ABSTRACT
Ultimately, findings of this study support the use of the GL15 cell line as an in vitro astrocyte model for studying physiological features of glial cells at different stages of differentiation.

INTRODUCTION
Transductive systems (TSSs) are well known to play a role in neuroprotection and cognitive function. However, as the number of TSSs increases in the nervous system (i.e. the number of synapses), the effects of TSSs on neuroprotection and cognitive function are less clear. Here, we show that tetradecanol (TdCA) modulates the transcription of a TSS called GL15, which is also co-expressed in synapses of astrocytes and neuroglial cells, and that tetradecanol enhances its expression. We show that tetradecanol induces TSSs in astrocytes and neuroglial cells, and that its effects on TSS expression are mediated Astrocytes, which are the most abundant type of cell in the central nervous system, play a crucial role in modulating neuronal component activity and are involved in various physio-pathological events within the brain. However, neurotrophin-mediated signalling may not be the sole factor controlling astrocyte-neuron interactions. Instead, specific intercellular connections between these two cell populations may provide an additional, rapid and unique means for interacting with each other and communicating with adjacent neurons. Extracellular physiological agonists that act as "insulators" can increase the concentration of intracellular Ca2+ ([Ca2 +]i) through voltage-dependent channels or controlled release from internal stores in mammalian astrocytes. However, Ca 2+ waves, which are transmitted via gap junctions (gjs), are thought to be essential for co-ordination of astroglial function. This event was first observed in cultured brain cells and has been demonstrated in various other systems, including brain slice preparations and living rat brain surfaces. The GL15 cell line was isolated from human glioblastoma multiforme approximately ten years ago. It was determined that the karyotype and immunohistochemical and cytogenetic expression of glaglacial fibrillary acidic protein (GFAP) were sufficient to characterize an astroglial-like cell type, while other biochemical traits peculiar to astrolials were found in the same population; such examples include glutamine synthetase expression, taurine transport, transforming growth hormone receptor expression and interleukin-induced Hence, our focus was on the mechanism(s) of cell communication, which is one of the most important aspects of astrocyte physiology. As in vivo astrocytoses can communicate with each other through membrane surface receptor-operated systems and/or gjs between two neighbouring cells, the study of these mechanisms is essential to propose GL15 cells as an in vitro model of this type of process. We define the features of this model by analyzing some morphological aspects, the mechanism of [Ca2+]i increase induced by different extracellular physiological agonists, and the expression and functional capacity of the gjs system in relation to the differentiative pathway.

CONCLUSION
Remarkable conclusions The results presented in this paper demonstrate that the GL15 cell line is a reliable in vitro model for astrocytes, which can help understand their unique physiological features and contribute to understanding the complex role they play in the brain. It is important to note that by using the differentiated or undifferentiated phenotype of this cell type, it becomes possible to study the mechanism by which the cells communicate with each other, either through gjs or membrane receptors.

This new angled model facilitates efficient analysis and interpretation of problems associated with the role of regulating and