from CLARITY, estimated from AAIC 2023 presentation (Michael Irizarry)

*There have been no head-to-head clinical trials between ACU193 and Lecanemab. Study designs and protocols for each product candidate were different, and results may not be comparable between product candidate.

Key Takeaway: ACU193 Demonstrates Potential for Best-in-Class Efficacy

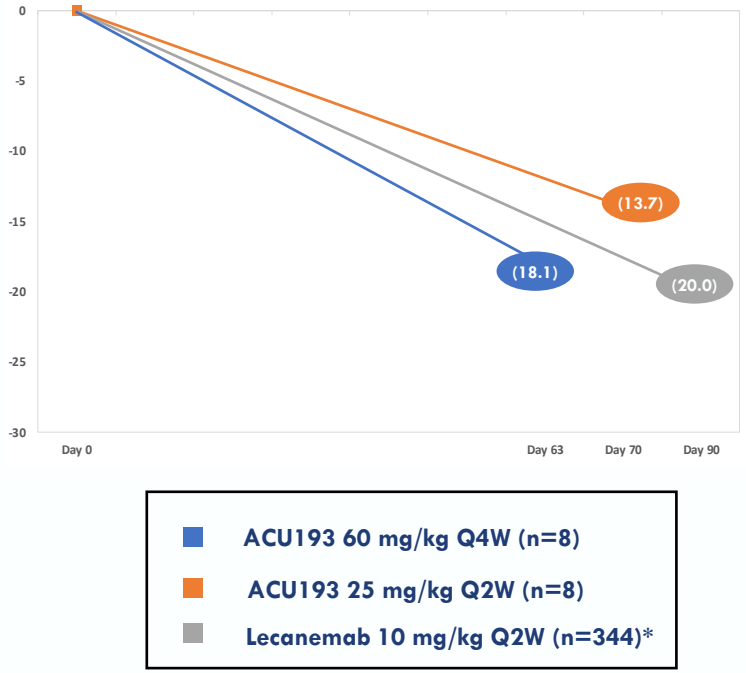
Engaged Toxic AβOs, Reduced Plaque at Comparable Rates to Market Leader, and Demonstrated Strong Downstream Pharmacology

Target Engagement in CSF



Toxic amyloid beta oligomers engaged in dose-proportional manner in CSF and reached near-maximal effect

Plaque Reduction



*Highest doses of ACU193 demonstrated reduction in amyloid plaque comparable to lecanemab at similar timepoints**

Biomarker Effects

Markers of amyloid plaque load
- Amyloid PET load (Centiloids)
- CSF Aβ 42/40 ratio

Markers of tau pathology
- CSF and plasma p-tau181
- Plasma p-tau217

Markers of synaptic and neuronal injury
- CSF neurogranin
- CSF VAMP-2
- Plasma GFAP

After just three administrations of ACU193, patients with early AD demonstrated impro vements in biomarkers associated with AD pathology

*There have been no head-to-head clinical trials between ACU193 and Lecanemab. Study designs and protocols for each product candidate were different, and results may not be comparable between product candidate.

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ACU193 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

ACUMEN

Experienced Clinical, Regulatory and Development Leaders with Substantial Experience Executing Early Through Late-Stage Alzheimer's Disease Trials

DANIEL O'CONNELL
President & CEO
ACUMEN neuroventures

ERIC SIEMERS, MD
Chief Medical Officer
ACUMEN Lilly

RUSSELL BARTON
Chief Operating Officer
ACUMEN Lilly

JANICE HITCHCOCK, PHD
VP, Regulatory Affairs
ACUMEN Lilly

LIEAN SCHENK
VP, Head of CMC
ACUMEN Lilly NOVAVAX Lonza

SIEW TIN GAN
Head of Clinical Operations
ACUMEN Lundbeck

JASNA JERECIC, PHD
Sr. Director
Bioanalaytical Methods
ACUMEN

ROBERT DEAN, MD, PHD
Sr. Development Advisor, Biomarkers and Analytical Methods
ACUMEN Lilly

Strong execution in 2023 achieved successful Phase 1 results, encouraging EOP2 feedback from FDA on future development plans and a partnership to develop a subcutaneous administration of ACU193

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Acumen has the Expertise and Resources to Advance ACU193 into the Second Half of 2026

