

# miRNAs and Endothelin: A potential nexus in the roadmap for diabetes linked cardiac complications therapeutic strategy

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## Abstract

Cardiovascular disorders are mainly responsible for the increased morbidity and mortality in people suffering with diabetes. The wide range of therapeutic strategies from pharmacologic treatment to antioxidant and nutritional interventions are being used to treat diabetes linked cardiovascular complications. The aim of present study was to elucidate the therapeutic role of miRNAs in Bisphenol A induced oxidative stress generated hyperglycemia linked cardiovascular complications. Different bioinformatics tools, Targetscan, miRanda and target site analysis of different genes showed the endothelin-1, a potent vasoconstrictor peptide, as target of miRNA-1-3p, 206, 613 and 203a-3p. In addition the PKC- $\delta$  was found to be the target of miRNA-214-3p. To the best of our knowledge very few data is available about the role of miRNA-214-3p in hyperglycemia linked cardiac complications. Therefore, the in-vivo hyperglycemia linked cardiovascular disease model was established by administration of 100ug/kgBW of Bisphenol A, a well-known endocrine disruptor to Sprague Dawley rats of average age (6-7 weeks). The BPA treatment group showed increased blood glucose, body weight, cell surface area and altered cardiac tissue histology. qRT-PCR analysis showed the downregulation of miRNA-214 while upregulation of PKC- $\delta$ , and p53 in heart tissues of BPA treated model. Immunoblotting has shown that BPA increased the expression of p53. In addition, BPA administered group depicted increased reactive oxygen species and decreased antioxidant enzymes. Our findings depicts the miRNA-214-3p as a new theragnostic marker for BPA induced hyperglycemia linked cardiovascular complications. However, further studies on other miRNAs is still needed to develop a cost effective therapeutic strategy for cardiovascular complications.

