ΜΕΣΟΓΕΙΑΚΗ ΔΙΑΤΡΟΦΗ ΚΑΙ ΑΛΛΕΡΓΙΚΑ ΝΟΣΗΜΑΤΑ

Αθηνά Παπαδοπούλου
Διευθύντρια ΕΣΥ
Παιδιατρικό Ιατρείο Ασθματος και Αλλεργιών
ΓΝ ΚΑΤ

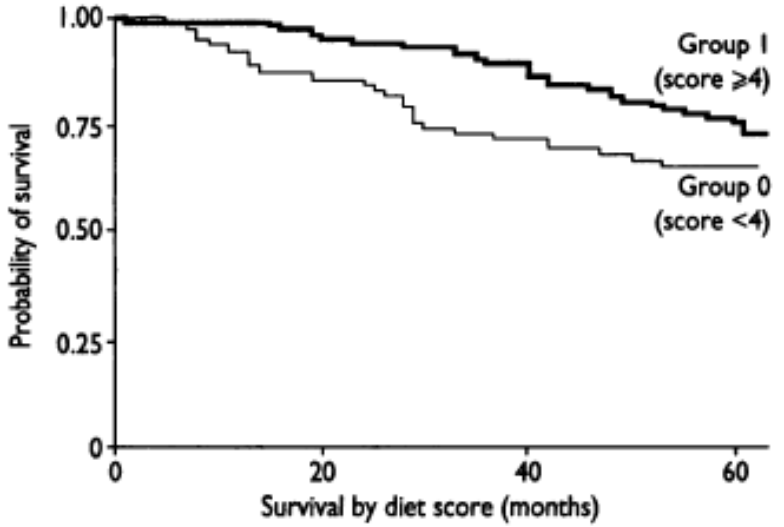
Nutrition and cardiovascular risk: the Mediterranean experience.

Mancini M Acta Cardiol 1989;44(6):466-7.

Institute of Internal Medicine and Metabolic Diseases, University of Naples, Italy.

Diet and overall survival in elderly people

Antonia Trichopoulou, Antigone Kouris-Blazos, Mark L Wahlqvist, Charalambos Gnardellis, Pagona Lagiou, Evangelos Polychronopoulos, Tonia Vassilakou, Loren Lipworth, Dimitrios Trichopoulos



Kaplan-Meier survival curves for individual subjects with diet score up to 3 and 4 or more

BMJ 1995;311:1457-60

James WP[1], Duthie GG, Wahle KW.

The Mediterranean diet: protective or simply non-toxic?

Eur J Clin Nutr. 1989;43 Suppl 2:31-41.

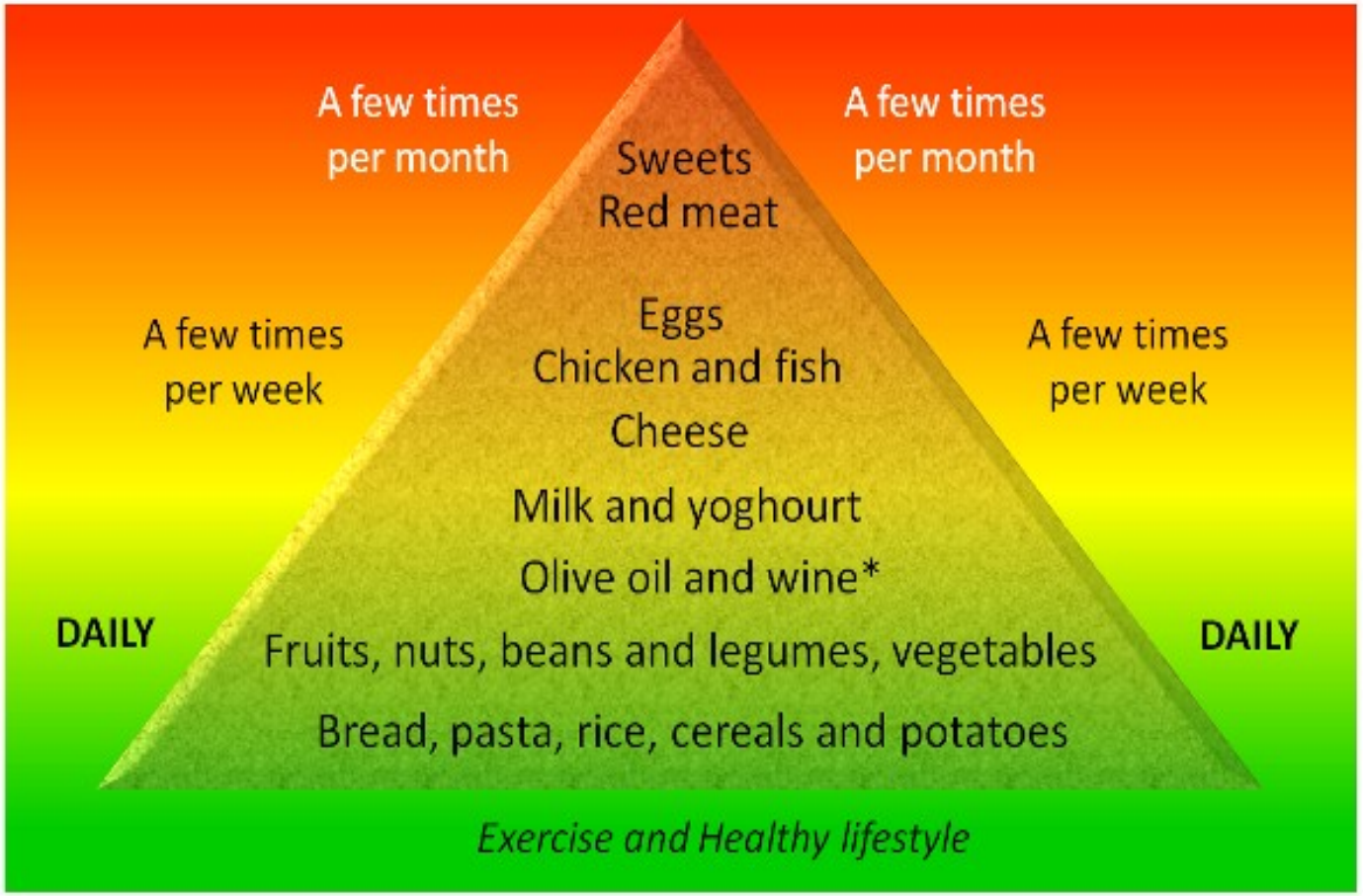
Rowett Research Institute, Bucksburn, Aberdeen, UK.

- **There is clear evidence that populations living in Mediterranean countries enjoy a longer life expectancy than Northern Europeans.** Genetic or racial factors do not explain these societal differences as revealed by migrant studies. The major causes of death in affluent societies, cardiovascular disease, cancers and digestive disorders, show markedly different incidence rates in different European countries. These differences seem to depend on the varied dietary patterns in Europe but the classic lipid hypothesis alone fails to explain the differing rates of coronary heart disease. Limiting the free radical damage to cholesterol thereby reducing the induction of atherosclerosis is a plausible explanation for the finding that some countries, e.g. France as well as Mediterranean countries with their high fruit and vegetable consumption, are well protected against coronary heart disease. **The Mediterranean diet is low in saturated fat content but contains either a high or low content of starch and total fat.** A high fat diet reveals the genetically determined individual propensity to obesity, e.g. in Greece, but does not predispose to cardiovascular disease or mitigate against the cancer protective properties derived from the **vegetable component of the Greek diet**. Studies in the Mediterranean area highlight the considerable dietary diversity which is possible for achieving longevity.

Eur J Cancer Prev. 1997 Oct;6(5):418-21.

International consensus statement on olive oil and the Mediterranean diet: implications for health in Europe. The Olive Oil and the Mediterranean Diet Panel.

