Scientists identify bioactive compounds in cacao pods to develop drugs to combat skeletal disorders

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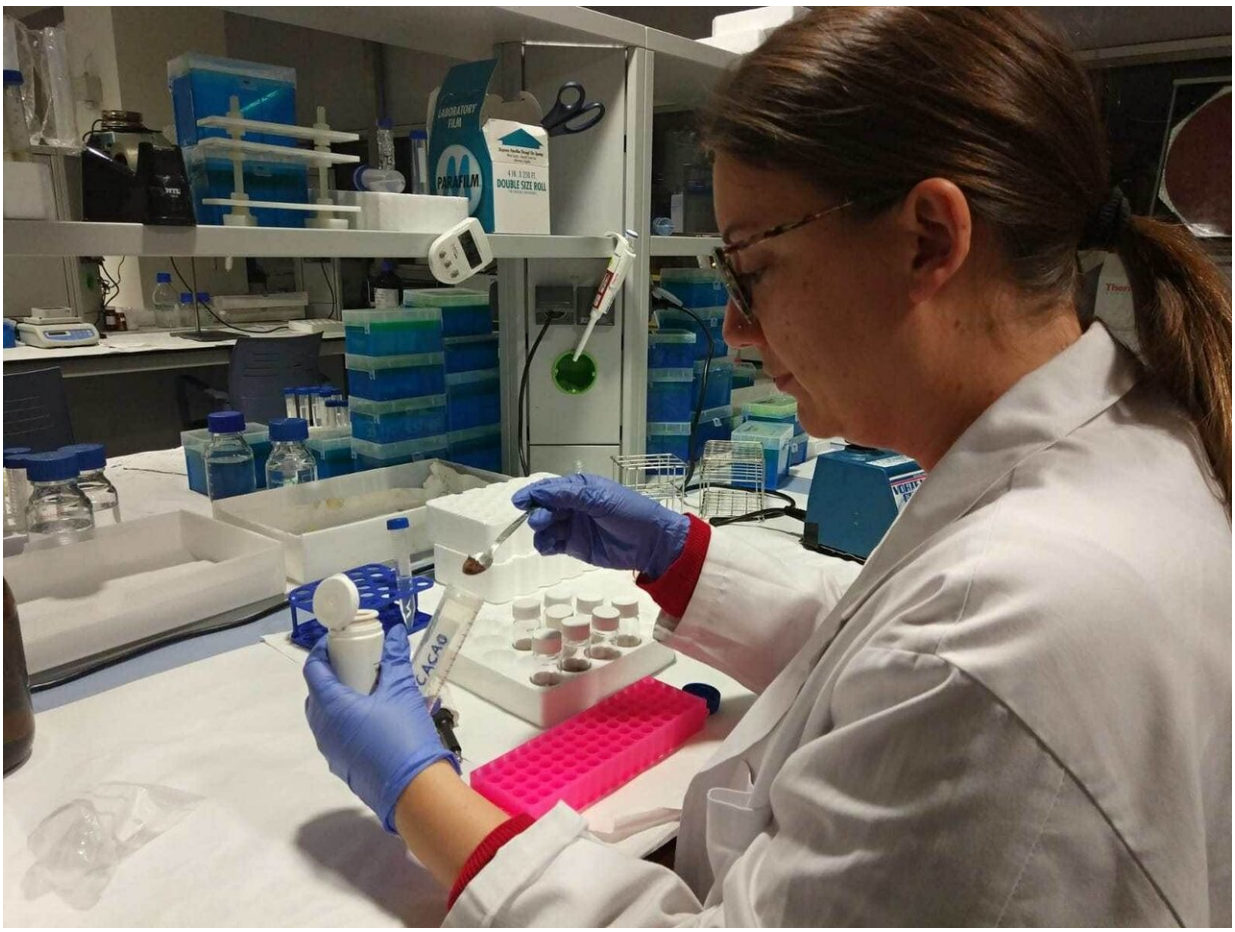

María de la Luz Cádiz Gurrea. Credit: University of Granada

An international team of researchers, led by the University of Granada (UGR) in Spain, has successfully isolated a bioactive compound present in cocoa bean extract that has proven effective in combating skeletal diseases such as achondroplasia. This genetic bone dysplasia, the primary cause of dwarfism, is a rare disease that affects one in 25,000 newborns. To date, no effective treatment has been developed.

The UGR researchers note that the (mainly phenolic) compounds contained in the fruit of the cacao tree (Theobroma cacao) offer a range health benefits. In recent years, numerous studies have therefore endeavoured to study their composition and bioactivity in relation to different pathologies.

In collaboration with other research groups based in Paris, Tunisia, and Almeria, the UGR scientists have focused on purifying the phenolic compounds found in cocoa bean extract and testing their toxicity at the cellular level. The aim is to be able to use them to develop drugs, nutraceuticals and/or functional foods.

The main author of a recently-published paper on this study,María de la Luz Cádiz Gurrea, of the UGR's Department of Analytical Chemistry and the Technology Centre for Functional Food Research and Development (CIDAF), explains: "To obtain different fractions of compounds of greater or lesser purity, we used different techniques, including solid-phase extraction, separation via micro-, ultra-, and nano-filtration membranes, semi-preparative liquid chromatography, and combinations of some of these." In addition, all the samples obtained were analysed via high-performance liquid chromatography combined with time-of-flight mass spectrometry analysis.

A beneficial effect

In general terms, the findings showed that the resulting fractions

presented no toxicity, except for high concentrations of the purest fractions. This could be due to the major bioactive potential of the individual compounds. These results indicate that the bioactive compounds found in cocoa bean extract could have a beneficial effect at low concentrations, and they can be easily incorporated into different products.

More specifically, such compounds could be used for pharmaceutical purposes, acting directly on the skeleton among achondroplasia sufferers. Such a pharmaceutical formulation could be taken from a young age, with no short- or long-term side effects.

This project has provided the groundwork for the application of these compounds to rare skeletal pathologies.

More information: Bioactive Compounds from Theobroma cacao: Effect of Isolation and Safety Evaluation.
Plant Foods for Human Nutrition. *Springer Nature*.
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