

The NVP Healthcare logo is positioned in the top right corner. It features a stylized illustration of a human brain and a large intestine, both rendered in a glowing, wireframe-like blue. The brain is on the left, and the large intestine is on the right, connected by a network of glowing lines representing the nervous system. The text 'nvp' is in a large, bold, blue sans-serif font, with 'Healthcare' in a smaller, blue sans-serif font below it.

¹ NVP Healthcare Co., Ltd., Suwon-si, Republic of Korea, ²Jeonbuk National University Hospital, Jeonju, Republic of Korea, ³College of Pharmacy, Kyung Hee University, Seoul, Republic of Korea.

ABSTRACT

Background

Methods

- 12-week randomized, double-blind, placebo-controlled trial
- Adults aged ≥ 60 years old with MCI; randomized (1:1)
- Intervention : NVP-2106 1×10^{10} CFU/day or placebo
- Assessments : ADAS-Cog13, memory, CNT VLT learning slope, ACPPT correct/incorrect responses, plasma A β 42/40 ratio, inflammatory markers, and gut microbiota.

Result

- ADAS-Cog13 total score improved at week 12 vs. placebo (p=0.0318).
- Memory domain improved at weeks 6 and 12 (p<0.05).
- Word recall and delayed word recall showed significant improvement.
- Plasma A β 42/40 increased and A β 42/40 ratio increased vs. placebo.
- Correlations identified among cognition, biomarkers, and gut microbiota.

Conclusion

NVP-2106 demonstrated improvements in cognitive performance, with pronounced effects observed in the memory recall domain. These cognitive changes were accompanied by modulation of amyloid-related, inflammatory, and microbiota profiles. These findings indicates NVP-2106 provides a promising microbiome-based therapeutic approach for early cognitive decline.

