THE REGULATION OF EPITHELIAL OVARIAN CANCER DEVELOPMENT BY CIRCULAR RNAs

Esra Es haghi, Dr. Burton Yang[1], and Dr. Chun Peng[2,3]

1. Sunnybrook Research Institute, S-Wing Research Building, 2075 Bayview Ave, Toronto, M4N 3M5, Canad
2. Department of Biology, York University, Toronto, ON, Canada
3. Centre for Research on Biomolecular Interactions, York University, Toronto, ON, Canada

Abstract

Circular RNAs (circRNAs) are a class of single-strand RNAs that are formed through the back splicing process meaning the joining of a downstream 5′ splice site of one exon to an upstream 3′ splice site of another axon via a covalent bond. This feature of circRNAs protects them from exonucleases-mediated degradation, making them highly stable compared to linear mRNAs. Therefore, they are increasingly recognized as novel biomarkers for various diseases, including cancer. In general, four mechanisms have been proposed for the actions of circRNAs. circRNAs exert their functions by sponging microRNAs (miRNAs), sponging or scaffolding proteins, regulating their host genes expression, and in some cases, translating into functional proteins.

Epithelial ovarian cancer (EOC) is the deadliest types of gynecologic cancer. CircRNAs play a major role in the regulation of EOC development. By acting as a tumor-promoting or suppressing effector, they contribute to different hallmarks of EOC such as proliferation, metastasis, and apoptosis. The most reported role of circRNAs in EOC especially for circRNAs with tumor-promoting action is sponging miRNAs. As they can sequester miRNAs from their target genes by binding to miRNAs and interrupting their interactions thus indirectly regulate the downstream targets of miRNAs. Now, circRNAs are widely considered to be potential biomarkers or therapeutic targets in EOC due to their ectopic expression in the tissues and patient serum samples.

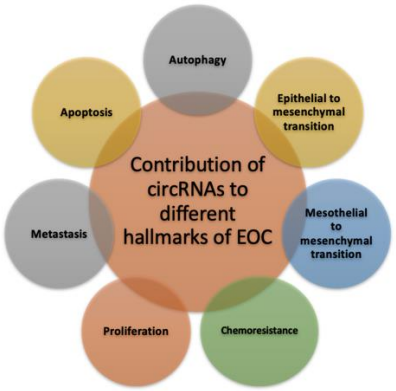


Figure 1: Contribution of circRNAs to different hallmarks of EOC.

Recent Publications

1. Qiu, Y., Chen, Y., Agbede, O., Eshaghi, E., & Peng, C. (2022). Circular RNAs in Epithelial Ovarian Cancer: From Biomarkers to Therapeutic Targets. Cancers, 14(22), 5711.
2. Wu, N., Li, F., Yang, W., Du, W. W., Awan, F. M., Zhang, C., Lyu, J., Misir, S., Zeng, K., Eshaghi, E., & Yang, B. B. (2022). Silencing mouse circular RNA circSlc8a1 by circular antisense cA-circSlc8a1 induces cardiac hepatopathy. Molecular therapy: the journal of the American Society of Gene Therapy, S1525-0016(22)00617-7.
3. Wu N, Xu J, Du WW, Li X, Awan FM, Li F, Misir S, Eshaghi E, Lyu J, Zhou L, Zeng K, Adil A, Wang S, Yang BB. YAP Circular RNA, circYap, Attenuates Cardiac Fibrosis via Binding with Tropomyosin-4 and Gamma-Actin Decreasing Actin Polymerization. Mol Ther. 2020 Dec 3: S1525-0016(20)30661-4.
4. Wu, N., Yuan, Z., Du, K. Y., Fang, L., Eshaghi,E., Lyu, J., Zhang, C., ... & Yang, B. B. (2019). Translation of yes-associated protein (YAP) was antagonized by it circular RNA via suppressing the assembly of the translation initiation machinery. Cell Death & Differentiation, 26(12), 2758-2773.



Biography

Upon graduation from York University in Toronto, Canada with a Bachelor of Biomedical Sciences, her passion for cancer research led her to pursue a position in Dr. Burton Yang's laboratory, a senior scientist at Sunnybrook Hospital, to support research projects regarding the role of circular RNAs in breast cancer. Devoted to research about circular RNAs roles and mechanisms, Esra earned her master's degree in Biology from York University focusing on the role of circular RNAs in ovarian cancer.

Email: esra.eshaghi@yahoo.com