INTERCEPT-AD phase 1 insights and findings from the investigation of ACU193, a monoclonal antibody targeting soluble Aβ oligomers

Clinical Trials on Alzheimer's Disease Boston, Massachusetts October 27, 2023



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Chair: Diana Kerwin, Kerwin Medical Center, Dallas, TX

Determination of target engagement at various doses of ACU193 in INTERCEPT-AD

Mirjam Trame, Certara, Boston, MA

Reduction in amyloid plaque load at higher doses of ACU193 in INTERCEPT-AD

Eric Siemers, Acumen Pharmaceuticals, Inc, Charlottesville, VA

Characteristics of participants in INTERCEPT-AD who did or did not develop ARIA with ACU193

Stephen Salloway, Alpert Medical School of Brown University, Providence, RI



Acknowledgements

Participants and their Study Partners

• We acknowledge with thanks the individuals who enrolled in INTERCEPT-AD trial as well as their family, study partners, and friends who supported them.

Site Staff and Study Team Members

• We would also like to acknowledge the site staff, CRO, and all study team members who were vital to the successful completion of this trial.

Site Investigators

Kimball Johnson (iResearch Atlanta), Diana Kerwin (Kerwin Research Center), Jeffrey Norton (Charter Research),
Mohammad Reza Bolouri (Alzheimer's Memory Center), Alida Reinoso (Columbus Clinical Services), Shirley Valdez-Arroyo
(Santos Research Center), Eric Carbonell (Combined Research), David Weisman (Abington Neurological), Alexander White
(Progressive Medical Research), Beth Safirstein (MD Clinical), Lawrence Honig (Columbia University Hospital), Nelson
Berrios (Clinical Trial Network), Steve Sitar (Orange County Research Institute), Nidia Laurin (Clinical Endpoints), Sanjiv
Sharma (CenExel), Gustavo Alva (Hoag Memorial Hospital Presbyterian) and Maria Johnson (ACMR)



Determination of Target Engagement at Various Doses of ACU193 in INTERCEPT-AD

Mirjam N Trame, PharmD, PhD
Vice President, Certara Drug Development Solutions

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Disclosure

Dr. Trame is an employee of Certara and consulting for Acumen Pharmaceuticals.

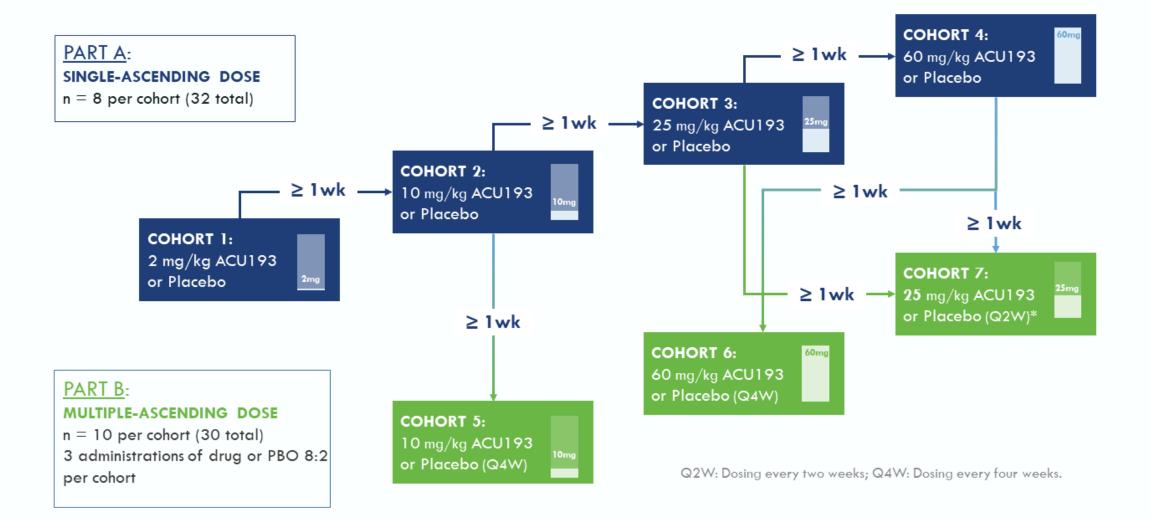


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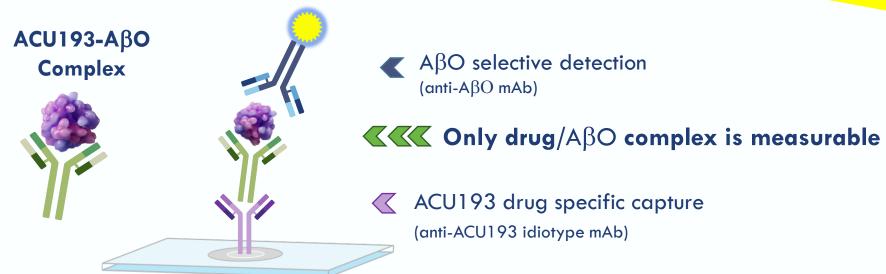
INTERCEPT-AD Phase 1 Study



Target Engagement: Measuring ACU193-ABO Complex in CSF

MSD S-Plex (Turbo) Immunoassay



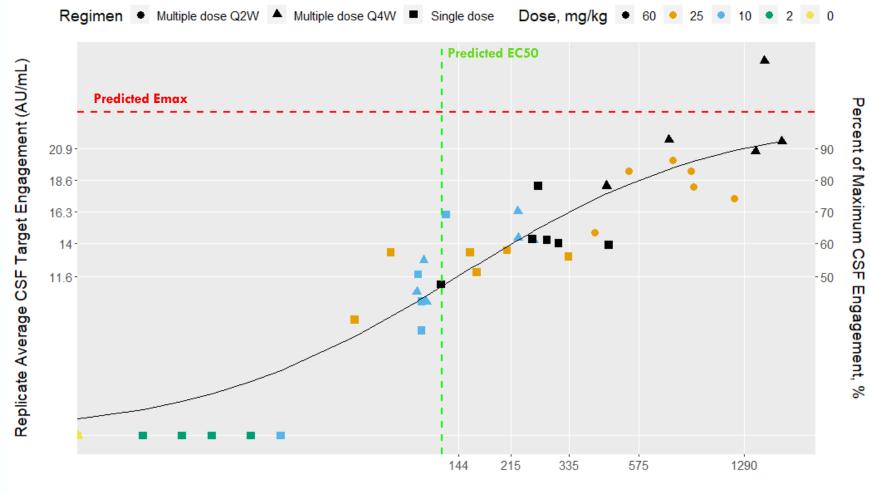


Novel assay configuration tailored to selectively detect ACU193-ABO complex in CSF as direct measure of target engagement



Clear ACU193 Concentration Target-Engagement Profile in the CSF

- Clear concentrationresponse profile in CSF
- These lumbar samples were taken while drug levels were falling, so they represent the lowest target engagement levels (something like "trough levels"); within dosing interval target engagement will be higher
- These results motivated the development of a PK/PD model for ACU193 effect on target engagement in the CSF