CONSORT

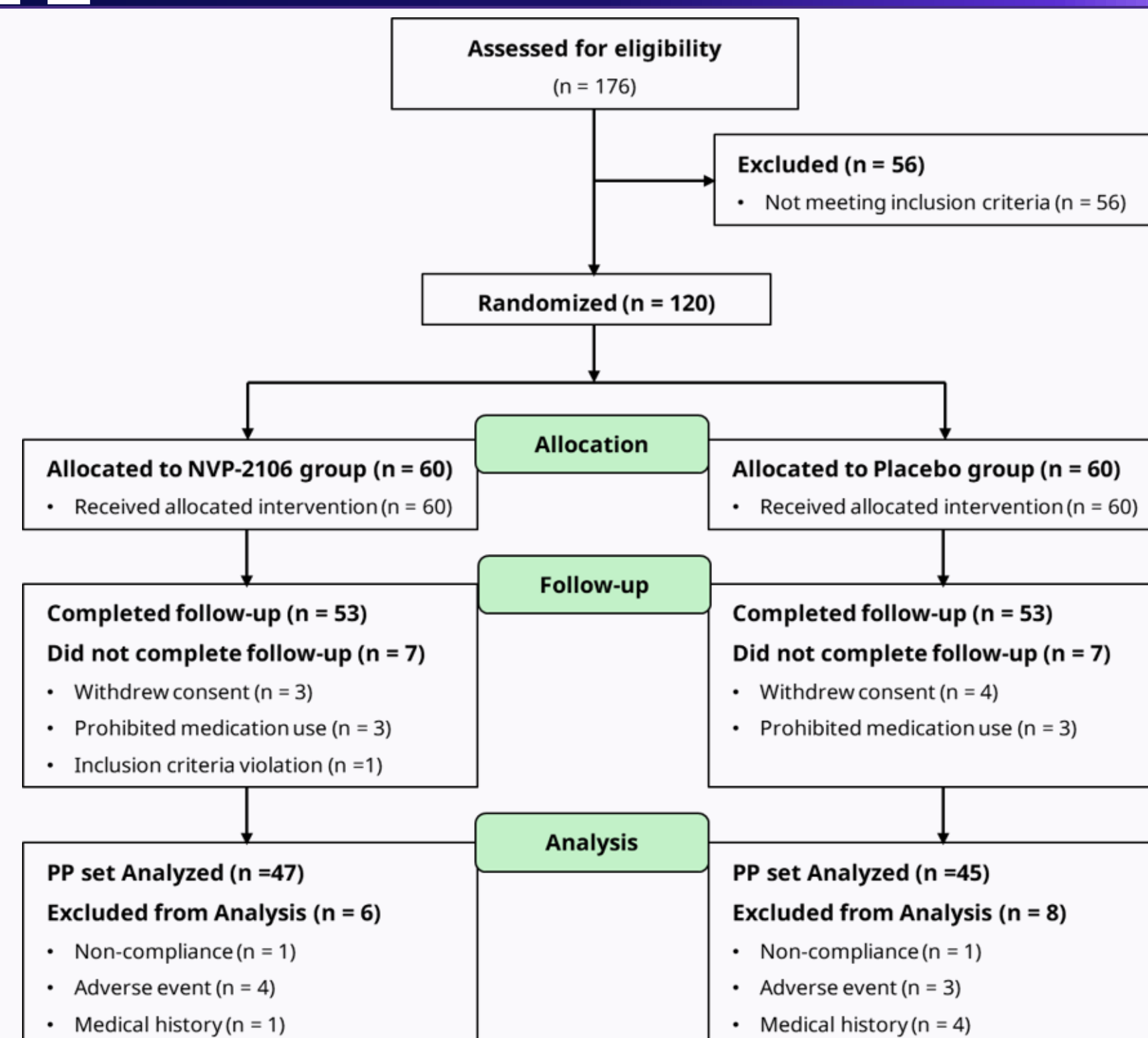


Figure 1. Consort flow diagram of participant disposition.

PP set; Per Protocol set

RESULTS 1. Cognitive Function

- ADAS-Cog13 total score improved at week 12 vs. placebo (p=0.0318).
- Memory domain improved at weeks 6 and 12 (p<0.05).
- Word recall and delayed word recall showed significant improvement.

