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

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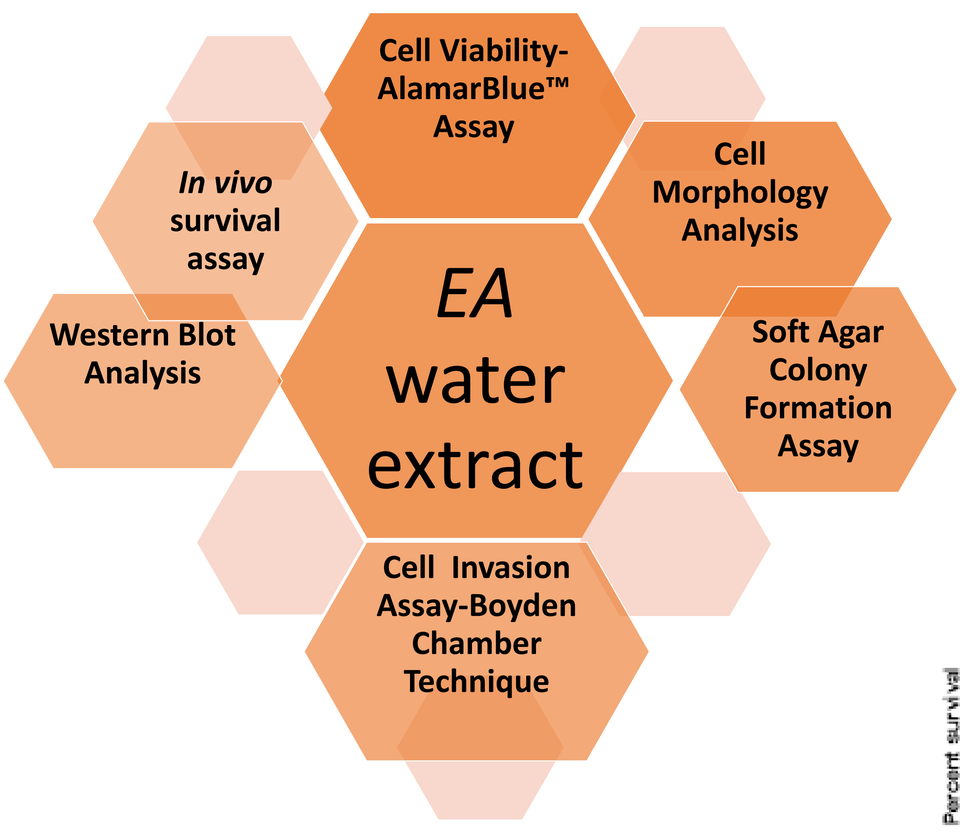
Background

- 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



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.

Results

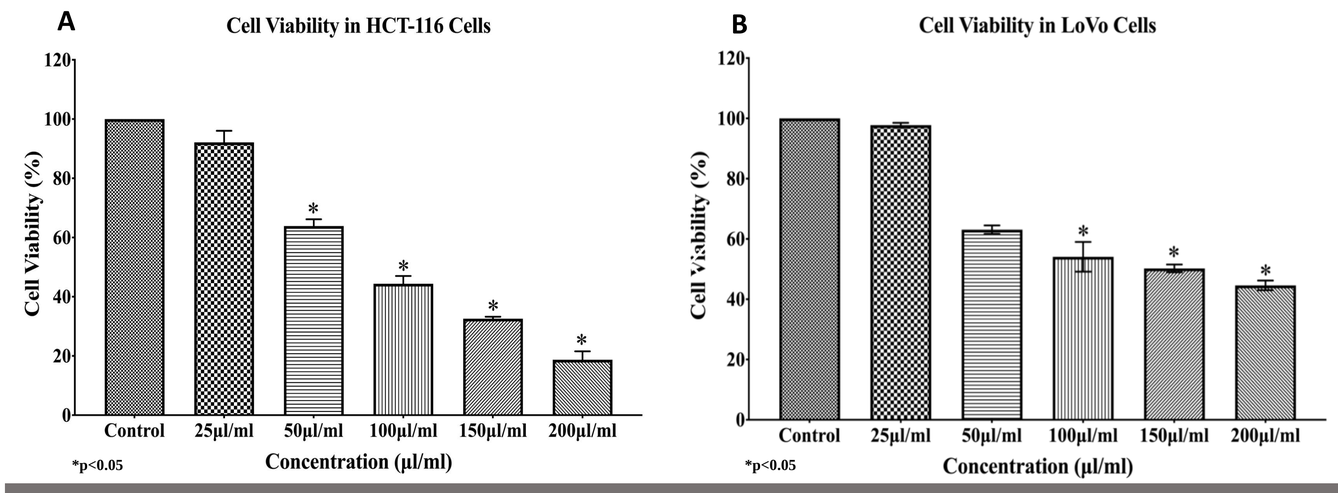


Figure 1 (A and B): Effects of *EA* plant extract on cell viability of CRC cells lines (A). HCT-116 and (B). LoVo at 48 h.

