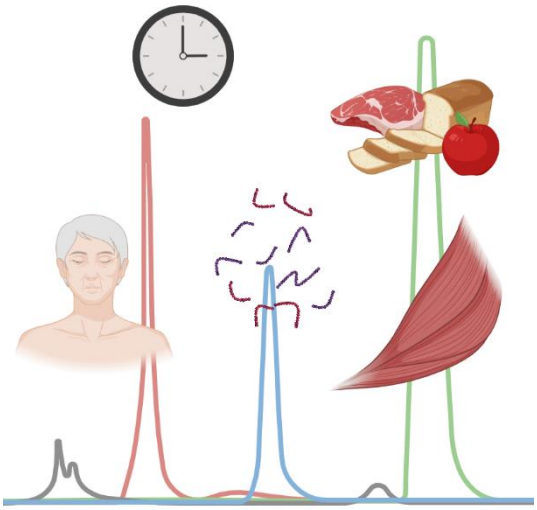
The role of peptides in skeletal muscle wasting.



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ABSTRACT

Objective: This master thesis aims to contribute to elucidating the peptide-muscle axis. To meet this goal, two concrete objectives were formulated:

1. a **systematic review** on the effect of peptides on the three main muscle wasting components (i.e. muscle mass, muscle strength and muscle function).
2. a study assessing the **short-term variability** (including prandial and exercise rhythms) of selected quorum sensing peptides (QSP) in human plasma.

Methods: For the review, a systematic literature search for relevant studies using Embase, Pubmed and Web of Science was performed. The crucial information from the included studies was extracted and laid out in a structured way. For the QSP short-term variability, young participants (20-30 years) were set on a 2-day timed meal protocol with blood samples being drawn before and after each meal. An extra sample was taken after an exercise session on the second day. The samples were processed and analyzed by UPLC-MS (MRM) for the presence of 17 selected QSP. Positive hits were determined by a dichotomic and probability approach. Qualitative binary and quantitative Cosinor analyses were afterwords performed to study the variability pattern.

Results: 86 studies were included in the review, revealing 75 chemically distinct peptides investigated for their influence on skeletal muscles. The identified peptides exhibit a wide biological, chemical and functional diversity, compounding the biochemical richness of muscle physiology. For the QSP study, 162 total positive hits from 30 participants over the two study days were obtained. The overall hit rate of 2.44% was in range of expected hit rate value based on prior research, with a possible influence of sampling time and meals, but not short-term exercise.

Conclusion: The review clarified the importance and role of peptides to muscle homeostasis research. The QSP short-term variability examination, a first study of its type, provides a solid foundation for future research on QSP rhythmicity in human plasma.