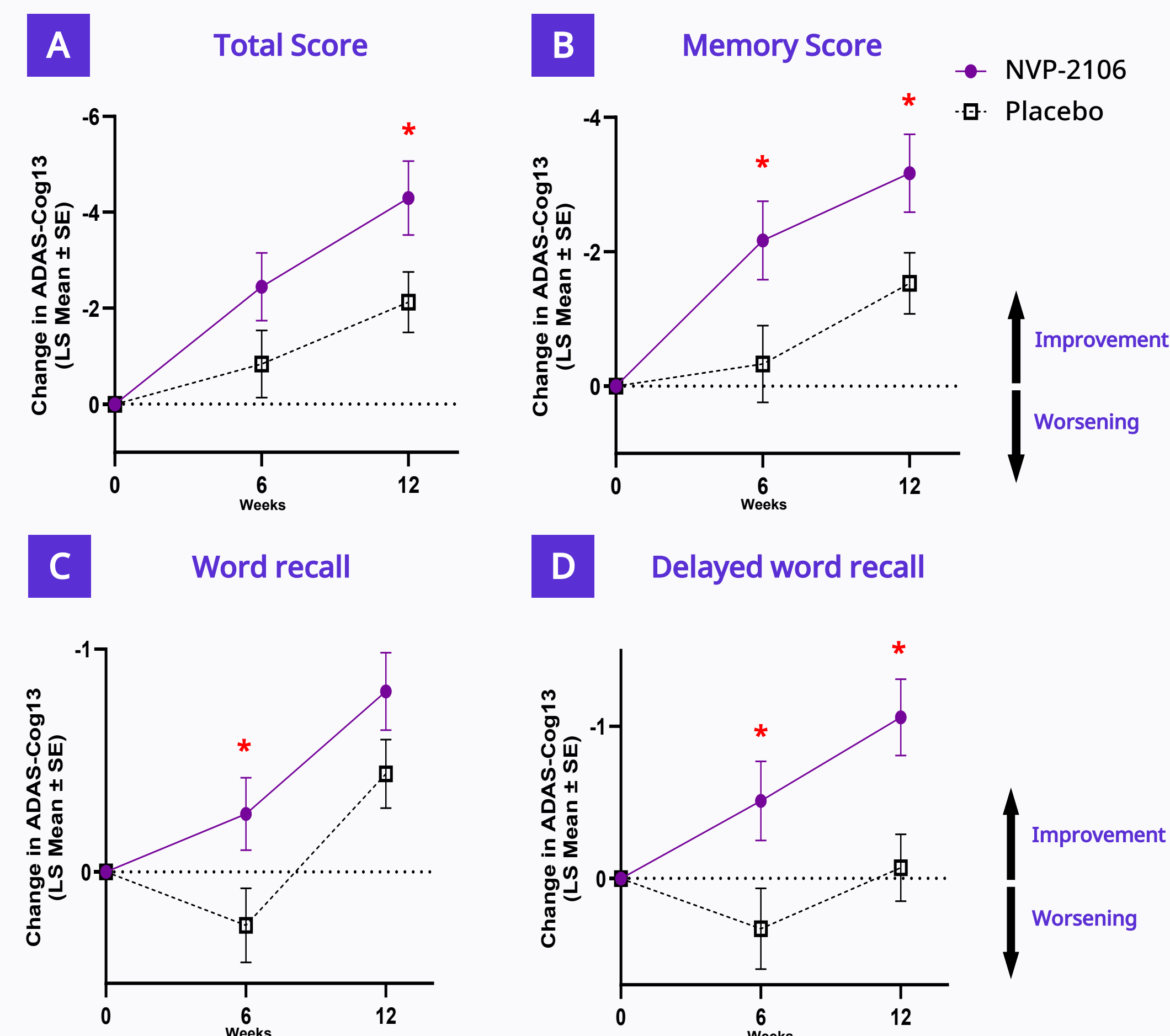


Figure 2. Changes from baseline in ADAS-Cog13 outcomes: total score (A), memory score (B), word recall (C), and delayed word recall (D). Data are presented as mean $\pm$ SEM. * $p < 0.05$ vs. placebo.

RESULTS 2. CNT test

- VLT learning slope improved with NVP-2106 compared with placebo ($p=0.0097$).
- ACPT correct responses increased ($p=0.0174$), and incorrect responses decreased ($p=0.0395$).
- CNT outcomes supported improvements in learning and attention.

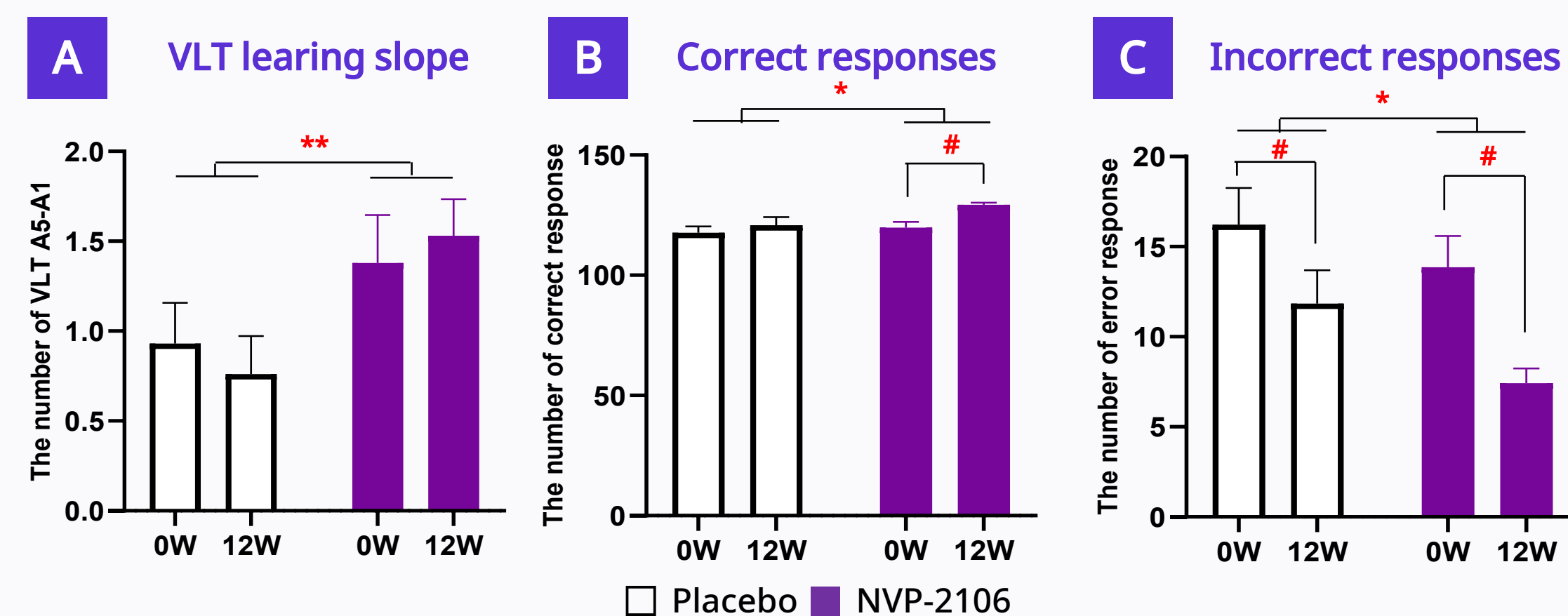


Figure 3. Changes from baseline in CNT outcomes: VLT learning slope (A5-A1) (A), ACPT correct responses (B), and ACPT incorrect responses (C). Data are presented as mean $\pm$ SEM. * $p < 0.05$ vs. placebo; # $p < 0.05$ vs. baseline.

