

Lower Plasma Amyloid beta-42 Levels Associated With Worse Survival in Patients With Glioma

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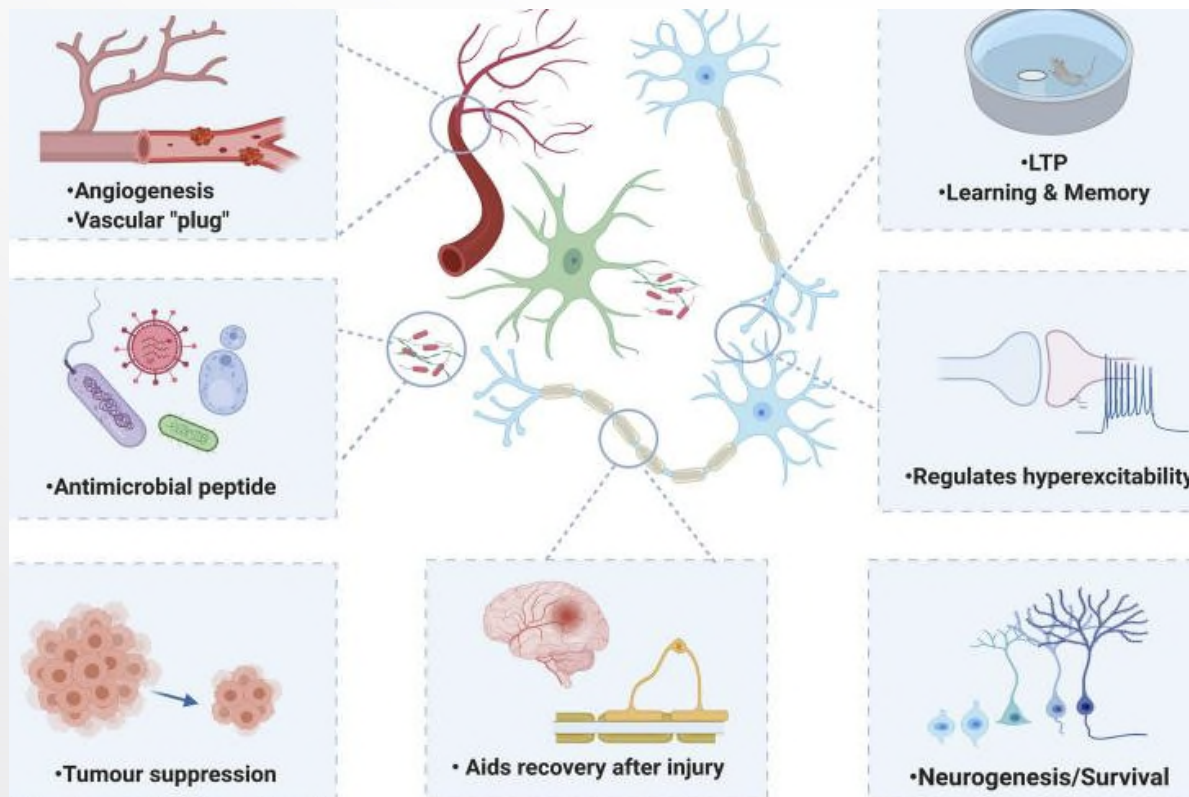
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Backgrounds

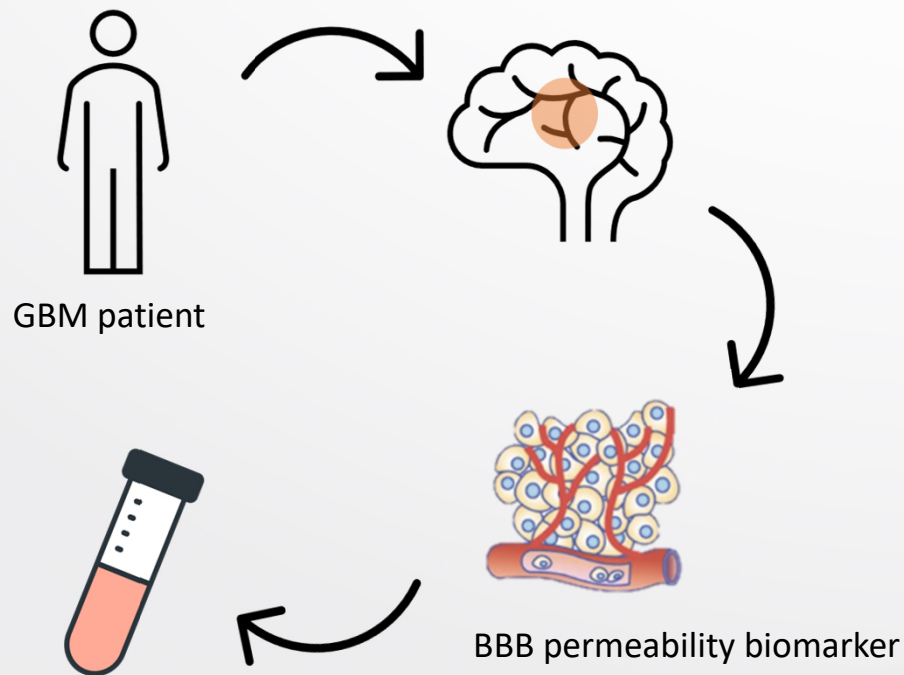
■ A schematic representation of the suggested physiological roles of A β in the brain and body



