Natural Course of Pediatric Food Allergy

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“Every food has its own story…”

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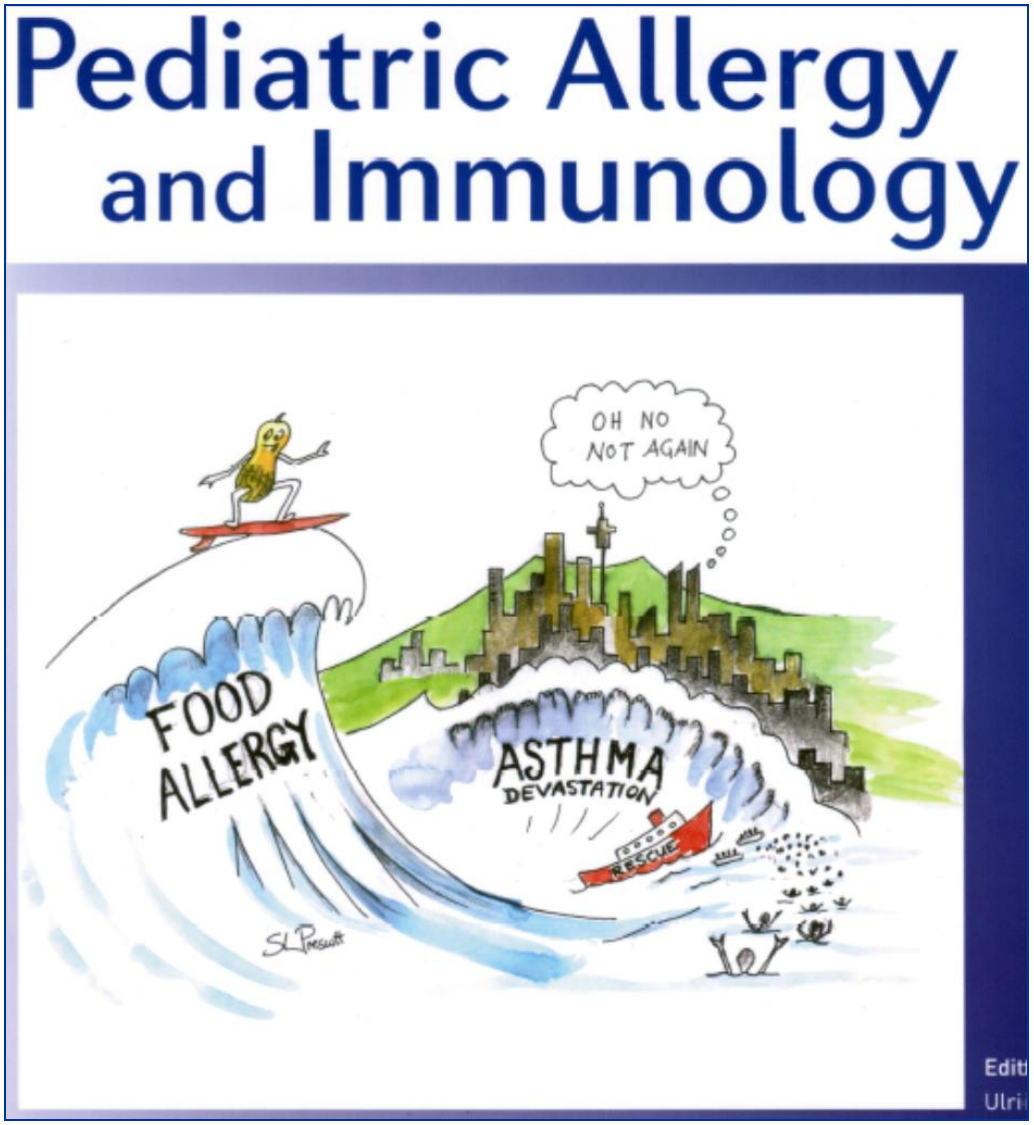
REVIEW ARTICLE