VLT, Visual learning test; ACPT, Auditory Continuous Performance Task

SAFETY : No clinically meaningful safety concerns were identified.

RESULTS 3. Amyloid-related Biomarkers

- Plasma Aβ42 increased compared with placebo (p=0.0224).
- The Aβ42/40 ratio increased compared with placebo (p=0.0471).
- Aβ40 decreased from baseline in the NVP-2106 group (#p < 0.05).

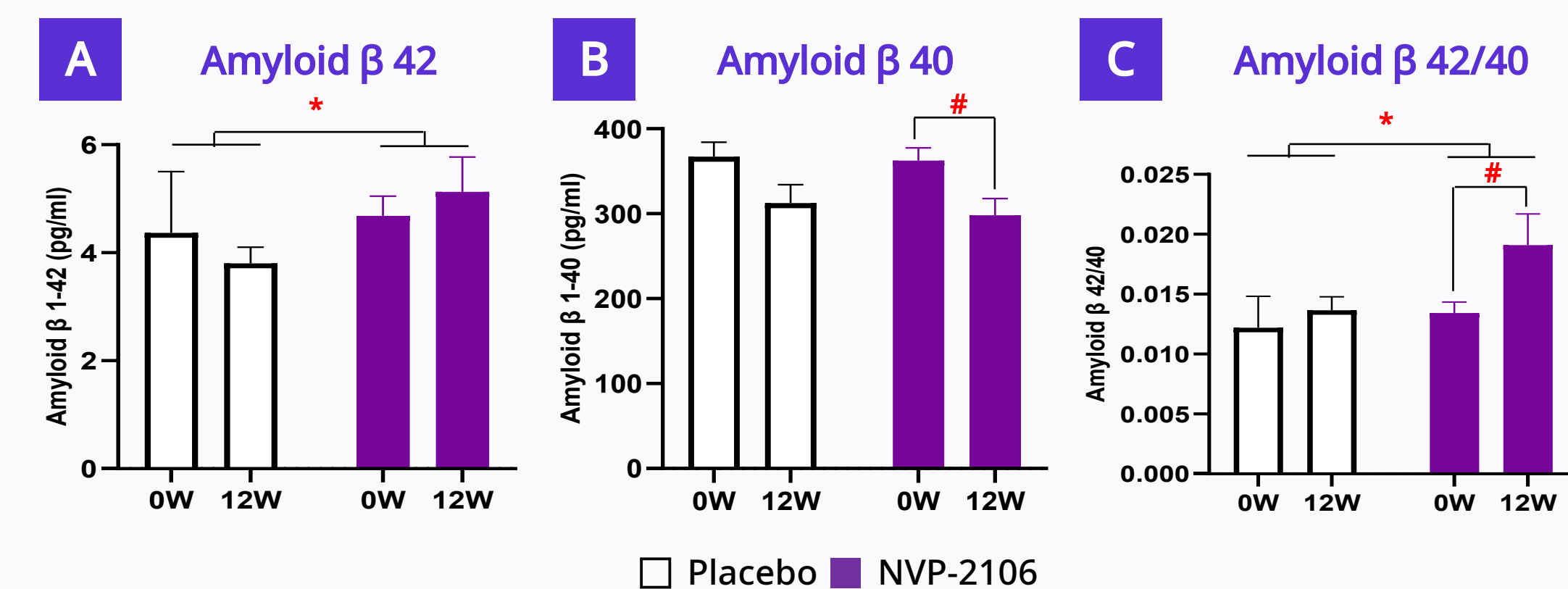


Figure 4. Changes in amyloid-related biomarkers from baseline to week 12: A β 42 (A), A β 40 (B), and A β 42/40 ratio (C). Data are presented as mean $\pm$ SEM. * p < 0.05 vs. placebo; # p < 0.05 vs. baseline.

RESULTS 4. Gut Microbiota & Correlations

- Gut microbiota changes were associated with cognitive and biomarker responses.
- Correlation patterns differed between the NVP-2106 and placebo groups.