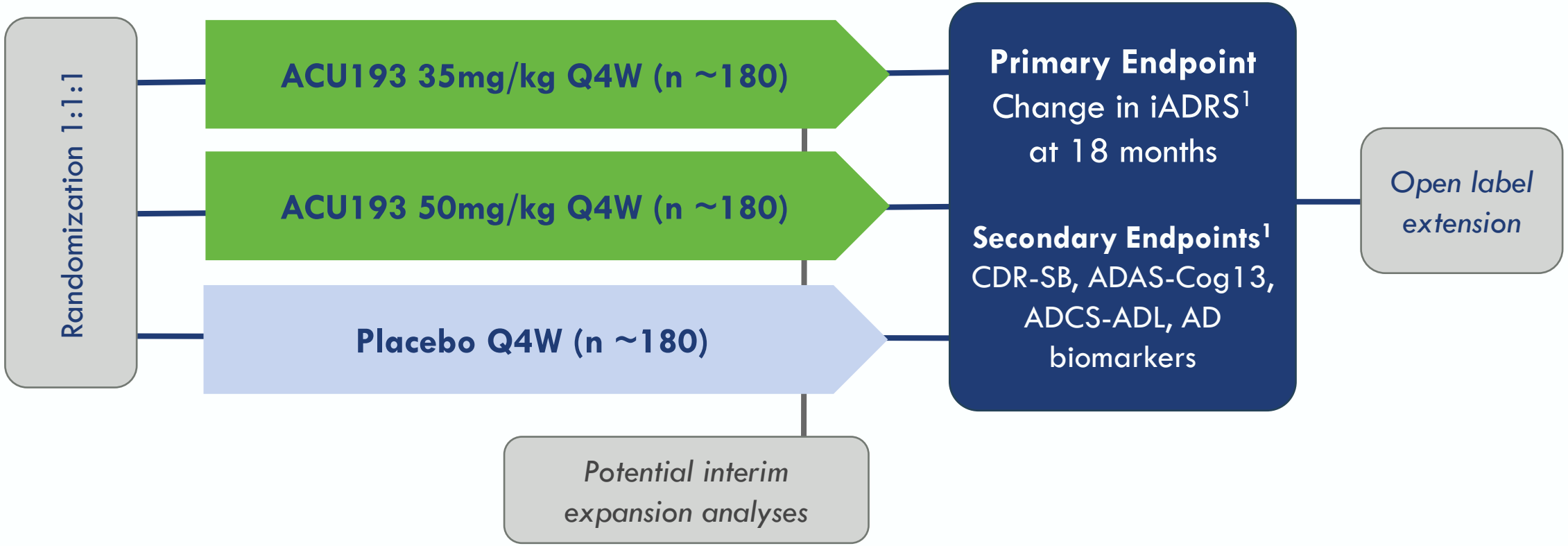
Cash, cash equivalents and marketable securities as of Sept 30, 2023	~$283M
Debt financing secured from K2 HealthVentures in November 2023	up to $50M Debt financing

Strong Balance Sheet and High-Quality Life Sciences Investor Syndicate

ALTITUDE-AD Phase 2/3 Study Design

Objective: To evaluate the clinical efficacy, safety and tolerability of ACU193

Patient population: Patients 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

ACU193 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 ACU193
- Halozyme's drug delivery technology, ENHANZE®, is commercially validated in seven approved therapies, with global collaborations covering more than 60 therapeutic targets
- Current ACU193 potential target product profile inclusive of no more than single weekly injection

Plan to initiate Phase 1 bioavailability study in mid-2024 comparing the pharmacokinetics of subcutaneous forms of ACU193 to the IV form

Summary

Key Takeaways

- ✓ Significant and growing Alzheimer's population in need of additional treatment options
- ✓ ACU193 demonstrates high selectivity for toxic AβOs in AD patients
- ✓ Highly experienced clinical, regulatory and development leaders driving ACU193's development
- ✓ **Potential for ACU193 to offer best-in-class efficacy and safety strengthened by positive Phase 1 data**

Next Steps

- ➡ Anticipate Phase 2/3 clinical study, ALTITUDE-AD, initiation in 1H 2024

  Two treatment arms versus placebo: 50 mg/kg Q4W and 35 mg/kg Q4W

- ➡ Anticipate Phase 1 subcutaneous clinical study initiation in mid-2024

Thank you

www.acumenpharm.com