

The Effects of Exon 14 Skipping in Lung Cancer Patients

Shayla Murray, 2021, Department of Ecology and Evolutionary Biology
Rutgers Cancer Institute of New Jersey
Funded by CHW under the Global Health and Health Policy Department

Introduction

- Rutgers Cancer Institute is a cancer treatment and research institution
- Investigating the exon 14 skipping mechanism in lung cancer patients
- Important work because if we prove these lung cancers are associated with exon 14 skipping, they can be treated with MET inhibitors

Objective of the Project

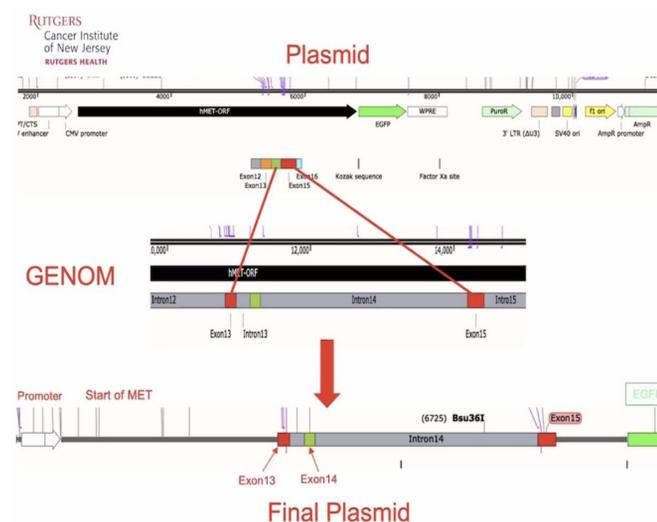
The objective of the project was to prove that a 67 year old, female patient's lung cancer was the result of a MET mutation which led to exon 14 skipping.

Methods

- Conducted background research about known mutations related to exon 14 skipping
- Recommended experimental design using polymerase chain reaction (PCR)
- Recorded observations for each experiment

Results

- Results from the lab experiments is not yet conclusive, we can not say for sure that the patient as an exon 14 skipping mutation
- More rounds of PCR will be completed for confirmation
- However, patient is responding to MET inhibitor treatment, received through a drug called crizotinib



Graphic made by Husam Al-Hraishawi, a lab member, showing the experimental design of inserting a piece of human genome into the plasmid during the PCR reaction

RUTGERS
Cancer Institute
of New Jersey

Response to MET inhibitors in patients with stage IV lung adenocarcinomas harboring *MET* mutations causing exon 14 skipping

Paul K. Paik,^{1,3,*} Alexander Drilon,^{1,3} Pang-Dian Fan,² Helena Yu,^{1,3} Natasha Rekhtman,² Michelle S. Ginsberg,⁶ Laetitia Borsu,² Nikolaus Schultz,^{4,5} Michael F. Berger,^{2,3,4} Charles M. Rudin,^{1,3,7} and Marc Ladanyi^{2,4,7}

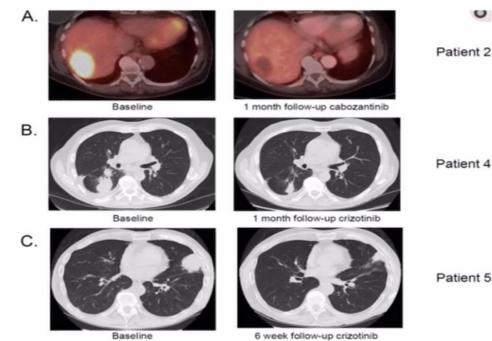


Photo from clinical report from Rutgers Cancer Institute showing tumor reduction post treatment with MET inhibitors

Discussion

- If we can prove that there is an association between this mutation and exon 14 skipping, it would provide a means for treating other lung cancer patients with a mutation near the same splice site
- Following the conclusion of this project, the lab will likely work to test other known mutations which cause exon 14 skipping, to see if they can also be treated with MET inhibitors

Personal Reflection

- The research I participated in the summer confirmed my career interest in clinical oncology
- Having a research background is useful even as a practicing physician

Conclusion

- The work completed this summer has provided some evidence of association between various non small cell lung cancers (NSCLC) and exon 14 skipping mutations

Acknowledgements

I would like to acknowledge the Rutgers Cancer Institute, specifically Dr. Ganesan and Husam Al-Hraishawi for their support all summer. I also acknowledge CHW and the GHP program for funding this opportunity.