Hirschsprung’s Disease: Understanding Persistence through Molecular Diagnostics

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Introduction
- Hirschsprung’s disease (HSCR) causes intestinal obstruction in the newborn due to a lack of ganglia in the distal bowel.
- The most common treatment is an invasive pull-through surgery.

Reflection
- I was able to learn how a large-scale research center operates in multiple aspects.
- I grew in my passion for research – it is trial and error, and learning from the mistakes is most valuable.
- I witnessed the importance of a supportive and cohesive team in building a positive work environment both outside and inside the lab.
- I enhanced my dedication to furthering the healthcare of children through research.

Objective of Internship
My summer project involved an investigation into the expression of several genes involved in normal smooth muscle contraction of the colon. I hoped to contribute to the explanation surrounding the persistence of HSCR symptoms post-pull-through operation.

Work profile
- NCRC is dedicated to improving the healthcare and lives of children through research.
- I was a part of a team dedicated to general pediatric surgery, specifically diseases of the bowel, and most prominently HSCR.

Results
- Our results showed downregulation of the following genes in both the aganglionic and ganglionic colon in HSCR patients: NCX2, KCNG3, KCNG4, JPH2, SCN1B (left), and FXYD1 (right).
- The marked reduction in the expression of these genes within ganglionic specimens suggests abnormal physiology in this region, which may explain the poor functional outcome in some patients following a properly performed pull-through operation.

Looking ahead
My summer at NCRC reinforced my dedication to becoming a pediatric surgeon-scientist. I am more sure than ever of the crucial bond linking the operating room and the bench.

Questions
- What is the link between the specific genes and the symptoms of the disease?
- What can the genetic differences and the abnormal physiology teach us about the treatment of HSCR?

Conclusion
Inherent genetic differences in HSCR that persist beyond surgery might be a sign for us to explore and consider alternatives to the operation.

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