***ꞵ-carotene oxygenase 2 deficiency-triggered mitochondrial oxidative stress promotes low-grade inflammation and metabolic dysfunction***

Little is known about the pigments in foods and their relationship to human nutrition. Humans do gain nutritional benefits from these pigments known as carotenoids, but little else is known. I interviewed Dr. Daniel Lin from Oklahoma State University whose research is focused on how pigments within certain foods effect the human body and the benefits they have on the gut microbiome.

There have not been many studies into carotenoids, so there is not much information into their mechanisms and processes within the human body like vitamin A. Carotenoids are typically found in plants and certain types of bacteria. They are yellow, orange, or red in color typically making the plant that color as well. An example of this is turmeric, sweet potatoes, or tomatoes. In the plants that they are found in they play an essential role in photosynthesis or the capture of light to make food for the plant. Many of these fruits and vegetables are a part of most people’s diet without them even knowing it. This signals a need to look further into what these pigments do for our bodies.

Dr. Daniel Lin hopes to further study how these pigments effect our body and our health. In his recent publication, *ꞵ-carotene oxygenase 2 deficiency-triggered mitochondrial oxidative stress promotes low-grade inflammation and metabolic dysfunction*, Dr. Lin’s research focuses on ꞵ-carotene specifically. Dr. Lin said the most challenging thing about designing these experiments and conducting them was that there is not much data or information on what or how this exactly happens in the human body. It is also hard to tell the difference between attached carotenoids and metabolites. Some other challenges include but are not limited to the sheer number of molecules and carotenoids to study as well as not quite knowing what to expect. From the perspective of someone not involved in research and science, as a whole it is difficult to remember that experiments are not always clear cut or a straight line. Although we have a solid understanding on many of the complicated processes that the human body performs to keep us going and this does aide researchers in having a more thorough understanding when formulation a hypothesis or what they think will happen in the experiment. For Dr. Lin’s research into ꞵ-carotene and mitochondrial stress the suspected outcome, that deficiency and stress cause inflammation, was fundamentally correct but they also discovered that there were other differences that also played into these processes as well. Dr. Lin hopes the next step is to study how the pigments help with non-absorbed carotenoid’s effects on the gut microbiome. From this research there is evidence that deficiency in theses necessary nutrients leads to inflammation and eventually other diseases like diabetes. It was found in this research that mitochondrial targeted antioxidants such as Mito-TEMPO help to reduce mitochondrial stress and inflammation. Other than finding new ways to possibly treat inflammation there is hope that this data and future experiments will lead to more solid information on carotenoid intake. This could also assist physicians, nutritionists, and dieticians in having a more concise recommendation for daily intake of foods containing these nutrients. Although this area may be difficult to study it seems rewarding and further research just uncovers more to study. It will be interesting to see how this line of research influences both the medical and nutritional field and further adds to the knowledge of how our body works and how certain foods benefit it.

**References:**

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