

# *Unleashing the Power of Tregs*

**COYA THERAPEUTICS, INC.**  
NASDAQ: COYA | Investor Presentation

May 2023

[www.coyatherapeutics.com](http://www.coyatherapeutics.com)

**COYA**  
THERAPEUTICS

# Cautionary Note of Forward-Looking Statements and Disclaimers

This presentation and the accompanying oral presentation contain “forward-looking” statements that are based on our management’s beliefs and assumptions and on information currently available to management. Forward-looking statements include all statements other than statements of historical fact contained in this presentation, including information concerning our current and future financial performance, business plans and objectives, current and future clinical and preclinical development activities, timing and success of our ongoing and planned clinical trials and related data, the timing of announcements, updates and results of our clinical trials and related data, our ability to obtain and maintain regulatory approval, the potential therapeutic benefits and economic value of our product candidates, competitive position, industry environment and potential market opportunities. The words “believe,” “may,” “will,” “estimate,” “continue,” “anticipate,” “intend,” “expect,” and similar expressions are intended to identify forward-looking statements.

Forward-looking statements are subject to known and unknown risks, uncertainties, assumptions and other factors including, but not limited to, those related to the success, cost and timing of our product candidate development activities and ongoing and planned clinical trials; our plans to develop and commercialize targeted therapeutics; the progress of patient enrollment and dosing in our clinical trials; the ability of our product candidates to achieve applicable endpoints in the clinical trials; the safety profile of our product candidates; the potential for data from our clinical trials to support a marketing application, as well as the timing of these events; our ability to obtain funding for our operations; development and commercialization of our product candidates; the timing of and our ability to obtain and maintain regulatory approvals; the rate and degree of market acceptance and clinical utility of our product candidates; the size and growth potential of the markets for our product candidates, and our ability to serve those markets; our commercialization, marketing and manufacturing capabilities and strategy; future agreements with third parties in connection with the commercialization of our product candidates; our expectations regarding our ability to obtain and maintain intellectual property protection; our dependence on third party manufacturers; the success of competing therapies or products that are or may become available; our ability to attract and retain key scientific or management personnel; our ability to identify additional product candidates with significant commercial potential consistent with our commercial objectives; and our estimates regarding expenses, future revenue, capital requirements and needs for additional financing.

We have based these forward-looking statements largely on our current expectations and projections about future events and trends that we believe may affect our financial condition, results of operations, business strategy, short-term and long-term business operations and objectives, and financial needs. Moreover, we operate in a very competitive and rapidly changing environment, and new risks may emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties and assumptions, the forward-looking events and circumstances discussed herein may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements. Although our management believes that the expectations reflected in our forward-looking statements are reasonable, we cannot guarantee that the future results, levels of activity, performance or events and circumstances described in the forward-looking statements will be achieved or occur. We undertake no obligation to publicly update any forward-looking statements, whether written or oral, that may be made from time to time, whether as a result of new information, future developments or otherwise.

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We have filed a registration statement on Form S-1 (including a preliminary prospectus) with the SEC for the offering to which this presentation relates. The registration statement has not yet become effective. Before you invest, you should read the preliminary prospectus in the registration statement (including the risk factors described therein) and other documents we have filed with the SEC for more complete information about our company and the offering. You may get these documents for free by visiting EDGAR on the SEC web site at <http://www.sec.gov/>. The preliminary prospectus, as amended, is available on the SEC website at <http://www.sec.gov>. When available, electronic copies of the preliminary prospectus supplement and the accompanying prospectus may also be obtained from the offices of Chardan Capital Markets at 17 State Street Suite 2130, New York, NY, 10004; by telephone at +1 646-465-9000; by email at [prospectus@chardan.com](mailto:prospectus@chardan.com).

# Coya Therapeutics' Highlights



## Focused on Regulatory T Cells (Tregs)

- Most clinically-advanced company focused on Treg-modulating therapies
- Multi-modality approach:
  - Biologics (COYA 300 series)
  - Exosomes (COYA 200 series)



## Strong Early Clinical Data

- **COYA 301 completed PoC IIT study\*** in Alzheimer's Disease (AD)
- **COYA 302 completed PoC IIT study\*** in Amyotrophic Lateral Sclerosis (ALS)
- COYA 200 series for neurodegenerative diseases, autoimmune / inflammatory conditions, and metabolic diseases

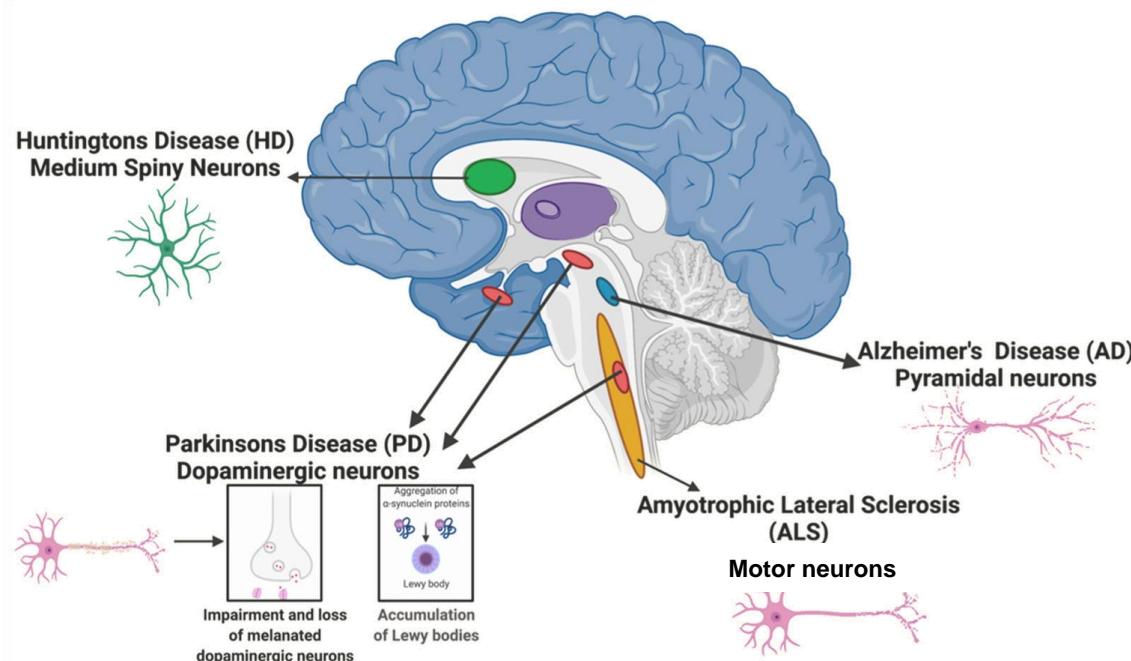


## Multiple Near-Term Catalysts (12-18 months)

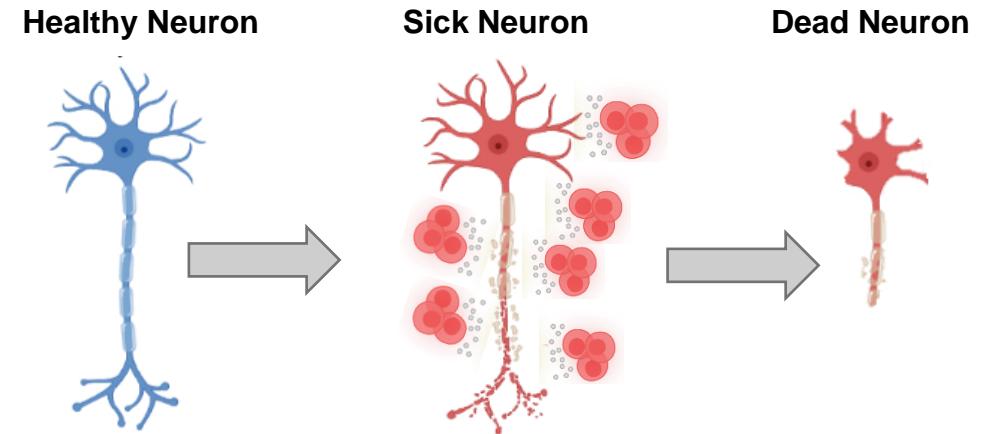
- COYA 301 clinical PoC data in Alzheimer's Disease (AD): Keystone (May 2023) and AAIC (July 2023)
- COYA 302 Phase 2 initiation in ALS (2H 2023)
- Multiple peer reviewed publications in 2023
- COYA 200 Platform Series animal model validation data/ out-license discussions
- COYA 206 target validation & custom cargo validation (1H 2023)/ out-license discussions

# Inflammation Plays a Critical Role in Neurodegeneration

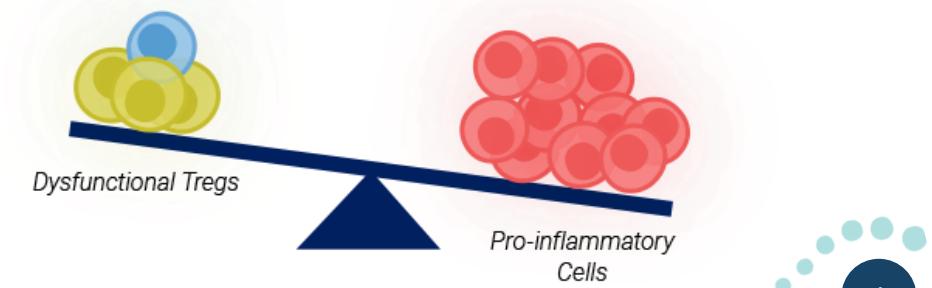
## Neurodegeneration: Loss of Selective Population of Neurons