Assmann G et al



American Institute for Cancer Research 11th Annual Research Conference on Diet, Nutrition and Cancer

The Mediterranean Diets: What Is So Special about the Diet of Greece? The Scientific Evidence[1]

Artemis P. Simopoulos[2]

The Center for Genetics, Nutrition and Health, Washington, DC

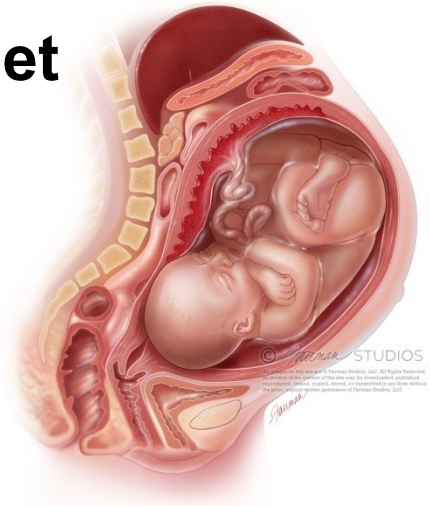
ABSTRACT The term "Mediterranean diet," implying that all Mediterranean people have the same diet, is a misnomer. The countries around the Mediterranean basin have different diets, religions and cultures. Their diets differ in the amount of total fat, olive oil, type of meat and wine intake; milk vs. cheese; fruits and vegetables; and the rates of coronary heart disease and cancer, with the lower death rates and longer life expectancy occurring in Greece. Extensive studies on the traditional diet of Greece (the diet before 1960) indicate that the dietary pattern of Greeks consists of a high intake of fruits, vegetables (particularly wild plants), nuts and cereals mostly in the form of sourdough bread rather than pasta; more olive oil and olives; less milk but more cheese; more fish; less meat; and moderate amounts of wine, more so than other Mediterranean countries. Analyses of the dietary pattern of the diet of Crete shows a number of protective substances, such as selenium, glutathione, a balanced ratio of (n-6):(n-3) essential fatty acids (EFA), high amounts of fiber, antioxidants (especially resveratrol from wine and polyphenols from olive oil), vitamins E and C, some of which have been shown to be associated with lower risk of cancer, including cancer of the breast. These findings should serve as a strong incentive for the initiation of intervention trials that will test the effect of specific dietary patterns in the prevention and management of patients with cancer. J. Nutr. 131: 3065S–3073S, 2001.

The child of today and the Mediterranean diet.

Fidanza AA Beitr Infusionsther
1991;27:152-60

Analytic evaluation of a "Mediterranean" diet in pregnancy.

Bellati U Minerva Ginecol 1994 Apr;46(4):183-7.



σπάνια

συχνά

καθημερινά

Διατροφικοί δείκτες

- Οι καταναλώσεις τροφίμων από διαφορετικές ομάδες συσχετίζονται ισχυρά (πρόβλημα πολυσυγγραμικότητας σε μοντέλα διατροφικής ανάλυσης).
- Λύση στο πρόβλημα αποτελούν οι διατροφικοί δείκτες οι οποίοι στηρίζονται σε βασικά διατροφικά πρότυπα πχ Μεσογειακή διατροφή.

- Δίνουν την δυνατότητα συνολικής αποτίμησης της ποιότητας των διατροφικών συνηθειών. Εύκολα υπολογίζονται με απλά ερωτηματολόγια και έτσι είναι αγαπητοί σε επιδημιολογικές μελέτες.

Διατροφικοί δείκτες ΜΔ

MedDietScore

- Αφορά ενήλικες
- Απαρτίζεται από 11 συνιστώσες ερωτήσεις όπου κάθε μια λαμβάνει τιμή από 0-5.
- Συνολικό score (0-55)
- υψηλότερες τιμές δείχνουν υψηλότερη υιοθέτηση της Μεσογειακής διατροφής.
  - 0–13: Καθόλου καλή συμμόρφωση
  - 14–27: Ανεπαρκής συμμόρφωση
  - 28 – 41: Καλή συμμόρφωση
  - 42 – 55: Πολύ καλή συμμόρφωση

Panagiotakos et al. 2006

MedDietScore

- Μη-επεξεργασμένα δημητριακά,ψωμί,ζυμαρικά (ολικής άλεσης), ρύζι
- Φρούτα
- Λαχανικά
- Όσπρια
- Ψάρια
- Πατάτες
- Ελαιόλαδο

- 0 μη κατανάλωση
- 1 κατανάλωση 1-4 μερ/μήνα
- 2 κατανάλωση 5-8 μερ/μήνα
- 3 κατανάλωση 9-12 μερ/μήνα
- 4 κατανάλωση 13-18 μερ/μήνα
- 5 κατανάλωση >18 μερ/μήνα

Αντίθετα από πιο πάνω ώστε

- Κρέας και κρεατοσκευάσματα
- Πουλερικά
- Πλήρη γαλακτοκομικά τυρί, γιαούρτι, γάλα

- 5 μηδενική ή πολύ χαμηλή καταν.
- 0 σχεδόν καθημερινή κατανάλωση.

Πρόσληψη αλκοόλ.

