

Cell Differentiation State of SH-SY5Y Cells Determinantes the Level of Aryl Hydrocarbon Receptor-Mediated Parkin Induction

F. E. Murillo-González¹, R. García-Aguilar², L. Vega-Loyo², and G. Elizondo-Azuela¹. ¹Cell Biology Department, CINVESTAV-IPN, Mexico city, Mexico; and ²Toxicology Department, CINVESTAV-IPN, Mexico city, Mex..

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Introduction

Parkin is an E3 ligase enzyme encoded by the *PRKN* gene. One of the main Parkin's roles is the maintenance of neuronal survival by promoting mitophagy through protein ubiquitination, making it an essential player for cellular mitochondrial integrity. Recent evidence indicate that mitochondrial dysfunction due to Parkin loss is a predominant cause of Parkinson disease. Therefore, it is essential to understand the molecular mechanisms that control *hPRKN* gene expression. Previous results revealed that the Aryl Hydrocarbon Receptor (AHR) induces *prkn* gene expression in the mouse ventral midbrain, suggesting that this transcription factor also modulates Parkin expression in human.

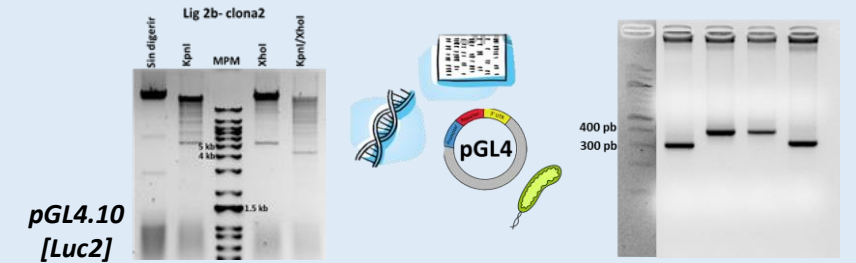
Objetive

To determinate whether *hPRKN* gene is under AHR regulation in non-differentiated (ND) and differentiated (DF) SH-SY5Y neuroblastoma cell line.

Methodology

1. AHR protein expression	Confocal immunostaining
2. Differentiation	
3. Treatment (TCDD 10 nM)	
4. <i>hPRKN</i> mRNA expression	RT-qPCR
5. <i>In silico</i> análisis	

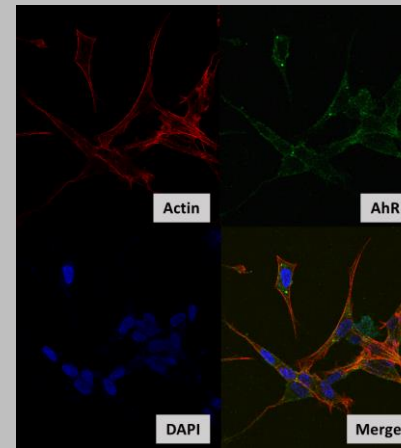
6. Cloning and characterization of the *hPRKN* promoter



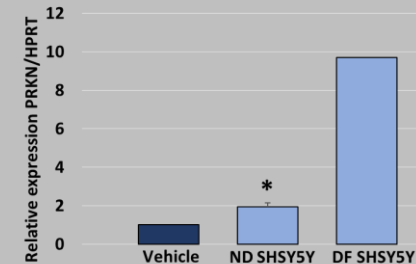
7. Cell transfection and Transactivation assays



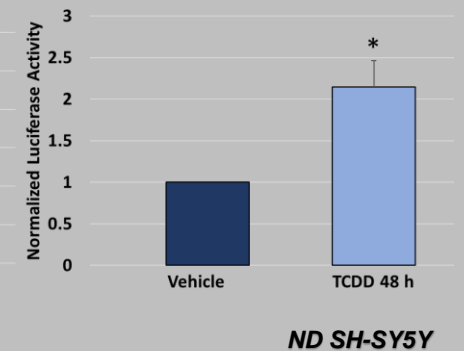
Results



Parkin mRNA expresión in ND and DF SH-SY5Y



Transactivation of *hPRKN* promoter



Conclusion

The present data show that human Parkin is transcriptionally upregulated by AhR and the magnitude of such induction depends on cell differentiation state.

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