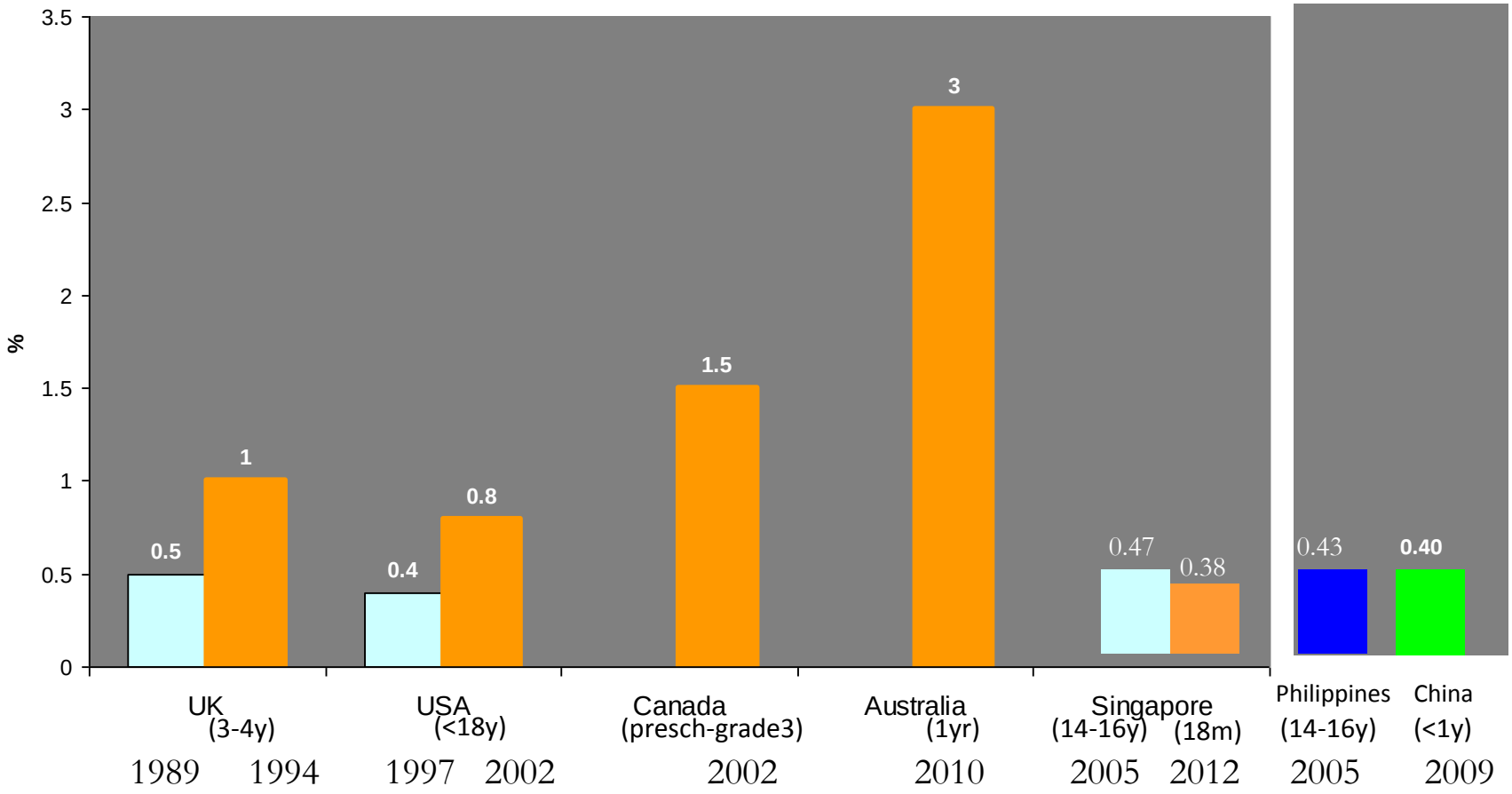
Food allergy: Riding the second wave of the allergy epidemic

Susan Prescott[1] & Katrina J. Allen[2]

Food Allergy: A 'hot' topic



Prevalence of Peanut Allergy Around the World



Grundy *et al*, J Allergy Clin Immunol 2002
Sicherer *et al*, J Allergy Clin Immunol 2003
Kagan *et al*, J Allergy Clin Immunol 2003
Shek *et al*, J Allergy Clin Immunol, 2010
Chen *et al*, Pediatric Allergy Immunol 2011
Tang et al, J Allergy Clin Immunol 2012
Gusto Cohort, Singapore (unpublished)

New insights in sensitization mechanisms…

- Most common allergy is HDM-allergy

- Inhalant route suitable for sensitization

- Small amounts → allergy
  Large amounts tolerance → cfr SIT

Epidemiologic risks for food allergy

Lack G. JACI, 2008, 121, 1331.