## Inflammation in the Nervous System



***Dysfunctional Tregs play central role in inflammation and progression of neurodegeneration***

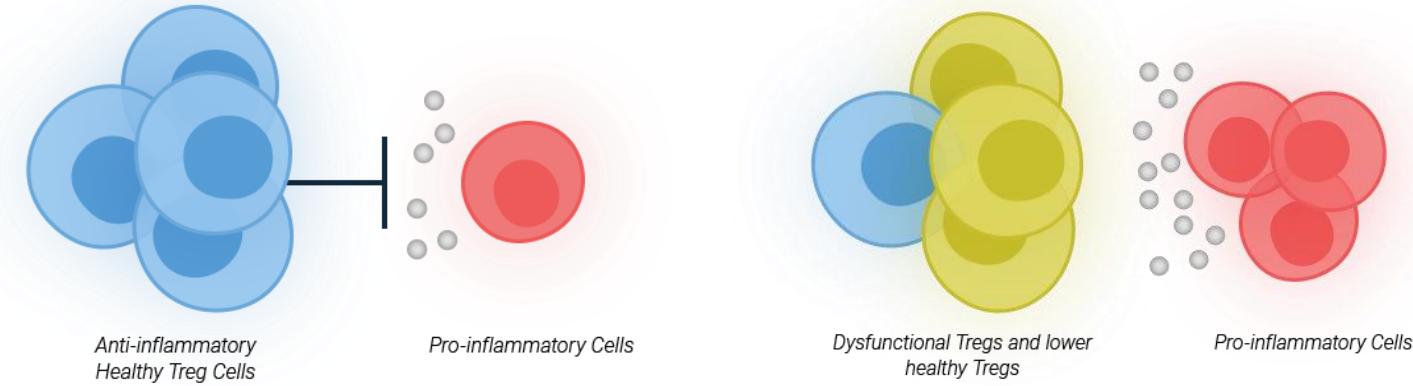


# What Are Tregs and How They Are Dysfunctional

Tregs are a type of lymphocyte that modulate the body's immune response

The main functions of Tregs are:

- *Ameliorate inflammatory mechanisms and reactions*
- *Inhibit the release of pro-inflammatory cytokines*
- *Maintain self-tolerance*



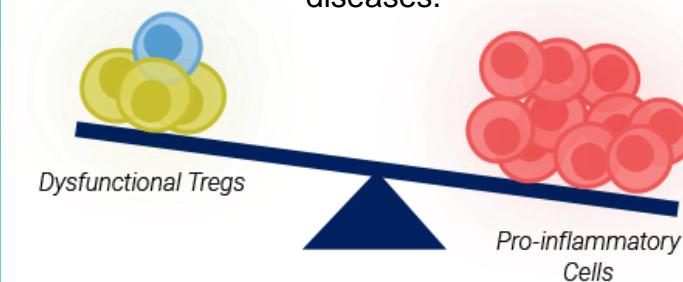
## Healthy Tregs

Tregs are important anti-inflammatory immune cells involved in homeostasis. Tregs act on multiple immune cells to down-regulate the release of pro-inflammatory cytokines.



## Dysfunctional Tregs

When Tregs become dysfunctional, a cytokine-mediated inflammatory state can arise leading to neurodegenerative, autoimmune, and metabolic diseases.



# Strong Proof-of-Concept Clinical Data

## COYA 302 for the Treatment of Amyotrophic Lateral Sclerosis\*

Open-label academic study in 4 ALS patients, conducted at Houston Methodist

Results were presented at MDA Conference in March 2023

No disease progression at week 24 and minimal progression at week 48 (by mean ALSFRS-R score)

Consistent and significant Treg function enhancement and increased Treg numbers

Expression of blood biomarkers of inflammation were downregulated, correlating with disease severity and treatment response

Safe and well tolerated

## Coya 301 for the Treatment of Alzheimer's disease\*

Open-label academic study in 8 mild-to-moderate AD patients, conducted at Houston Methodist

Results were presented at Keystone Conference in May 2023 and at Alzheimer's Association International Conference in July 2023

Statistically significant improvement in cognitive function, as measured by the Mini-Mental State Examination test (MMSE)

Restored peripheral Treg function and numbers, and lowered the levels of systemic pro-inflammatory chemokines and biomarkers

Safe and well tolerated

# Robust Treg-focused Pipeline

Product Type	Discovery	Preclinical	IND-Enabling	Phase 1	Phase 2a	Phase 2b/3	Partnerships / Collaborations	Upcoming Milestones
Treg-Enhancing / T Effector & Macrophage Depleting Biologics	COYA 302 (Biologic Combination)  <i>Amyotrophic Lateral Sclerosis</i>  <b>Completed POC IIT open label study in patients with ALS*</b>						  	H1 2023: POC from IIT - clinical data release H2 2023: File IND Phase 2 study in ALS H2 2023: Initiate Phase 2 study in ALS
Treg-Enhancing Biologic	COYA 301  <i>Frontotemporal Dementia</i>  <b>Completed POC IIT open label study in patients with Alzheimer's Disease (AD)*</b>							H1 2023: Report POC data in AD H2 2023: IND-Filing and clinical study initiation
Allogeneic Treg-Derived Exosomes	COYA 201  <i>Neurodegenerative, Autoimmune, and Metabolic Diseases</i>							H1 2023: Completion of Therapeutic Animal Model Studies
Antigen-Directed Allogeneic Treg-Derived Exosomes	COYA 206  <i>Undisclosed Indications</i>							H1 2023: Target & Cargo Validation

***Robust POC results warrant conducting a larger and well-controlled study for COYA 302 in ALS***

POC- Proof of Concept; IIT- Investigator Initiated Trial

\* Conducted using commercially available products

# Coya's Leadership Has Demonstrated Deep Expertise in Biotech

## Management Team



**Howard Berman, Ph.D.**  
Chief Executive Officer &  
Chairman of the Board



**Adrian Hepner, M.D., Ph.D.**  
President & Chief Medical  
Officer



**David Snyder**  
Chief Financial Officer &  
Chief Operating Officer



**Arun Swaminathan, Ph.D.**  
Chief Business Development  
Officer



**John Centanni**  
Vice President  
of Regulatory Affairs

## Prior Experience\*



## Board of Directors



**Ann Lee, Ph.D.**  
Chief Technical Officer  
of Prime Medicine



**Anabella Villalobos, Ph.D.**  
Head of Biotherapeutics and  
Medicinal Sciences of Biogen



**Dov Goldstein, M.D., MBA**  
Chief Financial Officer  
of BioAge Labs



**Hideki Garren, M.D., Ph.D.**  
Chief Medical Officer  
of Prothena Biosciences

## Prior Experience\*



# SAB Comprised of Seminal Leadership in Tregs



***Following the discoveries of Dr. Sakaguchi and Dr. Appel, Coya is developing multiple product modalities to enhance the therapeutic potential of Tregs for the treatment of disorders of high unmet need***



**Shimon Sakaguchi, MD, PhD**

*Distinguished Professor at the World Premier International Research Initiative (WPI)-Immunology Frontier Research Center (iFReC) at Osaka University*

**Discovered Tregs in 1995 and their role in inflammation and autoimmune conditions**



**Stanley Appel, MD**

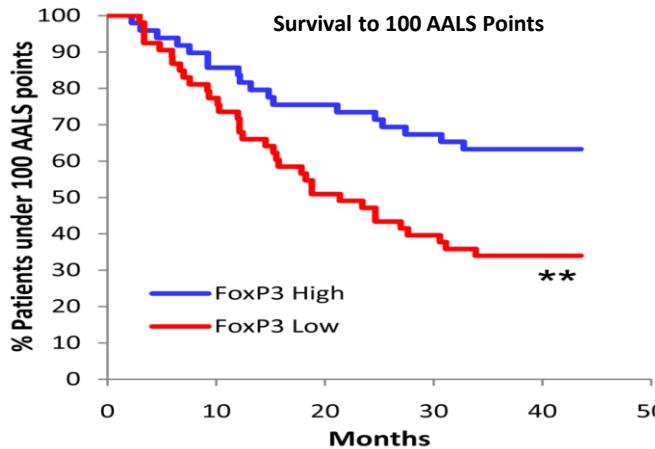
*Former Chair of the Stanley H. Appel Department of Neurology  
Director of the Ann Kimball & John W. Johnson Center for Cellular Therapeutics Houston Methodist Hospital*

**Pioneered research in neuro-inflammation and the development of Treg targeted therapies**

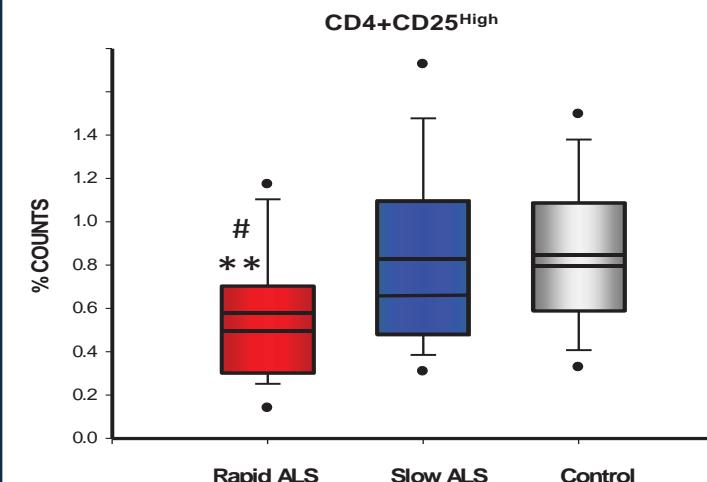
# Treg Dysfunction Is a Core Driver of Neurodegeneration

