The illustration illuminates the potential pathways involved in the PTEN hamartoma tumor syndromes (PHTS), a collection of syndromes characterized by hamartomatous lesions most commonly found in the skin and the gastrointestinal tract and by a risk of malignancy caused by the presence of germline mutations of the tumor suppressor gene PTEN. Patients with PHTS have an increased rate of eosinophilic gastrointestinal disorders (EGID). In the left photomicrograph, a jejunal polyp includes numerous ganglion cells in the lamina propria (arrows), typical of gastrointestinal polyps in individuals with PHTS. In the right photomicrograph, a biopsy of nonpolypoid gastric mucosa shows marked eosinophilic inflammation (arrowhead).

**Abbreviations:** AKT, protein kinase B; CHK1, checkpoint kinase 1; CK2, casein kinase 2; EGR1, early growth response 1; FOXO, forkhead box protein O; GSK3, glycogen synthase kinase 3; HAUSP, herpesvirus-associated ubiquitin-specific protease; IGF2, insulin-like growth factor 2; MEK, MAPK/ERK kinase; miR, microRNA; mTOR, mammalian target of rapamycin; NEDD4-1, neural precursor cell expressed, developmentally downregulated-4-1; NF-κB, nuclear factor-κ-light-chain-enhancer of activated B cells; P, phosphorylation; PI3K, phosphoinositide 3-kinase;PIP2, phosphatidylinositol 4,5-bisphosphate; PIP3, phosphatidylinositol (3,4,5)-trisphosphate; PPAR-γ, peroxisome proliferator-activated receptor-γ; PTEN, phosphatase and tensin homolog; RTKs, receptor tyrosine kinases; UB, ubiquitination; UTR; untranslated region.
PTEN Mutations
10q22-23

PTEN hamartoma tumor syndromes (PHTS)

Eosinophilic Gastrointestinal Diseases (EGID)