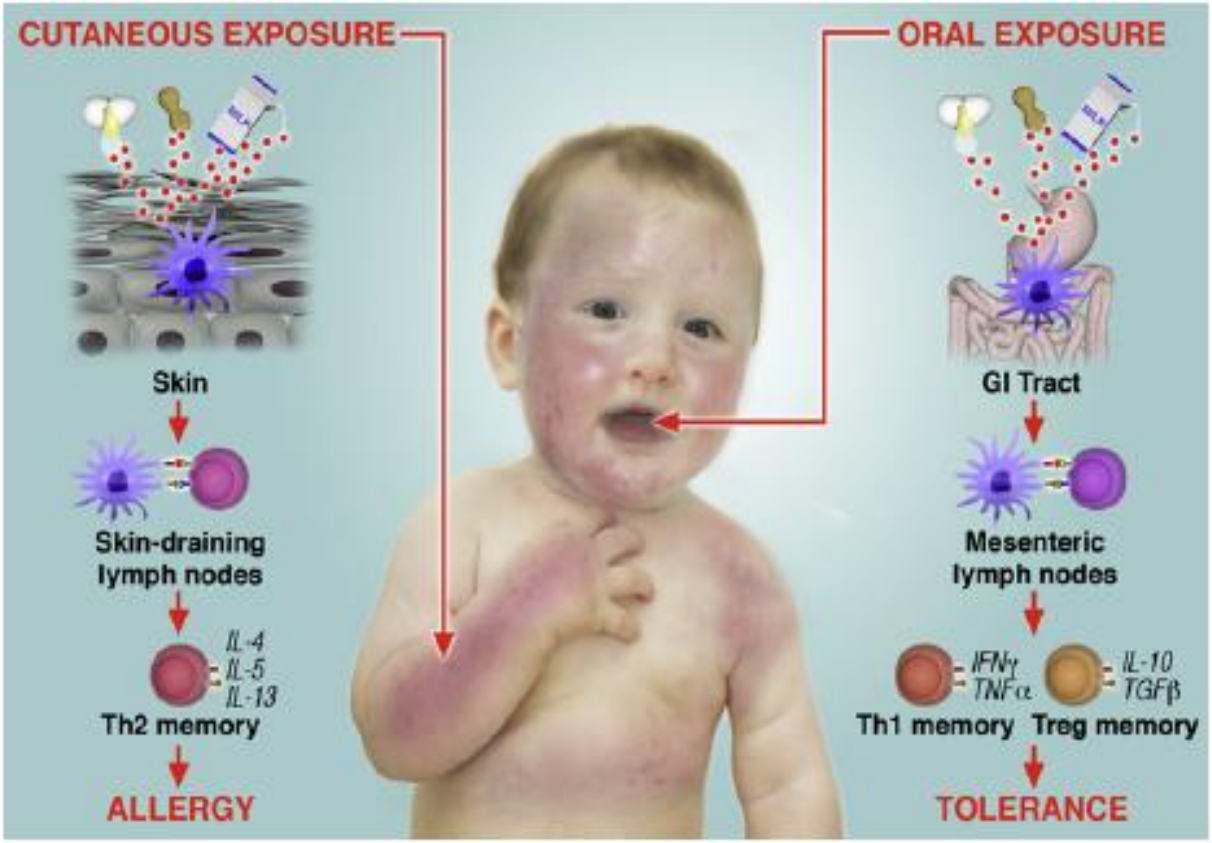


FIG 1. Dual-allergen-exposure hypothesis for pathogenesis of food allergy. Tolerance occurs as a result of oral exposure to food, and allergic sensitization results from cutaneous exposure. *GI*, Gastrointestinal.