-0 κατανάλωση >700 ml/ημ ,

-1 -4 κατανάλωση 700,600,500,400ml/ημ,

-5 καταναλώνει <300 ml/ημ

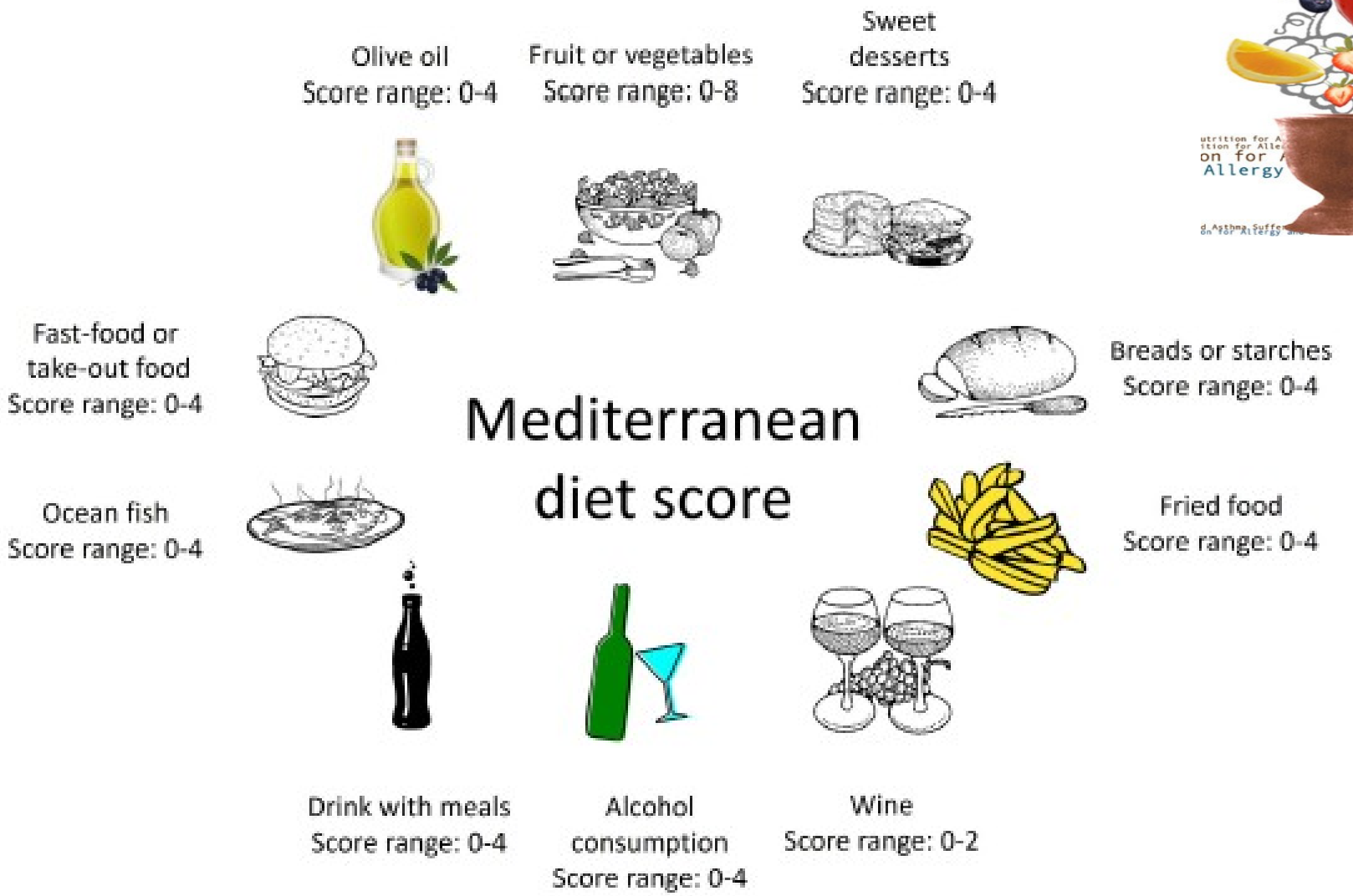
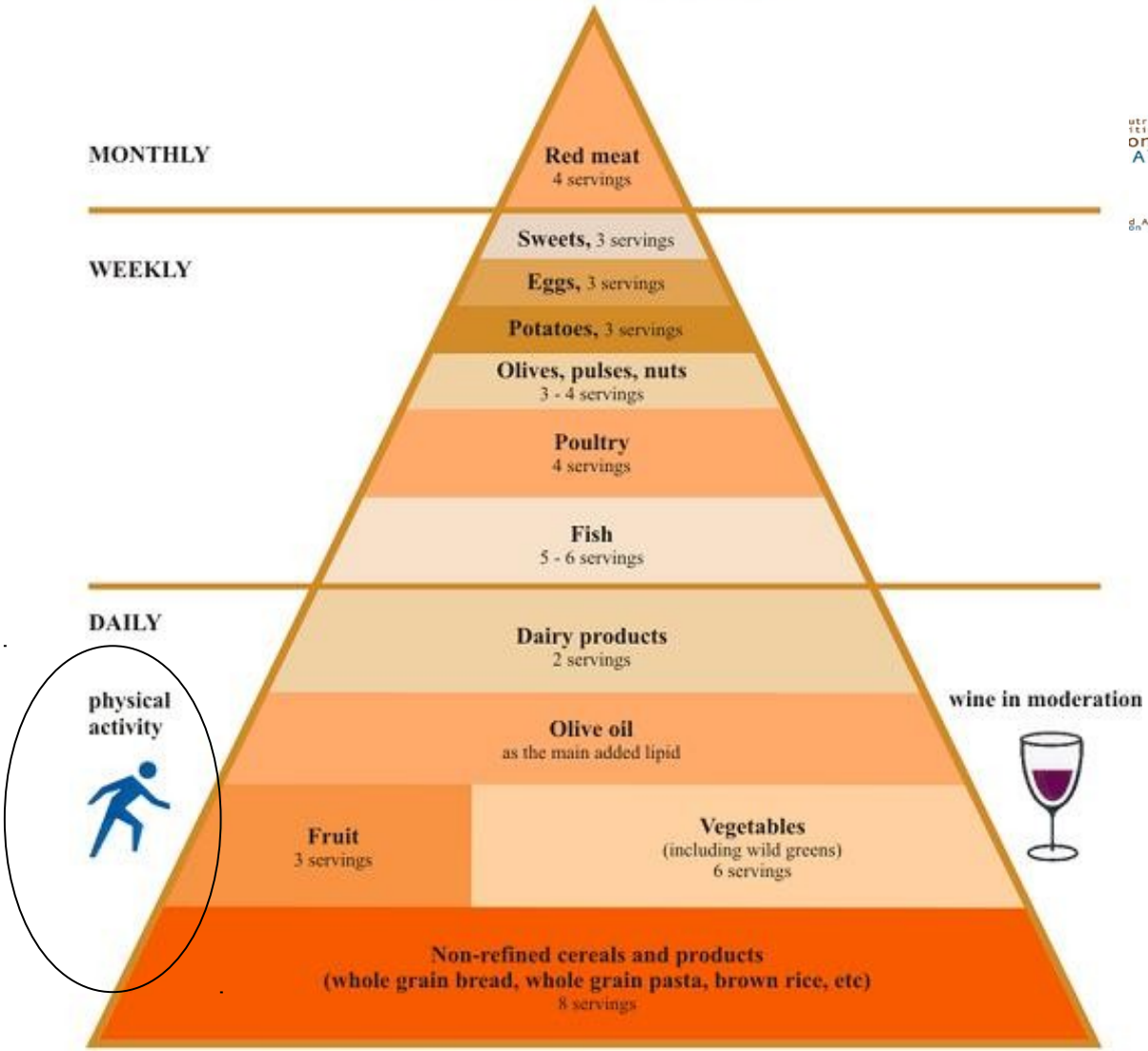


Figure 1. Mediterranean diet food domains and ranges of modified Mediterranean diet item scores (mMDS) among different categories.

doi:10.1371/journal.pone.0087539.g001

Yang J, Farioli A, Ko[illegible] M, Kales SN (2014) Modified Mediterranean Diet Score and Cardiovascular Risk in a North American Working Populati[illegible] S ONE 9(2):

MEDITERRANEAN DIET



Also remember to:

- drink plenty of water
- avoid salt and replace it by herbs (e.g oreganon, basil, thyme, etc)

Source: Supreme Scientific Health Council, Hellenic Ministry of Health

KIDMED score

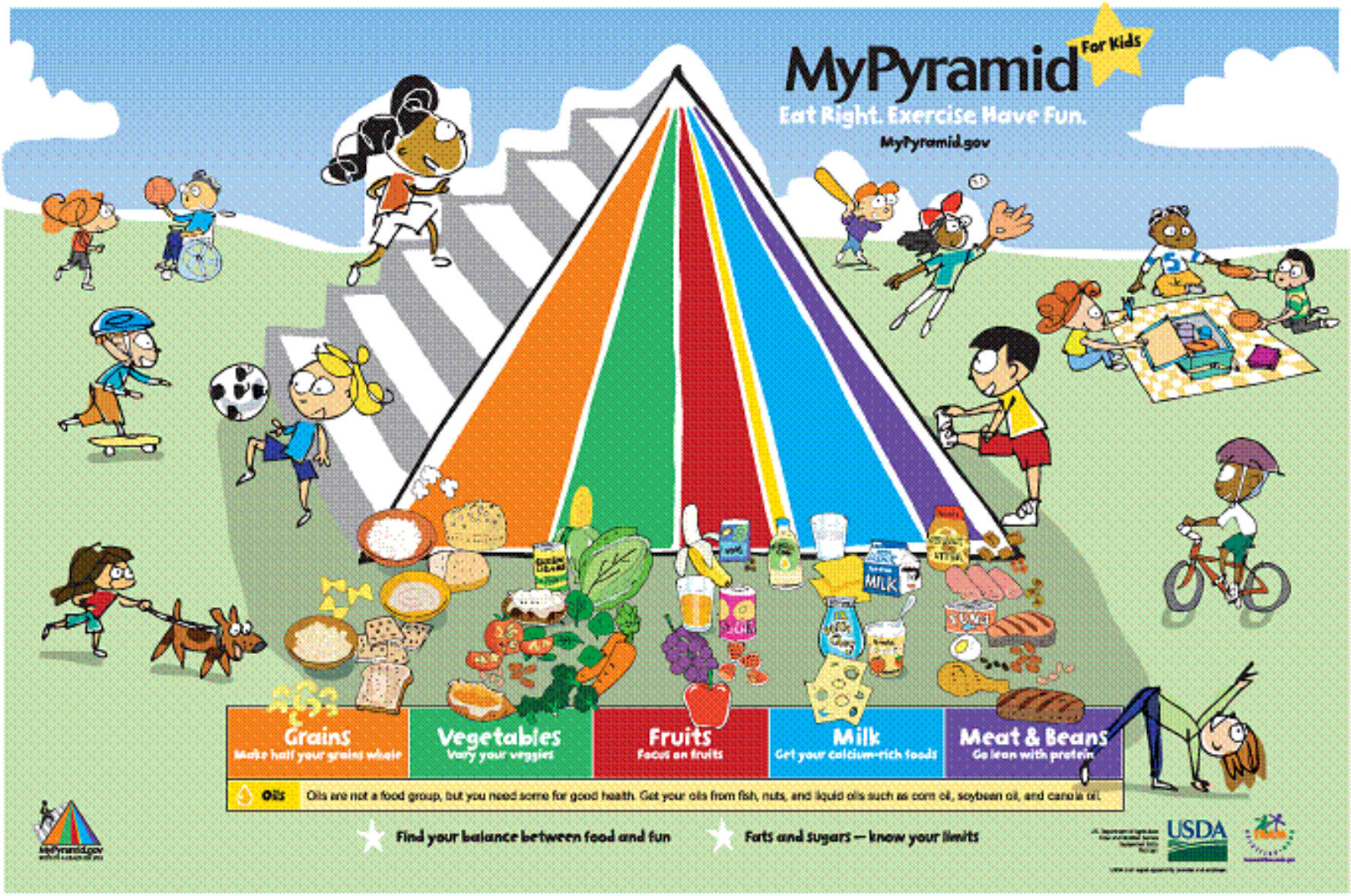
- Αφορά παιδιά
- Απαρτίζεται από 16 συνιστώσες και κάθε μια απάντηση βαθμολογείται με +1 ή -1
- Παίρνει τιμές από -4 – 12
- υψηλότερες τιμές δείχνουν υψηλότερη υιοθέτηση της Μεσογειακής διατροφής.

