

Biotechnology and neuroscience: where are we?

The experimental neuroscience is an area of great interest and complexity, in which the new techniques as well as new molecular tools not only allow the progress of knowledge, but sometimes also important conceptual resets. Areas that seem particularly interesting in this context will be presented as follows: 1. 4D new microscopy techniques in the study of neuron and neural network activity: is the same neuron was talking about Ramon y Cajal? Current microscopy uses molecular tools able to describe in real-time the functional status of the cell and computerized image analysis to track in real time and in quantitative way the evolution of a biological process. These techniques have redefined the morphology of the neuron in relation to its rapid temporo-spatial modifiability, and have imposed a conceptual review of the neuron masterfully described and theorized by Ramon y Cajal. 2. Transgenic animals and research into the Alzheimer's disease: are they useful for information about the disease and/or to screen new drugs? The neurobiological research, as all other areas of medical research, largely uses genetically modified animals to "mimic" the pathogenesis of disease or to identify molecular targets. However, we can not ignore the fact that this tool, which so many hopes had been given, often does not meet expectation. Different models of Alzheimer's mice and their use in pharmacological research will be discussed. 3. The weight of "no-knowledge": biotech and acupuncture. The mechanism of action of effective acupuncture treatment in certain medical conditions, as defined according to the principles of evidence-based medicine, is still unknown according to the Western science. The current working hypothesis concerning the structure and function of acupuncture points, as formulated with the study of the biomechanical properties of the extracellular matrix in atomic force microscopy, will be discussed.