DNA polymerase iota promotes invasion and metastasis in esophageal squamous cell carcinoma through the transcriptional factor ETS-1

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Abstract (300 word limit)

Statement of the Problem: An aberrantly elevated expression of DNA polymerase ι (Pol ι) is significantly associated with poor prognosis of cancer patients with esophageal squamous cell carcinoma(ESCC), yet the mechanisms remains obscur. Findings: Based on RNA-Seq transcriptome and real-time PCR analysis, the expression *Pol ι* was positively correlated with *ETS-1* in ESCC cell lines and clinical samples. Wound-healing and transwell assay indicated Pol ι-mediated invasiveness of ESCC was partly reversed through down-regulated ETS-1. Signaling pathway analysis showed Erk phosphorylation and ETS-1 phosphorylation played an important role in Pol ι-induced invasion of ESCC. Kaplan-Meier analysis revealed an inverse correlation between the level of ETS-1 phosphorylation and ESCC patient prognosis. Conclusion & Significance: ETS-1 phosphorylation may serve as a mediator of the Pol ι -induced invasion of ESCC, and all these findings further illustrate Pol ι is a potential prognostic biomarker for ESCC.

Recent Publications (minimum 5)

1. Zhou J, Zhang S, Xie L, et al. Overexpression of DNA polymerase iota (Pol iota) in esophageal squamous cell carcinoma. Cancer science. 2012; 103: 1574-9.
2. Sun H, Zou S, Zhang S, et al. Elevated DNA polymerase iota (Poli) is involved in the acquisition of aggressive phenotypes of human esophageal squamous cell cancer. International journal of clinical and experimental pathology. 2015; 8: 3591-601.
3. Zou S, Shang ZF, Liu B, et al. DNA polymerase iota (Pol iota) promotes invasion and metastasis of esophageal squamous cell carcinoma. Oncotarget. 2016; 7: 32274-85.
4. Dittmer J. The role of the transcription factor Ets1 in carcinoma. Seminars in cancer biology. 2015; 35: 20-38.
5. Phuchareon J, McCormick F, Eisele DW, et al. EGFR inhibition evokes innate drug resistance in lung cancer cells by preventing Akt activity and thus inactivating Ets-1 function. Proceedings of the National Academy of Sciences of the United States of America. 2015; 112: E3855-63.

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