Table 1 KIDMED test to assess the Mediterranean diet quality

Scoring	
+1	Takes a fruit or fruit juice every day
+1	Has a second fruit every day
+1	Has fresh or cooked vegetables regularly once a day
+1	Has fresh or cooked vegetables more than once a day
+1	Consumes fish regularly (at least 2–3 times per week)
−1	Goes more than once a week to a fast-food (hamburger) restaurant
+1	Likes pulses and eats them more than once a week
+1	Consumes pasta or rice almost every day (5 or more times per week)
+1	Has cereals or grains (bread, etc.) for breakfast
+1	Consumes nuts regularly (at least 2–3 times per week)
+1	Uses olive oil at home
−1	Skips breakfast
+1	Has a dairy product for breakfast (yoghurt, milk, etc.)
−1	Has commercially baked goods or pastries for breakfast
+1	Takes two yoghurts and/or some cheese (40 g) daily
−1	Takes sweets and candy several times every day

KIDMED – Mediterranean Diet Quality Index in children and adolescents.

Serra-Majem L et al. Public Heatlh Nutrition 2004


MyPyramid
For Kids
Eat Right. Exercise Have Fun.
MyPyramid.gov
Grains
Make half your grains whole
Vegetables
Vary your veggies
Fruits
Focus on fruits
Milk
Get your calcium-rich foods
Meat & Beans
Go lean with protein
Oils
Oils are not a food group, but you need some for good health. Get your oils from fish, nuts, and liquid oils such as corn oil, soybean oil, and canola oil.
Find your balance between food and fun
Fats and sugars — know your limits
USDA

Κύρια χαρακτηριστικά της ΜΔ

ΑΝΤΙΟΞΕΙΔΩΤΙΚΑ

Μη ενζυμικά

- υδροδιαλυτά

βιταμίνη C, σελήνιο, μαγνήσιο,φυσικές φαινόλες – φλαβοειδή

- Λιποδιαλυτά

βιταμίνη Ε καροτενοειδή

- φρέσκα λαχανικά, φρούτα, φυτικά έλαια,
- όσπρια, ξηρούς καρπούς
- ψάρια, αυγό κοτόπουλο

(αμινοξέα, πεπτίδια, ασκορβικό οξύ, καροτενοειδή, σελήνιο, ψευδαργύρο,φυσικές φαινόλες)

Κύρια χαρακτηριστικά της ΜΔ

Ω3 πολυακόρεστα λιπαρά οξέα (PUFA)

- δεν παράγονται ενδογενώς
- Στα παιδιά προσλαμβάνονται μόνο με την διατροφή.
- άλφα λινολεϊκό οξύ (ALA), εικοσαπεντανοϊκό οξύ (EPA) δεκαεξανοϊκό οξύ (DHA)
- Διαφοροποίηση από τα ω 6 όπως το λινελεϊκό (LA) και αραχιδονικό οξύ (AA)