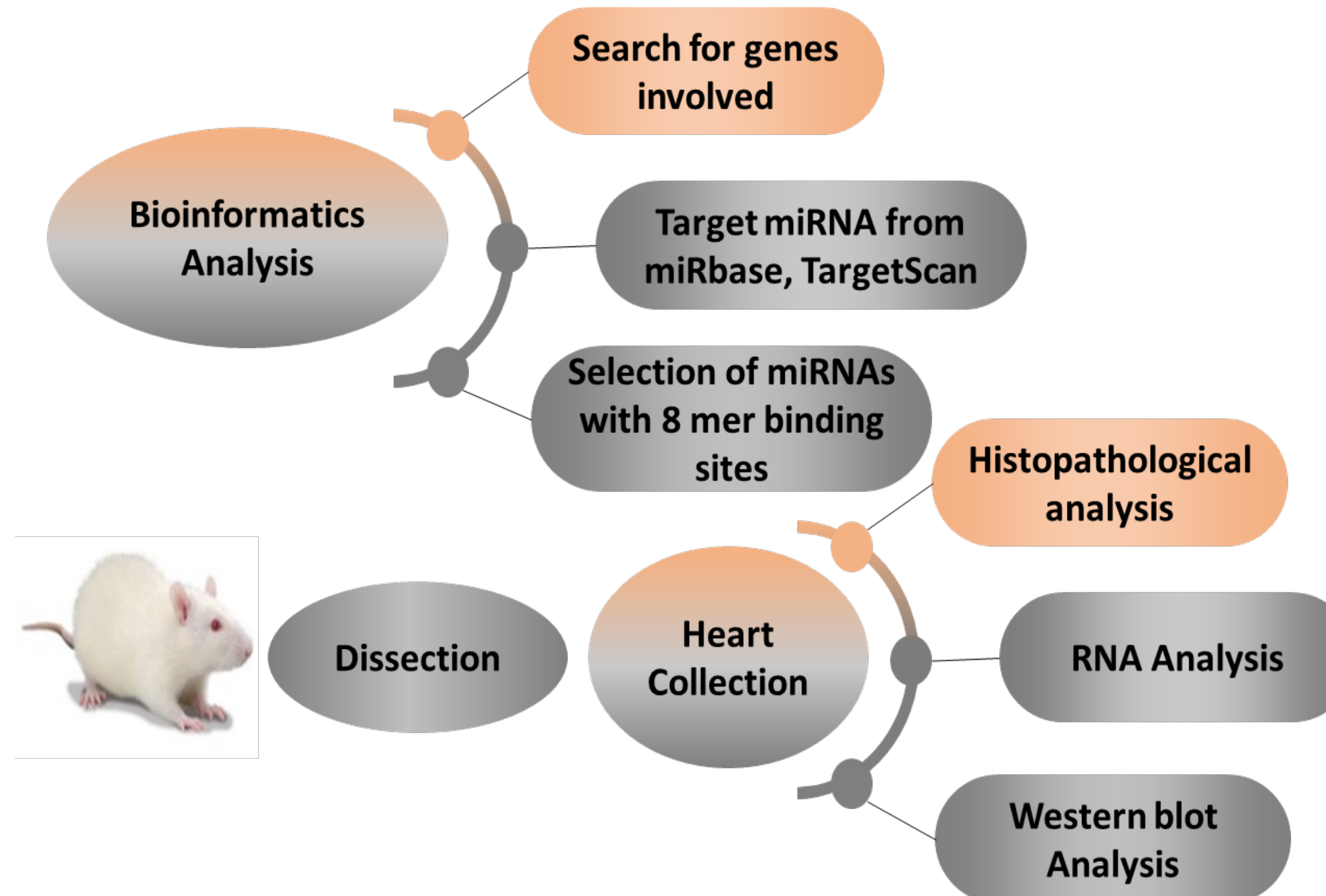
## Background

It is now a well proven fact that BPA is a xenoestrogen, a compound that hinders the function of endocrine system. It is also asserted that exposure to BPA may lead to a myriad of health effects in human ranging from metabolic disease (type-2 diabetes, and cardiovascular disease

## Objective

- To find miRNAs targeting endothelin 1
- To Elucidate the role of miRNAs in hyperglycemia linked cardiac complications

