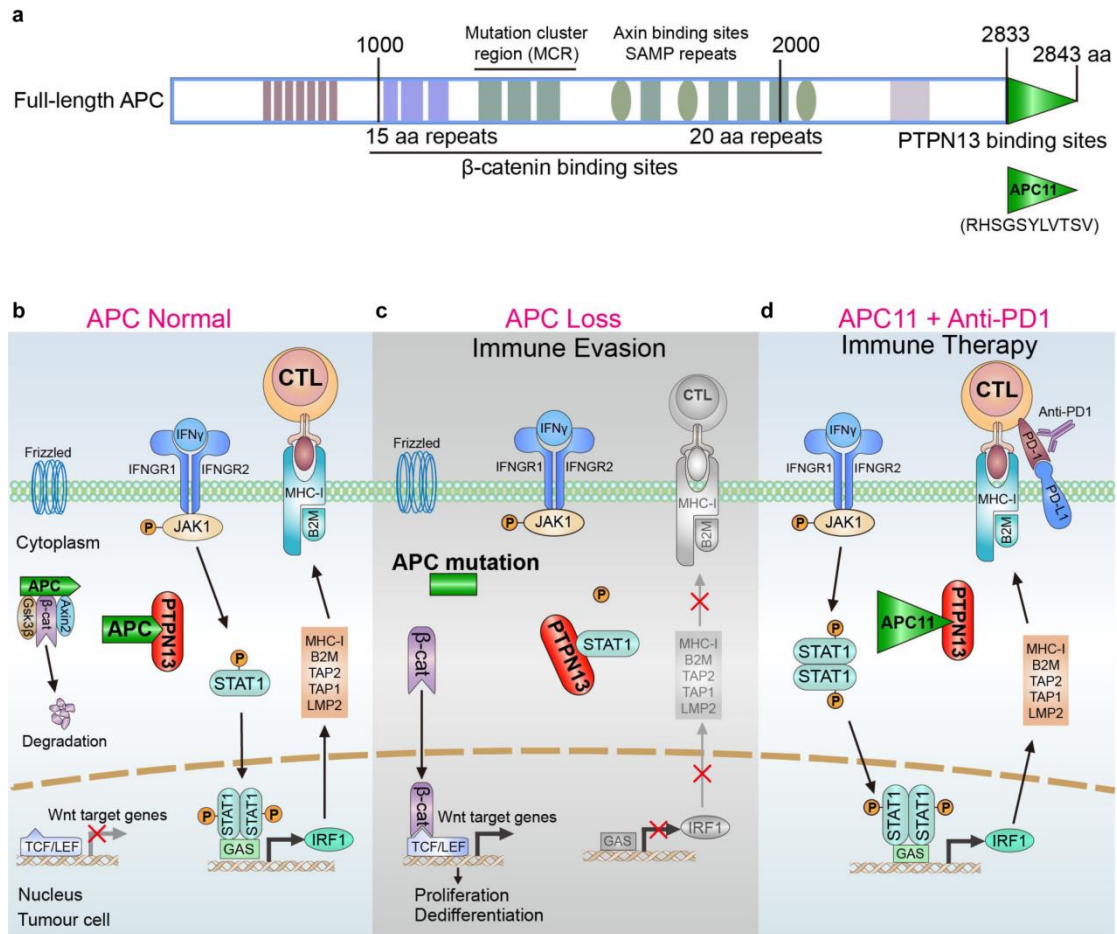




Supplementary information, Fig. S10. Diagram illustrating APC-loss-mediated tumor immune evasion. **a**, Diagram of the APC protein structure showing the regions relevant to Wnt signal transduction and PTPN13 interaction. **b**, In the presence of normal APC, APC is involved in destruction complex of β -catenin to inhibit Wnt/ β -catenin target gene transcription; meanwhile, C-terminus of APC directly interacts with PTPN13, competitively inhibiting the interaction between PTPN13 and STAT1. This enhances STAT1 phosphorylation and activates the IFN γ -STAT1-IRF1-MHC class I antigen presentation pathway, which ultimately leads to increased CD8 $^{+}$ T cell infiltration and suppression of tumor growth, independent of β -catenin. **c**, In the absence of APC (through genetic deletion or loss of function mutation), PTPN13 interacts with and dephosphorylates STAT1 to inhibit IFN γ -STAT1-IRF1-MHC class I antigen presentation pathway, leading to tumor immune evasion. **d**, The 11-aa peptide of C-terminal APC (APC11) binds to PTPN13, blocks PTPN13/STAT1 interaction to activate IFN γ -STAT1-IRF1-MHC-I antigen presentation signaling, overcomes tumor immune evasion, and synergizes with immune checkpoint blockade therapy.