- Some research indicates that A β , typically linked to AD, may act as a tumor suppressor, with studies showing an inverse relationship between AD and certain cancers.
- A β could also indirectly suppress tumor formation through intercepting oncogenic viruses, or via scavenging free metal ions, restricting availability of micronutrients required for cell proliferation

▣ The purpose of this study

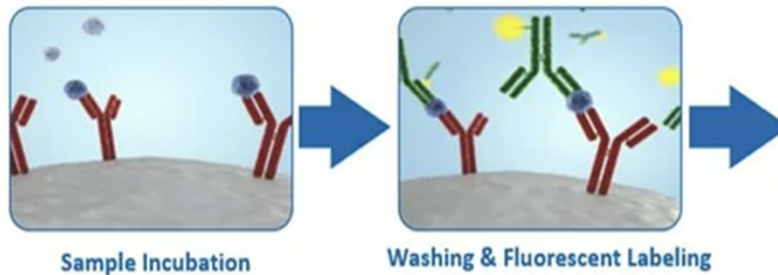
- A novel non-invasive biomarker for the prediction of glioma histology and prognosis



- Glioma, a type of brain tumor, is highly prevalent and associated with poor outcomes, especially in high-grade cases like glioblastomas (GBMs)
- A β has been found in the brains, cerebrospinal fluid, and serum of glioma patients, making it a potential biomarker for glioma histology and prognosis
- This study aims to investigate the relationship between serum A β 42 levels and the prognosis of astrocytoma patients, offering a non-invasive method for predicting glioma outcomes

☐ Immunoassay for amyloid-beta 42

Standard Immunoassay Protocol



○ Preparation process for collected samples

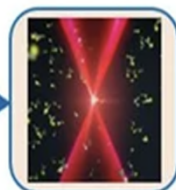
- Samples were used immediately stored at -20°C , while reagents from the SMCxPRO kit were stored at 4°C and thawed at room temperature
- Blood samples were centrifuged at $13,000 \times g$ for 10 minutes, and the supernatant was diluted at a 1:4 ratio with a standard diluent reagent before adding 100 microliters to each assay plate well

SMC™ Elution



Elution Step

SMC™ Quantify



SMCxPRO



○ Aβ42 antibody hybridization

- Anti-Aβ42 antibody-coated beads were resuspended, added to each well, and incubated for 2 hours at 25°C and 500 rpm
- After washing, buffer D was added, and the eluate was transferred for reading in a V-bottom plate, which was then sealed, agitated, and centrifuged before analysis using the SMCxPRO

Association between serum A β 42 concentration and the glioma progression

Table 1. Demographic and clinical characteristics of the patients with WHO grade of astrocytoma

	WHO grade			
	All	II ¹	III ²	IV ³
No. of patients	48	1 (2.0%)	6 (12.5%)	41 (65.1%)
Age in years (mean \pm SD)	55.2 (\pm 12.5)	50.0 (\pm 0.0)	45.5 (\pm 10.1)	56.7 (\pm 12.3)
Sex				
Male	30 (62.5%)	0	4	26
Female	18 (37.5%)	1	2	15
Immuno-markers				
Amyloid beta 42 (mean \pm SD, pg/ml)	6.7 (\pm 6.6)	13.6 (\pm 0.0)	7.6 (\pm 7.8)	6.4 (\pm 6.5)
EGFR (No. of positive cases)	40 (83.3%)	1	5	34
GFAP (No. of positive cases)	48 (100%)	1	6	41

¹Grade II subtypes (Diffuse astrocytoma, n=1), ²Grade III subtypes (Anaplastic astrocytoma, n=6), ³Grade IV subtypes (Glioblastoma multiforme, n=41).

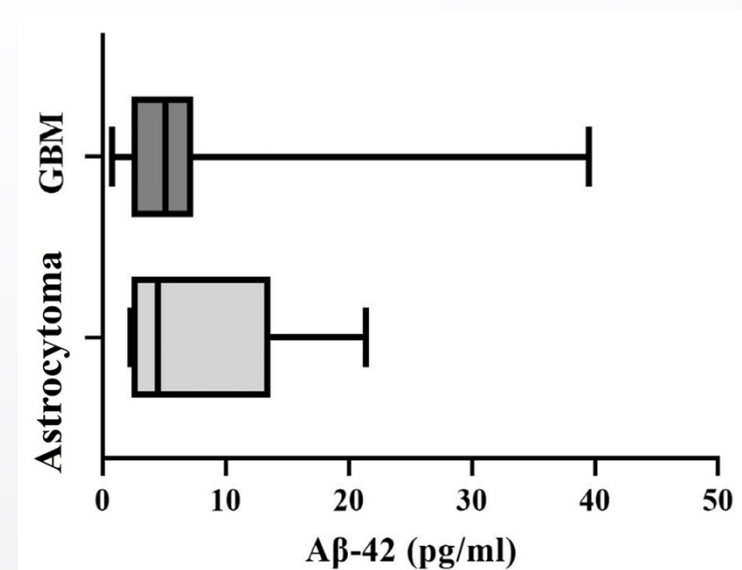


Figure 1. Comparison of serum A β 42 concentrations between astrocytoma and glioblastoma multiforme group