*Treg dysfunction is associated with ALS disease progression and burden of disease...*

## Treg Dysfunction is Associated with ALS Survival

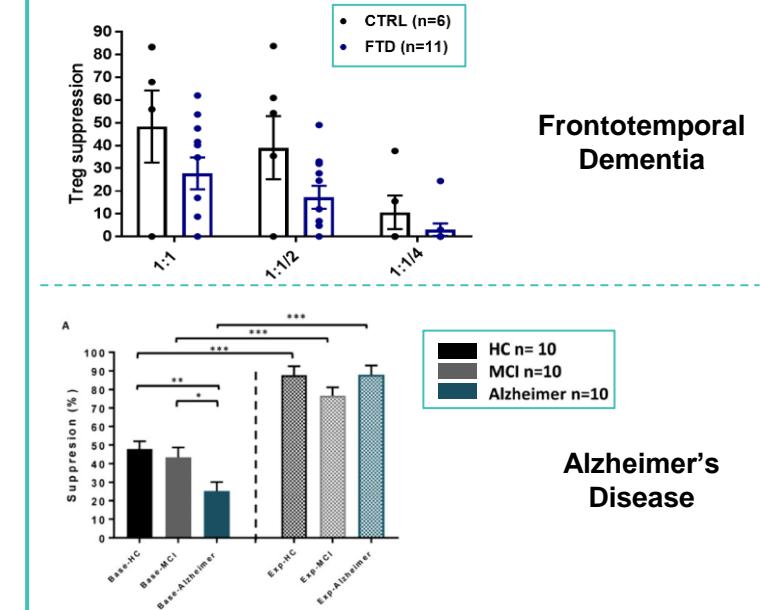


## Treg Dysfunction Plays a Role in the Rate of Decline in ALS



*...and is similarly associated in other neurodegenerative diseases*

## Treg Dysfunction Is Implicated in FTD & AD



# Initial Findings → Diverse Pipeline Addressing Treg Dysfunction

## Key Learnings From Two IIT Studies Conducted at Houston Methodist under Dr. Stanley Appel...

- **Treg Cell Therapy was well-tolerated** with no Serious Adverse Events (SAEs) reported across both studies
- **Discovery of Biomarkers:** High levels of proinflammatory (IL-17F, IL-17C, OLR-1) and oxidative stress (Ox-LDL, 4-HNE) biomarkers were associated to poor therapeutic response
- **Phase 1 Proof of Concept:** Three patients received 4 bi-weekly infusions over 8 weeks; 16 weeks later, patients received 4 monthly infusions. **Infusions halted ALS progression**
- **Phase 2a + Open-Label Extension:** 4/8 (50%) patients had a mean change in ALSFRS-R score of +0.2 points; 75% of patients (responders) showed a mean change in ALSFRS-R score of -2.7 points over 24 weeks, while 25% of patients did not respond to therapy.

## ...Led to the Discovery and Advancement of COYA 300 Series

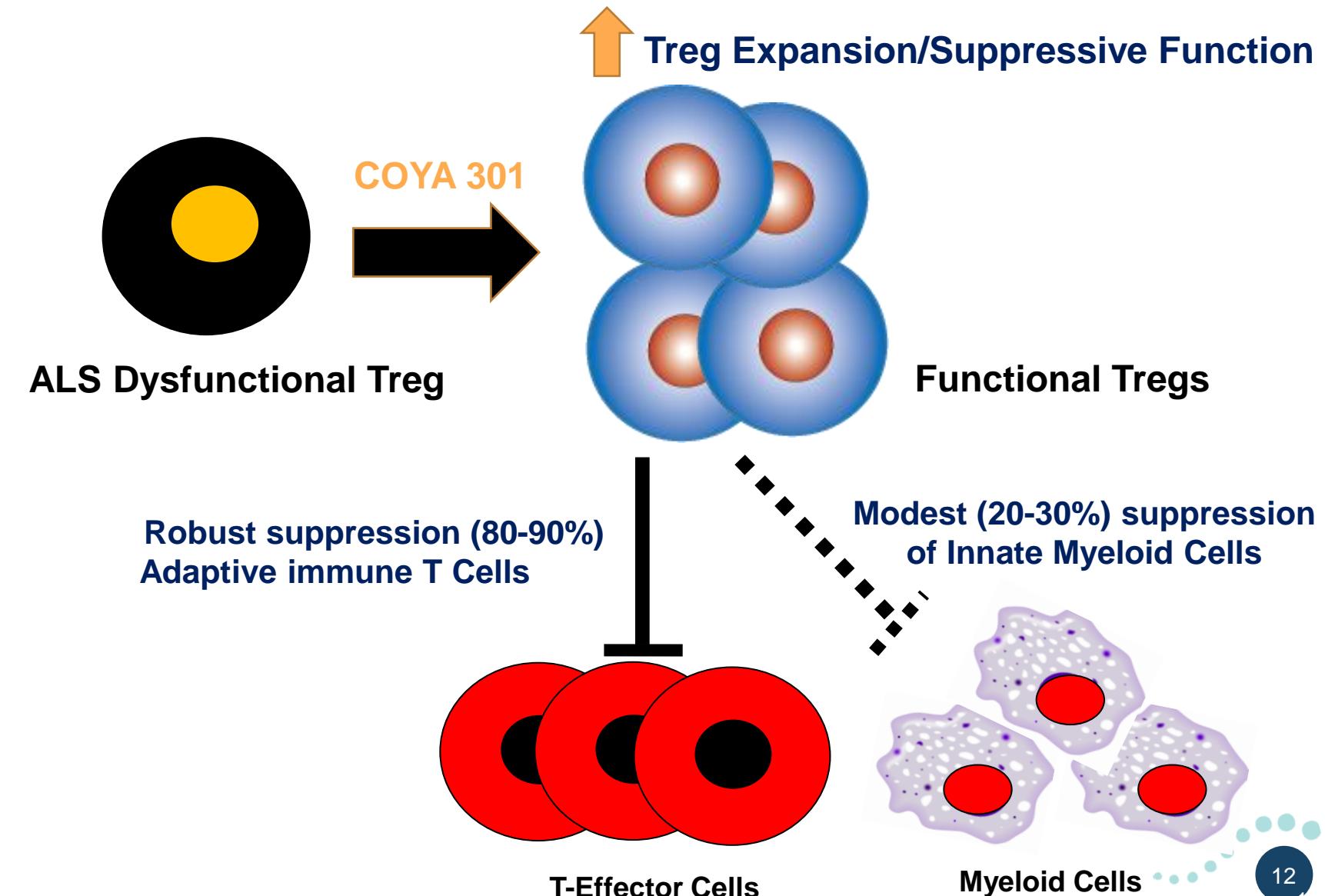
*Our initial learnings demonstrate targeting Tregs has a meaningful affect on ALS progression and other neurodegenerative diseases*

Biologic programs (COYA 300 series) represent:

- **Targeted pathway in Treg Dysfunction**
- **Multi-Pathway** approach to addressing Treg dysfunction *in vivo*
- **Cost-effective** clinical development and manufacturing
- **More scalable** approach for commercialization
- **Biomarker enrichment** for efficient clinical development
- **Defined and supportive regulatory** environment in ALS

# COYA 301: Proprietary Treg Enhancing Low-Dose IL-2 Suppresses Adaptive Immunity - Robustly - and Innate Immunity - Modestly

Dysfunctional Tregs are associated with neuroinflammation promoted by activated T effector cells and activated innate myeloid cells



