PEPTIDES AND BIOACTIVES IN MUCOSAL PROTECTION AND REPAIR

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The gastrointestinal tract maintains a dynamic equilibrium between aggressive factors such as acid, proteolytic agents and luminal bacteria and potent defence mechanisms. These defence mechanisms include rapid proliferation, antibacterial factors and in the stomach and colon, a continuous mucus layer. When a defect occurs it is usually rapidly healed by a combination of:

1. Early migration of surviving cells to re-establish epithelial continuity (restitution).
2. An increase in proliferation which only begins 24 to 48 hours following injury.
3. Remodelling of damaged area, a process which can take many months to occur.

At least 20 different peptides are involved in the healing process and they represent a complex, poorly understood homeostatic mechanism. However, many of these peptides can be considered as belonging to one of three broad categories according to their pathophysiological function.

1. Mucosal integrity peptides.
2. Luminal surveillance peptides.
3. Rapid response peptides.

Efforts to understand the function of these peptides have involved a combination of *in vitro* and *in vivo* model systems. Culture of primary and cancer cell lines allow investigation of cell migration and proliferation. *In vivo* models of disease further expand the study of proliferative activity and provide a useful initial screen for potential therapeutic activity. However, such models have limited clinical relevance and there continues to be the requirement for clinical-based studies. Models utilising genetic modification provide insights into function of peptides but these also have limitations when extrapolated to the human.

There is a long history of screening plant-based molecules for potential therapeutic usage. More recently there has been interest in the use of bioactive agents from animals such as bovine colostrum or honey to treat various medical conditions. These research studies are at a relatively early stage of development but appear hopeful. It is also clear that the distinction between food products and drugs is somewhat blurred, leading to the concept of nutriceuticals or functional foods.