Investigating the Role of Fusobacterium nucleatum in Esophageal Adenocarcinoma

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Fusobacterium nucleatum (Fn) is an opportunistic oral commensal bacterium that has been implicated in various GI disorders ranging from inflammatory bowel disease and appendicitis, to colorectal cancer (CRC). Recent studies have demonstrated that Fn stimulates CRC through the Annexin A1 (ANXA1) pathway. Esophageal adenocarcinoma (EAC) is a rapidly spreading cancer in the Western populations, yet it is severely understudied. Due to the similarities between EAC and CRC, it was hypothesized that Fn would play a similar role in both cancers. Thus, the purpose of this study was to test whether or not Fn is involved in EAC and if it plays a similar stimulatory role via the ANXA1 pathway. First, immunohistochemistry was performed on esophageal tissues collected from EAC patients to examine the presence of Fn. Next, growth stimulation assays were conducted to determine if Fn stimulates the growth of EAC cells. Western blot analysis was then performed to evaluate if Fn stimulates Annexin A1 expression. Finally, ANXA1 expression in EAC cells was suppressed by siRNA to examine its effect on cell growth. Through these studies, the presence of Fn in EAC was detected, and Fn showed a significant stimulatory effect on EAC cell growth. Additionally, Fn induced the production of Annexin A1, which was required for EAC growth. This is the first study to demonstrate the role of Fn in EAC, and based on its results, Fn and ANXA1 may be diagnostic and therapeutic biomarkers for EAC.