

Latest Research Topics on Marine Placenta[®] (MPC)

~ Proposal for Ingredients Featuring Peptides ~

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The Science of Salmon[™]

Nippon Barrier Free Co.,Ltd.

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1. Metabolome Analysis of MPC

Regarding MPC, measurements were performed using CE-TOFMS (Capillary Electrophoresis-Time-of-Flight Mass Spectrometry). This test analyzed substances registered in the metabolite library.

As a result, 232 peaks were detected.

Among these 232 peaks, 160 were peptide-related. After excluding duplicates and those potentially non-peptide, 150 peaks were selected.

It was confirmed that these included **at least 148 types of dipeptides and 2 types of tripeptides**, indicating that peptides constitute a significant portion of the substances present in MPC.

Additionally, peaks corresponding to **24 types of free amino acids** were also identified.

2. Peptides Contained in MPC

Ile-Glu or Leu-Glu	Ile-Arg	Gln-Asn or Asn-Gln	Thr-Thr	Thr-Asp or Asp-Thr	Phe-Gln	Asn-Pro or Pro-Asn	Phe-Met
Gly-Ala or Ala-Gly	Arg-Lys or Lys-Arg	Val-Ser	Gly-Asp	Phe-Thr or Thr-Phe	Asp-His or His-Asp	β -Asp-Leu	Asn-Arg or Arg-Asn
Gly-Arg	Lys-Glu	Glu-Ser or Ser-Glu	Asn-Ala or Gln-Gly	Met-Thr or Thr-Met	Phe-Asp	S-Methylglutathione	Lys-Phe
Thr-Val or Ile-Ser or Val-Thr	Gln-Ala or Ala-Gln	Gly-Ser	Asn-Leu or Gln-Val	Lys-His or His-Lys	Gly-Pro	His-Asn	Met-Arg
Val-Gln or Leu-Asn	Lys-Lys	Val-Asp	Val-Met	Asp-Phe	Met-Asp	Met-Ser	γ -Glu-Val-Gly
Ala-Ile or Ile-Ala or Ala-Leu or Leu-Ala	Ala-Lys	Gly-Met or Met-Gly	Ser-Asn	Ser-Asp	H-Asp(Gly-OH)-OH	Asp-Asp	Phe-Arg
Lys-Leu or Ile-Lys	Arg-Ala	Asn-Lys or Lys-Asn	Glu-Arg	Ser-His or His-Ser	Gln-His	Gln-Tyr or Tyr-Gln	γ -Glu-Ile or γ -Glu-Leu
Ile-Thr or Thr-Leu or Leu-Thr	Val-Leu or Leu-Val	Val-Arg	Tyr-Glu or Glu-Tyr	Glu-Asp	Asp-Tyr	Val-Phe	Cystine
Leu-Asp Asp-Leu	Ser-Ser	Glu-Glu	Lys-Met	His-Leu or Leu-His	Gln-Asp or Asp-Gln	Pro-Thr or Thr-Pro	γ -Glu-Gly
Ala-Ala	Gly-Gly	Asn-Glu or Glu-Asn	Ala-Met	Val-His	His-Arg	Tyr-Asp	γ -Glu-Asn
Lys-Gly	Gln-Lys or Lys-Gln	Gly-Asn	Lys-Tyr	Arg-Arg	Val-Tyr	Asp-Met	
Ser-Lys or Lys-Ser	Thr-Arg	Gln-Glu or Glu-Gln	Gly-Tyr or Tyr-Gly	Arg-Val	Asp-Arg	γ -Glu-Ornithine or H-Asp(Lys-OH)-OH	
Lys-Ala	Gly-His	Thr-Glu	Ser-Met	Ala-Phe	Asn-Phe	Pro-Ile or Ile-Pro	
Gly-Gln	Ser-Thr or Thr-Ser	Phe-Glu	Gly-Val or Val-Gly	His-Ala or Ala-His	Asp-Ser	Trp-Asn	
Thr-Ala or Ala-Thr	Gln-Ser or Ser-Gln or Thr-Asn	Gly-Phe or Phe-Gly	Gln-Met or Met-Gln	Thr-His or His-Thr	Asn-Tyr or Tyr-Asn	Tyr-Lys	
Thr-Gly or Ser-Ala or Gly-Thr	Val-Asn	Met-Glu or Glu-Met	Ile-Met or Leu-Met	Asn-Asn	Asn-Val	Pro-Phe	
Arg-Glu	Arg-Ile or Arg-Leu	Lys-Thr or Thr-Lys	Ser-Phe or Phe-Ser or Tyr-Ala	Pro-Lys	Arg-Phe	γ -Glu-Gln	
Gly-Glu or Glu-Gly	Lys-Asp or Asp-Lys	Glu-Lys	Ala-Pro or Pro-Ala	His-Glu	γ -Glu-Ser	Glu-Trp	
Val-Glu	Leu-Leu or Leu-Ile	Arg-Asp	Tyr-Ser	Tyr-Thr or Thr-Tyr	Asp-Gly	Carnosine	
Ser-Arg	Ala-Asp or Asp-Ala	Thr-Gln	Asn-Met or Met-Asn	Met-Lys	Pro-Glu or Glu-Pro	His-His	

2. Peptides Contained in MPC

- Over 148 naturally derived dipeptides and two tripeptides were identified.
- It was confirmed that MPC contains ingredients equivalent to the following 9 ingredients※ that are naturally derived.

dipeptide-15 (Gly-Gly)	dipeptide-18 (Gly-His)	dipeptide-35 (Gly-Ser)
dipeptide-67 (Glu-Glu)	dipeptide-9 (Glu-Lys)	dipeptide-17 (Gly-Pro)
dipeptide-48 (Gly-Pro)	dipeptide-72 (Gln-His)	Carnosine

- Although not detectable individually in the analysis, the presence of four components equivalent to the following※ was also suggested as potentially naturally occurring.

dipeptide-19 (Leu-Glu)	dipeptide-63 (Gln-Ser)	dipeptide-47 (Arg-Leu)
dipeptide-59 (His-Lys)		

※ Since they are not peptides generated by synthesis, some do not meet the definition for full ingredient labeling names; therefore, they are described as equivalent.

3. Free Amino Acids Contained in MPC

- Twenty-four types of free amino acids were identified in the right table.
- Many of the amino acids contained were components of the Natural Moisturizing Factor (NMF).
(Yellow cells indicate NMF components)

Alanine	Phenylalanine
Leucine	Asparagine
Arginine	Histidine
Lysine	Tyrosine
Glutamic acid	2-Aminobutyric acid
Valine	Glutamine
Isoleucine	5-Hydroxylysine
Serine	Ornithine
Aspartic acid	Citrulline
Glycine	Proline
Methionine	GABA
Threonine	Tryptophan

4. Summary

Marine Placenta[®] (MPC) is:

1. A **multi-peptide material** containing a rich variety of oligopeptides.
2. A **natural-oriented ingredient** rich in peptides equivalent to synthetic peptides registered in the ingredient list, **all derived from natural sources**.
3. Rich in amino acids, which are components of NMF.



With natural-oriented marine multi-peptides and rich NMF components, it delivers multifaceted anti-aging benefits.