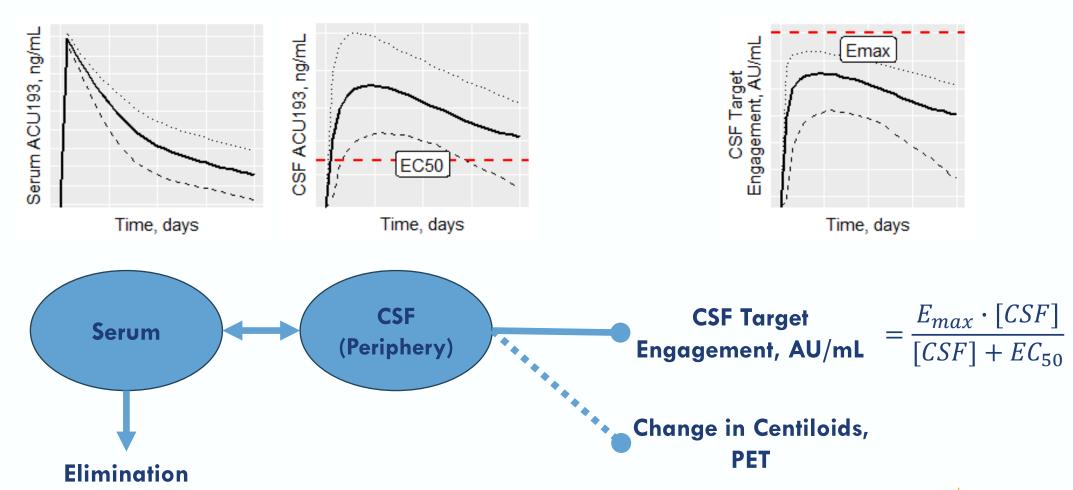
Replicate Average CSF ACU193 Concentration (ng/mL)

Red dashed line: predicted Emax from PKPD model; green dashed line: predicted EC50 from PKPD model



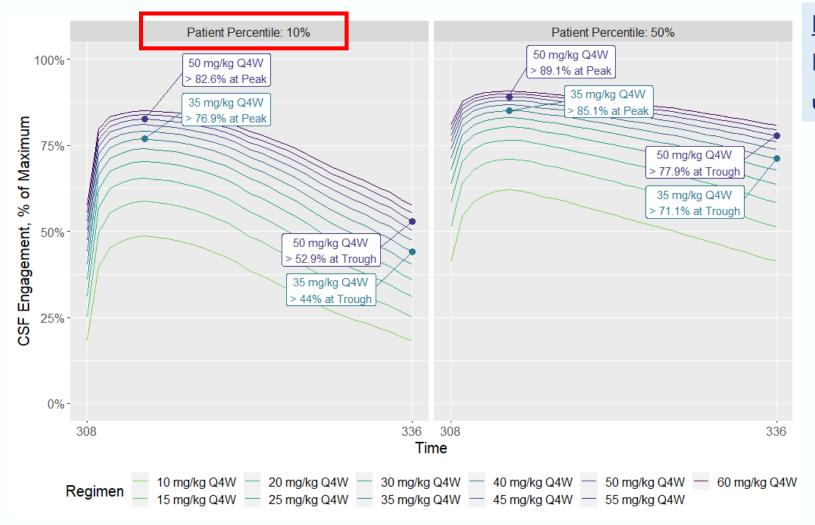
PK/PD Model for ACU193 Target Engagement

 CSF concentrations defined by a two-compartment model, then linked to target engagement in the CSF and Amyloid PET Centiloid reduction using a Michaelis-Menten (Emax) model



Simulated CSF Target Engagement at Steady-State

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



Ph2/3 Dosing Strategy (ALTITUDE-AD)

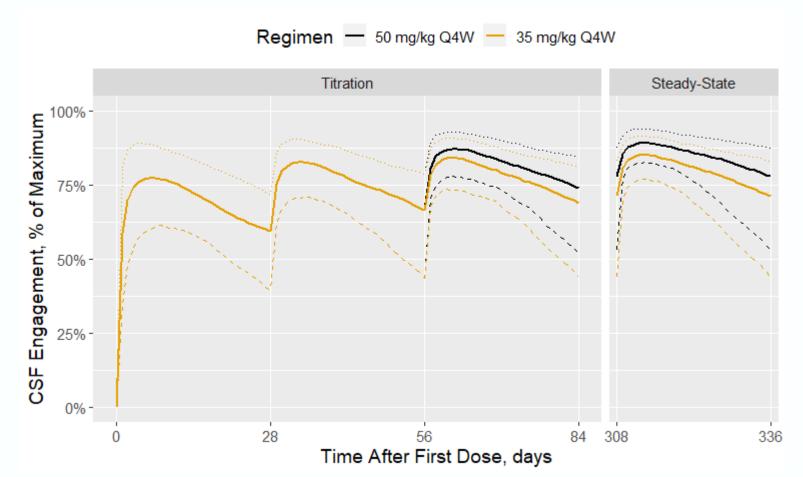
lower dose: 35 mg/kg Q4W upper dose: 50 mg/kg Q4W

- Notable diminishing differentiation as dose increases
- Doses were selected with variation in patient PK/PD in mind: select doses based on patients with the lowest (10th percentile) CSF target engagement
- Doses were selected with peaktrough variation in mind: select doses based on trough (end of dosing interval) CSF engagement



Simulated CSF Target Engagement for Doses Chosen for ALTITUDE-AD

CSF target engagement was simulated for doses chosen for the subsequent Phase 2/3 study



Solid lines: median patient; dashed and dotted lines are the 10th and 90th percentile patient

Ph2/3 Dosing Strategy (ALTITUDE-AD)

lower dose: 35 mg/kg Q4W

upper dose: 50 mg/kg Q4W

- Doses were selected with accumulation in mind: ACU193 concentrations build with repeated dosing, increasing target engagement
- To mitigate ARIA incidence, titration will be used for the 50 mg/kg dose starting at 35 mg/kg for the first two doses



Positive Effect and Significant Reduction in Amyloid PET Centiloids

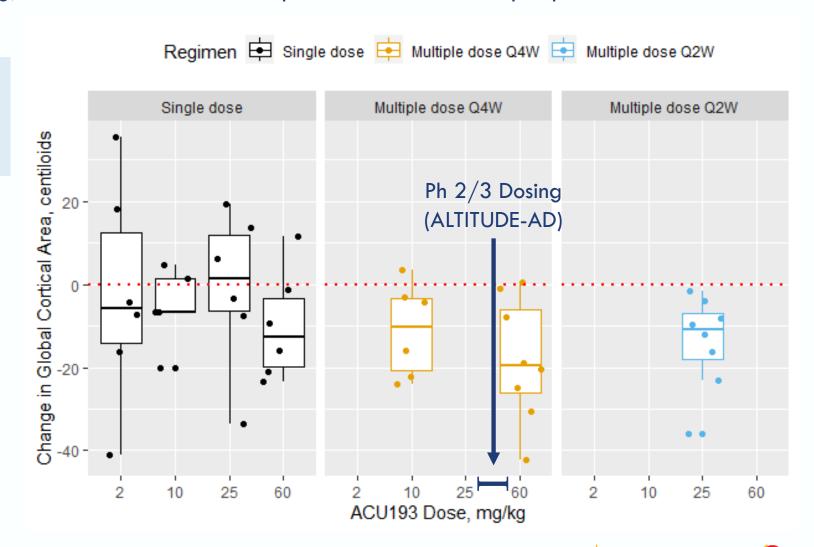
The PET data signal-to-noise is challenging, but dose and schedule dependence is evident in plaque reduction

Ph2/3 Dosing Strategy (ALTITUDE-AD)

lower dose: 35 mg/kg Q4W

upper dose: 50 mg/kg Q4W

- Centiloid data supports the doses selected by target engagement in the CSF
- No change: 2, 10, 25 mg/kg single dose
- Plaque reduction: 60 mg/kg single dose, 10 mg/kg Q4W, 25 mg/kg Q2W, 60 mg/kg Q4W





Summary and Conclusions

- A CSF measure of target engagement (ACU193-A β -oligomer complex) was developed showing clear dose-related increases in target engagement across all cohorts
- A PK/PD model was utilized and demonstrated that the highest doses used in INTERCEPT-AD (60 mg/kg Q4W and 25 mg/kg Q2W) approached target engagement at Emax
- Significant reduction in Amyloid PET Centiloids was observed with the highest two doses in INTERCEPT-AD
- PK/PD simulations were used to assess CSF target engagement at various doses to guide study design for upcoming Phase 2/3 study
- ALTITUDE-AD (Phase 2/3 study) will study three arms at the following dose levels:
 - Placebo
 - 35 mg/kg Q4W
 - 50 mg/kg Q4W (with titration from 35 mg/kg)



Thank you!

