

Guanylin enhances Cl⁻ permeability across the intestine of the eel acclimated to sea water

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To clarify a role of guanylin in seawater eel intestine, homologous guanylin (GN) was applied to the mucosal fluid under standard condition, which mimicks *in vivo* situation, where the mucosa was bathed with MgSO₄ Ringer solution while the serosa was bathed with normal NaCl Ringer solution. Under such condition, GN enhanced Cl⁻ secretion accompanied by water secretion from serosa to mucosa. Even after blocking the Na⁺-K⁺-Cl⁻ cotransport system with bumetanide, similar enhancement by GN in Cl⁻ and water secretion was observed, indicating distinct action of GN from that on the Na⁺-K⁺-Cl⁻ cotransport. The transepithelial potential difference (PD) under standard condition could be explained by a difference in diffusion rates between Na⁺ and Cl⁻, because summation of Na⁺ and Cl⁻ diffusion potentials was almost identical with the actual PD observed under standard condition. When GN was added to the mucosal fluid under standard condition, the serosa-negative PD caused by a faster diffusion of Na⁺ than Cl⁻ decreased gradually, and was restored after treatment with diphenylamine-2-carboxylic acid (DPC), an inhibitor of Cl⁻ channels, suggesting that GN enhances Cl⁻ permeability in paracellular pathways.