Food Allergy… Fact or Fiction?

1. Difficult problem ⟶ group of diseases

2. Lot of non-scientific data … opinions… truths… tradition… stories.

3. Food ⟶ other types of reaction (intolerance, intoxication, etc…)

4. Too many children are labeled as being “food-allergic”

Cow’s milk

Food allergy

- **IgE-mediated**
- **Non-IgE-mediated**
  → Cfr. CMA

CMA → UNIQUE!

- 1. IgE-mediated (urticaria – angioedema)
- 2. non-IgE-mediated (gastro-intestinal)
- 3. mixed type (role in atopic dermatitis)

Prevalence of food allergy

1. General population: 2 %
2. Young children (< 3 yrs): 8 %
3. Singapore children: 4 – 5 %

SPECIFIC GROUPS

4. Young children with severe eczema: 90 %
5. Children with asthma: <<< 1 %

Foods triggering anaphylaxis in Singaporean children (1992 – 1996)

124 children with **acute anaphylaxis** at NUH

		mean age (yrs)
1. Egg and milk	11 %	0.7
2. Bird's nest	27 %	4.5
3. Chinese herbs	7 %	5.0
4. Crustacean seafood	24 %	11.0
5. Others *	30 %	7.0

* Chicken, duck, ham, fruits (banana, rambutan), cereals, gelatin and spices

Goh et al. Allergy 54, 1999, 78-92.

Cow Milk is not a trigger among adults presenting with anaphylaxis in Singapore

Table I. Foods implicated in 30 cases of food-induced anaphylaxis.

	Number	Percentage	Type(s)
Molluscs	11	36.7	Limpet, abalone
Crustaceans	9	30.0	Prawn, crab, lobster
Tree nut	2	6.7	Almond, walnut
Fruit	2	6.7	Rambutan, longan, rock-melon
Bird's nest	1	3.3	
Peanut	1	3.3	
Fish	1	3.3	
Alga (as health supplement)	1	3.3	Chlorella
Others	3	10.0	Additives

