Uptake of *S*-(3-Amino-3-oxopropyl)-cysteine by Caco-2 Cells

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Acrylamide is a reactive neurotoxin with a high intestinal bioavailability. Recently we have shown that under the pH regime of the gut acrylamide can react with proteins and that this reaction reduces the uptake of acrylamide in a gut model. On the other hand, using radioactive labeled acrylamide, Bjellaas *et al.* [Toxicol. Sci. **100**, 374–380 (2007)] showed that *in vivo* the vast majority of orally administered acrylamide is absorbed and excreted as *N*-acetyl-*S*-(3-amino-3-oxopropyl)-cysteine with the urine. Therefore, we tested whether intestinal proteases can degrade a protein with acrylamide bound to cysteine residues. Furthermore we tested whether the product of this reaction, *S*-(3-amino-3-oxopropyl)-cysteine, can pass the intestinal barrier. Here we showed that *S*-(3-amino-3-oxopropyl)-cysteine is indeed a product of proteolytic degradation of acrylamide-treated proteins. Using Caco-2 cells as a gut model, we further showed that the non-protein amino acid *S*-(3-amino-3-oxopropyl)-cysteine is a substrate for the neutral and cationic amino acid transporter system. Hence we concluded that protein-bound acrylamide can be released in the intestine and that the resulting product *S*-(3-amino-3-oxopropyl)-cysteine is transported through the intestinal barrier and later excreted via the urine.

Key words: Acrylamide, Intestinal Uptake, Amino Acid Transport System