

# AB060. Autophagy-associated biomarkers ULK2, UVRAG, and miRNAs miR-21, miR-126, and miR-374: prognostic significance in glioma patients

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**Background:** Autophagy is a self-renewing process of the cell having a dual role in gliomagenesis depending on the tumor stage. Several microRNAs play a key role in the regulation of autophagy and the outcome of cancer. We investigated the potential relevance of autophagy in gliomagenesis and survival by exploring the association of the basal gene expression of autophagy-associated markers LC3, ULK1/2, UVRAG, Beclin1, mTOR, UVRAG, PI3K, AKT, PTEN and their target microRNAs miR-126, miR-374, miR-21, miR-7, miR-204 and miR-100 in low- and high-grades of gliomas.

**Methods:** A total of 50 fresh glioma tissues were used for the extraction of RNA using TRIzol-Chloroform method and reverse transcribed cDNA. The cDNA was used to determine the expression of genes and microRNAs using quantitative real-time polymerase chain reaction (qPCR).

Mann-Whitney *U*-test was used to determine the statistical significance.

**Results:** In high-grade glioma, increased expression of AKT and miR-21, coupled with reduced ULK2 and LC3 expression was distinctly observed. While correlation analysis identified a strong positive correlation between ULK2 and UVRAG, PTEN, miR-7, and miR-100 and a moderate positive correlation emerged between ULK2 and mTOR, miR-7, miR-30, miR-100, miR-204, and miR-374, also between miR-21 and miR-126 in low-grade glioma. Similarly, a positive correlation appeared between ULK2 and AKT, LC3, PI3K, PTEN, ULK1, VPS34, mTOR, Beclin1, UVRAG, miR-7 and miR-374. AKT positively correlated with LC3, PI3K, PTEN, ULK1, VPS34, mTOR, Beclin1, UVRAG, miR-7, miR-30, miR-204, miR-374, miR-126 and miR-21 weakly correlated with AKT and miR-30 in high-grade glioma. The low ULK2, UVRAG, and miR-374 expression group exhibited significantly poor overall survival in glioma, while miR-21 over-expression indicated a poor prognosis in glioma patients.

**Conclusions:** This study provides comprehensive insights into the molecular landscape of gliomas, highlighting the dysregulation of autophagy genes ULK2, and UVRAG and the associated miR-21, miR-126 and miR-374 as potential prognostic biomarkers and emphasizing their unique significance in shaping survival outcomes in gliomas patients.

**Keywords:** Glioma; autophagy; miRNAs (miRs); prognostic markers; overall survival (OS)

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## Footnote

*Conflicts of Interest:* All authors have completed the ICMJE uniform disclosure form (available at <https://cco.amegroups.com/article/view/10.21037/cco-24-ab060/coif>). The authors have no conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013) and the study was approved by the ethical review committee of Aga Khan University (AKU-ERC #

2019-1945-5110 with an extension AKU-ERC # 2021-1945-17282). Written informed consent was obtained from the participants.

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