Reduction in amyloid plaque load using higher doses of ACU193 in INTERCEPT-AD

Eric R Siemers, MD
Chief Medical Officer, Acumen Pharmaceuticals

Clinical Trials on Alzheimer's Disease Boston, Massachusetts October 27, 2023



Disclosures

Dr. Siemers is an employee and shareholder at Acumen Pharmaceuticals.

Consulting Agreements (2021 or later)

- Cogstate Ltd.
- Gates Ventures LLC
- Hoffman La-Roche Ltd.
- Vaccinex, Inc.

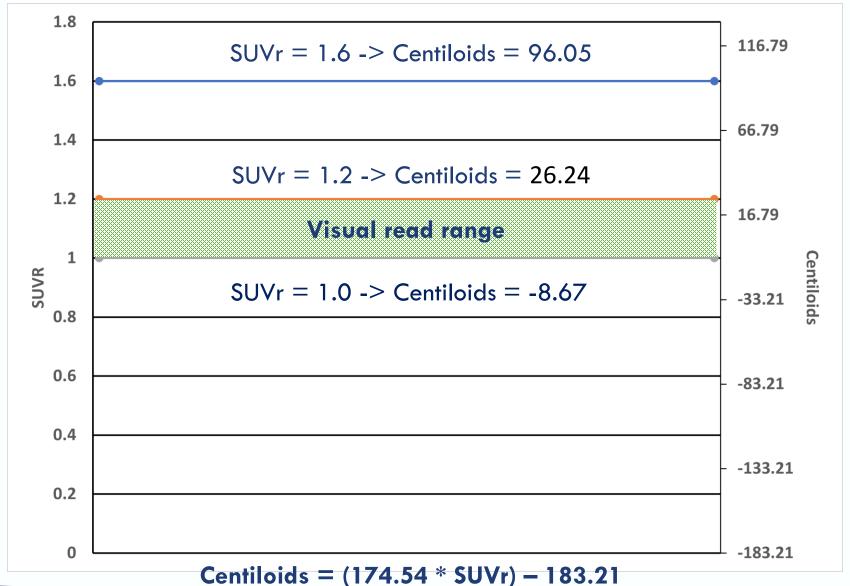


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Relationship between florbetapir SUVr and Centiloids



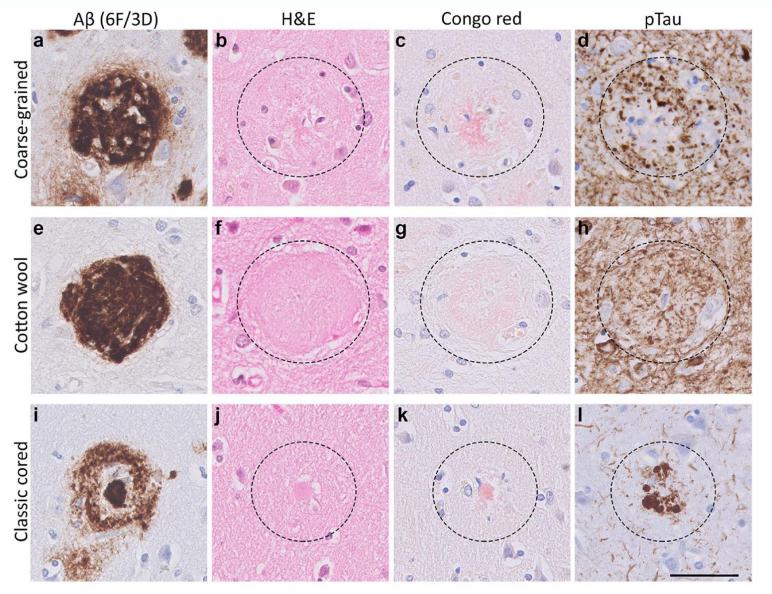


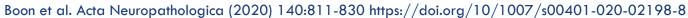
Results from hybrid SUVr/visual read assessments

- Of 194 amyloid PET scans obtained during screening:
 - > 49 (25%) had a global cortical SUVr of <1.0
 - ▶ 81 (42%) had a global cortical SUVr of 1.0 1.2
 - ► 64 (33%) had a global cortical SUVr of >1.2
- Of the 81 scans with a global SUVR of 1.0-1.2, 14~(17%) were read visually as amyloid positive
 - For the 14 scans with positive visual reads, Centiloid values ranged from -6.7 to 21.0
- Of the 65 randomized patients, 11 (17%) entered the study with an intermediate global cortical SUVr and a positive visual read