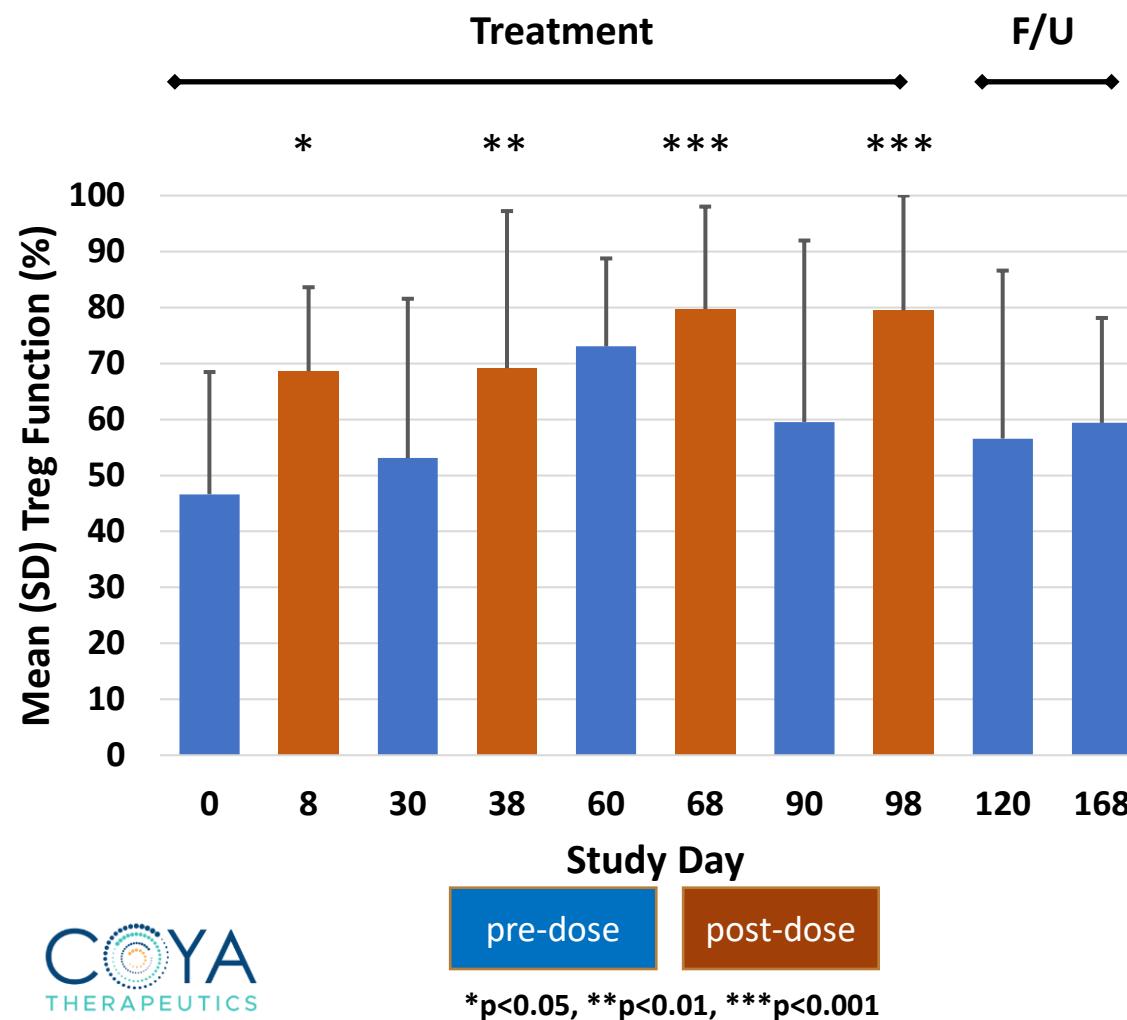
# COYA 301: Investigator-Initiated Study in Alzheimer's Disease (AD)

## Overall Study Design

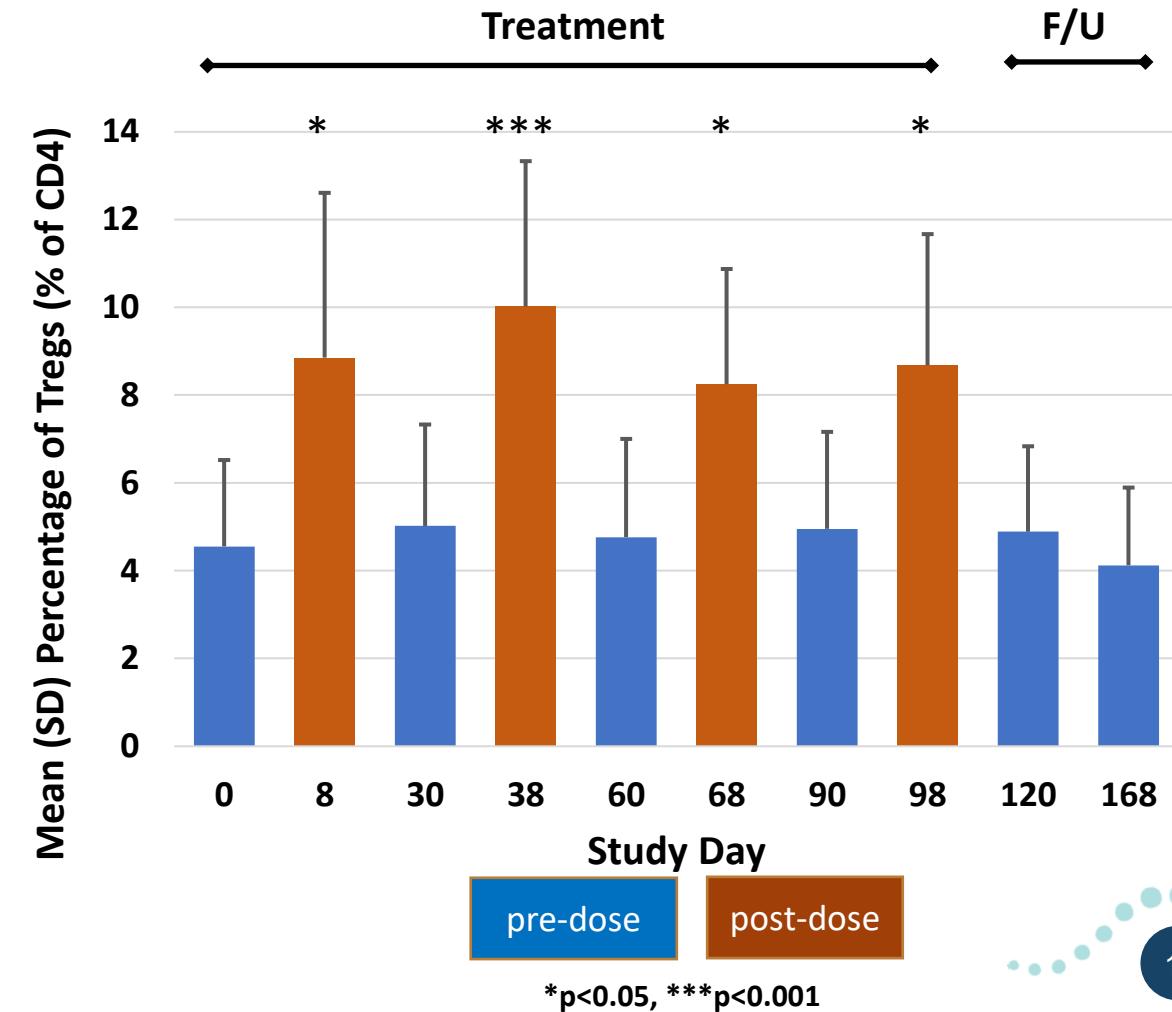
- Proof-of-Concept open-label study, conducted at Houston Methodist Hospital
- Population: 8 patients with mild-to-moderate AD
- Treatment: 4 monthly COYA 301 cycles administered subcutaneously, followed by 2-month post-treatment observation. The study was conducted with commercially available product.
- Assessments:
  - Treg suppressive function and Treg numbers
  - Peripheral proinflammatory biomarkers
  - Cognitive status
  - Safety and tolerability

# COYA 301 Enhances Treg Function and Numbers *in vivo* in AD Patients (N=8)

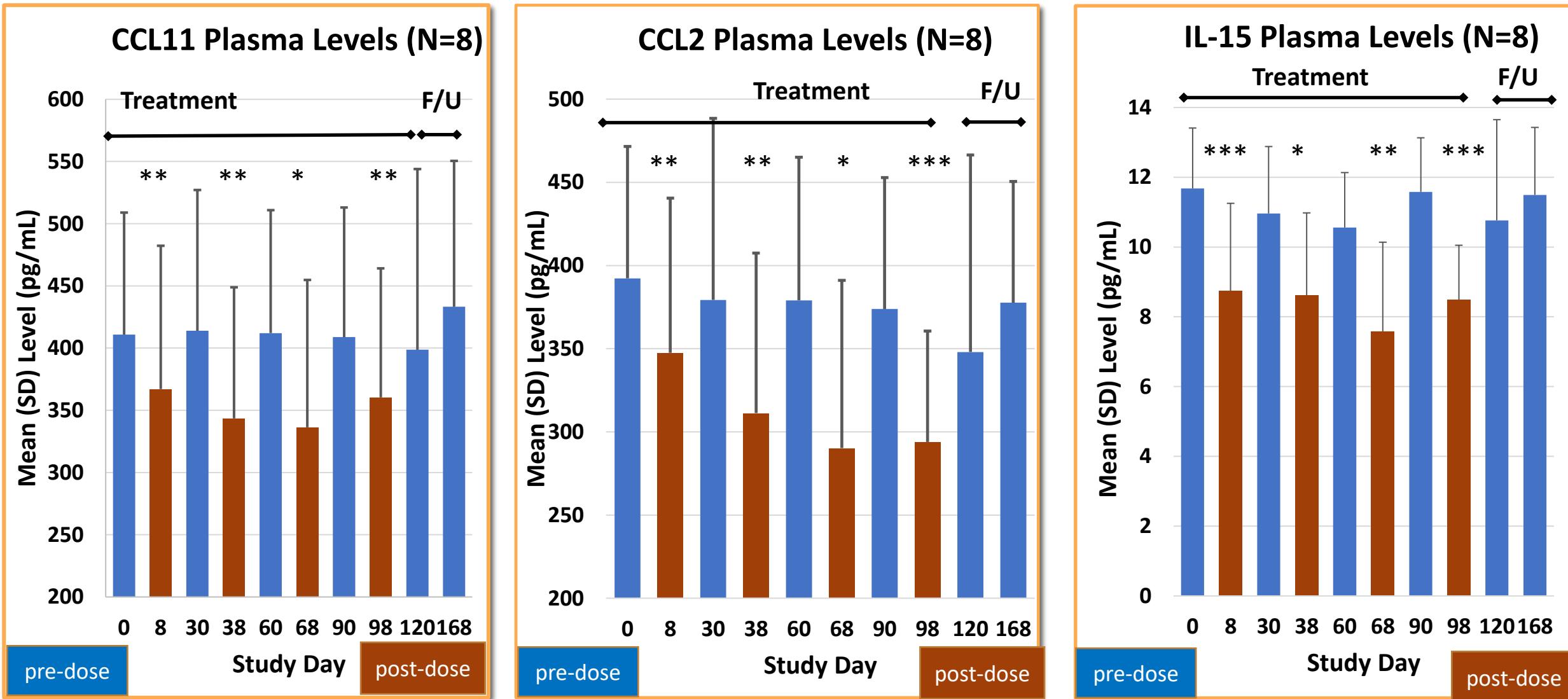
## Statistically Significant Enhancement of Treg Suppressive Function



