Researchers find a compound helping to regenerate neurons in damaged areas of the brain

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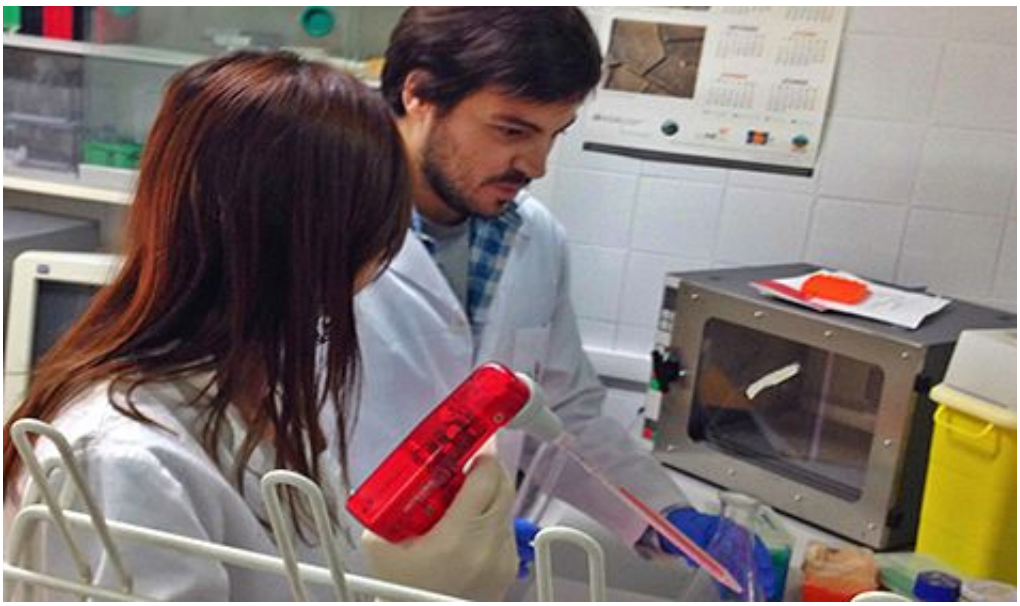

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Many neurology pathologies cause irreversible loss of neurons. They are mostly the so-called neurodegenerative diseases although there exist other causes for a focal loss of neurons, as it is the case in strokes or traumatic brain injuries. All these pathologies lack nowadays of an efficient treatment not being possible to regenerate dead neurons. In fact, although the brain has the ability to regenerate as many studies has

proved, this regeneration is very low, ranging from 0.2% to a maximum of 10% depending on the type of injury and the damaged area.

This is why different research groups have focused their activities in achieving regeneration of a brain area suffering from neuronal cell death so that this area can recover its function. For years, the team led by Professor Carmen Castro at the University of Cadiz work on this line. One of the latest progress of their research will be soon published in the *International Journal of Neuropsychopharmacology* under the title "12-Deoxyphorbols Promote Adult Neurogenesis by Inducing Neural Progenitor Cell Proliferation via PKC Activation," which is already available on an online version. In this article fully subscribed by UCA researchers including a researchers group from the Department of Organic Chemistry led by Dr Rosario Hernandez, it is proved how a number of isolated plant natural products with the ability to activate a family of proteins known as Kinase c type or PKC facilitates proliferation of neuronal cells in the brain. The research group has patented the use of these compounds to regenerate the nervous system.

"There exist other compounds in the market activating this family of proteins but they imply a high level of tumorigenesis. They could not be actually used as a regenerative therapy so we searched for other activators achieving an increase in neurogenesis without a tumorigenesis effect," Dr Carmen Castro states. Having this in mind, "we got in contact with a research group from the Department of Organic Chemistry working on the isolation of natural products out of plants and having compounds of the family of the 12 deoxyphorbols. This group had published that some of these compounds were able to activate PKC and that they did not imply tumorigenesis. This is why we decided to cooperate with them and prove these compounds, at a first stage, on cultures and later on, on mice."

Thus, the UCA researchers could check how these compounds facilitate

proliferation in neuronal precursor cells cultures and that their introduction in an adult mouse brain favours the generation of new neuronal cells.

Moreover, "nowadays we are studying other less invasive routes of administration of this compound rather than injecting medication directly into the brain. This type of compounds are difficult to obtain so that a way to administer a little quantity has to be found. It is also necessary that the whole quantity gets to the brain as if they are injected into blood, final quantity into the brain will be very little," as they explain from the UCA.

The work done so far is a first stage of a much more complex project with a final objective of developing new medicines in the long term. However, these researchers come to highlight that "it has not been easy to arrive up to this point. This work has demanded a great effort on the side of the staff of this institution as we are going through a period with great difficulties to obtain funding."

More information: Noelia Geribaldi-Doldán et al. 12-Deoxyphorbols Promote Adult Neurogenesis by Inducing Neural Progenitor Cell Proliferation via PKC Activation, *International Journal of Neuropsychopharmacology* (2015). DOI: 10.1093/ijnp/pyv085

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