- Ω3

ελαιόλαδο στα ιχθυέλαια και στα λιπαρά ψάρια

- Ω6

σπορέλαια, κρέας, γαλακτοκομικά

Μεσογειακή διατροφή και αλλεργία

- Παθογενετικά δεδομένα
- Επιδημιολογικά δεδομένα

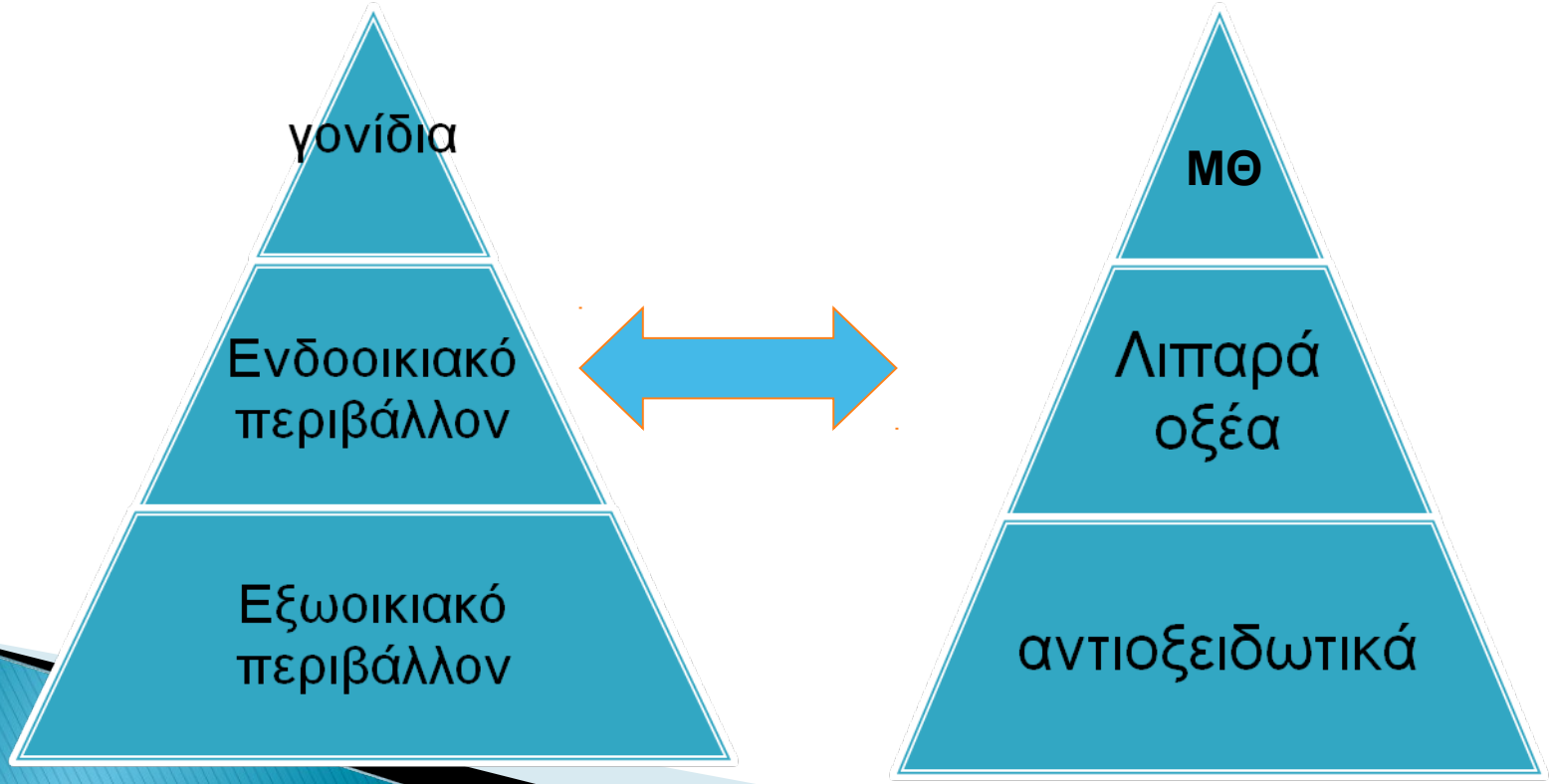
Μεσογειακή διατροφή και αλλεργία

- Παθογενετικά δεδομένα

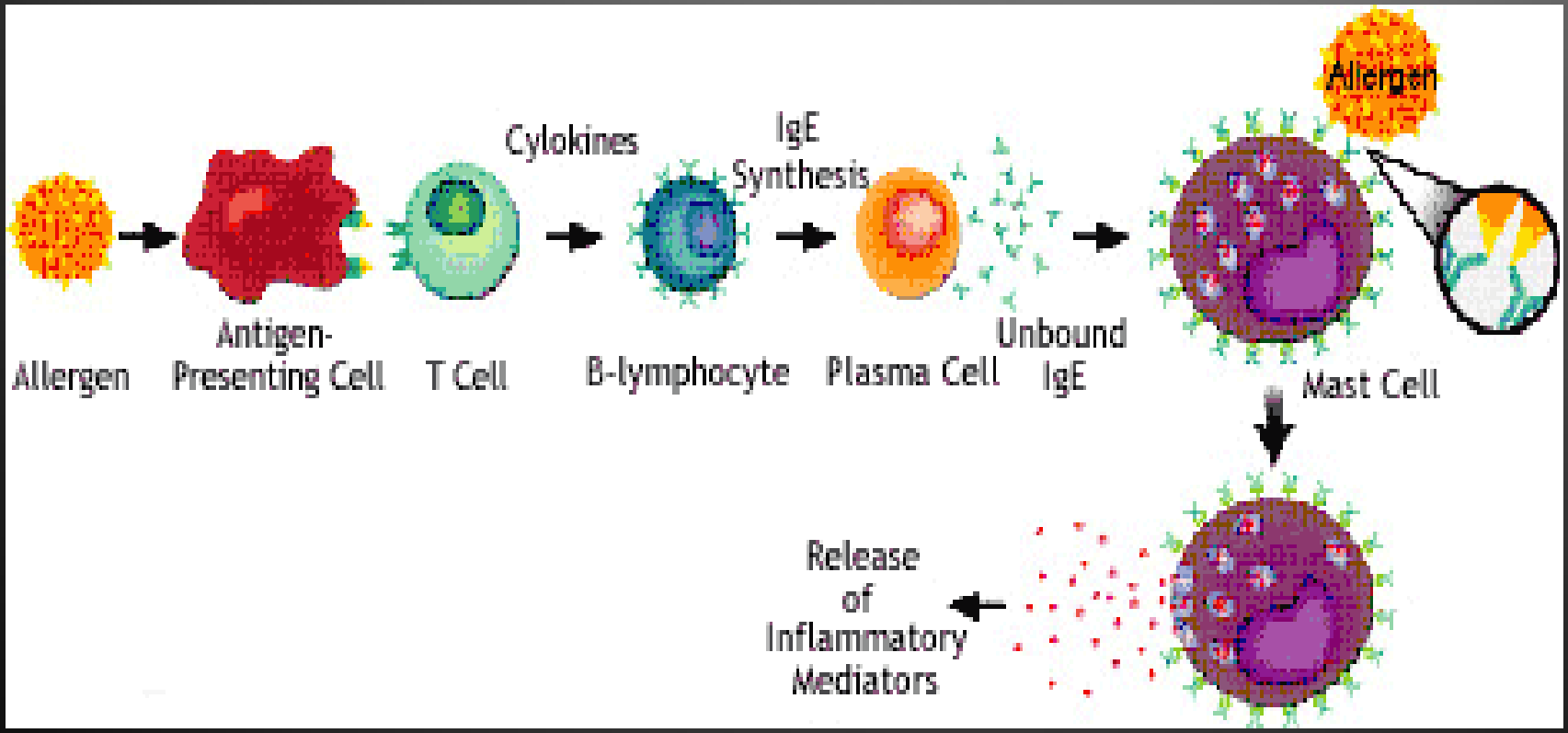
