透過體外細胞-微生物系統中驗證 *Fusobacterium nucleatum* 誘導的基因表達和細胞遷移率的變化

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胃癌是全球十大癌症之一，而且死亡率是排名第四名。根據最新的癌症登記報告中，在台灣十大癌症死亡率中，胃癌排名第八名，造成胃癌的原因有環境影響還有飲食影響。胃癌早期症狀不明顯，再加上台灣人很少有接受胃鏡檢查的習慣，所以初次診斷出胃癌的患者，很多都是第三期及第四期的病人，造成了治療困難，導致五年存活率很低。

具核梭桿菌（*Fusobacterium nucleatum*）是一種厭氧口腔細菌，通常在人類的口腔中發現，也跟牙齦炎、牙周病有關，有發現具核梭桿菌可以利用口腔傳播的方式進入食道、胃部還有結腸。

幽門螺桿菌（*Helicobacter pylori*）是罹患胃癌的危險因素，能夠穿透粘膜層，讓胃黏膜漸漸的變薄，改變胃裡面的酸性環境，這時候具核梭桿菌就可以附著在胃的細胞上，促進胃癌的發展。

我們在之前的研究有發現具核梭桿菌附著在晚期胃癌病人中是很常見的，而且一旦有具核梭桿菌感染的時候，存活率就直接開始變差，對患者的生存也會產生不利影響。

我們目前使用了四株胃癌細胞株，分別為 AGS、MKN45、MKN28、GES-1，作為模型來研究 *Fusobacterium nucleatum* 對胃癌細胞的病理效應。這些細胞株與 *Fusobacterium nucleatum* 一起共培養，接著進行 qPCR 測試，以進一步驗證與 *Fusobacterium nucleatum* 共培養後基因表達的差異。

在未來，我們還會進行細胞遷移實驗，觀察每種胃癌細胞株與 *Fusobacterium nucleatum* 共培養後的遷移能力。透過這個研究，我們之後會發現病原細菌如何促進胃癌侵襲性。

Verification of *Fusobacterium nucleatum*-induced change in gene expression and cell mobility using an *in vitro* cell-microbe system

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Gastric cancer is one of the top ten cancers worldwide, with a mortality rate ranking at fourth. According to the latest cancer registry report, Taiwan, gastric cancer ranks eighth among the top ten cancer mortality rates. The high-risk causes of gastric cancer are attributed to environmental factors and dietary influences as well as Helicobacter pylori infection. The early symptoms of gastric cancer are not apparent, coupled with the uncommon practice of undergoing gastroscopy examinations among Taiwanese people. As a result, many patients are diagnosed with gastric cancer at stage III or IV, making treatment challenging and leading to a low five-year survival rate.

Fusobacterium nucleatum is an anaerobic oral bacterium commonly found in the human oral cavity and associated with gum inflammation and periodontal disease. It has been found that Fusobacterium nucleatum can spread through the oral route and enter the esophagus, stomach, and colon. Helicobacter pylori is a risk factor for developing gastric cancer. It can penetrate the mucosal layer, causing gradual thinning of the gastric mucosa and altering the acidity of the stomach's environment. At this point, Fusobacterium nucleatum can adhere to the stomach's cells, promoting the development of gastric cancer.

In our previous research, we found that Fusobacterium nucleatum attachment is highly prevalent in advanced gastric cancer patients. Moreover, once there is an infection of Fusobacterium nucleatum, the survival rate significantly deteriorates, adversely impacting the patients' overall survival.

We currently use four gastric cancer cell lines, AGS, MKN45, MKN28, and GES-1, as model to investigate the pathological effect of Fusobacterium nucleatum to the gastric cancer cells. These cell lines are co-cultured with Fusobacterium nucleatum, and subsequent qPCR tests are conducted to further validate the differences in gene expression after co-cultivation with Fusobacterium nucleatum. In the future, we will also conduct cell migration experiments to observe the mobility of each gastric cancer cell line after co-cultivation with Fusobacterium nucleatum. Through our study, we will increase our understanding how pathogenic bacterium promotes invasiveness of gastric cancer.