All amyloid plaques are not created equal



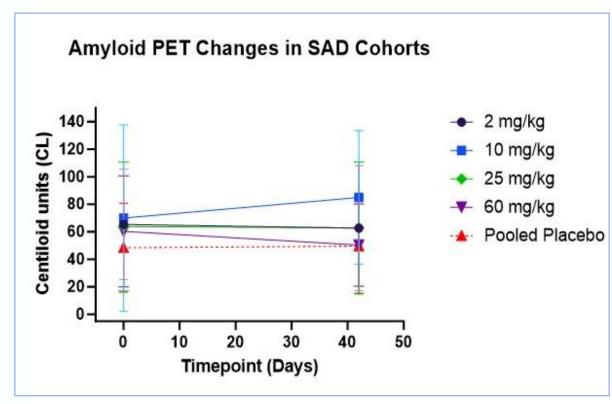


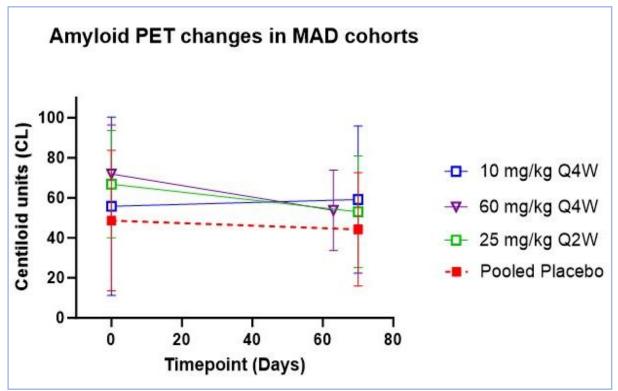


INTERCEPT-AD Individual Cohort Results

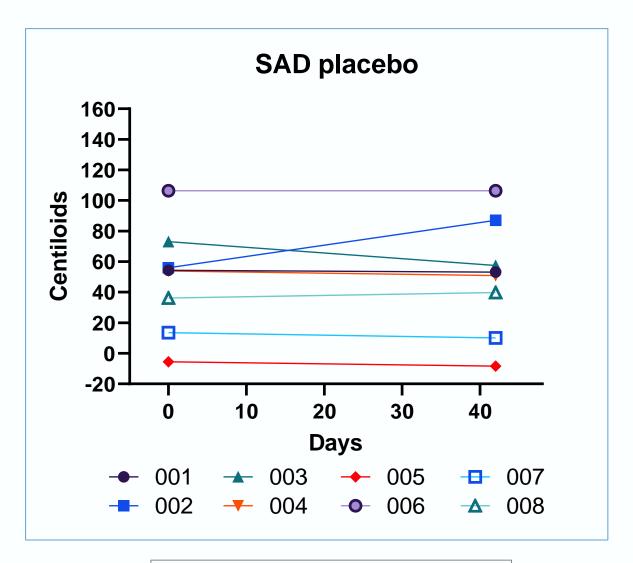


Mean Centiloid changes by cohort



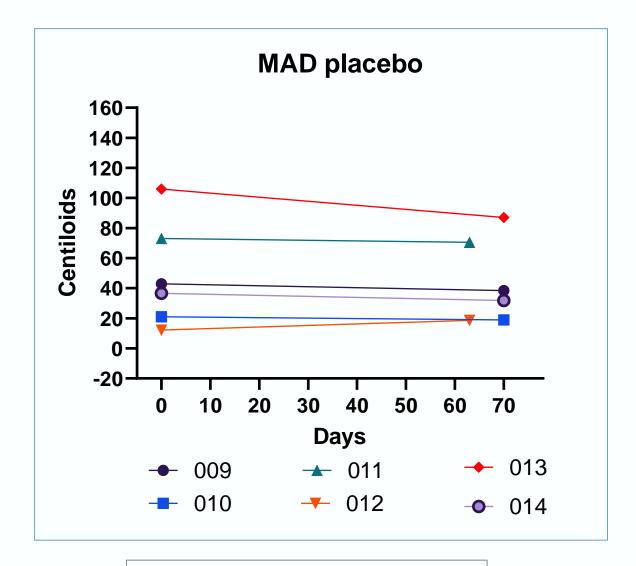






Baseline mean = 48.5 Centiloids

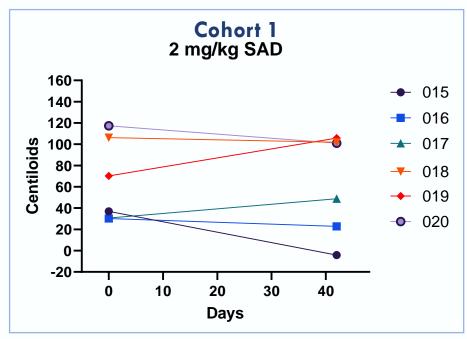
Endpoint mean = 50.0 Centiloids

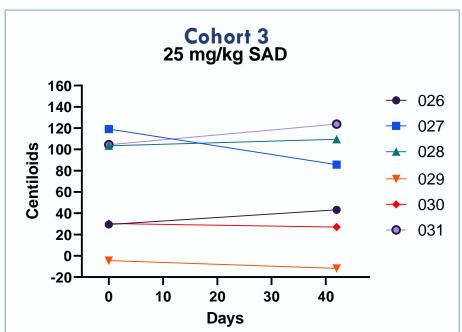


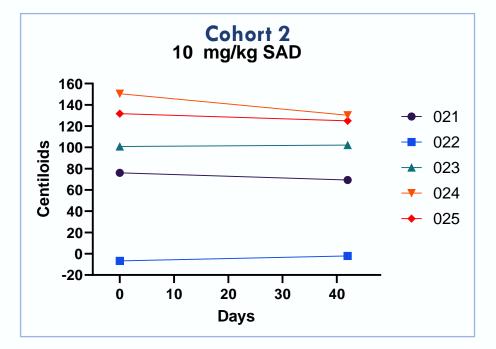
Baseline mean = 48.6 Centiloids

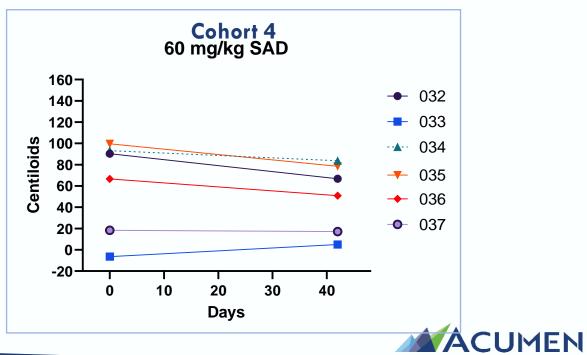
