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17TH ANNUAL CHILD HEALTH RESEARCH DAYS

Nutrition for a Changing World

The Science of Nourishing the Next Generation

CHRD 2021: Abstract & Poster Submission Form

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Research Category:

- Basic Science
- Clinical
- Community Health / Policy

What was your role in the project?

- Design
- Perform Experiments
- Analyze Data
- Write Abstract

Presenter Status:

- Undergraduate Students
- Masters Student
- PhD Student
- Post-Doctoral Fellows
- Residents
- Non-Trainee

Title

Food Sensitization and DNA methylation at age one in the CHILD Cohort

Background

DNA methylation (DNAm) plays a role in gene regulation and possibly alters cellular function of peripheral blood mononuclear cells (PBMCs), in turn influencing the development and severity of immune conditions such as allergy. Early life exposures can alter DNAm. Exposures such as diet are associated with food sensitization.

Objective

We hypothesized that DNAm might differ with sensitization to or introduction of highly allergenic foods.

Methods

Infant sensitization (skin prick testing at least 2 mm greater than the negative control) was measured to peanut, egg and cow's milk at 1 year and ages of food introduction were reported prospectively. DNAm of PBMCs was measured in blood samples at 1 year in a subset of 144 infants, over-sampled for documented atopy or wheeze. Statistical analysis of Illumina 450k array DNAm data was conducted in R, adjusting for clinical and genetic covariables. We chose false detection rate (FDR) p-values of 0.05 (high confidence) and 0.2 (medium confidence) and a minimum effect size of 0.01 to identify sites of differential DNAm.

Results

Based on predetermined FDR and effect size cutoffs, there were no significant DNAm differences between sensitized and non-sensitized infants. Borderline significant sites with high effect sizes were enriched for methylation quantitative trait loci, hinting at genetic factors influencing DNAm at these sites. DNAm patterns did not differ by peanut or egg introduction before or after 12 months.

Conclusion

This small pilot study did not show differences in methylation by food sensitization or introduction but demonstrated genetic influence on DNAm that differed by sensitization.

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