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Summary

THE EFFECT OF VASOACTIVE INTESTINAL PEPTIDE ON INTESTINAL STEM CELL DIFFERENTIATION AND ACTIVITY

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In vitro organoid study demonstrates that vasoactive intestinal peptide modulates intestinal stem cell activity and secretory differentiation in homeostasis and enhances stem cell expansion and proliferation following radiation-induced injury.

KEY POINTS

- VIP treatment promoted secretory cell differentiation in murine intestinal organoids, with expansion of Lysozyme 1-positive and Mucin 2-positive cells mediated mainly by p38 MAPK and MEK1 signaling.
- Under homeostatic conditions, VIP induced expansion of Lgr5-positive intestinal stem cells while reducing overall EdU-positive cell proliferation, with upregulated cell cycle gene sets in sorted stem cells.
- In a radiation-induced acute injury model, VIP treatment promoted organoid viability, markedly increased EdU-positive cell proliferation, and caused prominent expansion and upregulated activity of Lgr5-positive stem cells.
- The authors suggest VIP may have potential in mitigating radiation-induced intestinal epithelial damage and promoting tissue regeneration after injury.

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