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Commentary

Protein Phosphorylation and their Functional Abnormalities in Malabsorption

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DESCRIPTION

The significant enrichment of disruptive residues around phosphorylation sites, along which are obtained by applying DISPHOS to a variety of functional protein classes and proteomes, suggest that protein phosphorylation is predominantly in protein regions where intrinsically disordered. It strongly supports the hypothesis that Protein is an essential nutrient that is absorbed through the action of enzymes in the stomach, pancreas and small intestine. The gastric and pancreatic enzymes are important, but this appears to be the rate-limiting tissue in this process.

Although the clinical and laboratory features of this condition are non-specific and extensive, their presence provides clues to the underlying condition and serves as an indicator of the patient's nutritional status. The small peptides are taken up by the mucosa by various transport mechanisms. Diseases of the exocrine pancreas or small intestine can lead to significant protein-energy malnutrition, which can lead to significant structural and functional abnormalities in these tissues.

There are two basic processes causing congenital diarrhoea:

1. Secretory diarrhoea is brought on by the inhibition of intestinal absorption of electrolytes, increasing electrolyte and water flux towards the intestinal lumen.
2. Osmotic diarrhoea is brought on by non-digestion-absorption of nutrients leading to non-absorbed nutrients going into the lumen, increasing the osmotic force and driving fluids.

Energy deficit is caused by the malabsorption of macronutrients (carbohydrates, proteins, and lipids), and the symptoms vary depending on the macronutrient: carbohydrates cause watery, acrid diarrhoea; proteins cause edoema and hypoalbuminemia; and lipids cause steatorrhea and hypocholesterolemia.

The ionic malabsorption (Cl and Na) is the cause of severe and rapid dehydration, which can occasionally be accompanied by foetal defects (polyhydramnios and bowel dilatation). Proteins in food are first digested on the luminal level by pancreatic and stomach proteases, and then on the membrane level by peptidases connected to the brush border membrane of enterocytes. Dipeptides, tripeptides, and free amino acids are primarily the final byproducts of this digestion. Proton-coupled peptide transporters are used to transport free amino acids over the brush-border membrane, but not peptides, which are transported by numerous amino acid transporters.

Cytosolic peptidases hydrolyze dipeptides and tripeptides into free amino acids once they have entered the cell. Certain amino acid transporters, amino acids leave the cell over the basolateral membrane. The clinical effects of these problems rely on the individual amino acids whose absorption is compromised in each of the hereditary illnesses linked to amino acid transport deficiencies in the intestine. There haven't been any genetic disorders linked to intestinal peptide transport that have had substantial clinical repercussions.

The evidence for the involvement of many protein regions and even entire proteins (i.e., intrinsically disordered proteins) in protein-protein interactions, regulation, recognition, and signal transduction is rapidly growing. These proteins lack stable tertiary and/or secondary structure in solution.

Major advancements in the treatment of gastrointestinal illnesses have been made thanks to a better understanding of the physiology of the gastrointestinal tract. As an illustration, the creation of oral rehydration therapy based on knowledge of sodium transport across the enterocyte has contributed to the annual saving of thousands of lives. A number of intricate mechanisms are involved in digestion and nutrient absorption; some of these systems may be flawed from birth (primary disorders), while others may be flawed as a result of sick conditions (secondary disorders).

CONCLUSION

Reversible protein phosphorylation provides an important regulatory mechanism in eukaryotic cells. Due to the high variability of amino acid residues flanking the relatively limited number of experimentally identified phosphorylation sites,

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reliable prediction of such sites remains an important issue. These signaling proteins play important roles in the development of several pathological conditions, including cancer.