Μεσογειακή διατροφή και αλλεργία

Παθογένεια αλλεργικής αντίδρασης

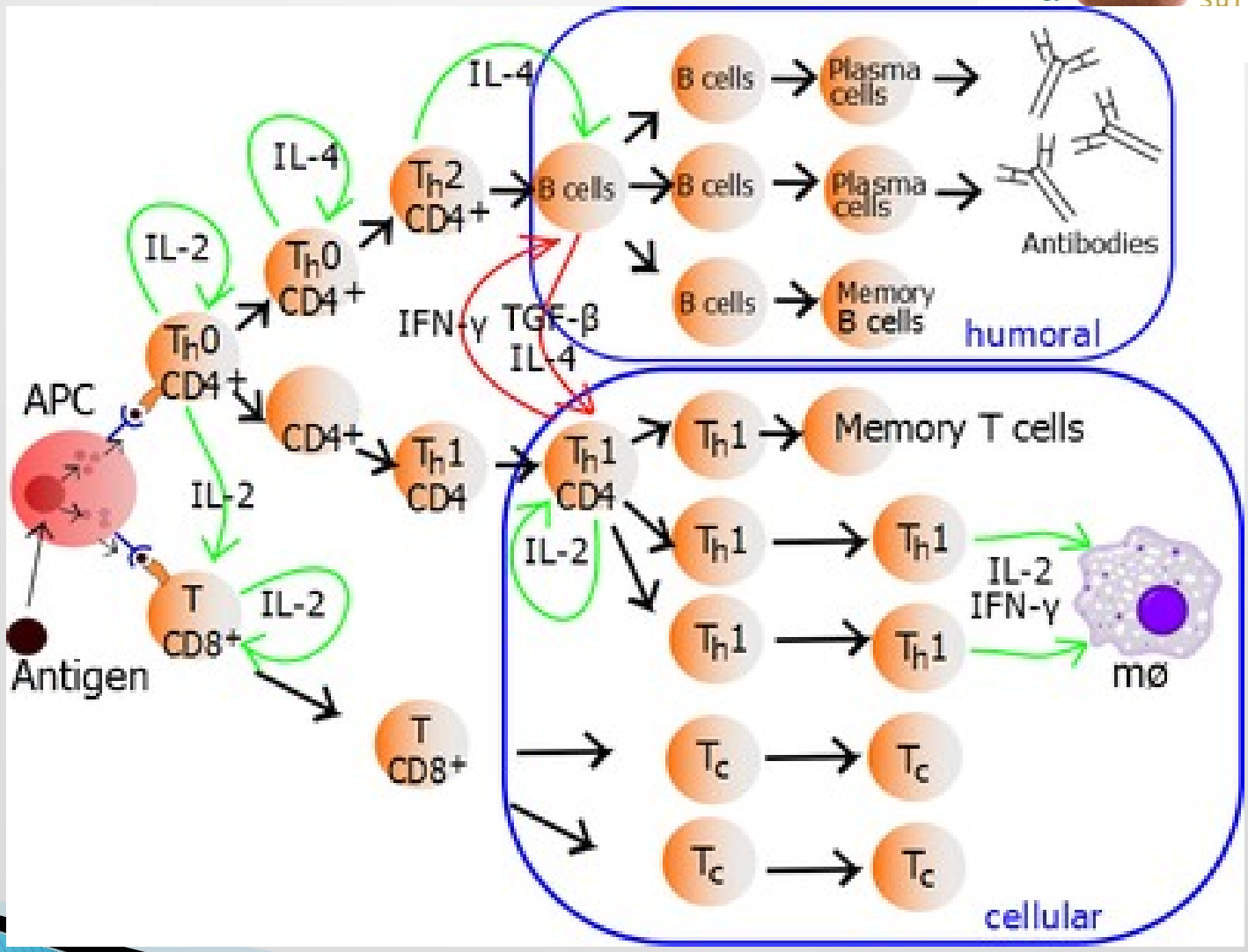
Μηχανισμοί ΜΔ



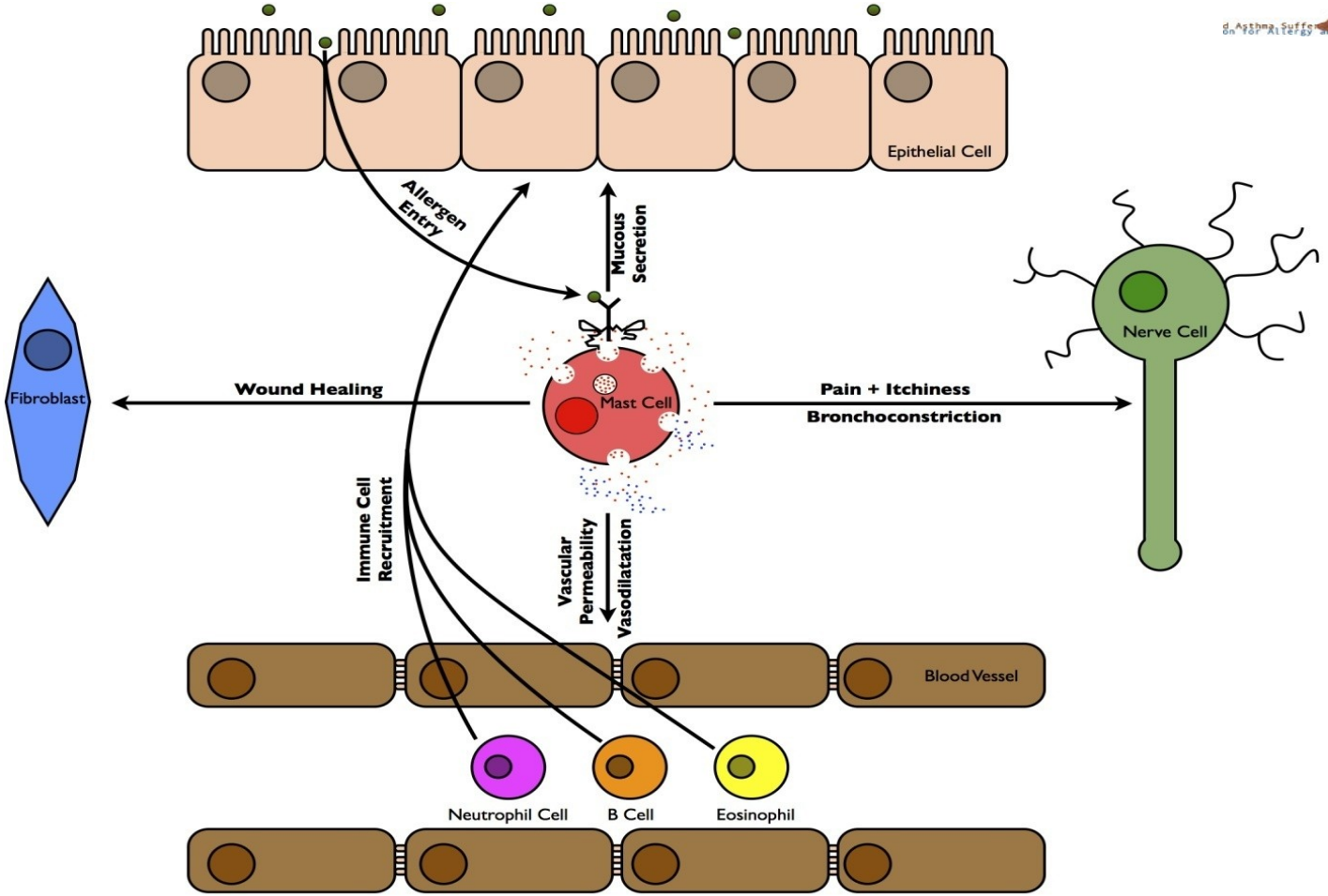
Παθογένεια αλλεργικής φλεγμονής



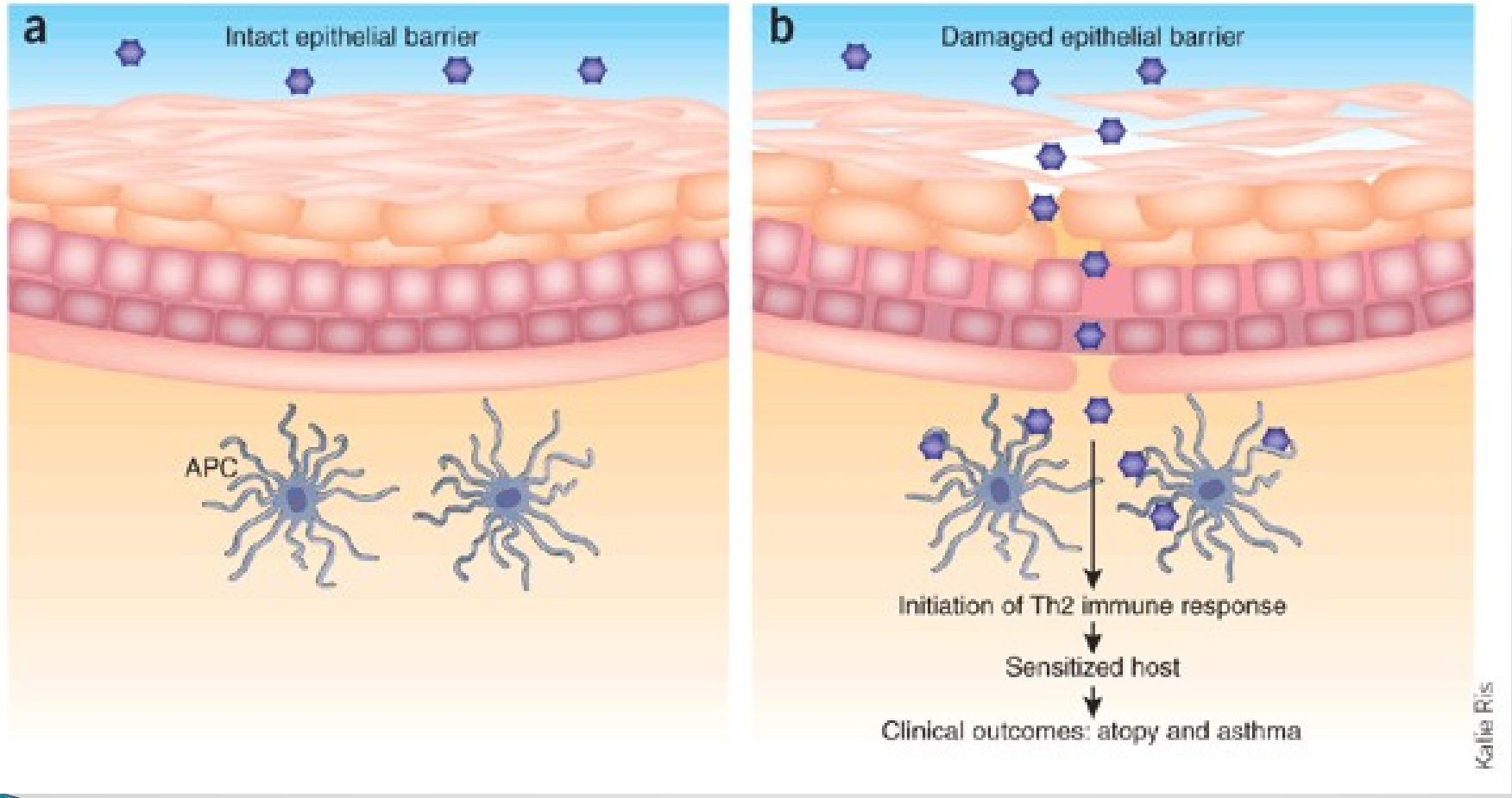
Ρόλος των αντιγονοπαρουσιαστικών κυττάρων