## Statistically Significant Enhancement of Treg Numbers

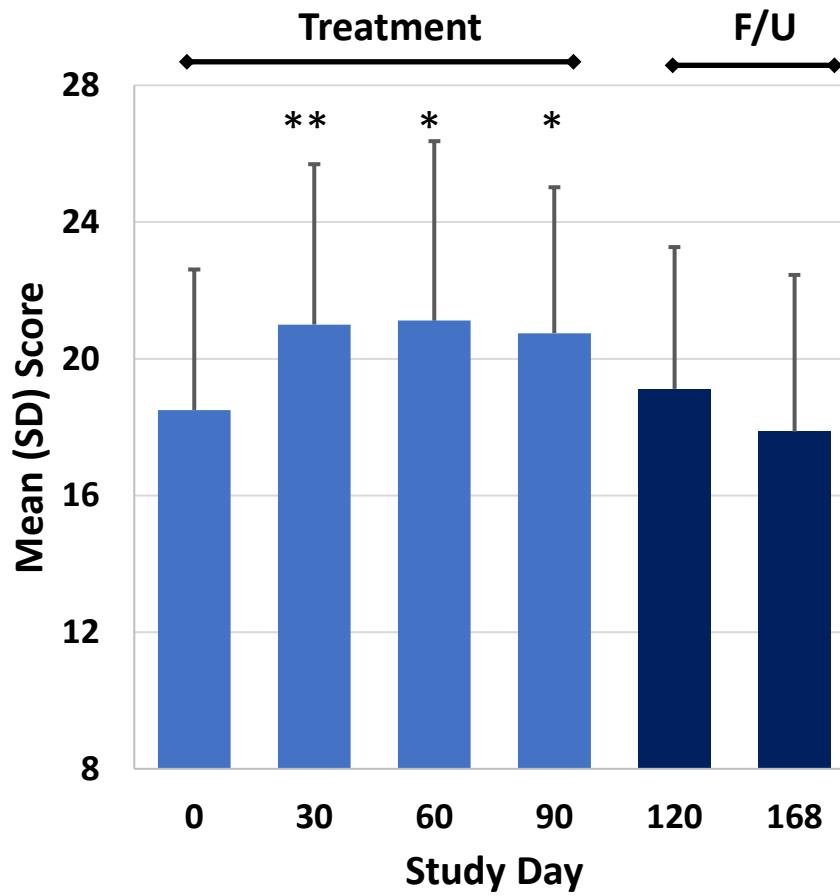


# COYA 301 Significantly Lowers Plasma Proinflammatory Chemokines and Cytokines in AD Patients

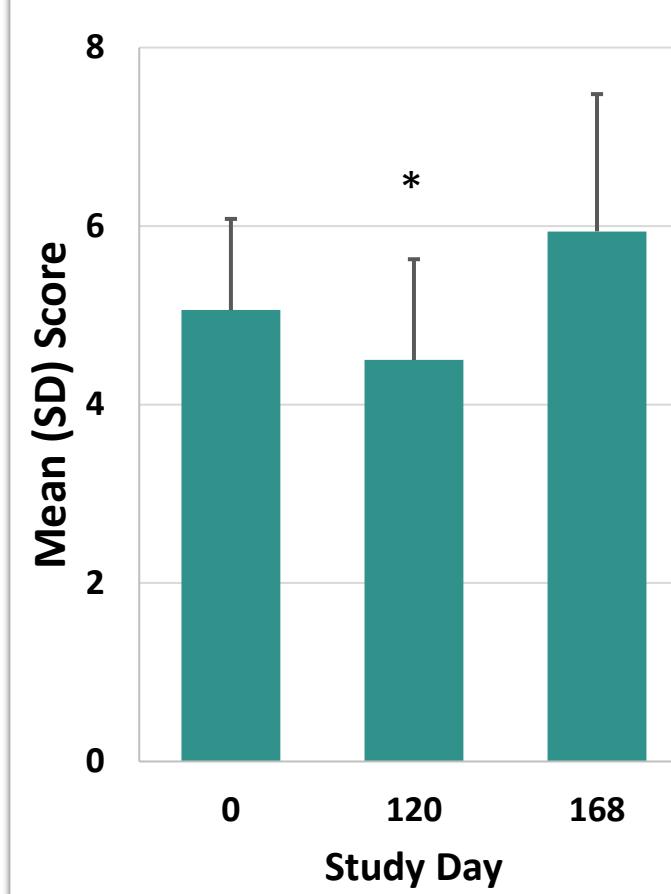


# COYA 301 Improved or Halted Cognitive Decline in AD Patients

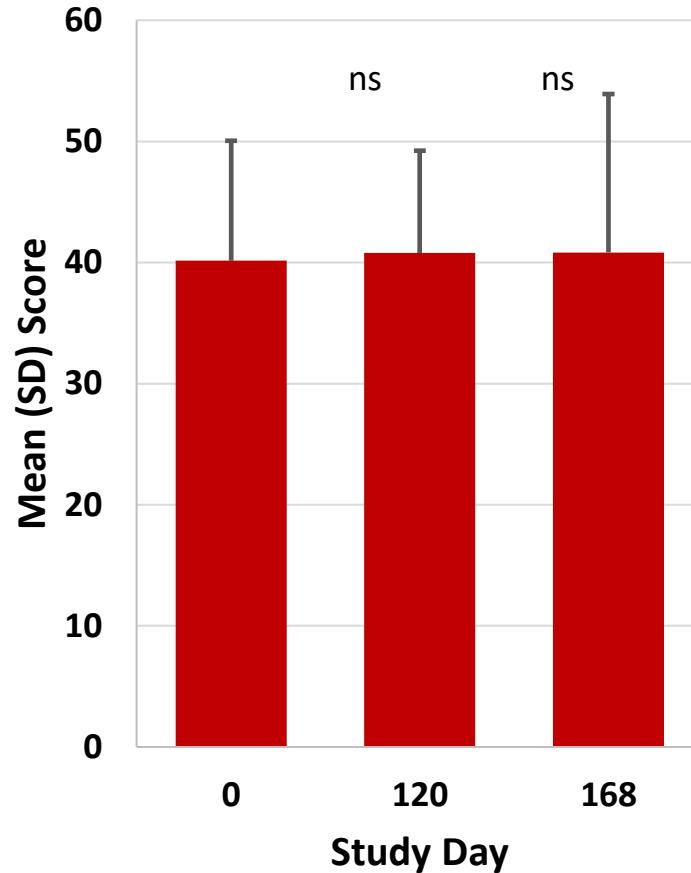
MMSE Score (N=8)



CDR-SB Score (N=8)



ADAS-Cog Score (N=8)

