# **#CAMBSCIFEST**

### New Therapies to Prevent & Treat Food Allergies Andrew Macginnite, MD, PhD



# New Therapies to Prevent and Treat Food Allergies

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# Disclosures

- Investigator on trial of omalizumab to facilitate desensitization to peanut
  - Funded by Genentech, FARE
  - No financial benefit from outcome

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R C E A W A 0 K 

E N S







Antigen	Effect of response to antigen	
	Normal response	Deficient response
Infectious agent	Protective immunity	Recurrent infection
Innocuous substance	Allergy	No response
Grafted organ	Rejection	Acceptance
Self organ	Autoimmunity	Self tolerance
Tumor	Tumor immunity	Cancer

Figure 1-32 Immunobiology, 6/e. (© Garland Science 2005)

# What is allergy

## al·ler·gy /ˈalərjē/ ♠

noun

a damaging immune response by the body to a substance, especially pollen, fur, a particular food, or dust, to which it has become hypersensitive.

synonyms: hypersensitivity, sensitivity, allergic reaction; anaphylaxis "an allergy to feathers"

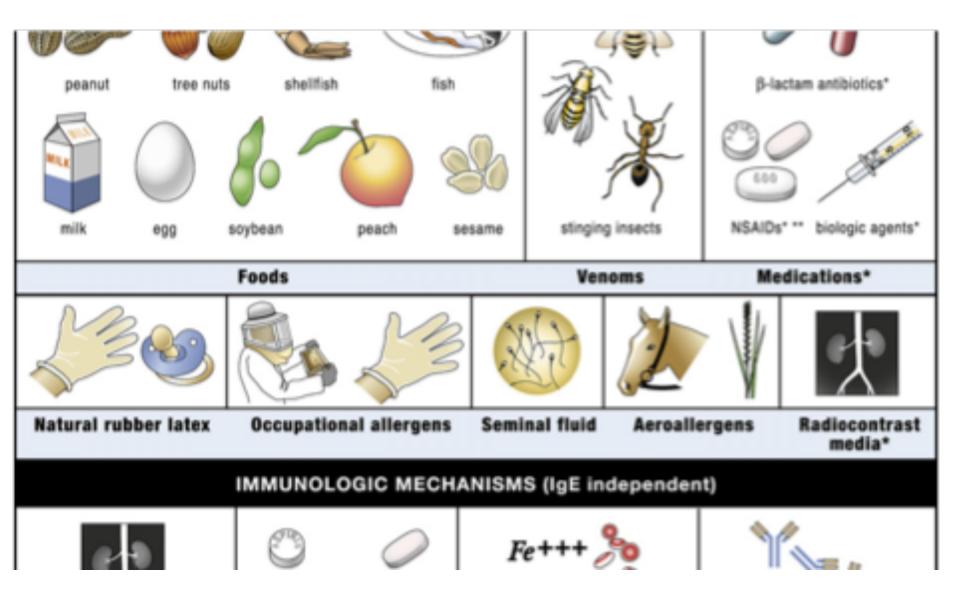
informal

#### an antipathy.

"their allergy to free enterprise"

synonyms: aversion, antipathy, opposition, hostility, antagonism, dislike, distaste

"their allergy to free enterprise"



### WAO Anaphylaxis guidelines

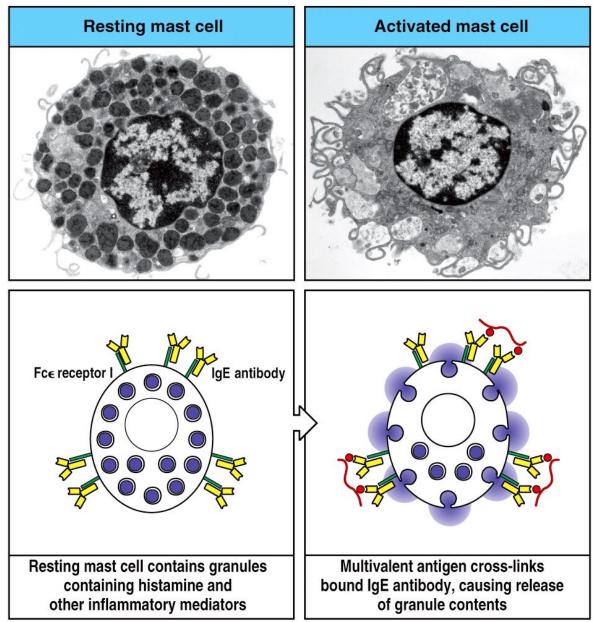


Figure 9-35 Immunobiology, 6/e. (© Garland Science 2005)

### Janeway Immunology

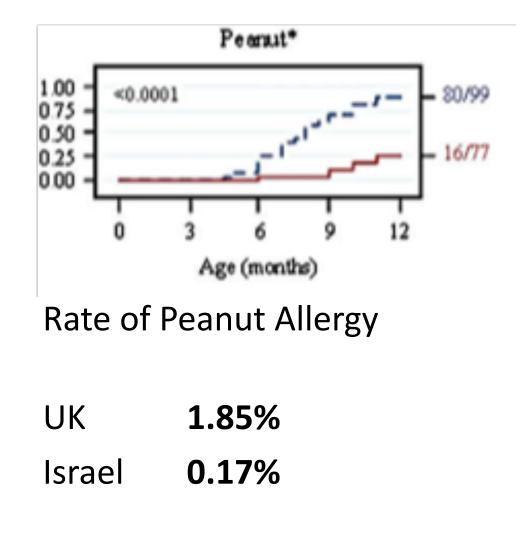
# Can we prevent food allergy?