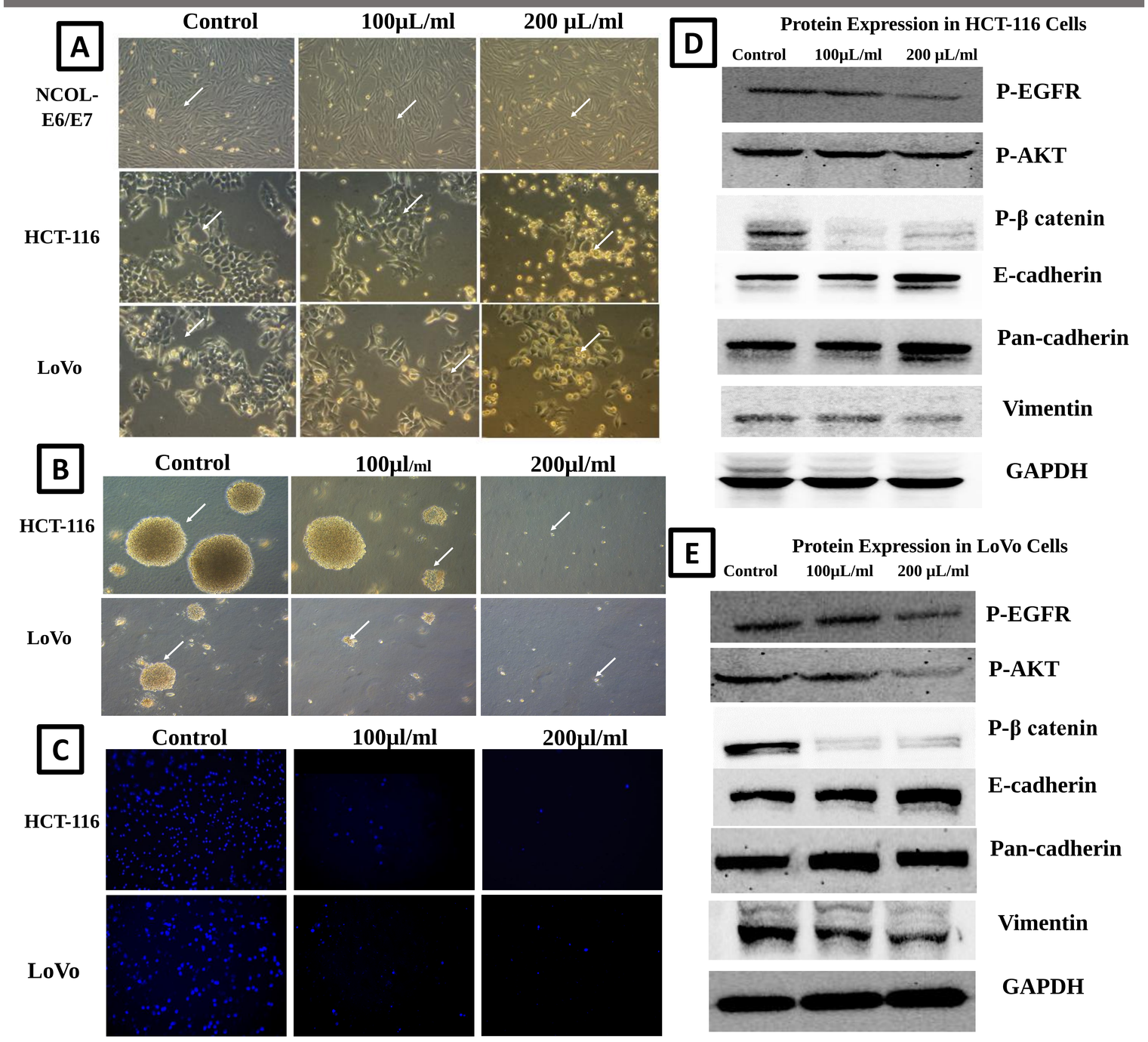


Figure 2 (A, B, C,D,and E): (A).Effects of EA plant extract onCRC morphology after 48 hours. (B) Effect of EA extract on colony formation in CRC cell lines. (C) Effect of EA flower extract on cell invasion of CRC cells. (D and E) Effect of EA extract on EMT biomarkers.

