### Background

Peanut allergies are one of the most common types of food allergy.
- Not likely to be outgrown
- Currently no cure
- Food avoidance is the only means of preventing reactions.

**Many effects beyond a potential histamine response**
- Causes social isolation due to reluctance to eat outside of one’s home in order to avoid the allergen.
- Relying on food avoidance can be difficult due to unexpected contamination.

### Clinical Need

**Clear need for a robust allergen avoidance method**
- Our novel detector:
  - Utilizes antibodies to determine presence of peanut allergen
  - Is portable, reusable, and inexpensive.

### Description of Market

In the United States about 3 million people have peanut allergies.
- Over 1,600 caregivers reported that having a child with a food allergy has a significant economic impact.

### Device Workflow

**Place food in device**
- Add water through top
- Grind
- Add 7 drops of buffer to test chamber
  - (Wait 5 minutes)
- Insert test strip
  - Add cleaning fluid to neutralize allergen (if positive test)
- Rinse device
- Test again
- Wait 5 minutes and read results
- Insert test strip

### Reading the Results

**Positive Test**
- Two Lines Present (control & test lines)
**Negative Test**
- One Line Present (control line)
**Invalid Test**
- No Lines Present

### Estimated Manufacturing Cost

- **One time device cost:** $2.48
- **Recurring cost per test strip:** $8.80

### Regulatory Pathway

**Anticipated to be a 510(k) submission**
- Comparable devices on the market in terms of risk level.
  - Allows for the user to make a decision that could harm them if the information provided is incorrect.
  - No predicate device for detecting peanut allergens

### Acknowledgements

We would like to thank Dr. Conrad Zapanta for his instruction and guidance as our faculty advisor and course instructor. We would like to thank Abraham Etu Ebung Umo for his assistance as our TA. We would like to thank the URO for their generous funding to support our project. Finally, we would like to give a special thanks to Dr. Jerald Redmond for his assistance as our clinical/industry advisor.

### References

- "Facts and Statistics - Food Allergy Research & Education." [Facts and Statistics - Food Allergy Research & Education](#).
- "Nima – A Portable Gluten Tester." [T](#).

### Novelty

- Currently no devices on the market made for portable peanut allergen detection.
- Nima uses a similar process to detect traces of the gluten allergen.
  - $279 starting price
  - Starting R&D for a peanut allergen detector

### Target Market

- Our target users require ingestion of the allergen for a reaction, rather than a reaction brought on by allergen present in the air.

### Description of Device

**Developed Operating Procedure:**
- Tap water works as the solvent
- Coffee filter works to remove food particles
- Bleach works as allergen neutralizer

**Food Items Successfully Tested:** Trail mix components, tomato, Special K cereal, Butterfinger, Rice Krispies, bread crumbs

**Limitations:** Won’t detect a 100% peanut sample; qualitative not quantitative result