



Characterisation of the role of dietary anthocyanins in regulating the cellular metabolism of bilirubin

Marco Stebel, Nevenka Medic, Paola Pelizzo, Federica Tramer, Antonella Bandiera, Andreja Vanzo* & Sabina Passamonti
 PROJECT PARTNER 1 - Department of Life Sciences, University of Trieste & *LEAD PARTNER – Agricultural Institute of Slovenia

WHAT IS BILIRUBIN?

Bilirubin is a molecule synthesised in the cells of our body at the rate of about 300 mg/die. Small increases of blood bilirubin have been shown to reduce the risk of several human age-related diseases, including Alzheimer diseases¹.

¹Ahmed AIA, Driessen S, Van Schendel FME. Role of plasma bilirubin as a biomarker for Alzheimer's disease: A retrospective cohort study. Vol. 62, Journal of the American Geriatrics Society. 2014. 62: 398–9.

WHAT ARE ANTHOCYANINS?

Anthocyanins are natural pigments occurring in red or blue fruits and beverages, e.g. wine. A diet rich in anthocyanins has demonstrated protection against cognitive decline¹.

¹Hein S, Whyte AR, Wood E, Rodriguez-Mateos A, Williams CM. Systematic Review of the Effects of Blueberry on Cognitive Performance as We Age. J Gerontol A Biol Sci Med Sci. 2019. 74 :984-995.

RESEARCH QUESTION & RELEVANCE

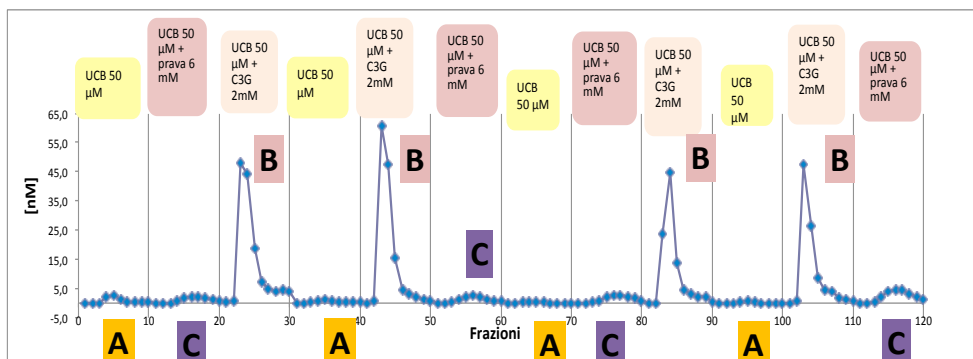
Could dietary anthocyanins raise the levels of bilirubin in blood?

If so, a diet rich in red fruits and some wine might protect us against age-related disease risk, including neurodegenerative diseases and cognitive decline. Red pigments and bilirubin may act in synergy.

EXPERIMENTAL APPROACH

- Since the liver is the organ that clears the blood from bilirubin, we tested the ability of a pure anthocyanin (cyanidine 3-glucoside, C3G) to inhibit bilirubin uptake by the rat liver.
- The liver was perfused with a saline solution containing glucose. Several injections of bilirubin alone or together with C3G or the drug pravastatin were done and the amount of bilirubin in the effluent was measured. A new ultra-sensitive fluorimetric bioassay of bilirubin was used.

EXPERIMENTAL RESULTS



1. The liver was able to take up bilirubin (injection A).
2. C3G caused some bilirubin to be released in the effluent (injection B).
3. The inhibitory effect of C3G was specific. Other compounds, such as the drug pravastatin, did not show this property (injection C).

CONCLUSIONS & PERSPECTIVES

- Our results show that anthocyanins can slow the rate at which the liver eliminates bilirubin.
- As a consequence, blood bilirubin may slightly increase according to the presence of these pigments in our diet.
- Both bilirubin and anthocyanins may therefore synergistically act to protect our organism and especially the brain from age-related functional decline.

CREDITS, ACKNOWLEDGEMENTS & CONTACTS

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