Comparative physiology of peristalsis in the gastrointestinal tract of *Aplysia* and *Lymnaea*, Gastropoda, Mollusca

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The enteric nervous system (ENS), also called "the second brain", consists of a network of neurons that are intrinsic to the gastrointestinal tract in a wide variety of animals. In this study, we examined whether ENS neurons are competent to control ordered autonomous peristalsis, which is apparent in the crop of *Aplysia* and in the esophagus of *Lymnaea.* Autonomous bursting activities of ENS neurons were shown to be responsible for the rhythmic automaticity of peristalsis. Interestingly, the "pacemaker region", which regulates the rhythm of peristaltic movements, was found in the gizzard in *Aplysia* and in the crop in *Lymnaea*, which are both located distal to the regions with peristalsis. Thus, the bursting activities of ENS first occurred in the gizzard of *Aplysia* or in the crop of *Lymnaea* and then were propagated in an ascending direction (i.e., in the opposite direction of peristalsis) along the crop or esophagus, respectively. The conduction velocity of the peristaltic movement was faster in the esophagus of *Lymnaea* than in the crop of *Aplysia*. Different mechanisms were supposed to be involved in producing gastrointestinal peristalsis between the two species.