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IN BRIEF

PANCREATIC CANCER

FAK regulates sensitivity to immunotherapy

Newly published research in mouse models of pancreatic ductal adenocarcinoma (PDAC), in which immunotherapy alone is largely ineffective, has revealed that inhibition of focal adhesion kinase (FAK) promotes sensitivity to adoptive T-cell transfer and inhibition of both cytotoxic T-lymphocyte protein-4 (CTLA-4) and programmed cell death-1 (PD-1). Based upon the finding of increased FAK expression in human PDAC biopsy samples, researchers inhibited FAK in a mouse model of PDAC. FAK inhibition delayed tumour progression and markedly reduced the extent of tumour fibrosis. When FAK inhibition was combined with other therapies, such as gemcitabine, it significanty increased overall survival, and the addition of adoptive T-cell transfer resulted in further inhibition of tumour growth. The combination of anti-PD1/anti-CTLA-4 with FAK inhibition resulted in significantly improved overall survival: ~20% of mice treated with this regimen survived for 180 days from the start of treatment, thus indicating a need for further investigation of FAK inhibition in patients with PDAC.

ORIGINAL ARTICLE Jiang, H. *et al.* Targeting focal adhesion kinase renders pancreatic cancers responsive to checkpoint immunotherapy. *Nature* http://dx.doi.org/10.1038/nm.4123 (2016)

TARGETED THERAPIES

P-selectin guides nanoparticle delivery to tumours

Most solid tumours are difficult to target with nanoparticles owing to the presence of a vascular barrier. Now, researchers have successfully delivered localized chemotherapy using a fucoidan-based nanoparticle with a high affinity for the cell-surface adhesion protein P-selectin, a molecule expressed on the vascular barrier of a wide variety of human cancers. Researchers used this nanoparticle to deliver doxorubicin to tumours in mice with metastatic melanoma or breast cancer: treatment with fucoidan-doxorubicin nanoparticles resulted in a significant increase in overall survival of these mice, relative to mice treated with non-fucoidan doxorubicin-conjugated nanoparticles, or conventionally delivered chemotherapy. These data indicate a need for further testing of P-selectin targeted therapies.

ORIGINAL ARTICLE Shamay, Y. *et al.* P-selectin is a nanotherapeutic delivery target in the tumor microenvironment. *Sci. Transl. Med.* **8**, 345ra87 (2016).

LUNG CANCER

Tumour-suppressive TANs identified in humans

Tumour-associated neutrophils (TANs) can be detected in the microenvironment of most tumours; however, the role of these cells has yet to be established. Now, an *in vitro* analysis of tumour biopsy and blood samples from patients with stage I–II lung cancer has identified a subset of TANs with a tumour suppressive role. These TANs expressed cell-surface proteins more typically observed on antigen-presenting cells (APCs), that were not detectable on neutrophils in patients' peripheral blood samples. An antigen-presenting role of APC-like TANs was then confirmed by the ability of these cells to trigger memory T-cell responses to HLA class I and class II epitopes. These cells were most commonly observed in the microenvironment of tumours <3 cm in diameter, but were absent in patients with tumours >7 cm, suggesting that APC-like TANs have a tumour suppressive effect.

ORIGINAL ARTICLE Singhal, S. *et al.* Origin and role of a subset of tumor-associated neutrophils with antigen-presenting cell features in early-stage human lung cancer. *Cancer Cell* http://dx.doi.org/10.1016/j.ccell.2016.06.001 (2016).