

Transcriptomic Analysis Identifies ACSL4 And GPX4 As Potential Regulators Of Ferroptosis Sensitivity in Oral Squamous Cell Carcinoma In The MOCCA (Pakistani) Cohort

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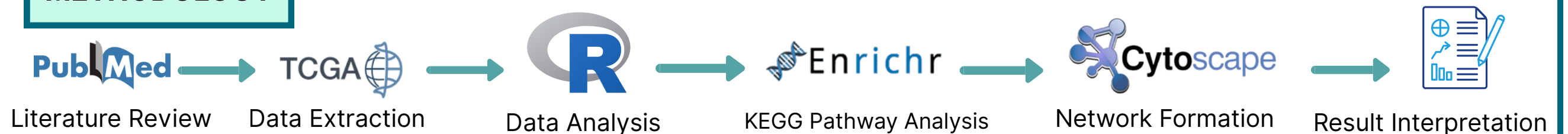
INTRODUCTION

Oral squamous cell carcinoma is the most common cancer among males in Pakistan with a survival rate of around less than 50%, mainly because cancer cells are resistant to the currently available therapeutic options.¹ Ferroptosis, an iron-dependent form of regulated cell death driven by lipid peroxidation, has recently emerged as a potential therapeutic vulnerability in cancer.²

OBJECTIVES

1. Analyze transcriptomic data of Oral Squamous Cell Carcinoma (OSCC) for ferroptosis-associated gene expression patterns.
2. Identify differentially expressed genes linked to ferroptosis sensitivity in OSCC.

METHODOLOGY



RESULTS

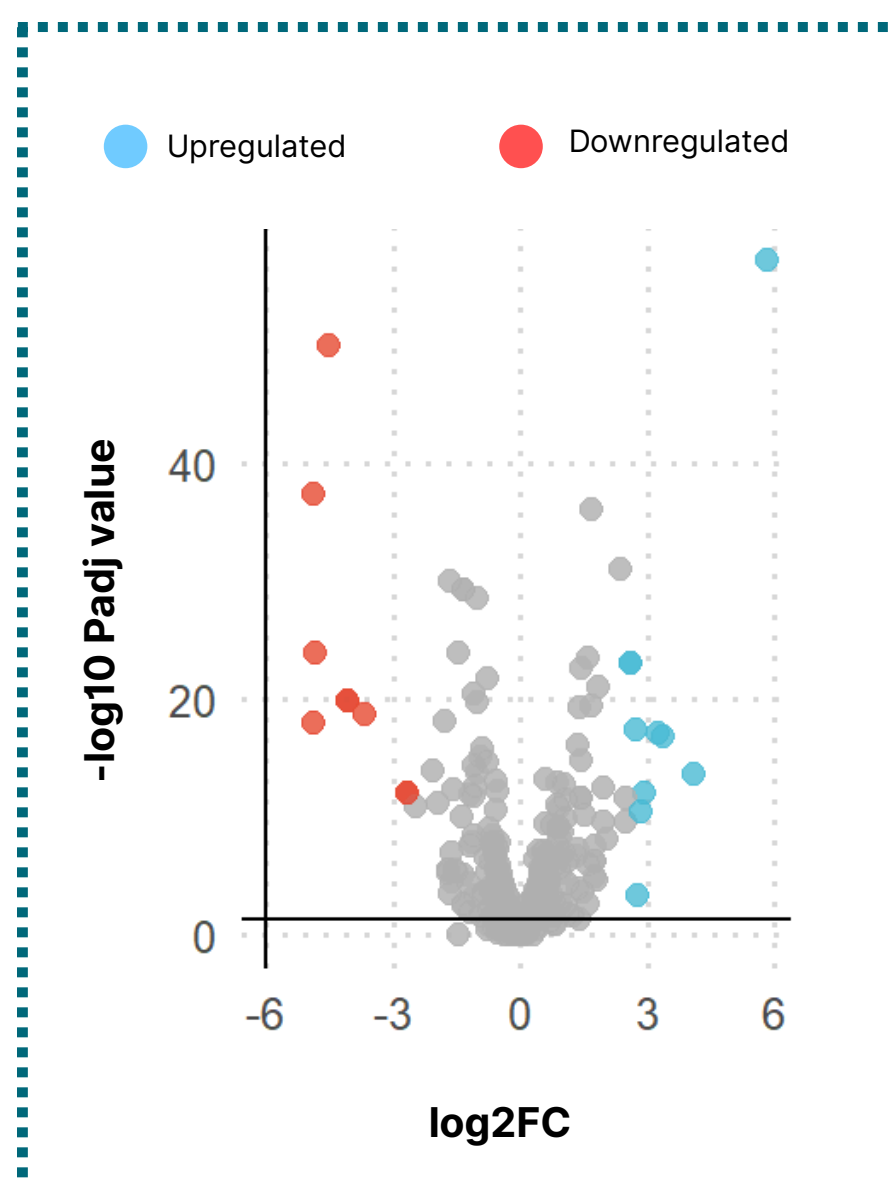


Figure 1. Volcano plot showing significantly upregulated and downregulated genes involved in ferroptosis. Log2FC cutoff was set as 2.5 and p-value was 0.05. At this threshold, we got 16 significant genes: 9 upregulated and 7 downregulated.

