

Metabolism of proteins is completed in the small intestine by proteolytic enzymes present in pancreatic and intestinal juices. The pancreas releases digestive enzymes into the small intestine. In the duodenum, the first section of the small intestine, trypsin breaks down proteins into single amino acids by a process called hydrolysis. During hydrolysis, a water molecule is placed between two amino acids, breaking the bond. Trypsin also activates the enzymes chymotrypsin, carboxypeptidase and elastase that are released into the small intestine for amino acid chain breakdown. While intestinal juice consists of aminopeptidase, tripeptidase and dipeptidase (Whitcomb & Lowe, 2007).

Finally, the end products of protein metabolism in the small intestine are amino acids.

The metabolic activity of the GIT, however, is not limited to orally administered proteins. Parenterally administered proteins and peptides may also be metabolized in the intestinal mucosa following intestinal secretion. At least 20 % of the degradation of endogenous albumin takes place in the GIT (Kontermann, 2011).

The kidneys constitute a major site of metabolism for many smaller sized proteins that undergo glomerular filtration. Glomerular filtration is generally the dominant, rate-limiting step in renal metabolism of protein drugs, with a cut-off value of approximately 60 KDa for molecular weight. In addition, molecular conformation and charge of proteins also contribute to the selectivity of glomerular filtration. For example, cationic macromolecules pass through the capillary wall more readily than neutral macromolecules, while neutral macromolecules pass through more readily than anionic macromolecules (Crommelin et al., 2008).

Various renal processes contribute to the elimination of peptides and proteins. For most substances, glomerular filtration is the dominant, rate-limiting step as