Tumour Suppressor GEN: Protein Level Expression Effects on Metastasis

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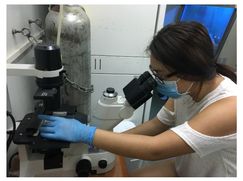
Funded by CHW under the Health Grand Challenge program

Introduction

- Gastric cancer rates are at an extreme high in Asian countries such as China.
- Gastric cancer mortality rate in China is FIND
- If the cancer has metastasized to organs such as the liver or brain, the **5 year survival rate** drops to **5%**.
- In this report the gene will be known as **GEN** to protect the further work of the graduate student.
- **GEN** is repressed in cancer cell lines and thus in gastric cancer. It is believed to be a **tumor**

Objective of the Study

The research project focused on discovering the role of **GEN** gene and its effects on **tumor metastasis in vitro**.

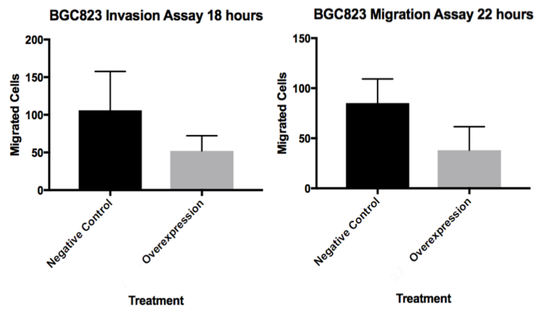


Methods

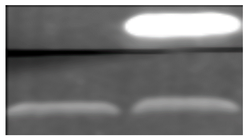
The Lab of Translational Medicine under the leadership of Dr.Tianhua Zhou studied different genes and proteins involved in gastric cancer metastasis using approaches such as **animal models** and traditional molecular biology experiments such as **Western Blot**, **Transwell**, and **Immunofluorescence Assays**.

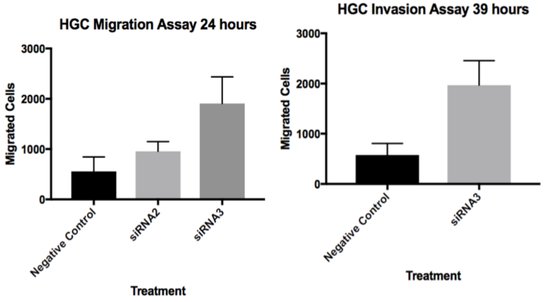
Results

GEN is **35 kiloDalton** in size and is supressed in cancer cell lines such a **HGC** and **BGC823**. **Overexpression of GEN** and two types of **siRNA** were used to study the protein expression level's effect on metastasis.

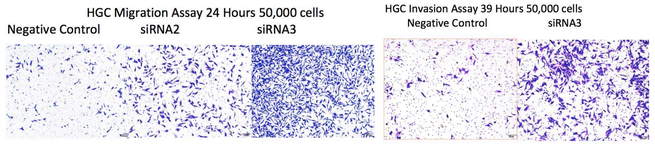


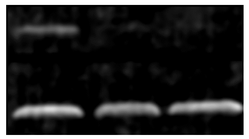
BGC823 cells were used to study overexpression using an injected plasmid. Less cells migrated after treatment. The Western blot supports the **change in protein expression** proving that the **plasmid transfection** worked.





In both cases, however, cells with further **repressed GEN** migrated more. Visual and graphical analysis supports the claim. The Western blots results support the claim of the treatment causing the **increase in migration and invasion rate.**





HGC cells were used to study a further repression of **GEN** using cell transfection with **siRNA type 2 and type 3** which targeted different domains of the protein. During my research, siRNA3 proved **more specific** in its targeting.

Discussion

These findings signify that **GEN** is a **tumor suppressor** gene that plays a significant role in cancer metastasis. Upon suppression of the gene, the migration and invasion rates of the cells increased. Correlating, the overexpression of **GEN** and the cell's lacking ability to migrate and invade, further proves that cancer cells themselves shut down **GEN** internally in order to be able to migrate to such organs as the liver.

A study done **in vivo** should occur next in order to test the theories accuracy in practice. Further, an investigation of the **mechanism** is necessary to study the association of GEN with other proteins.

Questions

- Why is gastric cancer so prevalent in Asian populations?
- How do cancer cells regulate the expression of **GEN**?

Conclusion

In conclusion, **GEN** could become incorporated in **immunotherapy** treatments of many gastric cancers. By reversing or overexpressing the silenced gene, patients may lower their chance of metastasis and thus have a higher rate of survival.

Acknowledgements

I would like to thank the **Health Grand Challenge Program**, **CHW**, and **Zhejiang University Medical School**, in particular **Dr. Zhou's Laboratory of Translational Medicine**. Thank you for the funds provided for me to be able to preform my research as well as for the large support given by my graduate student supervisors who helped me every step of the way.