Progression-Free Survival and Overall Survival based on serum A β 42 level

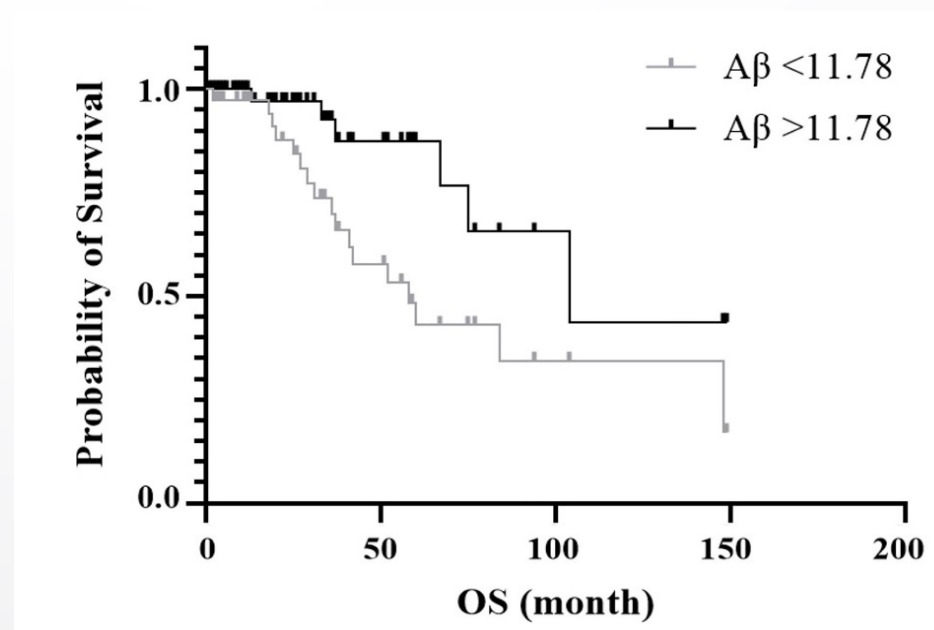
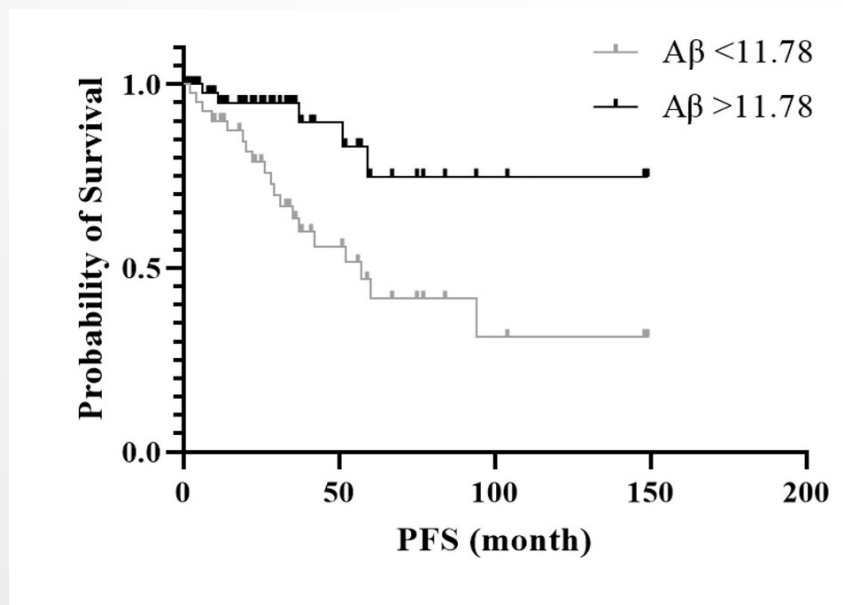
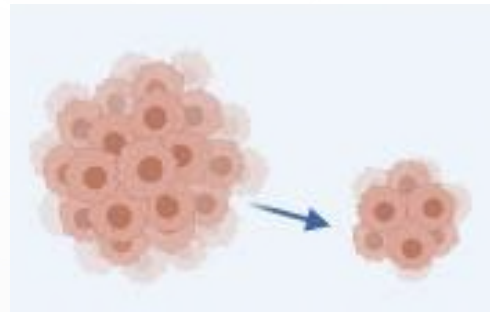


Figure 2. Kaplan–Meier curves for progression-free survival (PFS) and overall survival (OS) of patients with astrocytoma based on serum A β 42 levels

Conclusions



Vascular plug



Tumor suppression



- The low A β 42 group had a lower survival rate than the high A β 42 group. The finding is similar to previous studies suggesting that A β has tumor suppressor potential. These results suggest that A β 42 has a potential role as a prognostic marker in glioblastoma.