T50 NEWSLETTER

JUNE 2022

Clinical proof-of-principle study investigates the physiological *mineral buffer system* in blood.

Here we report the exciting findings of a recent human proof-of-principle study.

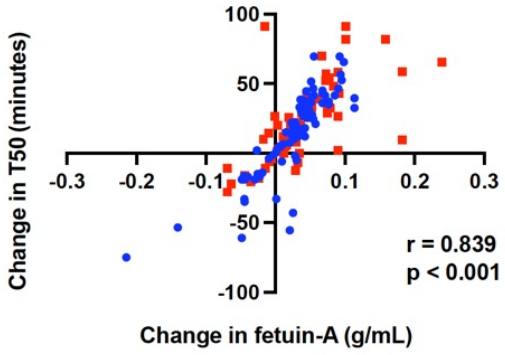
Calcium and phosphate concentration are metastabile in blood. Post-prandial increases in calcium and phosphate should therefore increase the risk of calcification deposition in soft tissues. The existence of a blood-borne mineral buffer system to sequester calcium phosphates and minimise the risk of deposition in the soft tissues has long been suspected.

Prof. Edward Smith and his team from the Royal Melbourne Hospital in Melbourne, Australia, studied the body's physiological response following a nutritional calcium phosphate load in adults with normal (n=16) and impaired kidney function (n=14).*

Following the ingestion, they found a sequential occurrence of calciprotein monomers (CPM), primary calciprotein particles (CPP1) and secondary calciprotein particles (CPP2) in blood.

Interestingly, the occurrence of the particles was preceded by a transient post-prandial increase in fetuin-A, which was coincident with an increase in T50.

According to the authors, «This study highlights the important, but often neglected, contribution of colloidal biochemistry to mineral homeostasis and provides novel insight into the dysregulation of mineral metabolism in CKD.»



Supplementary Figure S3: Change in T50 and serum fetuin-A from baseline after calcium and phosphate uptake.

Commentary by Prof. Andreas Pasch:

This is the first study demonstrating the formation of CPM, CPP1 and CPP2 after an oral mineral load in humans. It is thus the first study providing conclusive evidence of the existence of the long-suspected Mineral Buffer System in blood. Interestingly, the body increases it's mineral buffer capacity shortly after the food uptake, as evidenced by a corresponding increase in fetuin-A and T50.

*Effect of nutritional calcium and phosphate loading on calciprotein particle kinetics in adults with normal and impaired kidney function. Tiong MK, Cai MMX, Toussaint ND, Tan SJ, Pasch A, Smith ER.Sci Rep. 2022 May 5;12(1):7358. doi: 10.1038/s41598-022-11065-3.

The *T50 Newsletter* informs interested persons from medicine, science and industry about news on T50, CPP and Calciscon.

CALCISCON AG
Aarbergstrasse 46 · 2503 Biel/Bienne · Switzerland
www.calciscon.com · info@calciscon.com