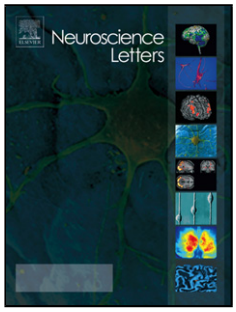

Title: Participation of satellite glial cells of the dorsal root ganglia in acute nociception

Authors: Júlia Borges Paes Lemes, Tais de Campos Lima, Débora Oliveira Santos, Amanda Ferreira Neves, Fernando Silva de Oliveira, Carlos Almicar Parada, Celina Monteiro da Cruz Lotufo

PII: S0304-3940(18)30258-1
DOI: https://doi.org/10.1016/j.neulet.2018.04.003
Reference: NSL 33526

To appear in: *Neuroscience Letters*

Received date: 24-11-2017
Revised date: 29-3-2018
Accepted date: 2-4-2018

Please cite this article as: Júlia Borges Paes Lemes, Tais de Campos Lima, Débora Oliveira Santos, Amanda Ferreira Neves, Fernando Silva de Oliveira, Carlos Almicar Parada, Celina Monteiro da Cruz Lotufo, Participation of satellite glial cells of the dorsal root ganglia in acute nociception, Neuroscience Letters https://doi.org/10.1016/j.neulet.2018.04.003

Participation of satellite glial cells of the dorsal root ganglia in acute nociception.

Júlia Borges Paes Lemes[a,], Tais de Campos Lima[a], Débora Oliveira Santos[a], Amanda Ferreira Neves[b], Fernando Silva de Oliveira[a], Carlos Almicar Parada[b], Celina Monteiro da Cruz Lotufo[a,*]*

[a]*Department of Physiological Science, Universidade Federal de Uberlândia, Minas Gerais, Brazil*
[b]*Department of Structural Biology, Universidade Estadual de Campinas, São Paulo, Brazil.*

[*]Corresponding author.
Federal University of Uberlândia, Institute of Biomedical Sciences.
Pará 1720, Umuarama, Brazil
Tel.: +55 34 98855-7679; e-mail address: celotufo@ufu.br (Lotufo, CM).

Highlights

- Nociceptors communicate with satellite glial cells in dorsal root ganglia through ATP release.
- Activation of glial P2X7 receptors by ATP participates in acute nociception.
- Communication through gap junctions in satellite glial cells is involved in acute pain

Abstract

At dorsal root ganglia, neurons and satellite glial cells (SGC) can communicate through ATP release and P2X7 receptor activation. SGCs are also interconnected by gap junctions and have been previously implicated in modulating inflammatory and chronic pain.We now present evidence that SGCs are also involved in processing acute nociception in rat dorsal root ganglia. Using primary dorsal root ganglia cultures we observed that calcium transients induced in neurons by capsaicin administration were followed by satellite glial cells activation. Only satellite glial cells response was reduced by administration of the P2X7 receptor antagonist A740003. In vivo, acute nociception induced by intraplantar injection of capsaicin in rats was inhibited by A740003 or by the gap junction blocker carbenoxolone administered at the dorsal root ganglia (L5 level). Both drugs also reduced the second phase of the formalin test. These results suggest that communication between neurons and satellite glial cells is not only involved in inflammatory or pathological pain, but also in the transmission of the nociceptive signal, possibly in situations involving C-fiber activation.

Keywords

Nociception, satellite glial cells, purinergic P2X7 receptor, Adenosine Triphosphate, Gap Junctions.