Pathway Enrichment Analysis

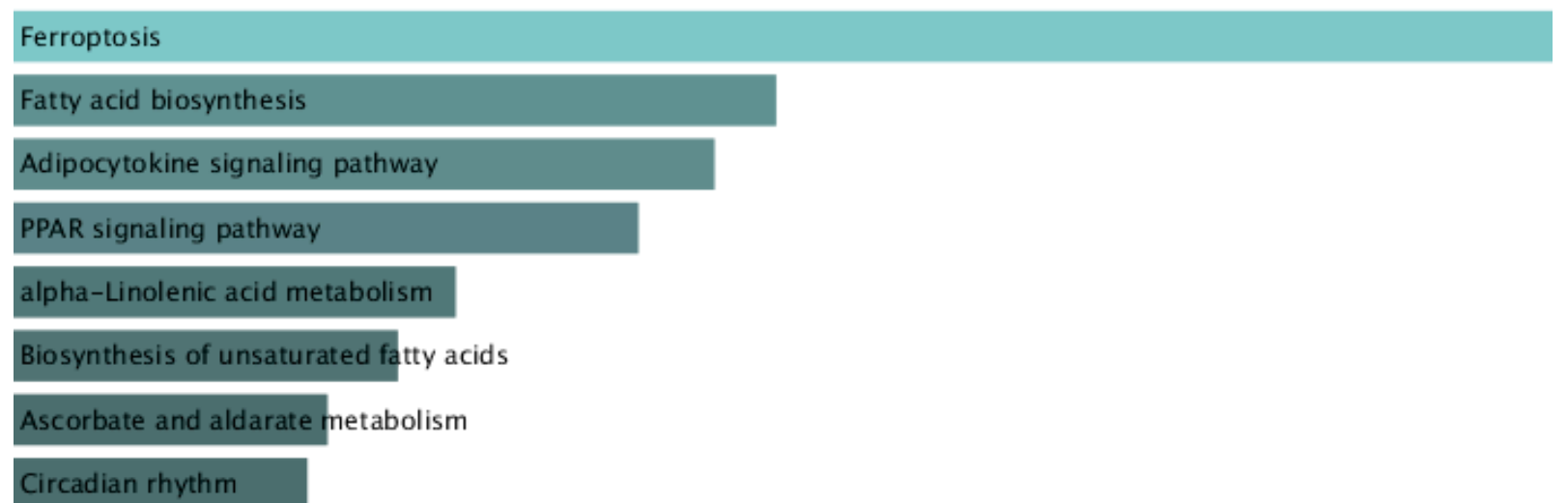


Figure 2. Bar Chart showing KEGG Pathway Enrichment Analysis of the significant genes. The most enriched pathway was found to be ferroptosis.

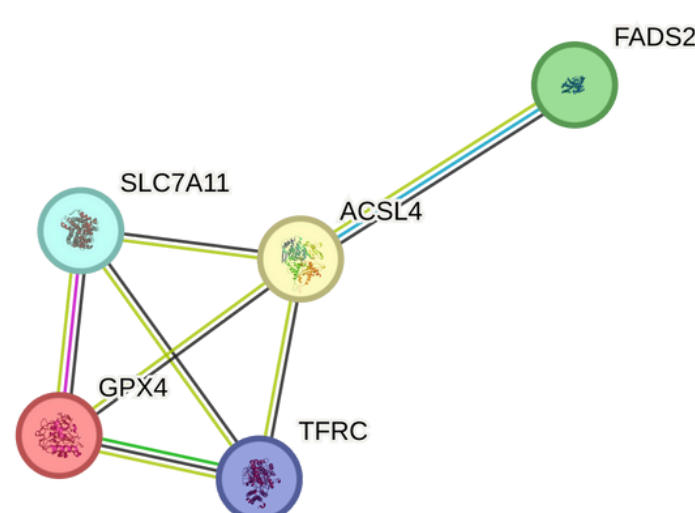


Figure 3. String network of genes involved in the process of ferroptosis, with ACSL4 being the central gene in this network.



Figure 4. Difference in the expression of ACSL4 and GPX4 in TCGA and MOCCA. MOCCA - PML's Multiomic data of local OSCC patients

CONCLUSION

Oral squamous cell carcinoma exhibits sensitivity to ferroptosis, as reflected by distinct gene expression signatures. These transcriptomic insights highlight ferroptosis as a potential therapeutic vulnerability in OSCC.

WAY FORWARD

Future directions include conducting wet-lab experiments to investigate how metabolic modulation of tumor cells influences ferroptosis sensitivity and overall viability, thereby providing functional validation of the transcriptomic findings.

REFERENCES

1. Tranby et al (2022) Oral Cancer Prevalence, Mortality, and Costs <https://doi.org/10.1158/1055-9965.EPI-22-0114>
2. Dixon et al (2012) Ferroptosis: an iron-dependent form of nonapoptotic cell death <https://doi.org/10.1016/j.cell.2012.03.042>

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