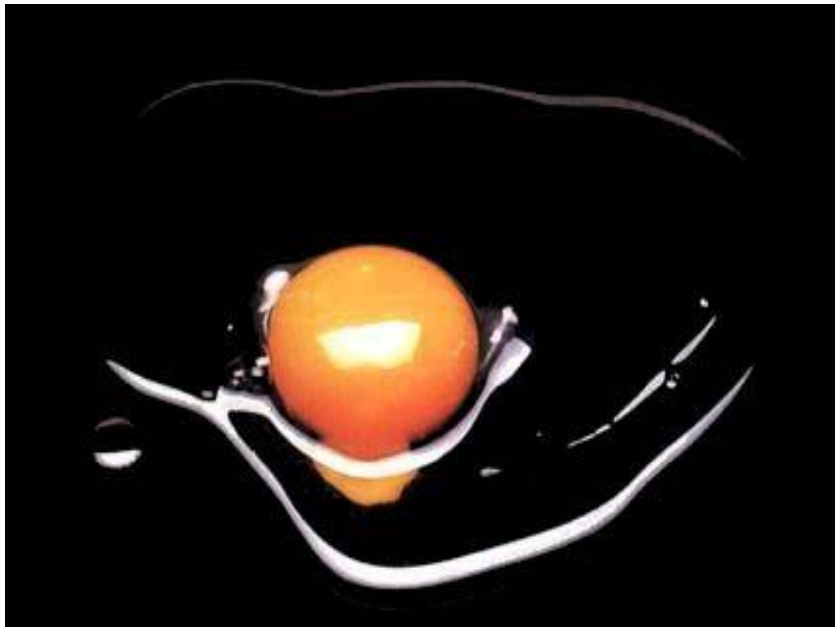
Thong BY *et al*; *SMJ* 2005

Common culprits - Singapore children

- Infants

cow’s milk

hen's egg ***(eczema)***



Common culprits - Singapore children

- Older children

  seafood (shellfish), bird's nest,

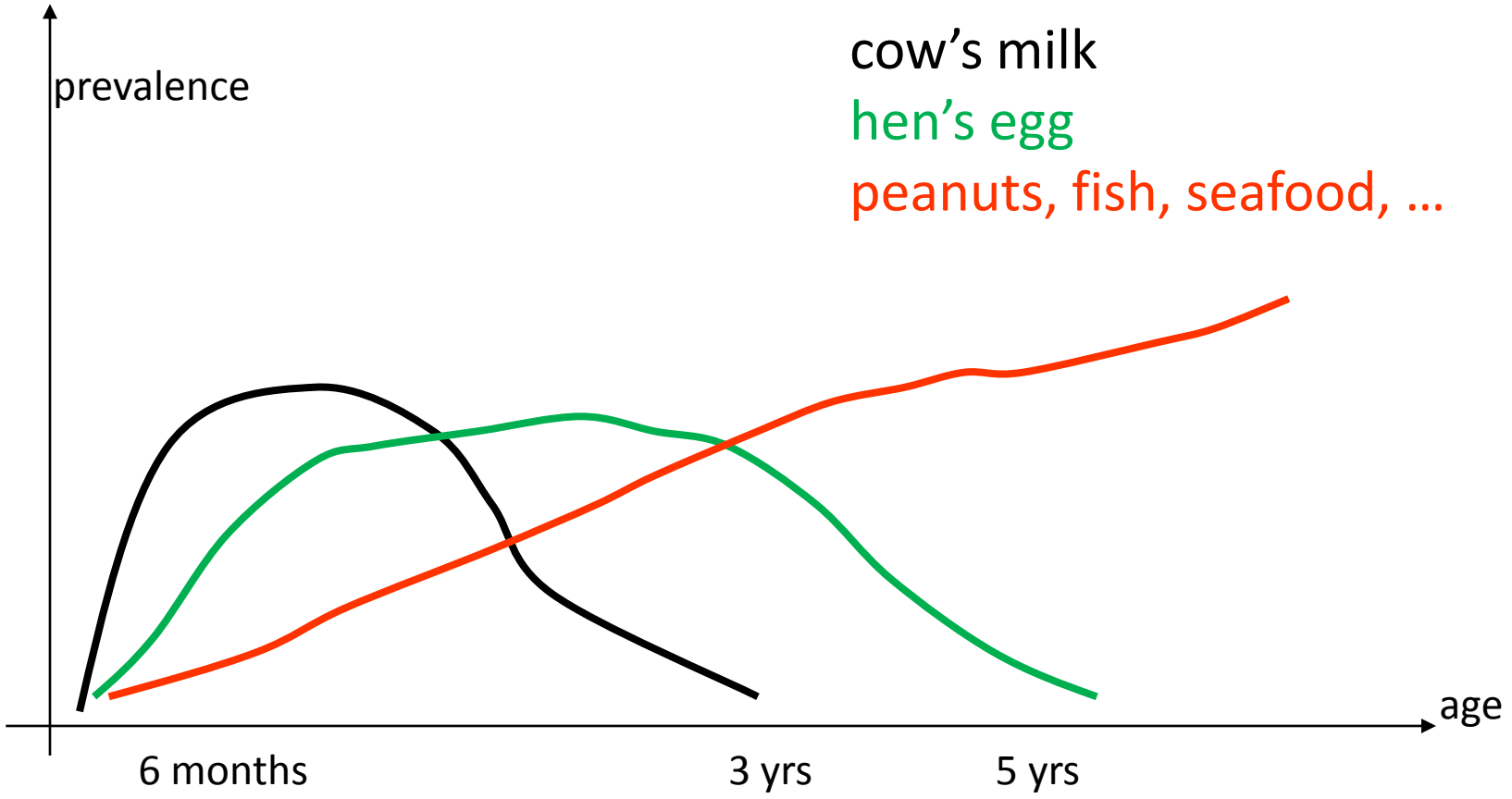
  Chinese herbs, eggs

  Peanuts ***(on the rise)***

Common food allergies in different countries

- **USA: peanuts**
- **Singapore: seafood**
- **Sweden: fish**
- **France: mustard**
- **Israel: sesame**