Old advice- avoid highly allergenic foods until child is older (3 years)

New advice- earlier is better

# Can we prevent food allergy?

OSEM 🛞 Peanut Snack Net Wt. loz (28g 🕑)



Du Toit JACI 2008 122:984

About 10 fold reduction!

# How much food causes a reaction?

• Old advice- strictly avoid even trace amounts

• Future advice- maybe not?

## How much food causes a reaction?

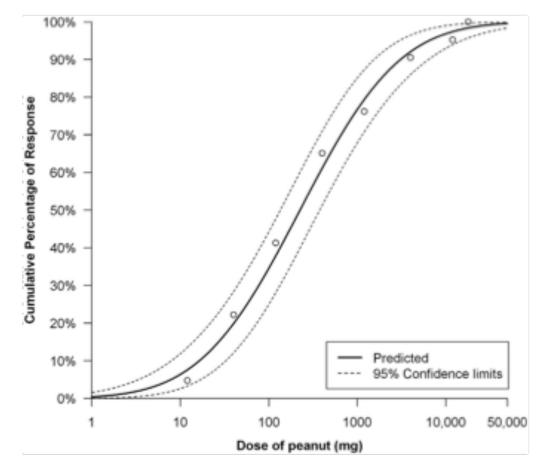


FIG 1. Log-normal probability distribution model of individual peanut thresholds (in milligrams of whole peanut) for patients with peanut allergy tested in this study. Distribution is based on lowest observed adverse effect levels and no observed adverse effect levels for objective symptoms only.

Blumchen JACI 2014 134:396

# Food Allergy Treatment

- Old (current) advice
  - Avoidance of implicated food
  - Self-injectable epinephrine
- New advice

– "That which doesn't kill us makes us stronger?"

# Desensitization

- Food allergens not intrinsically harmful
- Graded exposure effective in other allergies

– Venom

- Environmental allergies
- Initial trials of injections of foods with some efficacy

High rate of side effects

• Works with baked egg and milk

# Desensitization-the good

Increases amount of allergen patients can ingest.

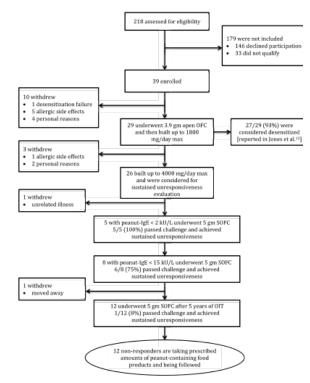


FIG 1. Conduct of the study.

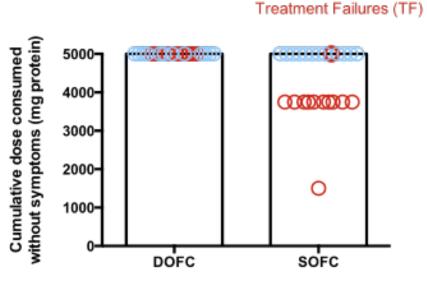


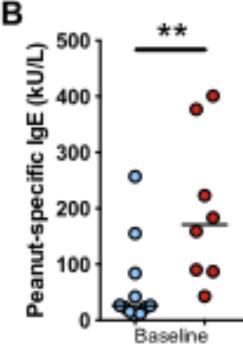
FIG 2. Food challenge results. Shown are the cumulative amounts of protein successfully ingested before onset of symptoms in TSs (blue circles) and TFs (red circles). Each circle represents 1 subject.

Vickery JACI14 133:468

Treatment Successes (TS)

# Desensitization-the bad

- Not all patients can be desensitized
- Many reactions
  - Anaphylaxis (10-15%)
  - Frequent GI symptoms
  - Eosinophilic eosphagitis
- Many kids hate taking food
- True tolerance rare
- Less severe patients benefit more



# Desensitization-summary

- Effort and time intensive
- Not a cure!
  - 1/3 or less with long term tolerance
- Increases amount of allergen patients can ingest
- May improve quality of life



# How does it work?

- Incredibly important
- Very little data
- Not like naturally outgrowing food allergy

# Oral immunotherapy induces IgG antibodies that act through FcγRIIb to suppress IgE-mediated hypersensitivity

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# Alternative approaches

- Low dose protect against accidental exposure
- Other routes (sublingual, epicutaenous)
- Start younger
- Treat longer
- Omalizumab to prevent reactions
- Adding something to influence immune response

# Quesstions?

May the force go with you!

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