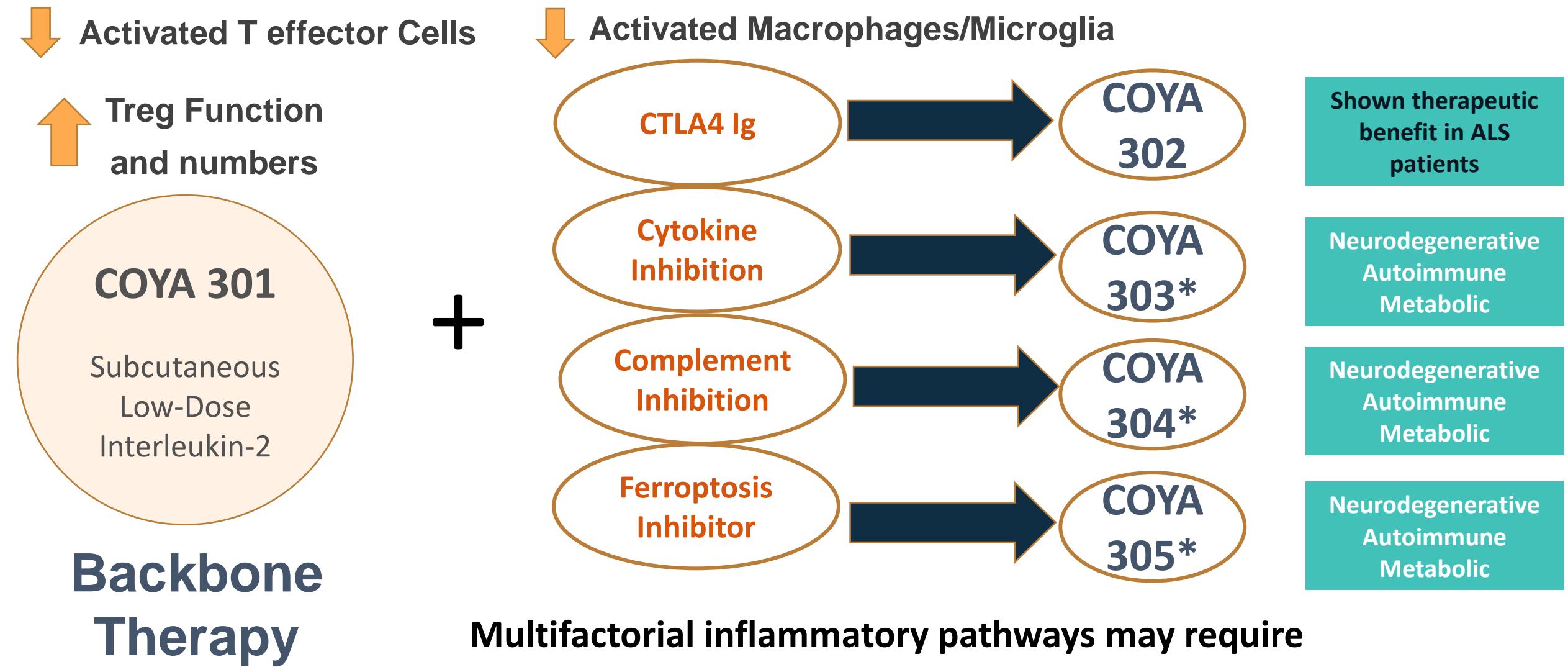


\*p<0.05, \*\*p<0.01 ns: not significant

# COYA 301 Safety & Tolerability

- Overall, COYA 301 was well tolerated.
- Most common adverse events (AEs) were mild injection site reactions and mild leukopenia.
- All patients completed the study.
- No death or other serious AE occurred over the course of the study.

# COYA 301 as a Backbone for Combination Immunotherapy



## COYA 302 Addresses Dysfunctional Tregs and Pro-inflammatory Macrophages

### COYA 302 =

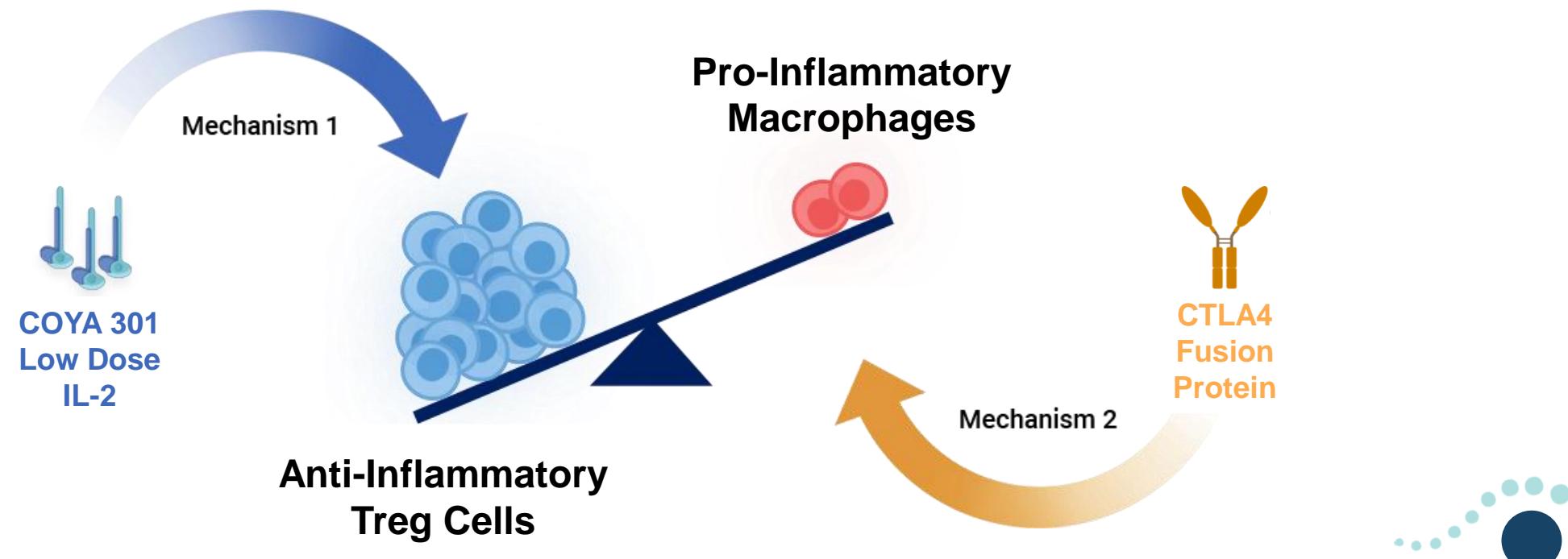
*Low Dose IL-2*

↓ Dysfunctional Tregs  
↑ Treg Numbers & Suppressive Function

*CTLA4-Ig*

+

↓ Pro-Inflammatory Macrophages  
↑ Anti-Inflammatory Macrophages



# COYA 302: A Novel Approach to the Treatment of Neurodegenerative Diseases

**Unique products compared to commercial IL-2 (High Dose Lyophilized Format) or CTLA4-Ig (Orencia)**

New Indications including ALS, Alzheimer's, other ND diseases

Unique low dose strength and dosing regimen

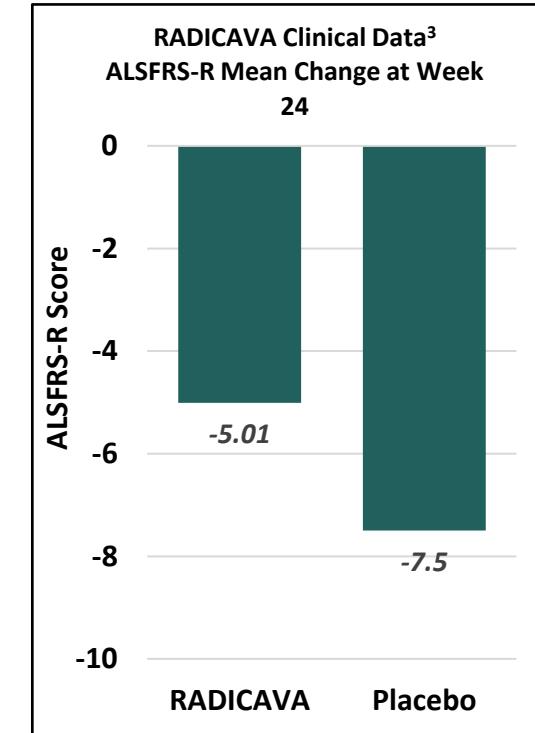
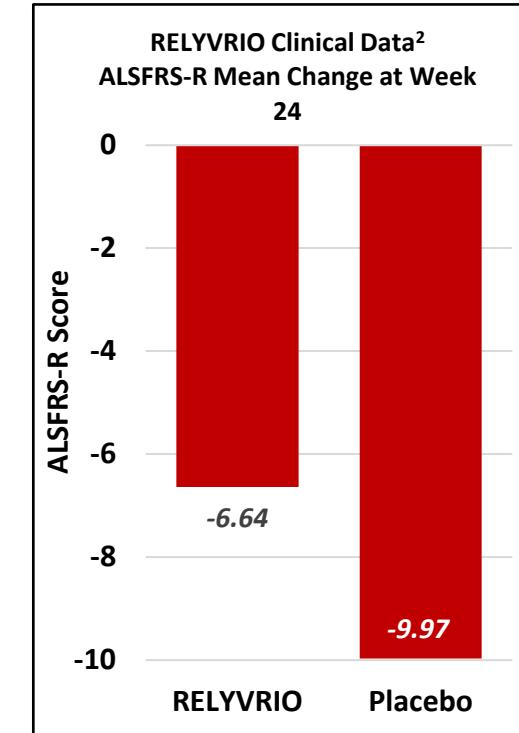
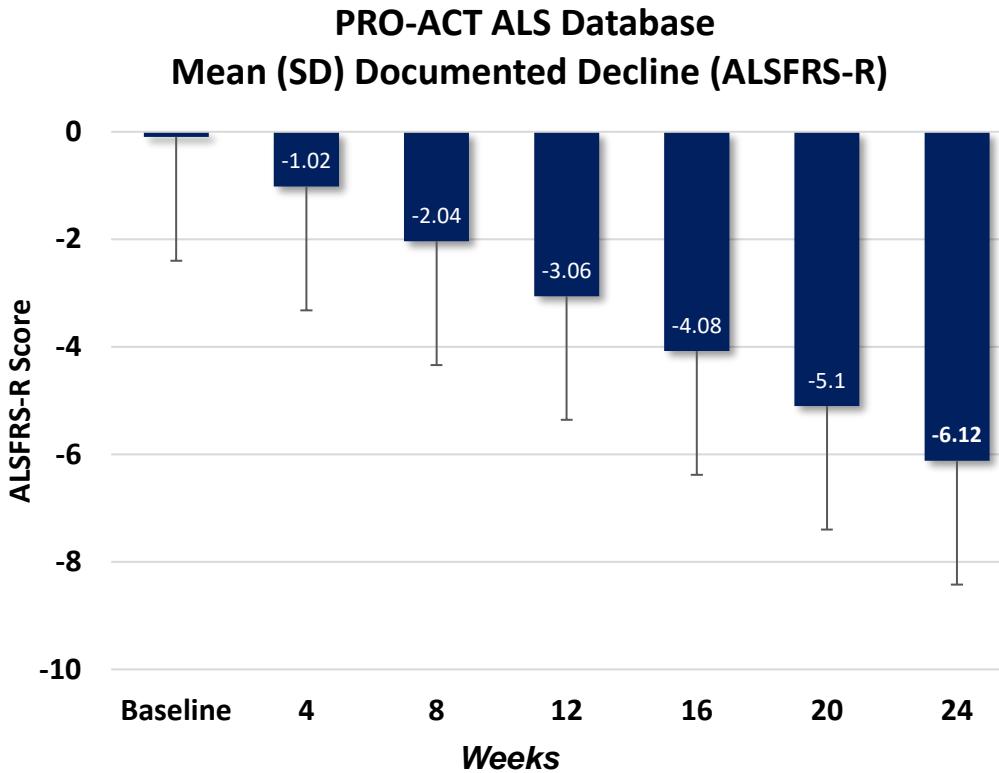
Ready-to-administer stable subcutaneous formulation