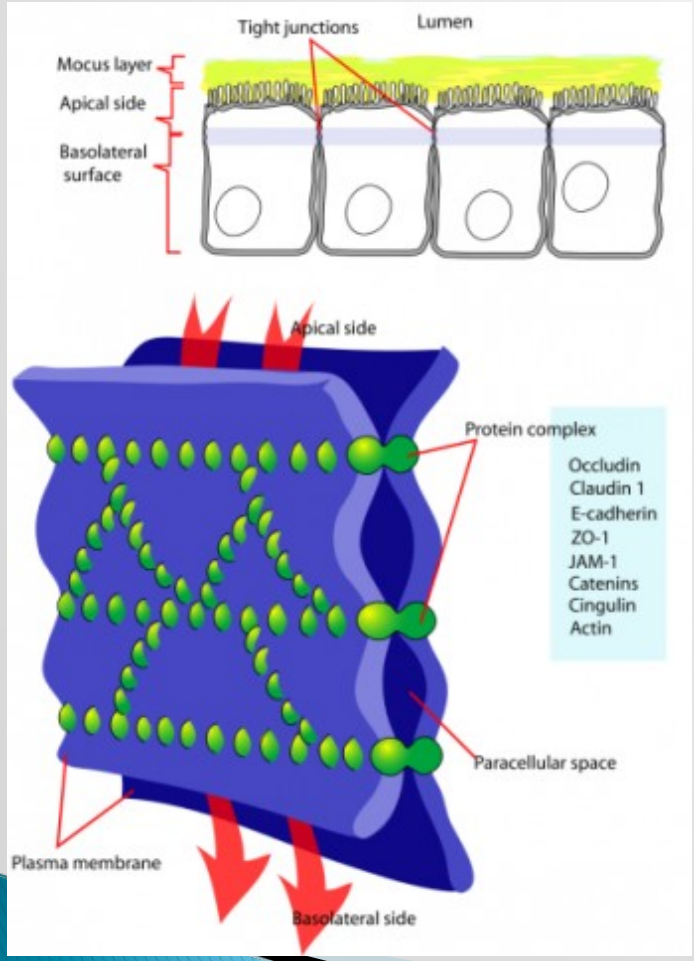
Επιθηλιακός φραγμός στην αλλεργία

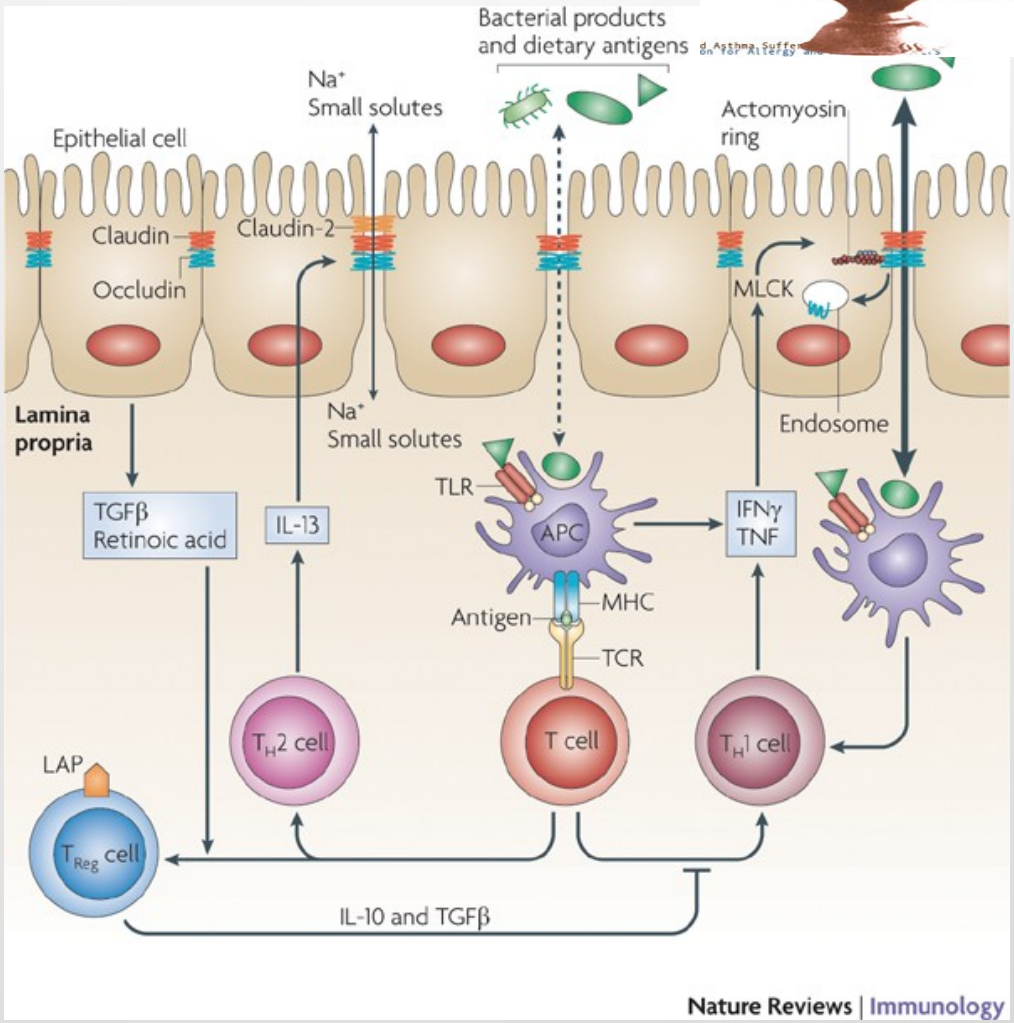


Διαταραχή του επιθηλίου

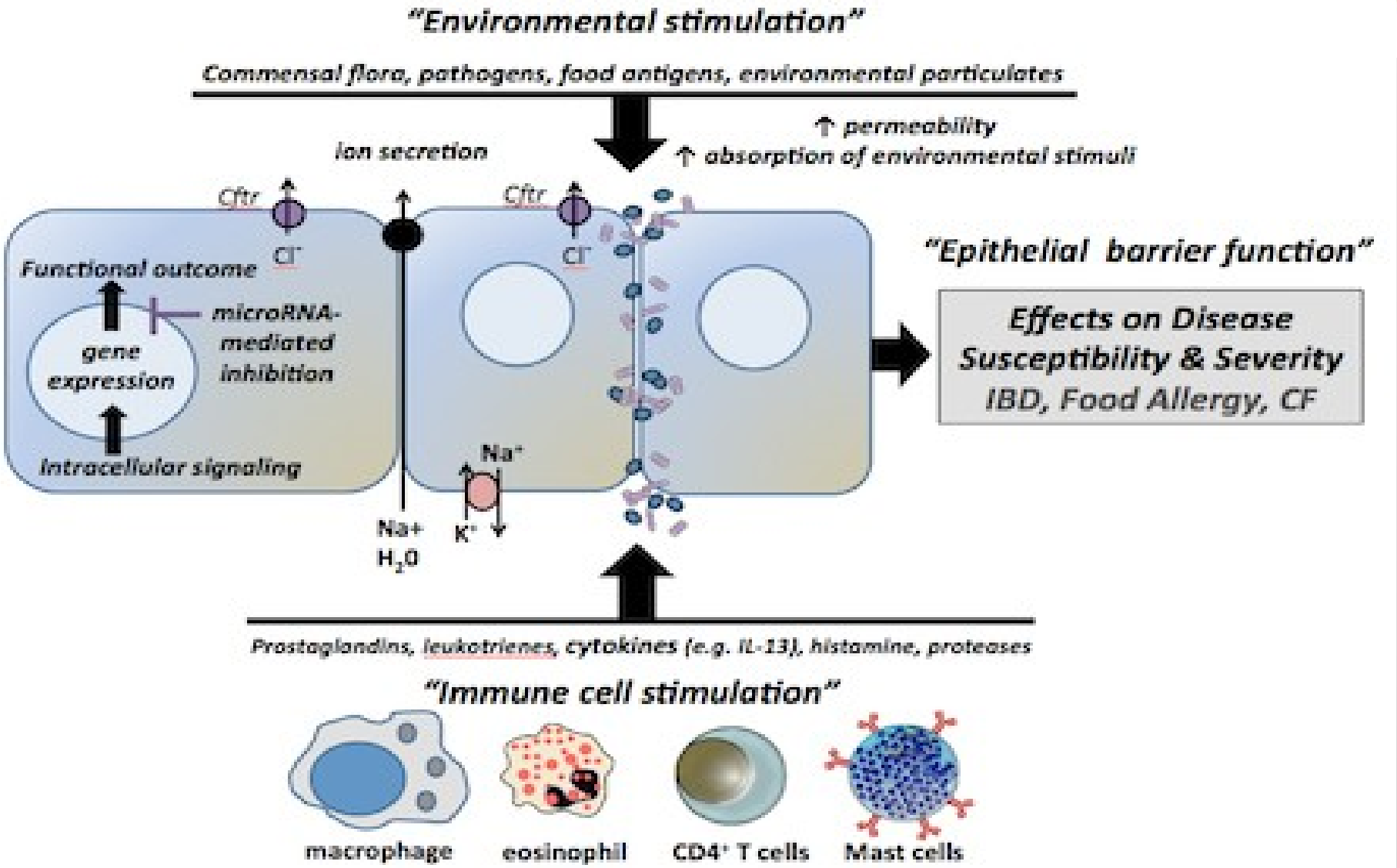


Συνδέσεις επιθηλιακών κυττάρων





Γενετική βλάβη του επιθηλίου

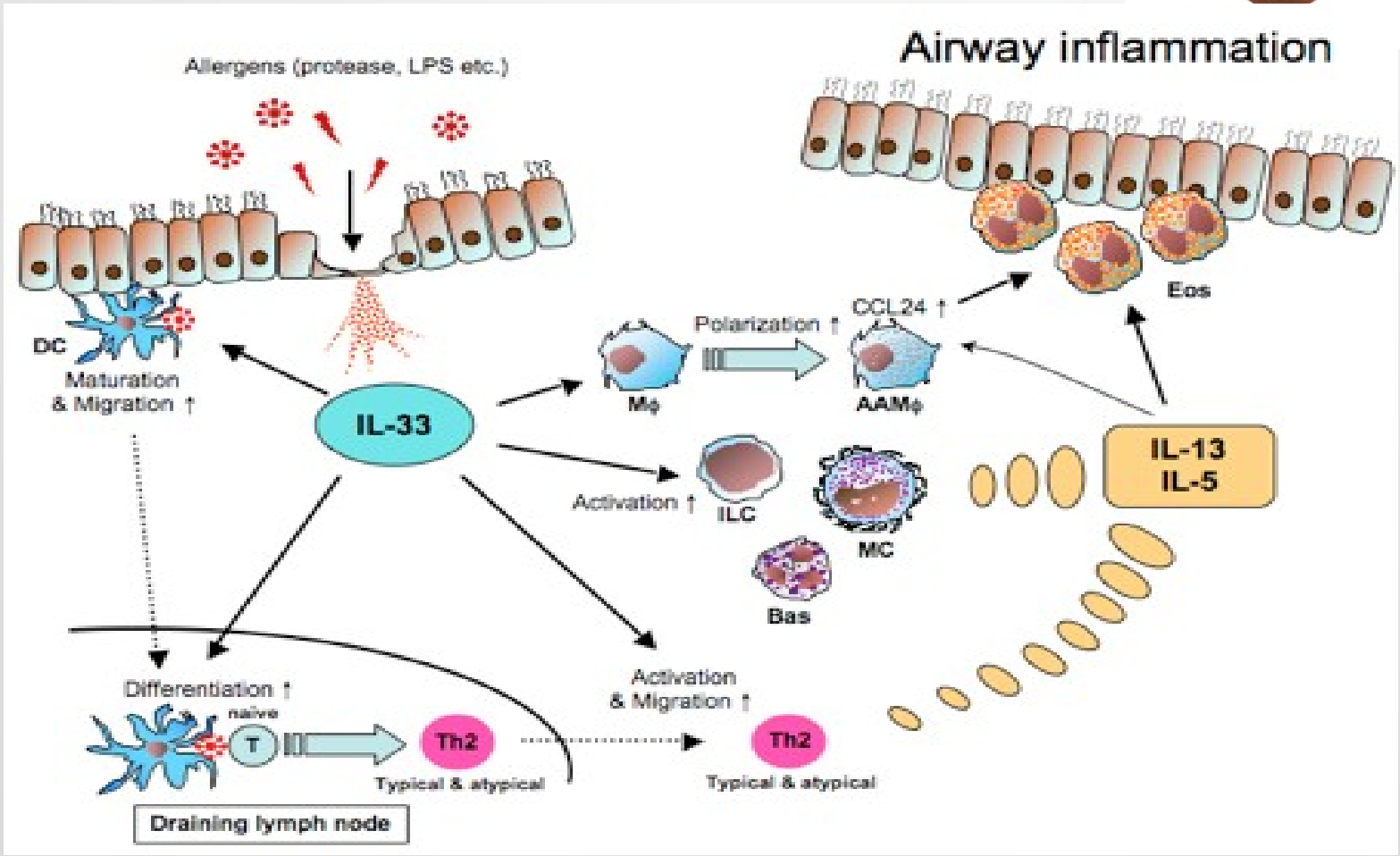


Fillagrin reseptors

- πολυμορφισμοί του γονιδίου των υποδοχέων της φιλακρίνης συσχετίστηκαν με
  - σοβαρό έκζεμα