Endpoint mean = 44.2 Centiloids



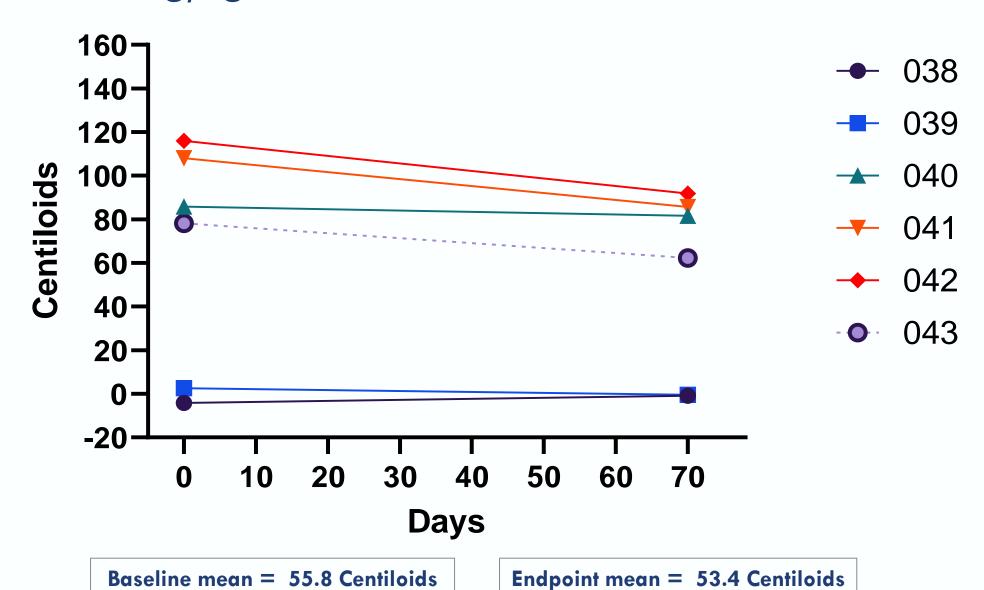






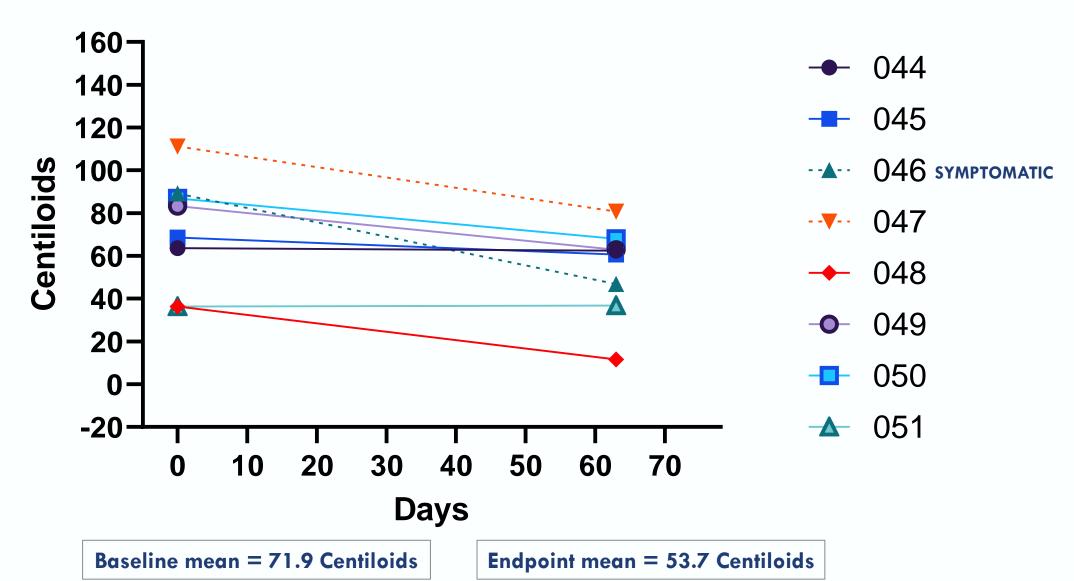


Cohort 5: 10 mg/kg Q4W MAD



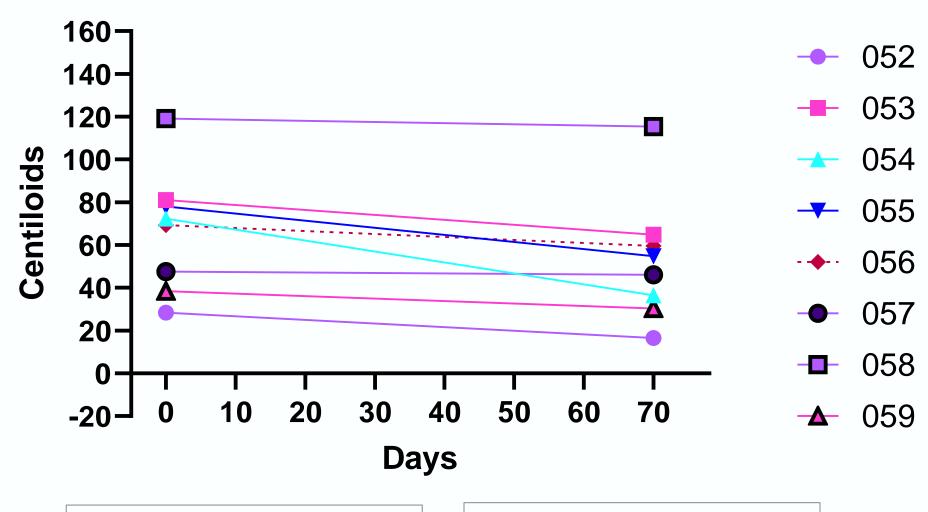
ACUMEN

Cohort 6: 60 mg/kg Q4W MAD





Cohort 7: 25 mg/kg Q2W MAD

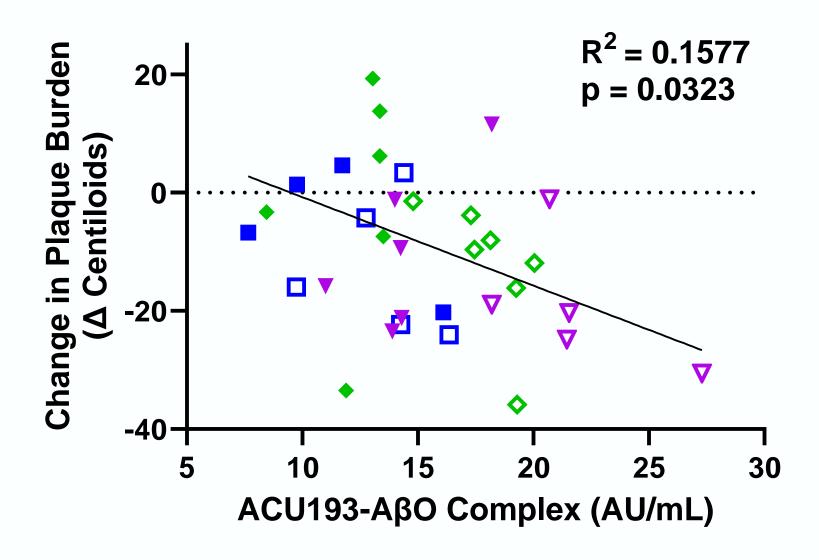


Baseline mean = 66.8 Centiloids

Endpoint mean = 53.0 Centiloids



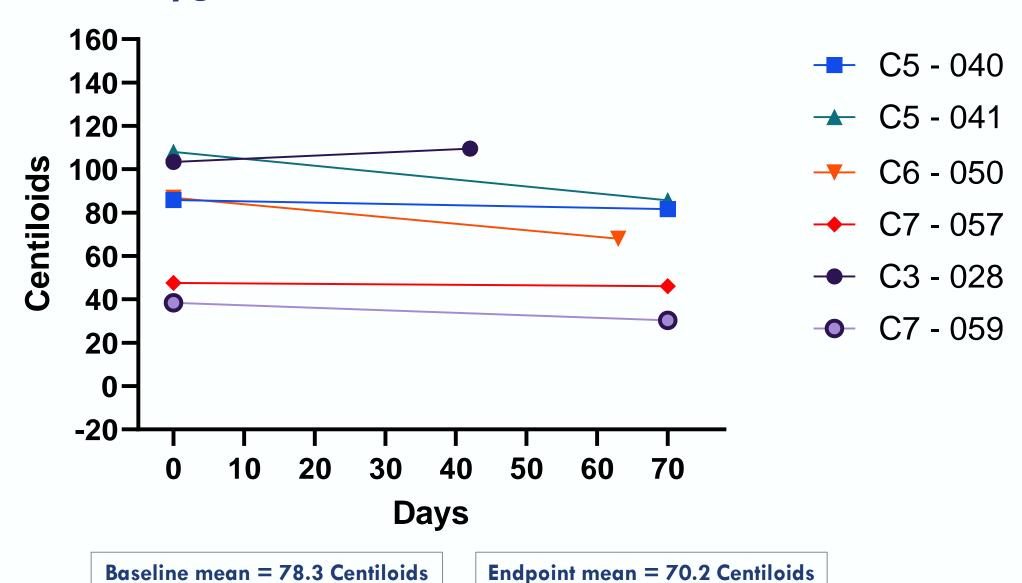
All cohorts: Plaque reduction vs target engagement



- 2 mg/kg SAD
- 10 mg/kg SAD
- 25 mg/kg SAD
- 60 mg/kg SAD
- 10 mg/kg Q4W
- 25 mg/kg Q2W
- ▼ 60 mg/kg Q4W