Well-established GMP manufacturing

Strong IP

# Current Therapies for ALS Aim to Slow Disease Progression

Many companies have garnered significant value by demonstrating a *limited* benefit of slowing the rate of ALS progression



**Average rate of patient decline is 1.02 points/month in ALSFRS-R score<sup>1</sup>**

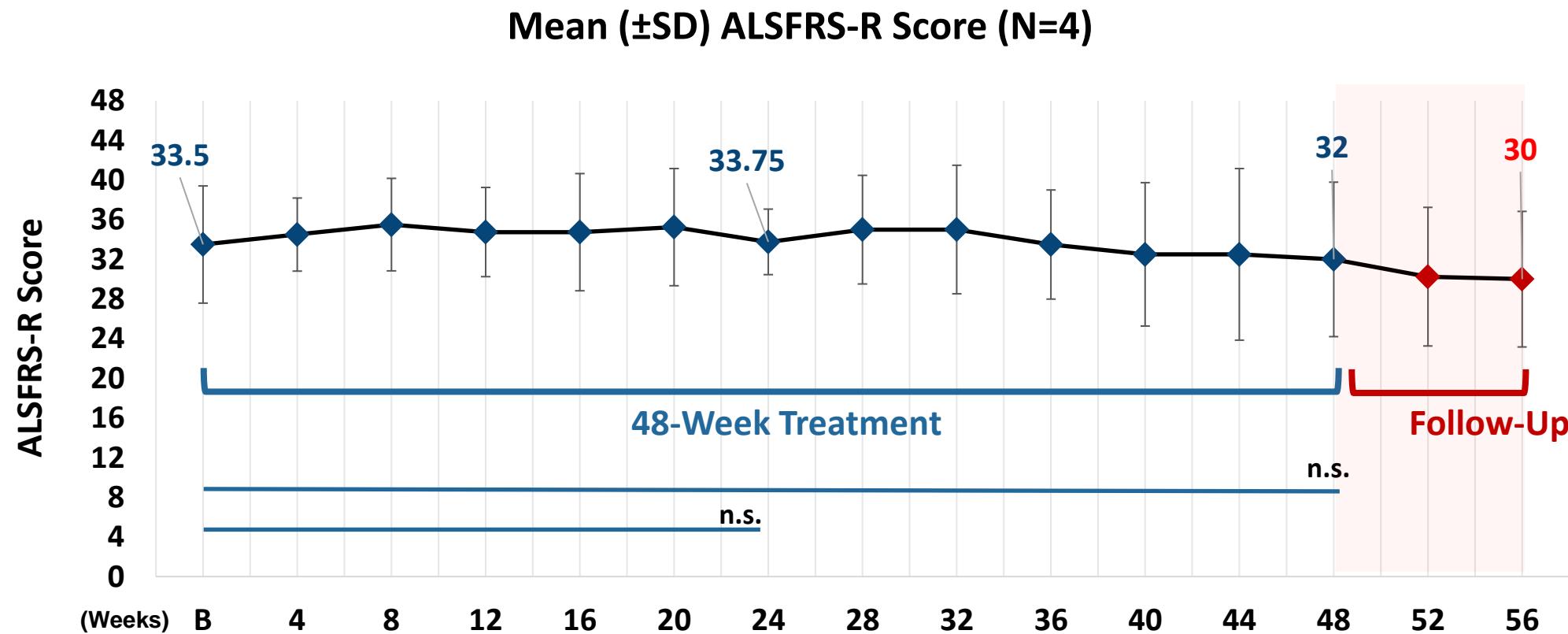
# COYA 302: Open-Label, Single-Arm PoC Clinical Study in ALS Patients (N=4)

Screening	Treatment Period	Follow-Up
20 weeks	<p><b>COYA 302</b> was administered via subcutaneous injection over 48 weeks</p>	8 weeks
<p><b>Screening Assessments</b></p> <ul style="list-style-type: none"><li>✓ Clinical Labs</li><li>✓ ALSFRS-R Score</li><li>✓ Electrocardiogram (ECG)</li><li>✓ Physical &amp; Neurological Exam</li></ul> <p><i>Study patients had well-documented disease progression prior to treatment (-1.1 points/month prior to treatment with COYA 302)</i></p>	<p><b>Treatment Period Assessments</b></p> <ul style="list-style-type: none"><li>✓ Safety and Tolerability</li><li>✓ Treg Function and Numbers</li><li>✓ Serum Biomarkers</li><li>✓ ALSFRS-R Score</li></ul> <p><i>Safety and tolerability assessments included reported adverse events, periodic physical and neurological exams, clinical labs, and ECGs</i></p>	<p><b>Post-Treatment Assessments</b></p> <ul style="list-style-type: none"><li>✓ Safety and Tolerability</li><li>✓ Treg Function &amp; Numbers</li><li>✓ Serum Biomarkers</li><li>✓ ALSFRS-R Score</li></ul>

# COYA 302: Patients' Demographics and Baseline Characteristics

	Age (years)	Sex	Type	Onset	ALS Progression Prior to Baseline (ALSFRS-R score)	Respiratory Status	Respiratory Support
Patient 1	47	Female	Familial	Limb	-1.6 points / month	No Respiratory Insufficiency	None
Patient 2	54	Male	Sporadic	Limb	-1 points / month	Respiratory Insufficiency	Non-invasive Ventilation
Patient 3	57	Female	Sporadic	Bulbar	-1 point / month	Respiratory Insufficiency	Non-invasive Ventilation
Patient 4	84	Female	Sporadic	Bulbar	-0.7 points / month	Respiratory Insufficiency	None

