

# Identifying proteins and metabolic pathways associated with the neuroprotective response mediated by tibolone in astrocytes under an induced inflammatory model

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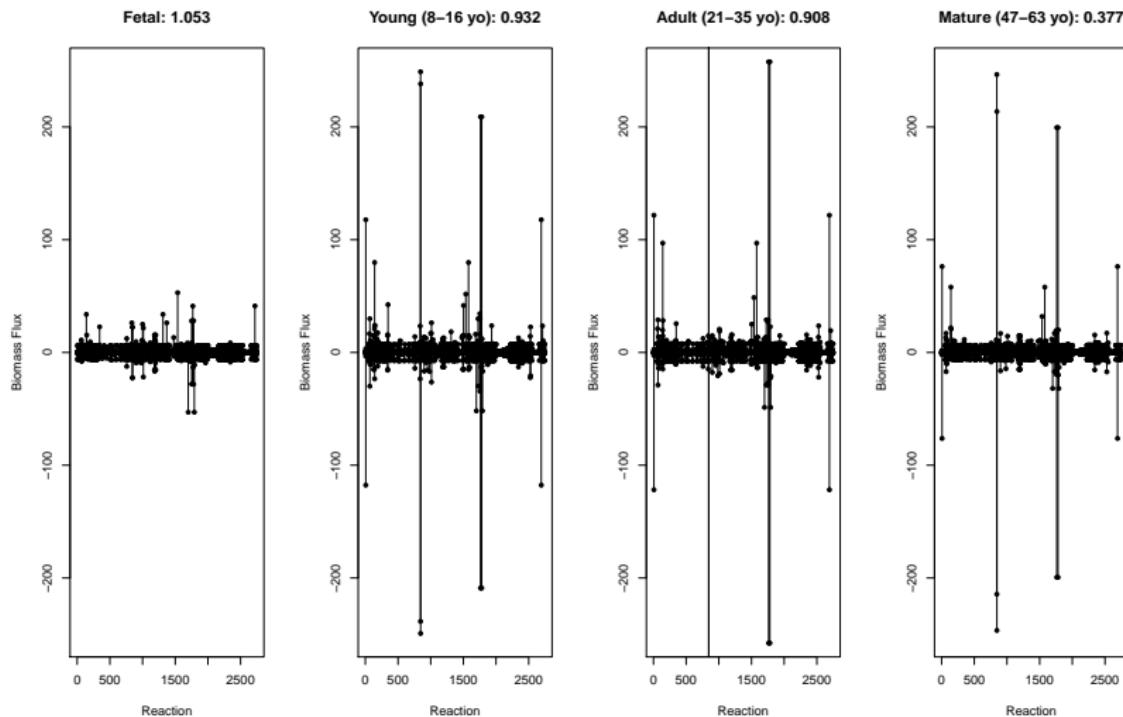


