

不同來源的胜肽螯合鈣之能力分析及其對 Caco-2細胞單層鈣吸收的影響

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- 三、歐洲鰻魚骨的胜肽螯合鈣之性質分析及對Caco-2細胞的凋亡作用
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摘要

胜肽螯合鈣可改善腸道吸收和生物利用度，通過較小分子或寡肽之途徑增強腸壁的吸收，同時具有更好的溶解性和熱穩定性，這些特性對於鈣通過食品加工和人體胃腸系統吸收鈣的持久性至關重要；螯合物還防止鈣離子在含有單寧、草酸鹽和植酸鹽的食物中沉澱來提高鈣的生物利用度，並使用 Caco-2 細胞在腸道進行吸收試驗，其滲透特性與人體小腸類似，廣泛用於藥物或營養物質在小腸內的攝取轉運和代謝研究。本篇目的探討為不同來源的胜肽螯合鈣之能力分析與對 Caco-2 細胞單層鈣吸收的影響。羅非魚骨膠原水解物(Tilapia Bone Collagen Hydrolysate, TBCH)使用 RP-HPLC 對其進行分析，並得到 GPAGPHGPVG、FDHIVY 和 YQEPVIAPKL，其在腸道的吸收與對照組相比分別分別提高 89 ± 9 、 202 ± 12 和 $130 \pm 7\%$ 。歐洲鰻魚骨胜肽(European eel bone collagen peptide, EBPC)與鈣螯合後，EBPC-Ca 含有較高含量的絲胺酸(serine)、蘇胺酸(threonine)、麩胺酸(glutamic acid)和丙胺酸(alanine)，同時在 Caco-2 細胞表現出更高的增殖作用，也發現高濃度的 EBPC-Ca 顯著促進 Caco-2 細胞的凋亡。豬骨膠原胜肽使用鹼性蛋白酶及中性酶製備具有高鈣結合能力的膠原蛋白肽，鈣螯合率為 78.38%，其在不同溫度和 pH 值下均穩定，同時顯著改善 Caco-2 細胞單層中的鈣轉運，並逆轉磷酸鹽和植酸鹽對鈣吸收的抑制作用，促進人體胃腸道對鈣的吸收。綜合以上結果，不同來源之胜肽螯合鈣在 Caco-2 細胞中，皆可改善鈣在腸道吸收的方式及效果，進而提升胜肽螯合鈣的生物利用度。

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