# COYA 302: Appears to Ameliorate ALS Progression Over 48-weeks

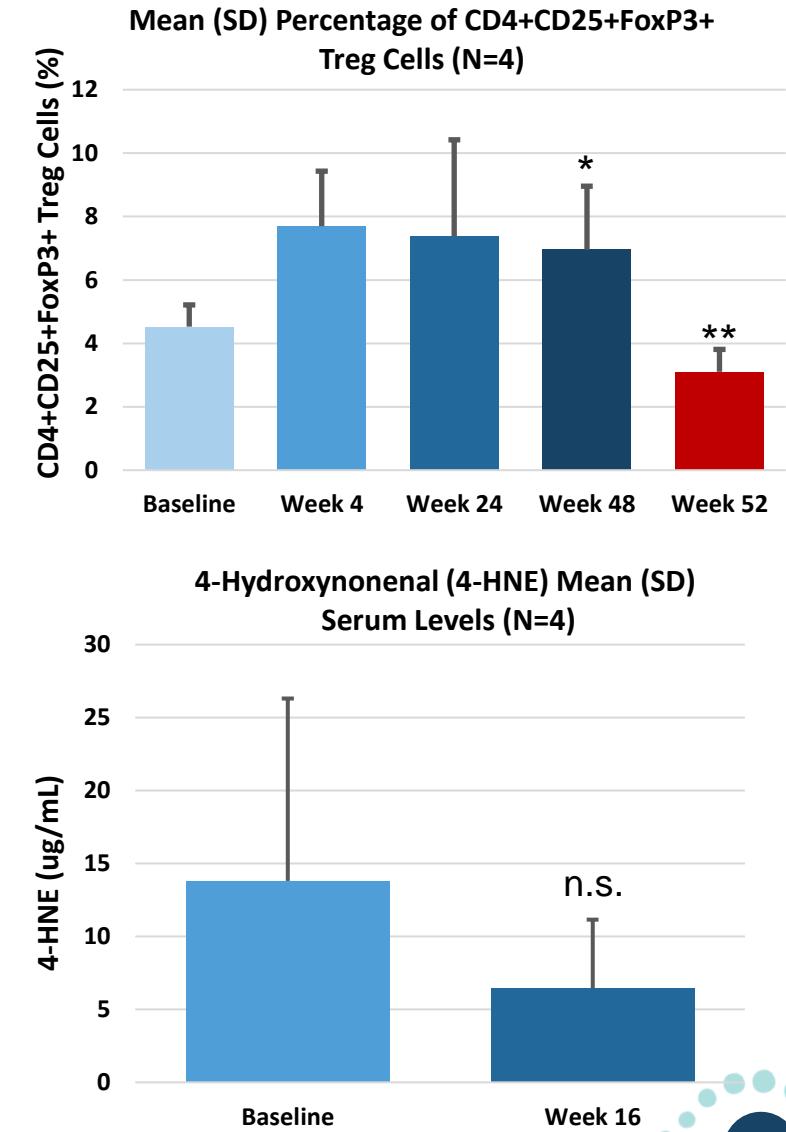
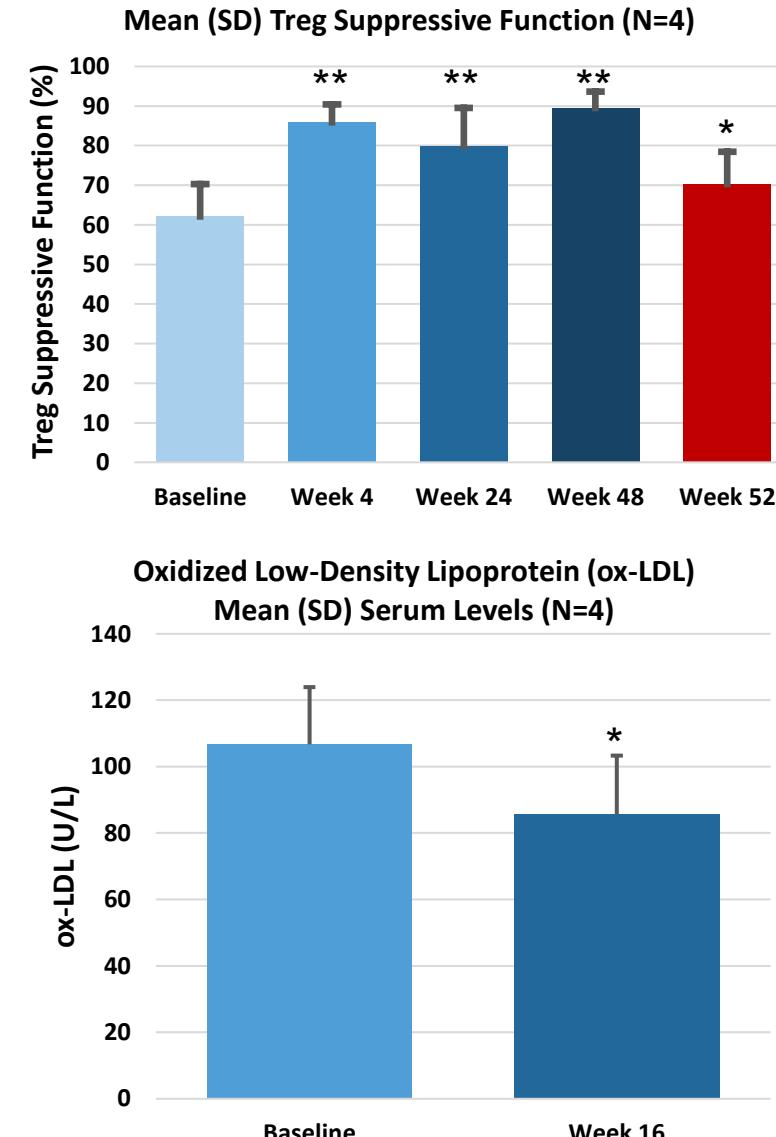


COYA 302 was well tolerated over 48 weeks; the most common AE was mild injection site reaction. All patients completed the study; no death or serious AEs (SAEs) occurred over the course of the study.

# COYA 302: Enhanced Biologic Activity

## Key Takeaways

- ✓ COYA 302 significantly expands Treg suppressive function as early as 4 weeks after initiation of treatment and maintained a significantly increased Treg function.
- ✓ COYA 302 increased Treg numbers as early as 4 weeks after initiation of treatment and maintained a higher number over the course of treatment.
- ✓ COYA 302 enhanced suppression of macrophage-mediated oxidative stress and proinflammatory cytokine biomarkers over 48 weeks



# COYA 302: Overview of Phase 2 Study Design in ALS



## Study Objectives

- Efficacy
- Safety and tolerability
- Biological activity
- Biomarkers

## Primary Efficacy Endpoint

- Combined Assessment of Function (ALSFRS-R) and Survival (CAFS)

## Main Inclusion Criteria

- Diagnosis of sporadic or familial ALS
- Time since onset of ALS symptoms  $\leq$  24 months from Screening
- ALSFR-R score  $\geq$  35 at Screening
- A score of at least 2 points in each ALSFRS-R item
- Forced vital capacity (FVC)  $\geq$  70% of predicted capacity for age, height, and gender at Screening
- Documented disease progression (by ALSFR-R score) for at least 16 weeks prior to Screening

# Total Addressable Market Exceeding \$7B

## In the United States Alone:



Estimated 30k people in the US; The global market size is **\$673mm** in 2022<sup>1</sup>



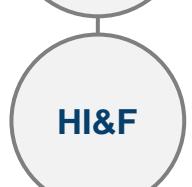
Estimated 60k people in the US; US market size extrapolated to be **\$600mm**<sup>2,6</sup>



Estimated 1.5 million Americans and at least 5 million people worldwide have a form of lupus; Currently the US market is **\$2.8b**<sup>3</sup>



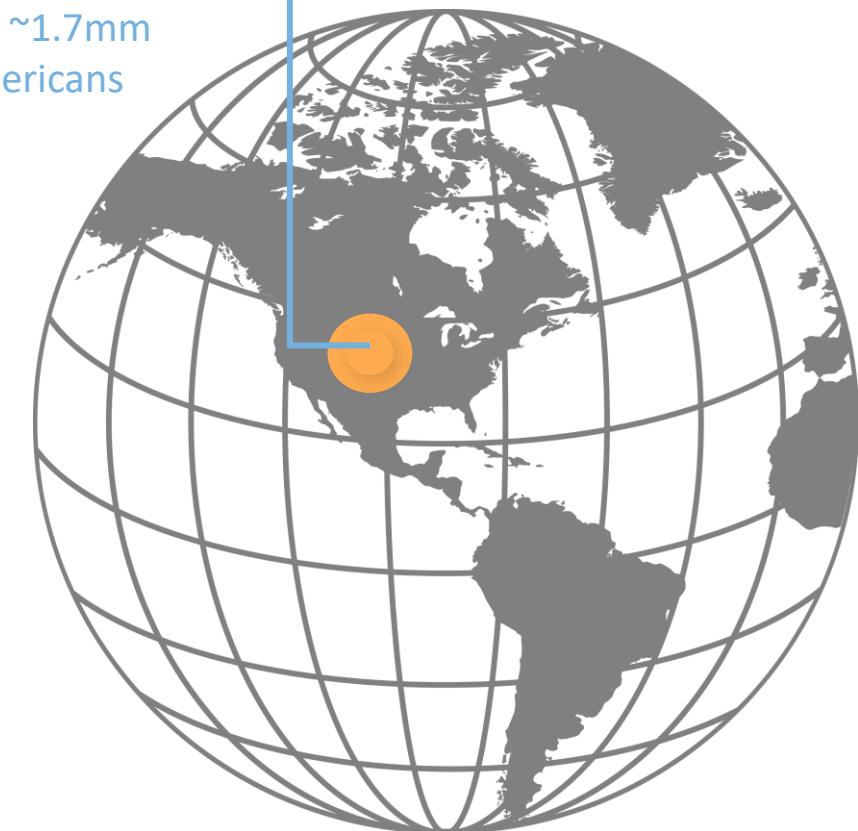
Estimated 125k cases in the US and perhaps 2.5 million worldwide; US market alone is **\$1.4b**<sup>4</sup>



Estimated Liver Inflammation & Fibrosis' global market was **\$1.6b** in 2021, increasing to **\$24b** by 2028<sup>5</sup>

## US MARKET

Coya is looking to treat ~1.7mm Americans



# Multiple Near-Term Preclinical and Clinical Catalysts

	H1 2023	H2 2023	2024
<b>COYA 302</b>	<ul style="list-style-type: none"> <li>Amyotrophic Lateral Sclerosis PoC IIT data presented (MDA Conference, March, 2023)</li> </ul>	<ul style="list-style-type: none"> <li>Amyotrophic Lateral Sclerosis PoC IIT data published in peer review journal</li> <li>Treg biomarker data published in peer review journal</li> <li>IND Filing- well controlled Phase 2 trial in Amyotrophic Lateral Sclerosis</li> <li>Initiate Phase 2 trial in Amyotrophic Lateral Sclerosis</li> </ul>	<ul style="list-style-type: none"> <li>Enrollment completion</li> </ul>
<b>COYA 301</b>	<ul style="list-style-type: none"> <li>Alzheimer's Disease PoC IIT data presented (Keystone Conference, May, 2023)</li> </ul>	<ul style="list-style-type: none"> <li>Alzheimer's Disease PoC IIT data presented (AAIC, July, 2023)</li> <li>Alzheimer's Disease PoC IIT data published in peer review journal</li> <li>IND Filing and trial initiation in FTD</li> </ul>	<ul style="list-style-type: none"> <li>Interim Data Readout in Frontotemporal Dementia</li> </ul>
<b>COYA 200 Platform Series (Neurodegenerative, Autoimmune, Metabolic Diseases)</b>		<ul style="list-style-type: none"> <li>Preclinical in-vivo efficacy data</li> <li>Disease-specific Animal Model Validation</li> </ul>	<ul style="list-style-type: none"> <li>Completion of pharmacology in multiple models</li> </ul>
<b>COYA 206 (Undisclosed)</b>		<ul style="list-style-type: none"> <li>Target validation</li> <li>Customized cargo validation</li> </ul>	

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