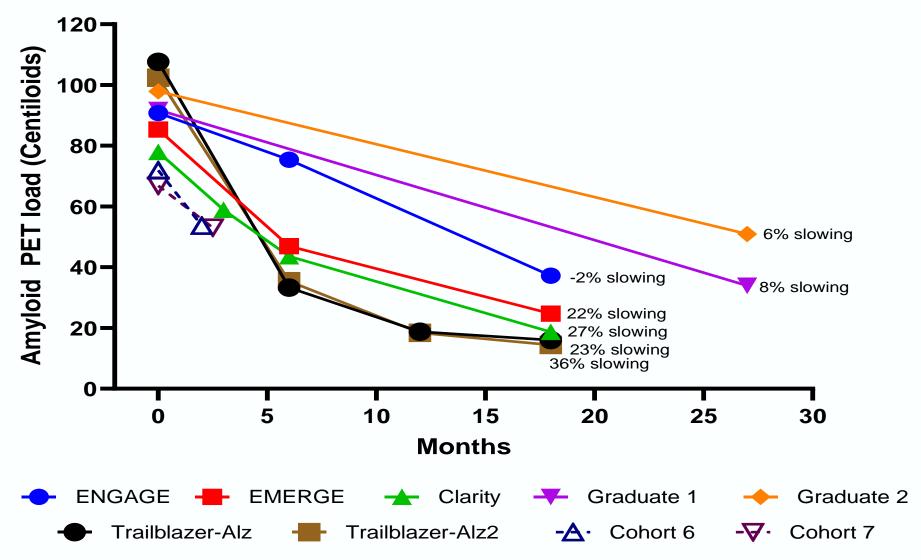


ApoE4 homozygotes



ACUMEN

Slowing of CDR-SB progression versus reduction in plaque load





Summary and conclusions

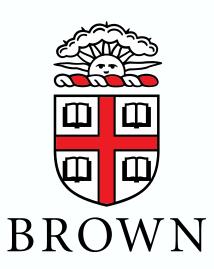
- Hybrid quantification/visual read system was used in Phase 1 trial of early AD
 - > Relatively few patients entered the trial on the basis of the visual read
 - Given the SUVr cut-off used in this study, somewhat lower baseline Centiloid values were seen compared to other studies of early AD
- Plaque reductions in cohorts using the highest 2 doses of ACU193 (60 mg/kg Q4W and 25 mg/kg Q2W)
- Low baseline Centiloid values had little or no decrease in plaque load; however, reduction in plaque load not clearly related to baseline
- While reduction in plaque load modest compared to longer trials, at similar early timepoints plaque reduction seen in INTERCEPT-AD similar to plaque reduction seen with other antibodies
- Mechanism of reduction in plaque load unclear: possibly due to direct binding of ACU193 to plaque, shifts in equilibria, or combination of both



Thank you!



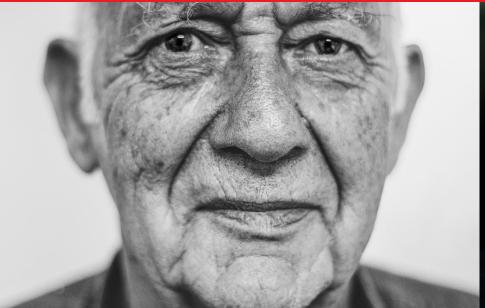


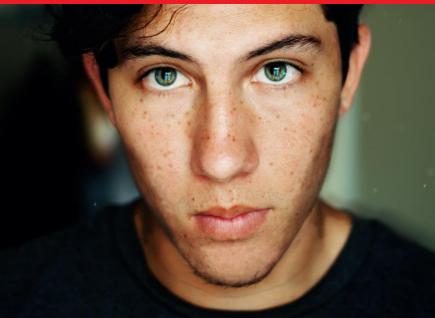




Characteristics of participants in INTERCEPT-AD who did or did not develop ARIA







Disclosures

Stephen Salloway, MD, MS

- Butler Hospital receives research support for clinical trials from Janssen, Lilly, Eisai, Genentech, Roche, and Biogen
- Dr. Salloway has provided consultation to Eisai, Biogen, Lilly, Roche, Genentech, Bolden, Novo Nordisk,
 Prothena, Acumen, Labcorp, Alector, Corium, Kisbee and AbbVie
- Dr. Salloway is a member of the ADRD Therapeutic Working Group and an author on the Appropriate Use Recommendations for lecanemab and aducanumab. He is also a member of the Editorial Board of the Journal of Alzheimer's Disease Prevention and Alzheimer's and Dementia: Diagnosis, Assessment and Disease Monitoring
- Dr. Salloway owns no stocks or equity in any pharmaceutical company and has no patents or royalties

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INTERCEPT-AD: MRI-related protocol information

- Exclusion Criteria: MRI at screening has more than four ARIA-H, presence of ARIA-E, or superficial siderosis
- The investigator may request a safety MRI at any time based on clinical findings or suspicion
 - Medical management will be determined by local reading of the images; however, the readings from the central imaging vendor will be used for the final determination for the clinical safety data base
- If a participant is found to have ARIA-E, administration of study drug will be withheld, and he/she will have approximately monthly MRI examinations until ARIA-E findings are resolved
 - Management of treatment-emergent ARIA-H will be as determined by the investigator
- Medical management of the study participants based on MRI findings (e.g., presence of ARIA-E) will be determined by the site principal investigator

MRI and ACU193 dosing schedule

SAD Cohorts 1-4 (2,10, 25 and 60 mg/kg)					
Day 1 Day 21 Day 140					
ACU193 (or placebo)	X				
MRI X X					

MAD Cohort 5 (25 mg/kg Q4W) MAD Cohort 6 (60 mg/kg Q4W)							
Baseline							Day 196
ACU193 (or placebo)	ACU193 (or placebo) X X X						
MRI – cohort 5 X X X							
MRI – cohort 6		X		X		X	

MAD Cohort 7 (25 mg/kg Q2W)							
Baseline Day 14 Day 28 Day 70 Day 98							
ACU193 (or placebo)	X	X	X				
MRI X X X							

MRI results for cohorts 6 and 7 were to be read prior to dosing

INTERCEPT-AD: ARIA-E summary

SAD

2 mg/kg Cohort 1

ApoE	D21	D140
3,4		
3,3	PBO	РВО
3,4		
2,3		
3,4	РВО	РВО
3,3		
3,3		
3,3		

10 mg/kg

Cohorts 2, 5

ApoE	D21	D140
3,4	РВО	РВО
3,3		
3,3		
3,4		
3,4	PBO	РВО
3,4		
3,4		
3,4		

25 mg/kg

Cohorts 3, 7

ApoE	D21	D140
_	UZI	DITO
3,3		
3,3	РВО	РВО
4,4		
3,3		
2,4		
3,3	РВО	РВО
3,4		
3,3		

60 mg/kg

Cohorts 4, 6

ApoE	D21	D140
4,4	РВО	РВО
3,4		
3,4	РВО	РВО
3,3		
3,3		
3,4		
2,4		
3,4		

NO ARIA-E Asymptomatic ARIA-E Symptomatic ARIA-E Discontinued

PBO: Patient on placebo

MAD

D28	D70	D196
РВО	РВО	РВО
РВО	РВО	РВО
	PBO	PBO PBO

ApoE	D28	D70	D98
3,3			
3,4			
3,4			
3,4			
3,4			
3,4	РВО	PBO	РВО
3,3			
3,4	РВО	РВО	PBO
4,4			
4,4			

ApoE	D28	D63	D126
3,4			
3,3			
3,3			
4,4			
4,4	PBO	PBO	РВО
3,3			
3,4			
3,4			
3,4	PBO	PBO	РВО
3,3			

No ε4 homozygotes developed ARIA-E despite comprising 13% in study; 4/5 ARIA-E cases are £4 heterozygotes which comprise 47% of the population

