

# **Apolipoprotein E Genotyping, Neuropsychological Profiling, and Neuroplasticity in Non-CNS Cancer Patients: A Scoping Review Protocol**

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## **Abstract**

**Background.** Evidence suggests that understanding of the genetic architecture of cognitive function can help identify underlying pathological mechanisms and potential novel neuroprotective interventions. Apolipoprotein E (APOE) plays a critical role in promoting neuroinflammation and disrupting neurogenesis. Limited research exists in oncology, yet the APOE isoform  $\epsilon 4$  variant is linked to impaired synaptic plasticity, a risk factor for neurodegenerative diseases, and is associated with cognitive decline. This protocol outlines the rationale and methods for conducting a scoping review to address this knowledge gap.

**Aim:** Study aims to synthesize the existing evidence on the association between APOE genotyping, neuropsychological profiling, and neuroplasticity in central nervous system cancer (non-CNS).

**Methods.** The Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA-ScR) method and Arksey and O'Malley's framework will be followed. The electronic databases PubMed, CINAHL, EMBASE, and SCOPUS will be searched using the Population, Context, Concept (PCC) criteria for English, peer-reviewed articles published between January 2010 and January 2026. Data will be independently extracted by the researchers using a self-developed extraction form. Any conflicts will be resolved through discussion and where needed, with a third reviewer.

**Results.** The articles included in the review will be analysed through thematic narrative synthesis and the results will be reported in a thematic format.

**Conclusion:** This proposed study fills an important gap in mapping out the evidence of precision oncological care that is of particular importance for LMICs. Based on the findings of this scoping review, we intend to make recommendations for clinical practice and future research while identifying potential knowledge gaps that will be relevant to LMICs.

**Ethics:** No need for ethical approval because no patient data will be collected. Results will be disseminated through open-access and peer-reviewed journals. The scoping review protocol has been registered with Open Science Framework and can be accessed at <https://doi.org/10.17605/OSF.IO/JXY2P>.