New therapeutic target for diseases caused by lack of oxygen

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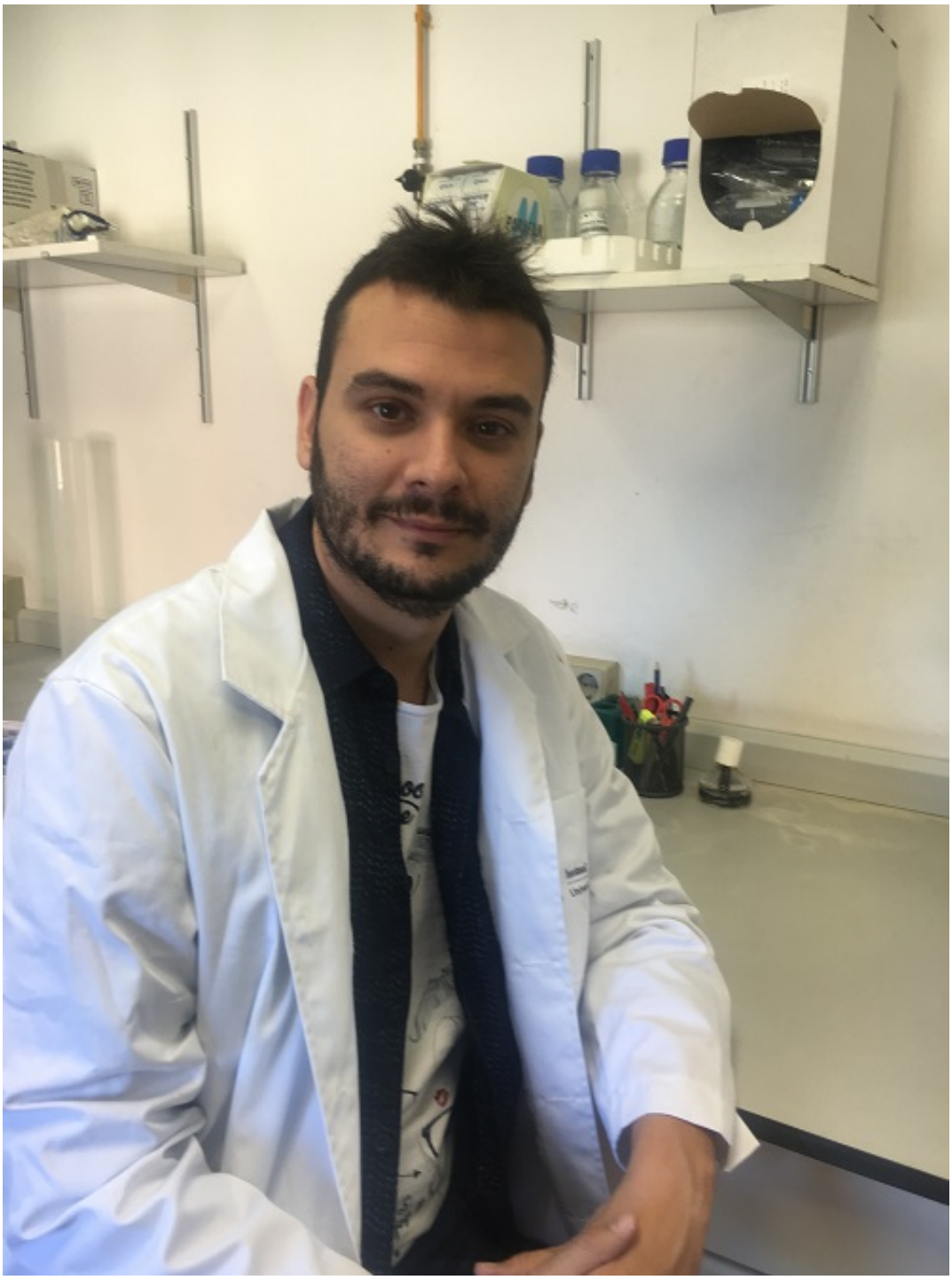

Credit: Carles Galdeano, Beatriu de Pinós researcher from the Faculty of Pharmacy and Food Sciences of the University of Barcelona

An international scientific team has developed a new small molecule –VH298- which can provoke a hypoxic response controlled from outside the cells, according to a study recently published in the magazine *Nature Communications* with its first authors being the expert Carles Galdeano, Beatriu de Pinós researcher at the Department of Pharmacy and Pharmaceutical Technology and Physical Chemistry of the Faculty of Pharmacy and Food Sciences and the Institute of Biomedicine of the University of Barcelona (IBUB), and Julianty Frost, from the University of Dundee (United Kingdom).

This new study, led by the researcher Alessio Ciulli from the University of Dundee (United Kingdom), is a new therapeutic approach of great importance in the field of research on ischemic injury –produced by the lack of blood circulation- in the brain and heart, and also cardiovascular injuries and anaemia for chronic renal diseases or chemotherapy.

A new therapeutic target of biomedical interest

The use of small molecules is an area with growing interest in the development of new drugs since it allows verifying new pharmacological targets in a selective way and adding chemical compounds that can be quickly developed as drugs. However, identifying and developing these molecules is extremely difficult.

According to the UB researcher Carles Galdeano, "VH298 can inhibit the protein-protein interaction between the E3 ubiquitin ligase VHL and the HIF-1α transcription factor, a process that causes –in a selective and controlled way- a set of similar processes in cells that are under hypoxia conditions, that is, lack of oxygen. This work verifies for the first time the E3 ligase VHL protein as a therapeutic target that can be modified with drugs. VH298 is able to stimulate the levels of the hormone erythropoietin (EPO) in cells, able to increase blood cells ". In short, it is as if cells were given oxygen, but in this case it is done through a

pharmacological treatment.

Carles Galdeano is member of the Research Group on Computational Biology and Drug Design of the UB and collaborates with the group the ICREA researcher Xavier Barril. He graduated in Pharmacy at the University of Barcelona, where he got the doctorate in 2012 with his thesis "Disseny, síntesi, avaluació farmacològica i modelatge molecular de nous inhibidors de l'acetilcolinesterasa de lloc d'unió dual", a work of great scientific interest in the field of study on neurodegenerative diseases, such as Alzheimer.

Galdeano, who is now focusing his researching work on the identification and characterization of small molecules with biomedical interest in the system of proteasome ubiquitin, did his postdoctoral studies at the University of Cambridge and University of Dundee (United Kingdom), granted by European Union's Marie Curie.

Provided by University of Barcelona