ARIA-E: Patient details

Cohort	ApoE4	Gender	Age	Baseline/Endpoint Plaque Load (Centiloids)	Severity by FDA Criteria
C4 SAD 60 mg/kg	Heterozygote	F	58	93.1/83.8	Moderate - Asymptomatic
C5 10 mg/kg Q4W	Heterozygote	F	72	78.2/62.2	Mild - Asymptomatic $3^{rd}/final\ dose\ on\ D56$
C6 60 mg/kg Q4W	Heterozygote	F	80	89.1/46.9	Moderate - Symptomatic (R leg dysfunction) 1 dose at BL; 2 remaining doses withheld
C6 60 mg/kg Q4W	NonCarrier	F	56	111.2/80.7	Mild - Asymptomatic $3^{rd}/final\ dose\ on\ D56$
C7 25 mg/kg Q2W	Heterozygote	F	70	69.3/59.6	Moderate - Asymptomatic 3 rd /final dose on D28 D28 ARIA-E (mild) noted in retrospective review

Of 5 total ARIA-E cases, 1 was symptomatic (2.1% overall) and symptoms resolved with resolution of radiographic ARIA-E. All cases showed radiographic resolution.

Cohort 4 participant (asymptomatic ARIA-E)

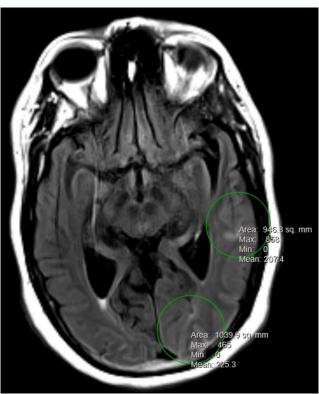
- 58-year-old white female
 - History of hypothyroidism, diverticulum, diabetes mellitus, depression, and menopause
- SAD Cohort 4 (ACU193 60 mg/kg)
- ARIA-E found on Day 21 MRI
 - Asymptomatic
 - One infusion of ACU193
 - Extensive ARIA-E leptomeningeal parieto-occipital left and bilateral temporal
 - The investigator considered the event of ARIA-E severe (Grade 3) in severity.
- ARIA-E resolved 81 days after onset

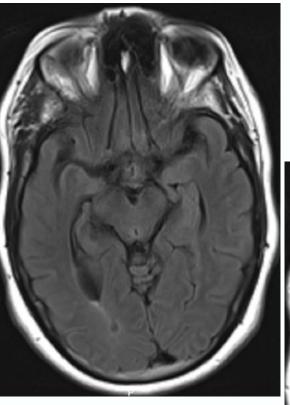
Cohort 4 participant (asymptomatic ARIA-E) images

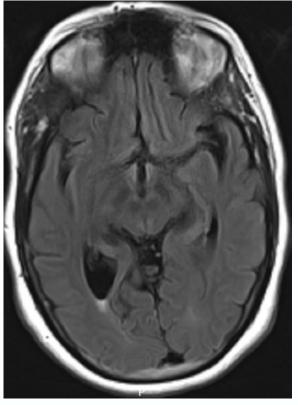
Day 21











Cohort 6 participant (symptomatic ARIA-E)

80-year-old white female subject

• History of ventricular extrasystoles, essential tremor, arthritis, scoliosis, spinal osteoarthritis, rotator cuff syndrome, skin cancer, pollakiuria, allergy to arthropod sting, and drug hypersensitivity (penicillin)

MAD Cohort 6 (60 mg/kg Q4W)

ARIA-E found on Day 28 MRI

- Symptomatic (right leg dysfunction)
- One of three infusions of ACU193; study drug stopped
- Multifocal ARIA-E bifrontal (L>R) and R parieto-occipital, mostly consisting of FLAIR parenchymal hyperintensities with some sulcal hyperintensity in R parietal region
- The investigator considered the event of ARIA-E moderate (Grade 2) in severity.

ARIA-H

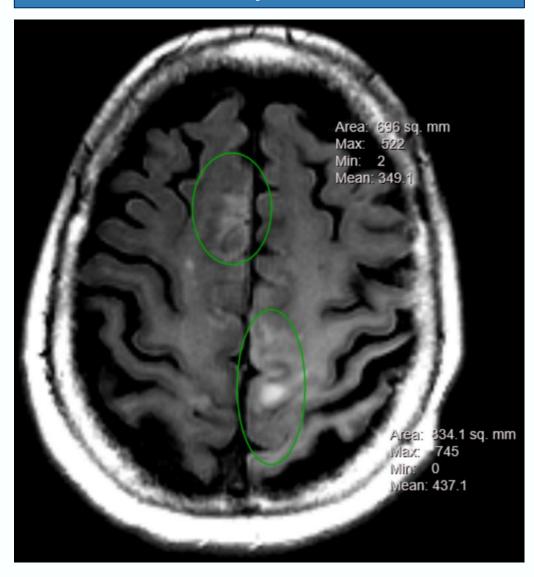
- Two microhemorrhages (MH) at screening
- One new MH identified (L frontal) on UNSCHEDULED follow-up MRI for the initial ARIA-E
- The investigator considered the event of ARIA-H mild (Grade 1) in severity.

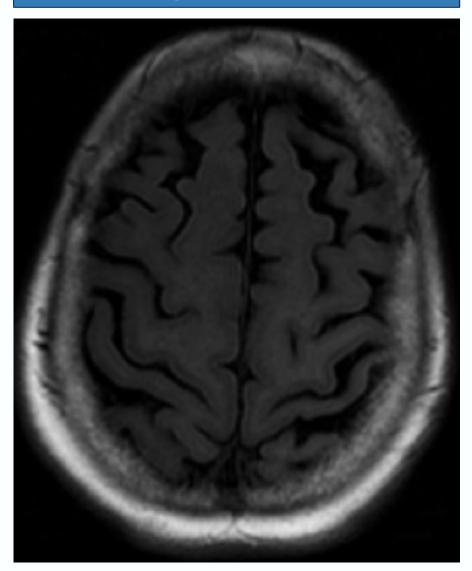
ARIA-E resolved 69 days after onset

Cohort 6 participant (symptomatic ARIA-E) images

Day 28

Day 126 (EOS)





Cohort 7 participant (asymptomatic ARIA-E and superficial siderosis)

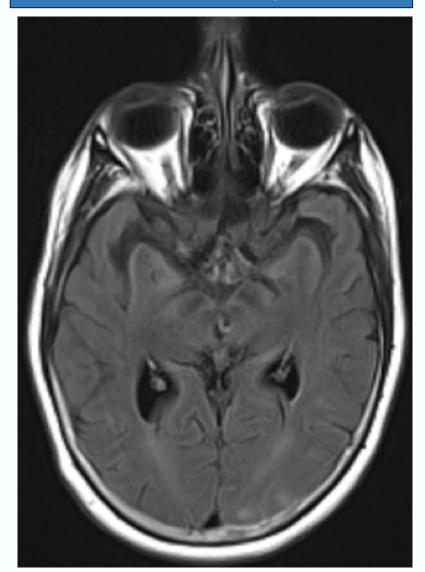
- 70-year-old white female
 - History of GERD, osteoporosis, hyperlipidemia, urinary tract infection, and hypertension
- MAD Cohort 7 (ACU193 25 mg/kg Q2W)
- ARIA-E and superficial siderosis found on Day 70 MRI
 - Asymptomatic
 - All three infusions of ACU193
 - Extensive multifocal ARIA-E increased compared to previous scan (Note: previous scan originally read no findings)
 - Leptomeningeal most of the left hemisphere except frontal lobe; increase multifocal sulcal right hemisphere; extensive parenchymal involvement left
 - Multifocal small deposits of superficial siderosis (L parietal, L temporal)
 - At Day 70 MRI, ARIA-E was retrospectively identified on the Day 28 MRI
- The investigator considered the events of ARIA-E and superficial siderosis moderate (Grade 2) in severity.
- ARIA-E resolved 135 days after onset

