THE ARSENAL

Augusta University's Undergraduate Research Journal

ISSN 2380-5064 | The Arsenal is published by the Augusta University Libraries | http://guides.augusta.edu/arsenal

Volume 5, Issue 1 (2023)
Special Edition Issue

GENERATION OF HOMOZYGOUS TRANSPARENT TRANSGENIC ZEBRAFISH STRAIN TO STUDY CARDIOMYOCYTE ACTIVITY

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Citation
Balyan, V., Bhat, K., Derhei, A., Chen, R., Ouellette, L., Gossman, T., Nasanally, S., Aikhionbare, K., Arora, V., & Rajpurohit, S. (2023). Generation of homozygous transparent transgenic zebrafish strain to study cardiomyocyte activity. *The Arsenal: The Undergraduate Research Journal of Augusta University*, *5*(1), 8-9.
http://doi.org/10.21633/issn.2380.5064/s.2023.05.01.08

Generation of Homozygous Transparent Transgenic Zebrafish Strain to Study Cardiomyocyte Activity

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ABSTRACT

The Zebrafish heart cells are similar to human heart cells at the molecular level and determine the function of genes that control cardiac function and dysfunction. In zebrafish, myl7 is myosin light chain 7 gene and identified as a regulatory gene of heart orthologs to human MYL7. Our laboratory is developing transparent transgenic zebrafish cellular phenotype to study annexin-5 activity in the cardiovascular function under normal and in metabolic aberration and pathological circumstances by generating casper/ myl7:RFP; annexin-5:YFP transgenic zebrafish. In vertebrates, including zebrafish, murine and human systems, the in-vivo spatial resolution is limited due to the normal opacification of skin and subdermal structures. For in-vivo imaging the skin transparency is primary requirement and to maintain the transparency, blocking the pigmentation needs to maintain. Blocking of the pigmentation can be maintained by chemical inhibition by block melanization. Chemical inhibitor PTU (1-phenyl 2-thiourea) is adequate to block the pigmentation in pigment epithelium melanization. Chemical inhibition treatment is temporary and possible till the organism treated with the chemical inhibitor agent. Zebrafish casper mutant maintain transparency throughout the life and serve as ideal combination of sensitivity and resolution for in-vivo stem cell analyses and in-vivo imaging. In this study, we established transparent transgenic zebrafish model and establishment of time lapse in-vivo confocal microscopy to study of cellular phenotype/pathologies of the cardiomyocytes to quantify changes in cardiomyocyte

morphology and function overtime by comparing control and cardiac injury. Our strategist approach to yield crucial new insights into in-vivo cardiomyocyte imaging by confocal microscopy to observe and track the cell death pattern and cardio inflammatory pathways in cardiomyocyte and develop novel therapeutic approaches to treat cardio inflammatory pathology.

Received: 02/15/2023 Accepted: 03/29/2023

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