High throughput screening of novel small molecules for the identification of NRF2 activators

Megan DeMattia, Dr. Kayla N. Green, Dr. McKale R. Montgomery

Department of Nutritional Sciences, Texas Christian University, Fort Worth, TX, 76109, USA

Abstract

The transcription factor, Nuclear factor erythroid 2-related factor 2 (NRF2), functions by activating genes that help protect the body against oxidative stress, inflammation, and various toxins. Thus, identification of small molecules that can increase NRF2 activity could be helpful to increase the body's natural defense system against chronic disease. The goal of this interdisciplinary project is to use cell lines generated by the Montgomery lab (Nutrition) that express a fluorescent NRF2 reporter to test a small library of novel compounds generated by the Green lab (Chemistry) for their NRF2 activation capacity.

First, our reporter system will be validated with known NRF2 activators. We will then use a luciferase reporter assay to screen 15 novel compounds for their capacity to activate NRF2 compared to the known standards. These data can then be used to inform both labs about their antioxidant capacity and help optimize their furthered development and utility.

Approach

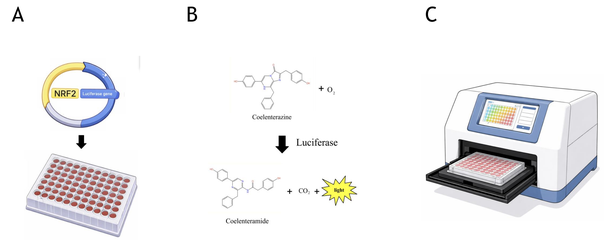

Figure 1. Experimental design and data collection. (A) HEK 293T cells were transfected with a luciferase reporter plasmid. (B) Coelenterazine was added 24 and 48 hours after exposure to a specific treatment. (C) An OD of 570 was used in order to measure luciferase activity for each treatment

Results

Results

Conclusions

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