Oral peptide delivery: Translational challenges due to physiological effects

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Oral Peptide Delivery: Translational Challenges due to Physiological Effects

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Abstract

Oral delivery of peptide therapeutics as a convenient alternate to injections has been an area of research for the pharmaceutical scientific community for the last several decades. However, systemic delivery of therapeutic peptides via the oral route has been a daunting task due to the low pH denaturation of the peptides in the stomach, enzymatic instability, and poor transport across the tight junctions resulting in very low bioavailability. The low bioavailability is accompanied by large intra- and inter-subject variability leading to translational issues, preventing the development of successful peptide therapeutics. The inter-subject variability leads to large differences in pharmacologic responses in individuals and thus the dose required to produce therapeutic effect could vary between individuals making the development of drug product a very difficult task. A substantial amount of research has been (and continues to be) performed with a focus on getting acceptable absorption and reproducible results. Nonetheless, the high variability and low bioavailability during oral administration of peptides is still a work in progress and under-explored in a systematic way.