

# Accepted Manuscript

Norman Bowery's discoveries about extrasynaptic and asynaptic GABA systems and their significance

David A. Brown



PII: S0028-3908(17)30515-4

DOI: [10.1016/j.neuropharm.2017.11.006](https://doi.org/10.1016/j.neuropharm.2017.11.006)

Reference: NP 6933

To appear in: *Neuropharmacology*

Received Date: 30 May 2017

Accepted Date: 4 November 2017

Please cite this article as: Brown, D.A., Norman Bowery's discoveries about extrasynaptic and asynaptic GABA systems and their significance, *Neuropharmacology* (2017), doi: 10.1016/j.neuropharm.2017.11.006.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Norman Bowery's Discoveries about Extrasynaptic and Asynaptic GABA Systems and their Significance<sup>1</sup>

David A. Brown

Department of Neuroscience, Physiology & Pharmacology, University College London, London, WC1E 6BT, UK.

## Abstract

Before finding the GABA-B receptor, Norman Bowery completed a series of studies on an extrasynaptic or asynaptic "GABA system" in the rat superior cervical sympathetic ganglion. First, he discovered an uptake system for GABA in neuroglial cells in the ganglia and in peripheral nerves, with a different substrate specificity than that in neurons. Second, he showed that accumulated GABA in sympathetic glial cells was metabolized to succinate by a transaminase enzyme. Third, he provided detailed structure-activity information about compounds activating an extrasynaptic GABA-A receptor on neurons in the rat sympathetic ganglion. Fourth, he showed that some amino acid substrates for the neuroglial transporter could indirectly stimulate neurons by releasing GABA from adjacent glial cells, and that GABA could also be released from neuroglial cells by membrane depolarization. In this review, these discoveries are briefly described and updated and some of their implications assessed.

[143 words]

## Highlights

- GABA is taken up by a Na<sup>+</sup>-dependent transporter in peripheral neuroglial cells.
- GABA is metabolized to succinate by neuroglial cells
- Peripheral neurons devoid of GABAergic input can be depolarized by GABA via asynaptic GABA-A receptors.
- Some amino acids can activate neuronal GABA receptors by releasing GABA from adjacent glial cells.

[50 words]

**Key words:** sympathetic ganglion; sensory ganglia; neuroglial cells; GABA uptake; GABA release; GABA-A receptor; GABA depolarization

5394 words including title, abstract, highlights, key words, references and figure legends

<sup>1</sup> **Material in italics summarizes subsequent relevant work and its implications**

Download English Version:

<https://daneshyari.com/en/article/8516599>

Download Persian Version:

<https://daneshyari.com/article/8516599>

[Daneshyari.com](https://daneshyari.com)