FIGHTING THE PANDEMIC! – MicroRNAs, the new weapon against pancreatic cancer.

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Introduction

With an average 5 year survival of <5% pancreatic cancer is a leading cause of cancer related morbidity and mortality worldwide. In the UK in 2008, the incidence of pancreatic cancer was 13.2 cases per 100,000 with a mortality rate of 12.7 per 100,000 and a median 5 year survival of <3%. Current therapeutic approaches have little efficacy and many patients are given a survival prognosis of months from time of diagnosis. The incidence of pancreatic cancer increases with age, with >80% of diagnoses being in people over the age of 60. There is a slight increase in the number of males who develop pancreatic cancer. Tobacco use is responsible for ~25% of cases of pancreatic cancer with alcohol consumption and poor diet have a significant, if lesser effect.

MicroRNAs are short sequences of RNA which interfere with protein production within cells. In healthy cells, microRNAs fine tune protein expression in order to maintain normal cellular function. Some mutations involved in cancer are thought to perturb microRNA expression and in turn effect protein expression in a way which aids a cancers progression.

This study has utilised a mouse model of pancreatic cancer to establish how a specific mutation to a gene known as p53, which is known to drive pancreatic cancer, may affect microRNA expression and subsequently the development of the disease.

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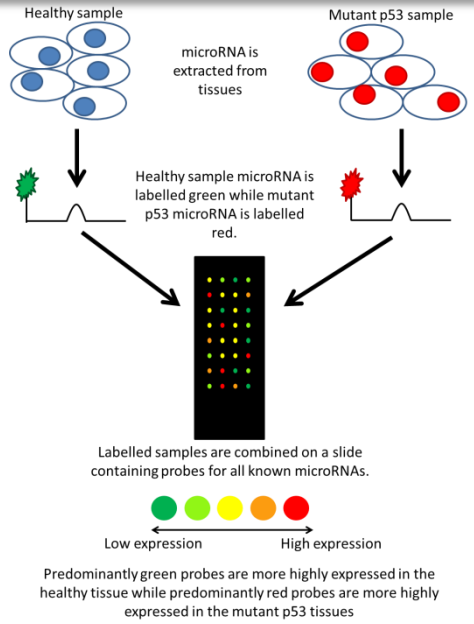
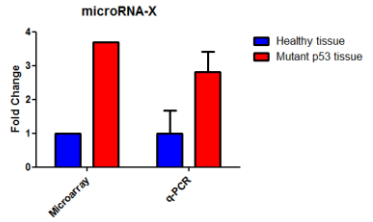
Methods

This study has implemented microRNA microarrays to compare microRNA gene expression in healthy tissue, to tissues harbouring a mutation to p53. MicroRNAs found to be differentially expressed were tested again using q-PCR to ensure the differential expression was genuine.



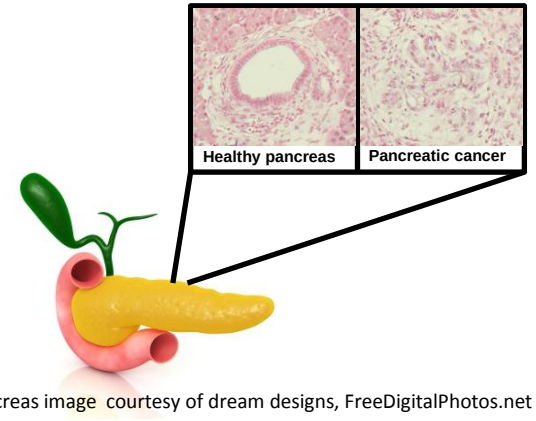
Results

The microarrays identified a number of microRNAs which were differentially expressed in tissues harbouring mutant p53. MicroRNA-X was the only microRNA where the change was statistically significant. Further analysis of this microRNA using Taqman q-PCR (Applied Biosystems) shown a similar change in expression which was also statistically significant. This microRNA has been linked to poor prognosis in pancreatic cancer and has also been shown to be a potential blood borne biomarker of pancreatic cancer.



Conclusion

MicroRNA-X has been found to be statistically significantly, differentially expressed in tissues which express mutant p53. Further work is required to establish the biological effect of microRNA-X in pancreatic cancer. If it is found to be involved in the disease progression, it may be a suitable target for therapeutic intervention.



Pancreas image courtesy of dream designs, FreeDigitalPhotos.net

References

All statistics were obtained from CancerResearch UK.