# Objectives:

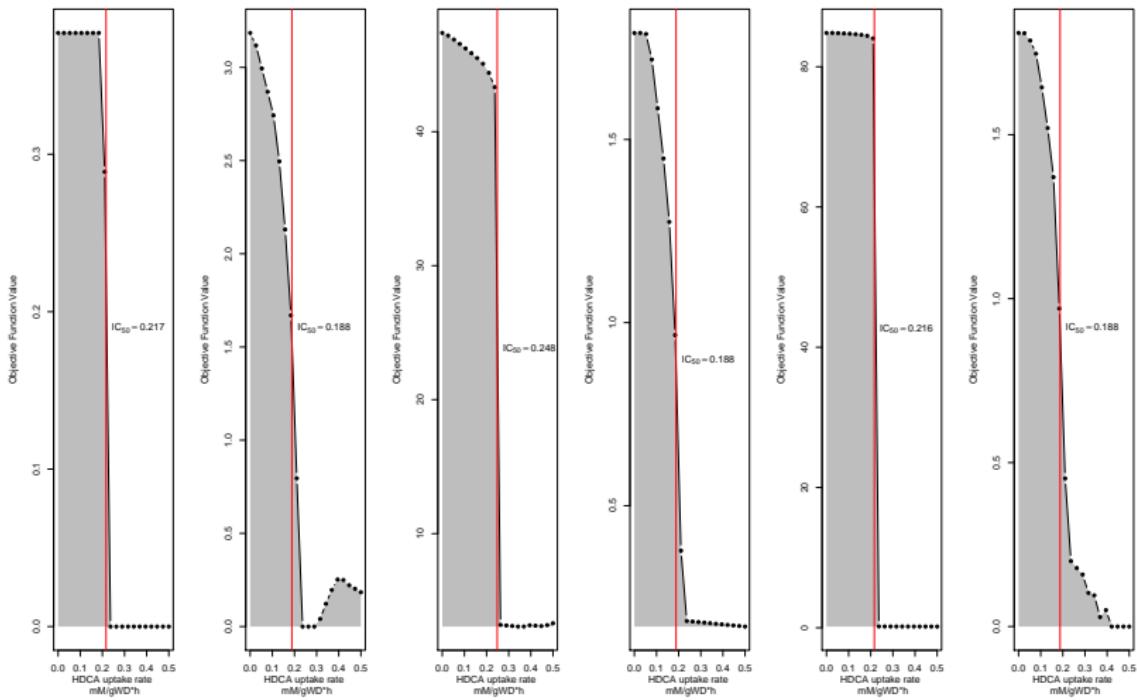
To identify proteins and metabolic pathways involved in the neuroprotective effects of tibolone in human astrocytes based in metabolic scenarios comparation we set:

- ▶ Build a tissue specific computational model of astrocytes metabolism using gene expression data integration.
- ▶ Evaluate the effects caused by the increase of free fatty acids and tibolone presence in astrocytes metabolism.
- ▶ Determine metabolic pathways and relevant functional products in response to steroid tibolone through systems biology approximations.
- ▶ Evaluate the importance of proteins and metabolic pathways previously identified on the dynamics of the metabolic model.

# Age Related Metabolic Changes in Astrocytes



$$IC_{50} = 0.208 \pm 0.024 \text{ mMgDW}^{-1}\text{h}^{-1}$$



# Software Development



## 'minval' Package

An R Package for MINimal VALidation of stoichiometric reactions

Daniel Osorio, Janneth Gonzalez and Andres Pinzón-Velasco.

Language: R

Stable: CRAN

Development: gibbslab/minval

License: GPL-2

Binaries: Windows - Linux - Mac

# Software Development



## 'g2f' Package

An R Package to Find and Fill Gaps for genome-scale metabolic networks

*Kelly Botero, Daniel Osorio, Janneth Gonzalez and Andres Pinzón-Velasco.*

Language: R

Stable: CRAN

Development: [gibbslab/g2f](#)

License: [GPL-2](#)

Binaries: Windows - Linux - Mac

# Software Development



## 'exp2flux' Package

An R Package to convert expression data to FBA fluxes

Daniel Osorio, Kelly Botero, Janneth Gonzalez and Andres Pinzón-Velasco.

Language: R

Stable: CRAN

Development: [gibbslab/exp2flux](#)

License: [GPL-2](#)

Binaries: Windows - Linux - Mac



# Advances of this work were presented as:

## Metabolic inflammation effects over the gliotransmitters release in mature astrocytes: a network-based approach.

Daniel Osorio MSc., Janneth Gonzalez PhD., Andrés Pinzón-Velasco PhD.  
Bioinformatics and Computational Systems Biology Lab, Universidad Nacional de Colombia.



at: \_\_\_\_\_



CDMX, México  
Short Talk



Barcelona, España  
Poster

ICGEB Course on Bioinformatics and Computational Neuroscience



Pontificia Universidad Javeriana  
5 - 8 October - Bogotá, Colombia

Bogotá, Colombia  
Short Talk

This study is under development at the:



## **Bioinformatics and Computational Systems Biology Lab**

Institute for Genetics - Universidad Nacional de Colombia

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