## Materials & Methods



## Results

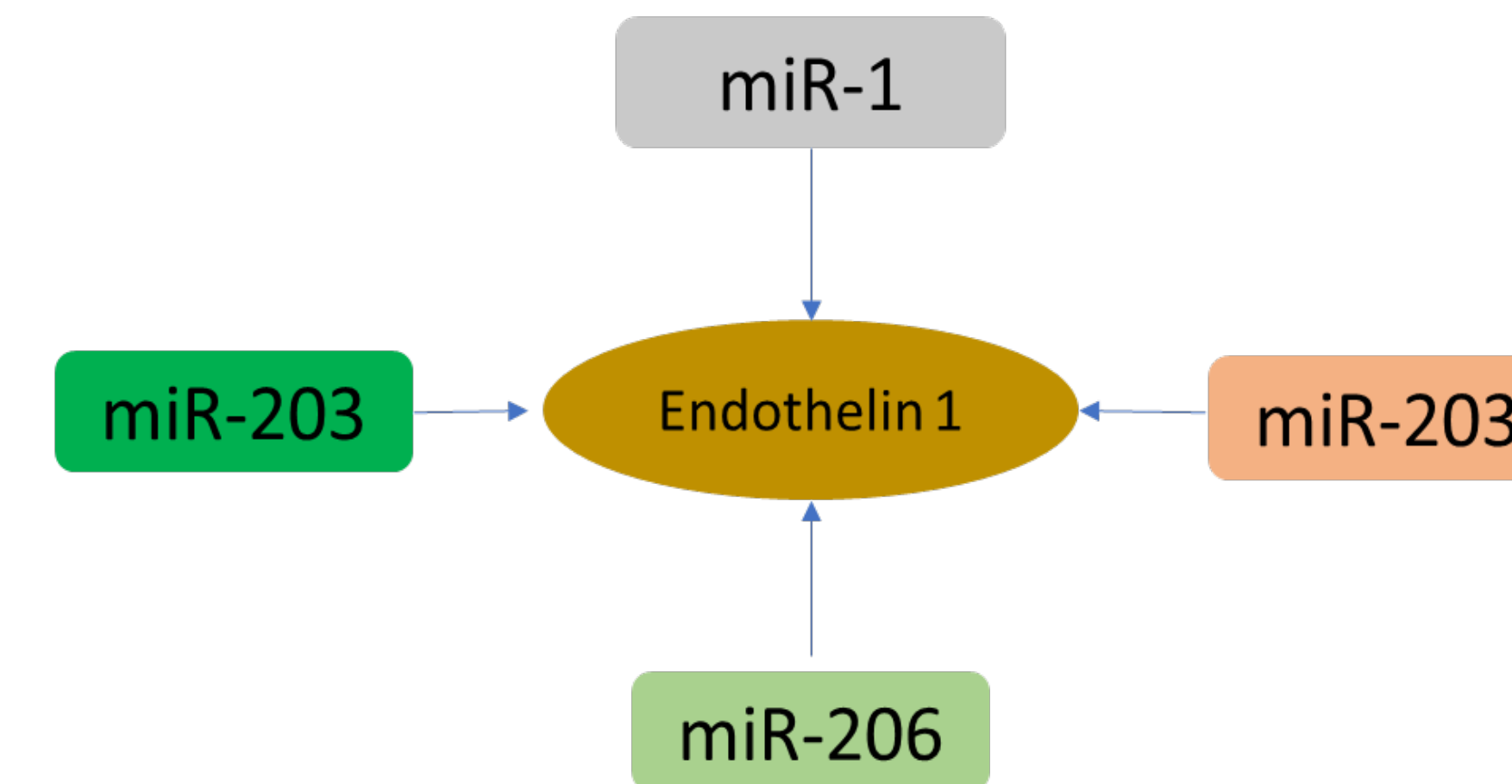


Fig. 1 Different miRNAs targeting endothelin 1

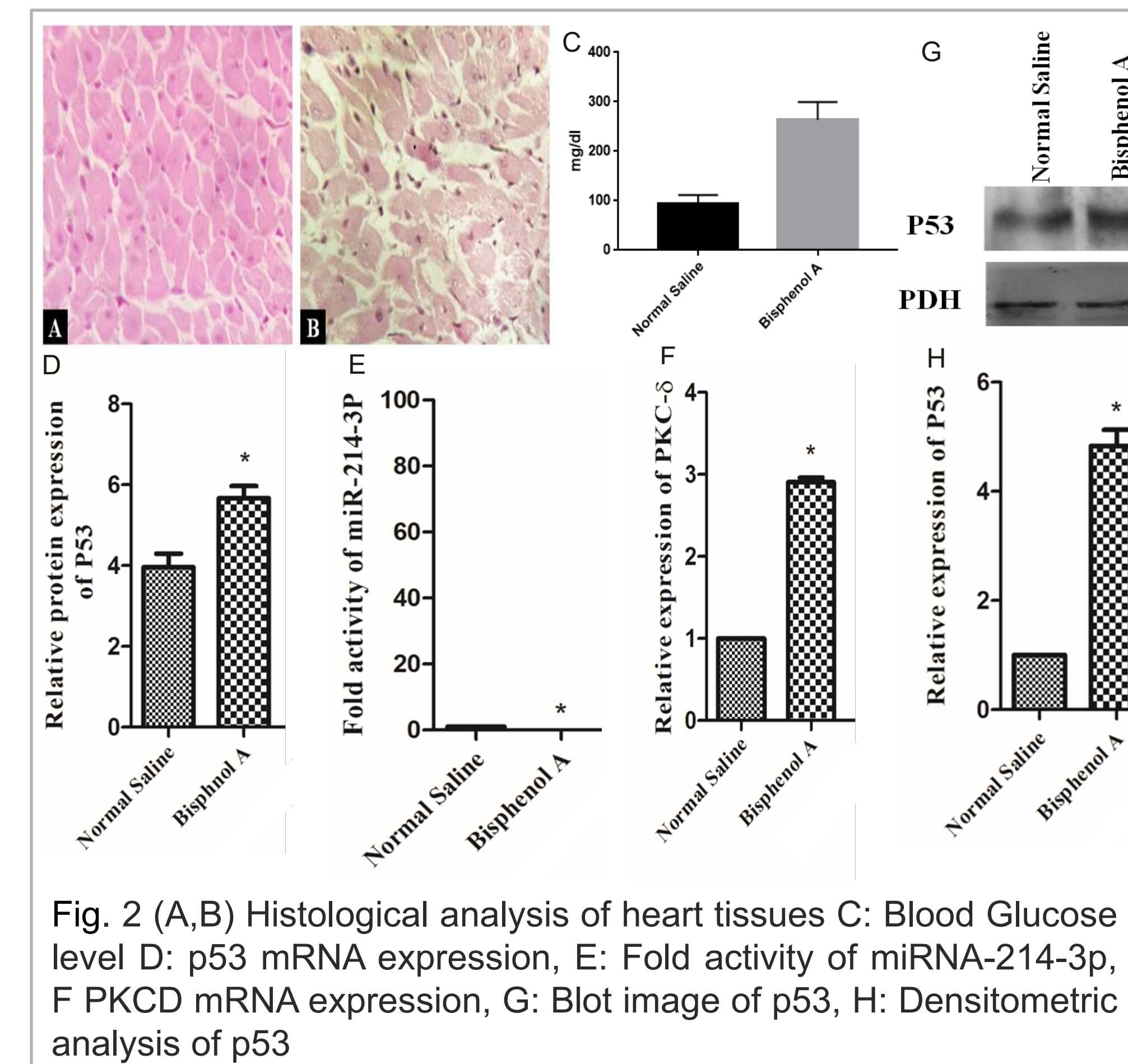
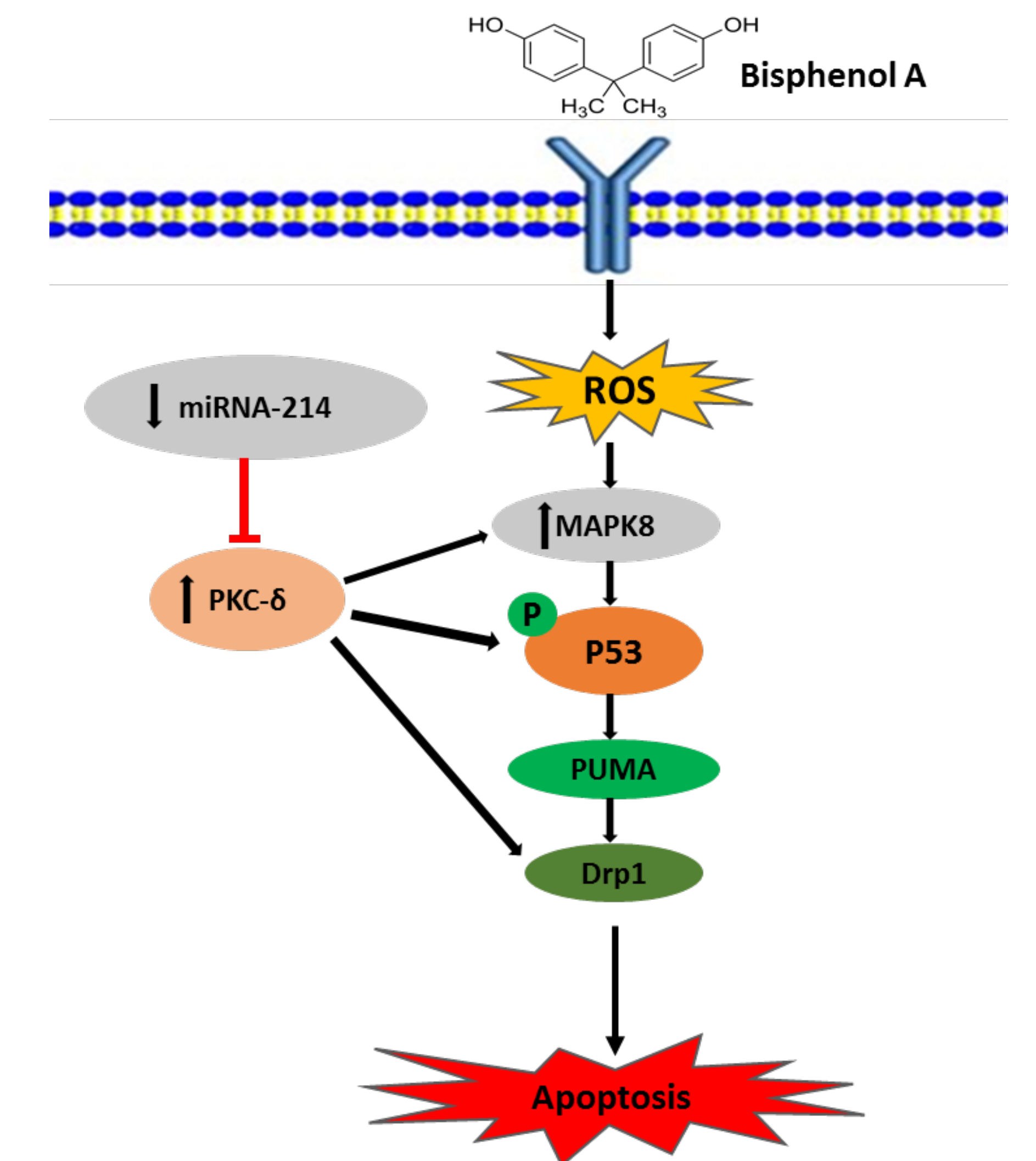


Fig. 2 (A,B) Histological analysis of heart tissues C: Blood Glucose level D: p53 mRNA expression, E: Fold activity of miRNA-214-3p, F PKCD mRNA expression, G: Blot image of p53, H: Densitometric analysis of p53

## Summary



## References

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