Elaeagnus Angustifolia extract inhibits cell invasion of human colorectal cancer cells and increases the survival rate of the Drosophila colon cancer model

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Background

- Colorectal cancer (CRC) is the third most common type of cancer in the world and its incidence is increasing constantly.
- In 2018, CRC cases reached 1.85 million with more than 880,000 deaths worldwide.
- Current chemotherapies for CRC, including 5-fluorouracil (5-FU), are not efficient with severe side effects like neutropenia, bone marrow suppression and renal dysfunction. More importantly, tumors tend to develop resistance against these drugs.
- Elaeagnus Angustifolia (EA) is a traditional plant known to possess numerous therapeutic and pharmacological properties including anti-inflammation, antioxidant and gastroprotective effects. More importantly, based on our recent investigations, EA plant extract can be used as a potential treatment against HER2-positive breast and oral cancers.
- Herein, the effect of EA extract on CRC was investigated in vitro, using KRAS CRC cell lines (HCT-116 and LoVo), and in vivo, using the Drosophila melanogaster model for KRAS gene which is known to develop CRC.

Objectives

- To determine the effect of EA extract in vitro using two CRC cell lines.
- To establish a new in vivo colon cancer model using D. melanogaster with KRAS gene mutation and use it to explore the effect of EA extract on their survival.

Methodology

- Cell Viability-AlamarBlue™ Assay
- Cell Morphology Analysis
- Western Blot Analysis
- Soft Agar Colony Formation Assay
- Cell Invasion Assay-Boyden Chamber Technique

Results

![Graphs and images showing cell viability and protein expression](image)

Conclusion

- EA extract has antiproliferative effect against CRC and its molecular pathway. Via the inhibition of EGFR and AKT in both CRC cell lines. Furthermore, the downregulation of Vimentin and increased expression of E-cadherin decreases cell motility and invasion ability of CRC cells by reversing EMT.
- EA increases the survival rate of both transgenic and wild type strains of D. melanogaster.
- Further studies are needed to prove the anticancer activity of EA against CRC.

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