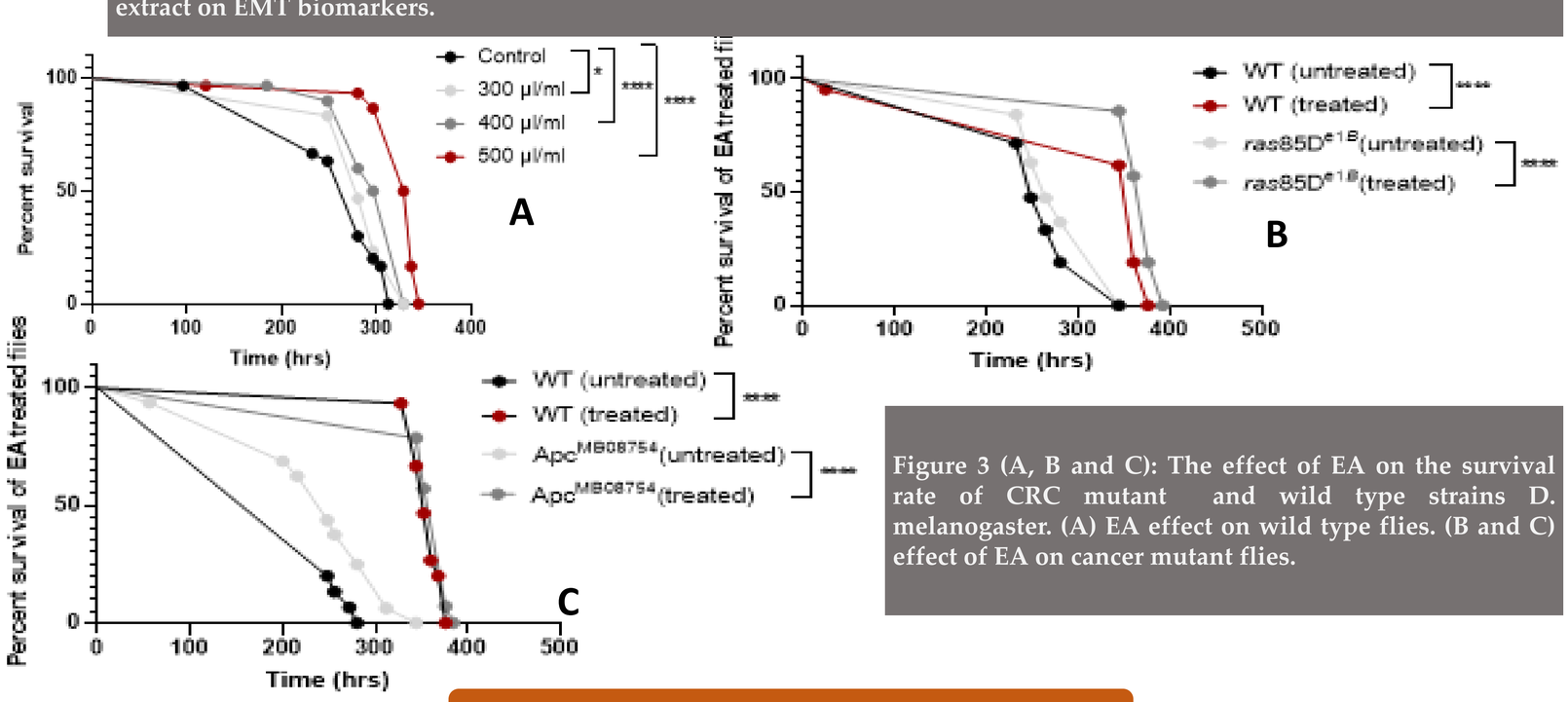


Figure 3 (A, B and C): The effect of EA on the survival rate of CRC mutant and wild type strains D. melanogaster. (A) EA effect on wild type flies. (B and C) effect of EA on cancer mutant flies.

Acknowledgment

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