

## Glia, Next Research Brain Frontier

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### Abstract

There are many different cells inside our brain, such as astrocytes, neurons, ependymary cells, microglia and oligodendroglia. The role of neurons has been studied by decades because of its important interventions in cell communication in the nervous system. However other brain cells, glial cells, have been poorly studied compared to neurons. Astrocytes are more abundant than neurons in brain and in fact, they are more and more glial cells when we advanced in the phylogeny compared to neuron number. Einstein's brain has three times more astrocytes than normal brain. So many scientists are thinking about the important role of astrocytes in memory, inflammation, oxidative stress, nutrition, cleaner brain cells, etc. Which roles of astrocytes are inside our brain and they have important works in neurogeneration, neurodegeneration and illness?

### Introduction

Oxidative Stress and inflammation are elevated in many illness producing neurodegeneration and badly neurogenesis [1-3], but their pathogenic significance remains unclear. Central nervous system has its own resident immune system, glial cells, which can serve producing supportive and nutritive roles inside brain. Also, glial cells are involved in several inflammatory processes, defending central nervous system in front of pathogens [4-6]. Normal glial functions can sometimes result in a serious and chronic neuro-inflammatory cycle that actually promotes neurodegenerative diseases, constituting a viable target for the discovery or development of neurodegenerative diseases [7-9]. Also astrocytes perhaps act protecting neurons in the mixer culture from the toxic action and this point of view needs more research investigation, perhaps, by an increase in mitochondriogenesis. They obtain a better processing of oxidative stress and an efficient inflammation control [Aguirre-Rueda et al., in peer revision]. The importance of glial cell-propagated inflammation disorders such as AD has been seen as a bystander effect, or epiphenomenon, occurring when damaged neurons develop an activation response by glial cells. Wyss Corey et al., demonstrated a phagocytosis process done by astrocytes in the Alzheimer's plaques [8] and also Valles et al., showed [3] anti-inflammatory effects after A $\beta$ -induction in astrocytes. Recently, authors have discovered important astrocyte actions in the brain. We need sleep because astrocytes enter the body in sleeping situation, because we need to clean our brain with minimum six hours. Astrocytes need a lot of energy to do it, so disconnect neurons and clean brain of rubbish elements [10]. So who control who, astrocytes control neurons and they do not permit activation during sleeping situation. Furthermore, astrocytes control neurons in the quimio-sensible brain area, producing influx of calcium to adjacent neurons and provoking more influx of fresh air inside our alveolus to introduce more oxygen in our body and to clean carbonic hydroxide from our blood. Deficient mitochondrial respiratory chain function may have catastrophic consequences for the long-term health and survival of cells associated with dementia [8,11]. Recently Steve Goldman group from University of Rochester, EEUU, has discovered that astrocytes can control neurons to produce long term potentiation, controlling memory astrocytes [12]. Furthermore, in 2012 was published that astrocytes will be the future of the brain research, because you know almost everything from neurons and a few information about the role of astrocytes [13] and Valles et al., published an important paper about the control of Cancer by Central Nervous System via hormone production [14].

The relationship between immunologic genes and schizophrenia

has been discovered recently. Our point of view has changed and now astrocytes and microglia play important roles in neurogenesis and neuro-degeneration brain. Problems with depression and with bipolar disorders are growing and the relationship with the political and crisis in the world are evident, so we need to be realist and look for diminish immunological action of genes and all research community need to replant all drugs to resolve neural illness. Glia will be in the next frontier of the brain study. We will look for its physiology and psychiatric/psychology problems and at last to obtain the future of our healthy brain. Why research people only look for neuron works? Why don't we investigate the role of astrocytes and glia in brain? Why evolution invented an astrocyte after neurons? Why astrocytes in differentiation and in adult life have a new cytoskeletal protein, GFAP (glial fibrillary acidic protein)? We need to investigate more and more looking by good ideas and as Einstein said, "you cannot say God exist or not exist, because anyone demonstrate it, only you can know the light do not exist because is only a perception of our brain, only exist light photons traveling in the universe". So perhaps people have special receptors to note God presence and others do not have. In science many people have good ideas many of them from countries in the three world, etc., but remember, in the brain of poor people continuous evolution and Lucy was poor, pregnancy woman who start evolution of the brain many, many, many years ago. People are thinking about that; and now woman are at least in research, let's see the future of research brain, probably people with a lot of sensibility will be the best to understand astrocytes roles, at last.

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