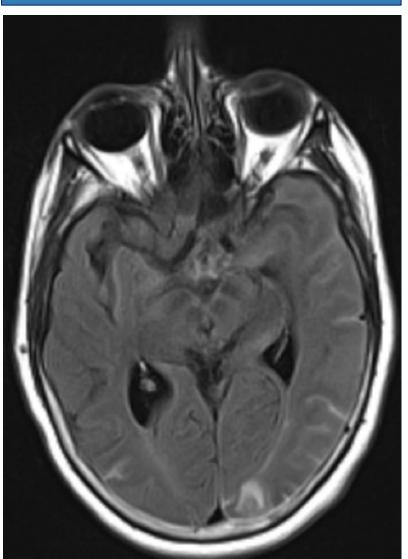
Cohort 7 participant (asymptomatic ARIA-E) images

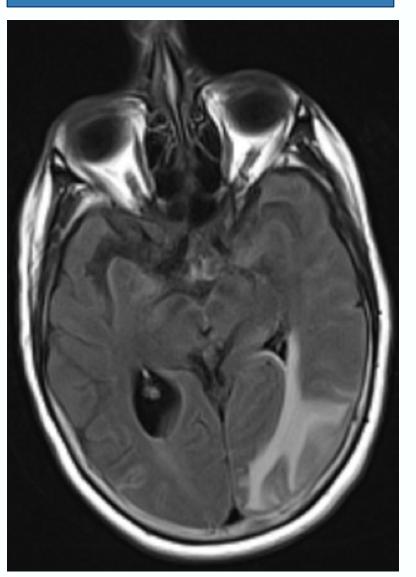
Day 28 ARIA-E noted in retrospect at D70



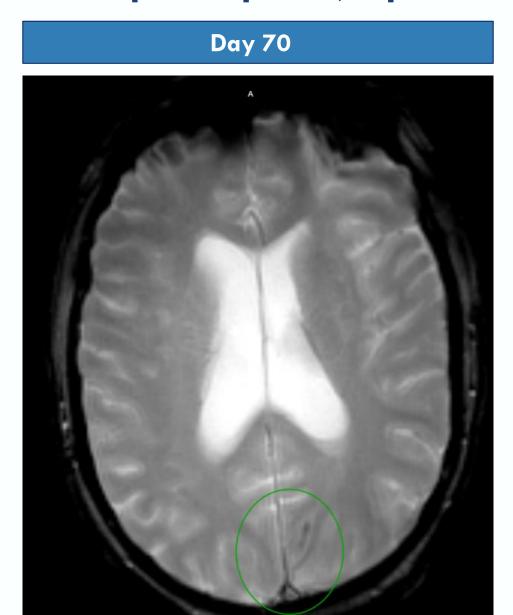
Day 98 (EOS) Resolution occurred D135 - post DBL



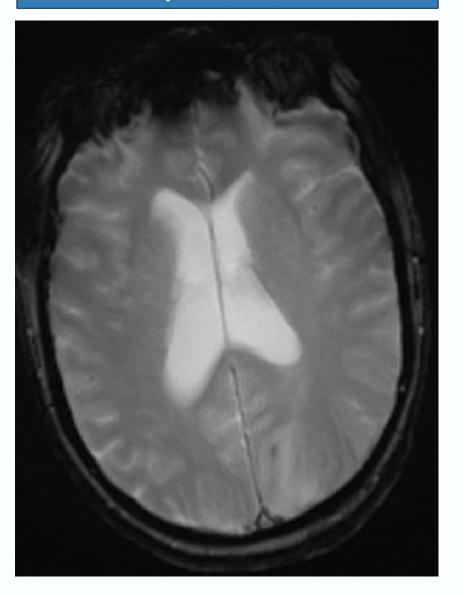




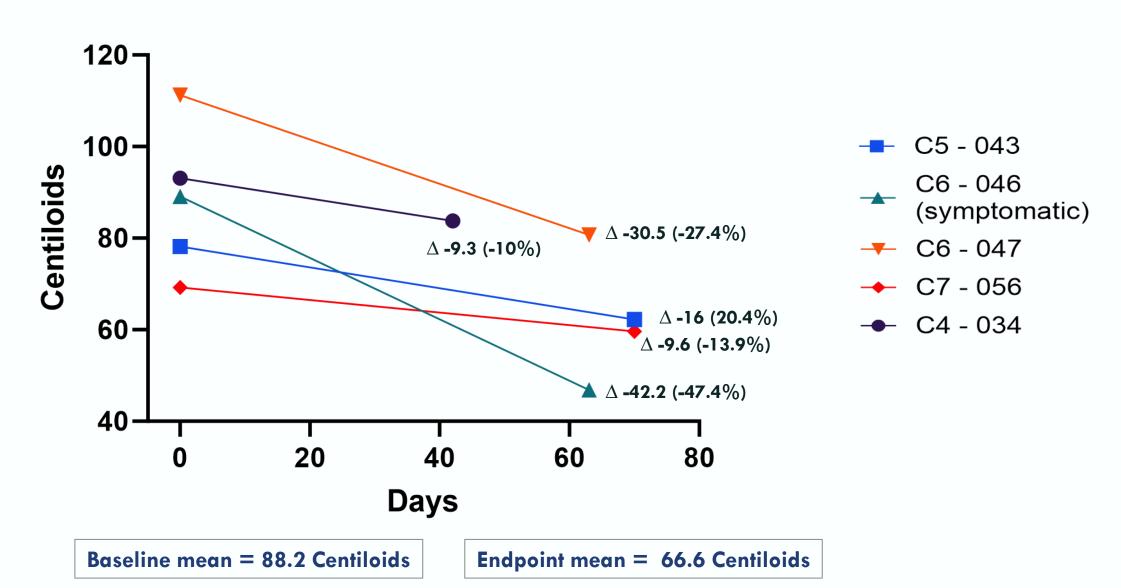
Cohort 7 participant (superficial siderosis) images



Day 98 (EOS)



Change in amyloid burden in participants with ARIA-E



Summary

- Differentiated rate of ARIA-E
 - 5 cases of ARIA-E; 1 symptomatic from 48 on drug
 - No cases of symptomatic ARIA-E at 2, 10, or 25 mg/kg doses
 - 4 of 5 ARIA-E cases in ApoE4 heterozygotes
 - No ARIA-E observed in ApoE4 homozygotes (n=6)
- All treatment-emergent ARIA-E showed radiographic resolution
- Phase 2/3 trial (ALTITUDE-AD) scheduled to start next year
 - Doses selected (35 and 50 mg/kg Q4W)
 - Careful monitoring of ARIA

Frequency of ARIA-E in combined SAD/MAD groups						
10 mg/kg 25 mg/kg 60 mg/kg						
Any ARIA-E	1/14 (7.1%)	1/14 (7.1%)	3/14 (21.40%)			
Symptomatic ARIA-E 0/14 (0.0%) 0/14 (0.0%) 1/14 (7.1%)						

Thank you!