- **Cognitive biomarker correlation** (cognitive outcomes vs. blood biomarkers)

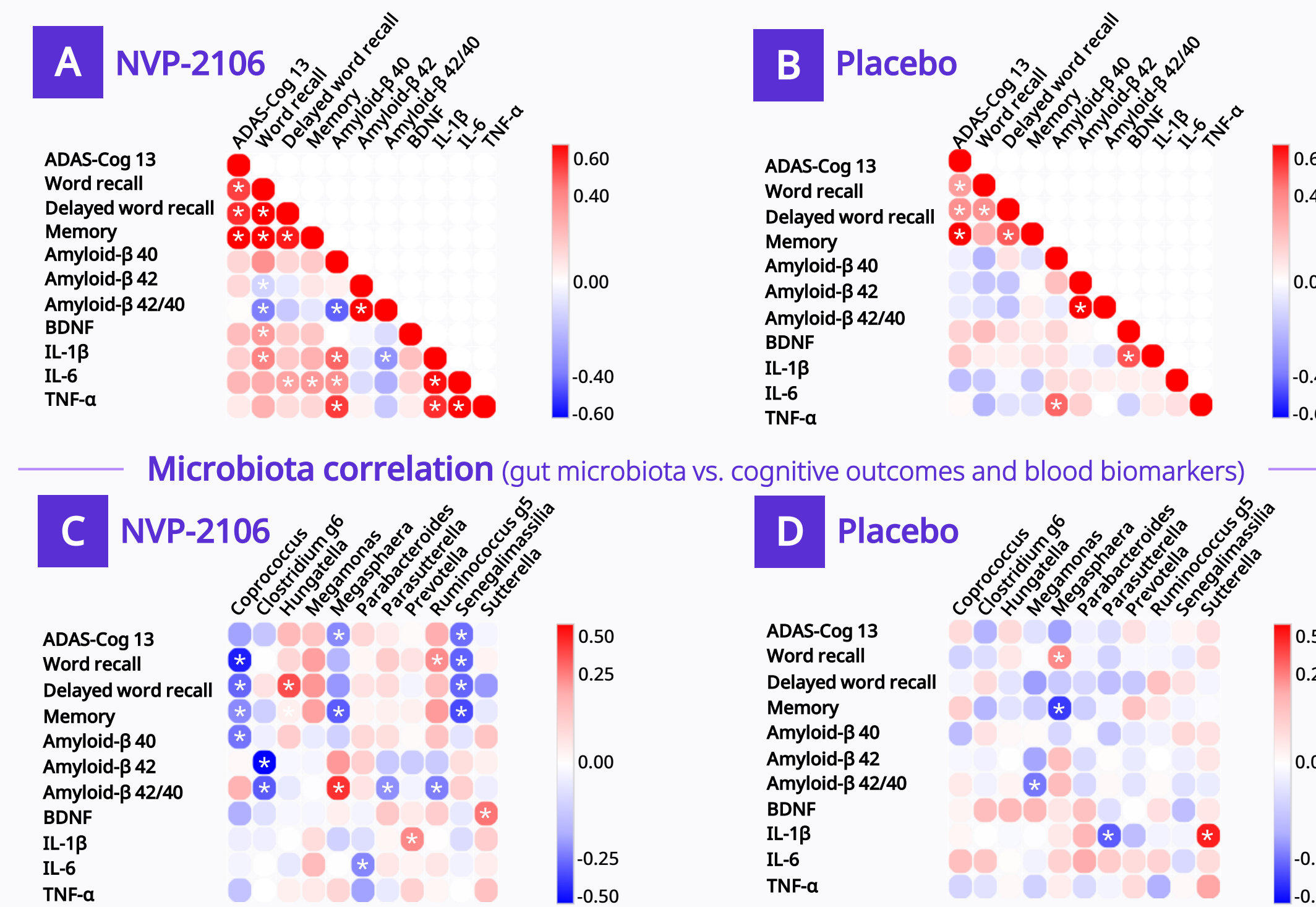


Figure 5. Pearson correlation heatmaps in the NVP-2106 and placebo groups. Red indicates positive correlations; blue indicates negative correlations. * $p < 0.05$.

REFERENCES

Ma X, *et al. Nutrients*. 2023;15:3381; Han SK, Kim DH. *J Microbiol Biotechnol*. 2019;29:1369–1374; Mekhora C, *et al. Neurochem Int*. 2024;181:105900; Sheng C, *et al. Alzheimers Res Ther*. 2022;14:35.

FUNDING

NVP Healthcare Co., Ltd.; Technology Innovation Program for SMEs, Ministry of SMEs and Startups, Republic of Korea (Grant No. S3142483).

CONTACT

Se-Hui Kang, NVP Healthcare Co., Ltd.

E-mail : shkang@nvp-healthcare.com