



Collagen peptides Improve your smile

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Introduction

- Collagen is a naturally occurring protein and constitutes 25% to 30 % of total protein and mainly abundant in skin;
- Absorption of collagen is unrealistic because of its high molecular weight;
- Collagen derived peptides or hydrolysates are proven to be safe after oral ingestion in humans;
- Collagen constitutes (X-Y- Gly) as the main amino acid sequence. Most often X and Y positions are proline and hydroxyproline with 28% and 38% respectively;
- Commercially, collagen peptides are derived from pig skin (46%), bovine hide (29.4%), pork and cattle bones (23.1%) and fish (1.5%);
- Alternative animal sources of collagen derived peptides are in demand for skin care.

Objectives

- To develop low molecular weight collagen peptides from poultry by-products for skin care;
- Increase the bioavailability by functionalization with amino sugars.

Approaches

- Caco-2 cells (HTB 37) are obtained from ATCC;
- All the cell culture reagents were from Invitrogen;
- Caco-2 cells will be used as an intestinal cell model to screen the absorption of functionalized collagen peptides;
- Caco-2 cells will be grown for 21days on transwell inserts for monitoring the transport of collagen derived peptides.
- Trans epithelial electrical resistance (TEER) will be used to probe the integrity of Caco-2 cells for transport studies.
- Glycosylation or glycation is known to enhance the functionality of food derived proteins or peptides;
- Using this approach we would select suitable peptide or collagen hydrolysate sequences which enhance absorption;
- This technology will be transferred to collagen hydrolysates of poultry by-products for increasing their bioavailability;
- Absorption will be monitored by Liquid chromatography methods (UPLC).

Results

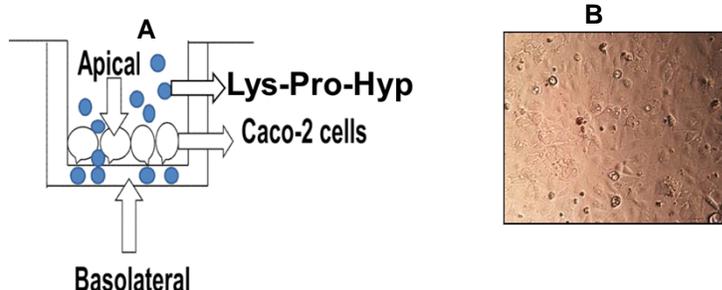


Fig1. Pictorial view of transwell (A) for screening collagen mimetic peptide (Lys-Pro-Hyp). (B) Morphology of confluent Caco-2 cells used for transport studies.

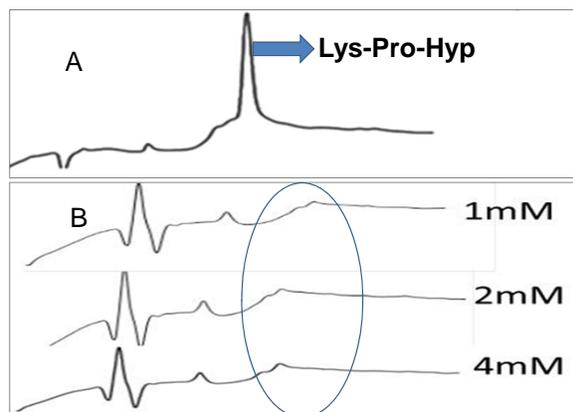


Fig 2. Collagen mimetic peptide (Lys-Pro-Hyp) (A) standard and (B) Absorption of Lys-Pro-Hyp with increasing concentrations in Caco-2 cell monolayer from Apical to basolateral surface.

Observations

- ❖ Caco-2 cells can be used to screen collagen mimetic peptide (Lys-Pro-Hyp) as observed from the transport studies;
- ❖ Collagen derived mimetic tripeptides (Lys-Pro-Hyp) can be transported through Caco-2 cells;

Conclusions

- ❖ Collagen derived peptides (Lys-Pro-Hyp) can be passed through Caco-2 cells;
- ❖ Caco-2 cell based screening method will be used to monitor for collagen derived functionalized peptides from poultry by-products.

Acknowledgements

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