Every food has its own story…



The natural history of peanut allergy

Helen S. Skolnick, MD,[a] Mary Kay Conover-Walker, MSN, RN, CRNP,[a] Celide Barnes Koerner, MS, RD,[a] Hugh A. Sampson, MD,[b] Wesley Burks, MD,[c] and Robert A. Wood, MD[a] *Baltimore, Md, New York, NY, and Little Rock, Ark*

- Of 223 children above the age of 4 with PN allergy, 21.5% outgrew their allergy
- PN-IgE levels at evaluation *but not at diagnosis* were significantly lower in those outgrowing their PN allergy
- Negative challenges in
  - 61% with a PN-IgE <5 kU/L
  - 67% with a PN-IgE <2 kU/L
  - 73% with a PN-IgE <0.35 kU/L
- Only 2 patients with a PN IgE >10 at diagnosis were shown to have outgrown their PN allergy

JACI 2001; 107:367

Early clinical predictors of remission of peanut allergy in children

Marco H. K. Ho, MD,[a] Wilfred H. S. Wong, MMedSc,[b] Ralf G. Heine, MD,[a,c,d] Clifford S. Hosking, MD,[e] David J. Hill, MD,[c] and Katrina J. Allen, MD, PhD[a,c,d] *Melbourne and Newcastle, Australia, and Hong Kong, China*

Patients	Children under 2 years who had peanut allergy followed up to 8 years; non-remitters (n=218)
Analysis	What are the predictors of remission
Comparator group	Remitters (n=49, 21%)
Outcome	Skin prick test ≥ 6mm ($p<0.01$) and PN sIgE ≥ 3kU/L ($p<0.001$) before 2 years of age were predictors of persistent PN allergy. Also tree nut sensitization ($p<0.01$)

JACI 2008; 121:731

Evaluation of peanut-allergic child

- All children with PN should be re-evaluated every 1-2 years, at least up to age 6
- PN sIgE measurement is the preferred method of evaluation
- Selected patients should undergo challenge
  - No reaction in the past 1-2 years to PN
  - PN sIgE < 2kU/L (consider for those < 5 kU/L)
  - Age > 4 years

Tree nuts – prophylactically avoid?

- Generally recommended because
  - High cross-reactivity between nuts
  - Potential for cross-contamination
  - Difficult to identify specific nuts in processed foods
  - Tree nut allergy appears to be severe and persistent, similar to peanut

CEA 2003; 33:1019

Potential Therapies for Peanut Allergy

- Anti-IgE antibodies
- Immunotherapy
  - Intact allergens
  - Modified allergens
  - Routes of delivery:
    - Oral, subcutaneous, rectal

Oral peanut immunotherapy in children with peanut anaphylaxis

Katharina Blumchen, MD,[a] Helen Ulbricht,[a] Ute Staden, MD,[a] Kerstin Dobberstein,[a] John Beschorner,[a] Lucila Camargo Lopes de Oliveira, MD,[a] Wayne G. Shreffler, MD, PhD,[b] Hugh A. Sampson, MD,[b] Bodo Niggemann, MD,[a] Ulrich Wahn, MD,[a] and Kirsten Beyer, MD[a] *Berlin, Germany, and New York, NY*

JACI 2010; 126:83

Sublingual immunotherapy for peanut allergy: Clinical and immunologic evidence of desensitization

Edwin H. Kim, MD,[a] J. Andrew Bird, MD,[a] Michael Kulis, PhD,[a] Susan Laubach, MD,[a] Laurent Pons, PhD,[a] Wayne Shreffler, MD, PhD,[b] Pamela Steele, CPNP,[a] Janet Kamilaris, RN,[a] Brian Vickery, MD,[a] and A. Wesley Burks, MD[a] *Durham, NC, and Boston, Mass*

JACI 2011; 127:640

Conclusions

- Every food has its own story.

- Dangerous foods versus not-so-dangerous foods.

- Increase of food allergy (second wave)?

- New treatments are expected soon.