Pattern formation in enteric nervous system
development: Building a complex nervous
system and human disease mechanisms

Summary
Normal intestinal function requires an integrated network of neurons and glia that controls most aspects of intestinal function. This network called the enteric nervous system (ENS) contains more neurons than the spinal cord and every transmitter found in the central nervous system. These cells are neural crest derivatives and the majority begin in the vagal region of the neural tube before migrating in a proximal to distal direction all the way down the bowel. ENS precursors have a very long migratory route and must extensively proliferate to populate the bowel before differentiating. Many mechanisms are shared in common between the developing central and enteric nervous system, but some unique mechanisms are required to generate the ENS. I will discuss the molecular genetics, cell biology and developmental biology underlying ENS development and how these mechanisms influence human disease.