  - σοβαρή τροφική αλλεργία (χ5)

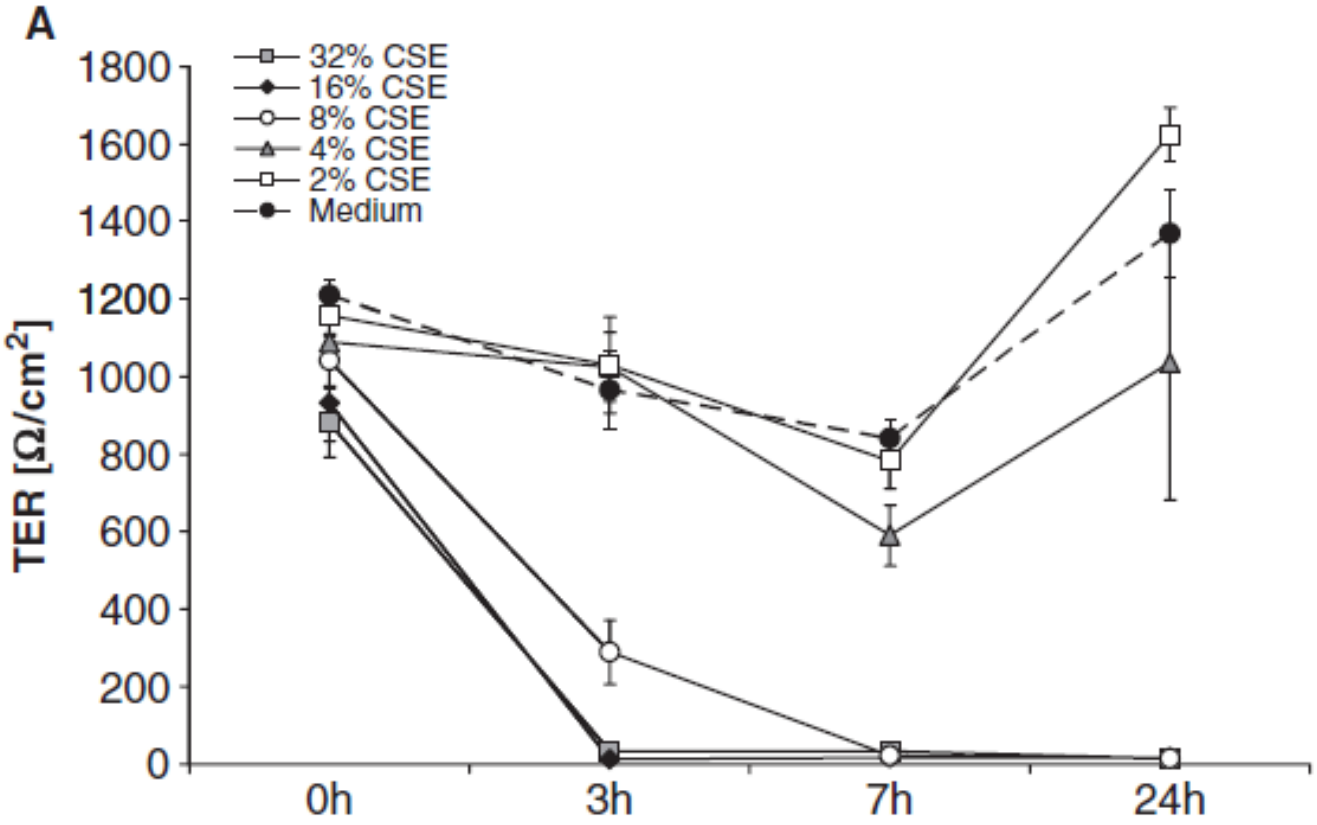
Brown SJ, Asai Y, Cordell HJ et al. Loss-of-function variants in the filaggrin gene are a significant risk factor for peanut allergy. J Allergy Clin Immunol. 2011;127(3):661-7.

Πρωτεολυτική δράση αλλεργιογόνων



Runswick S. Pollen proteolytic enzymes degrade tight junctions. Respirology. 2007

Επίκτητη βλάβη του επιθηλίου -κάπνισμα

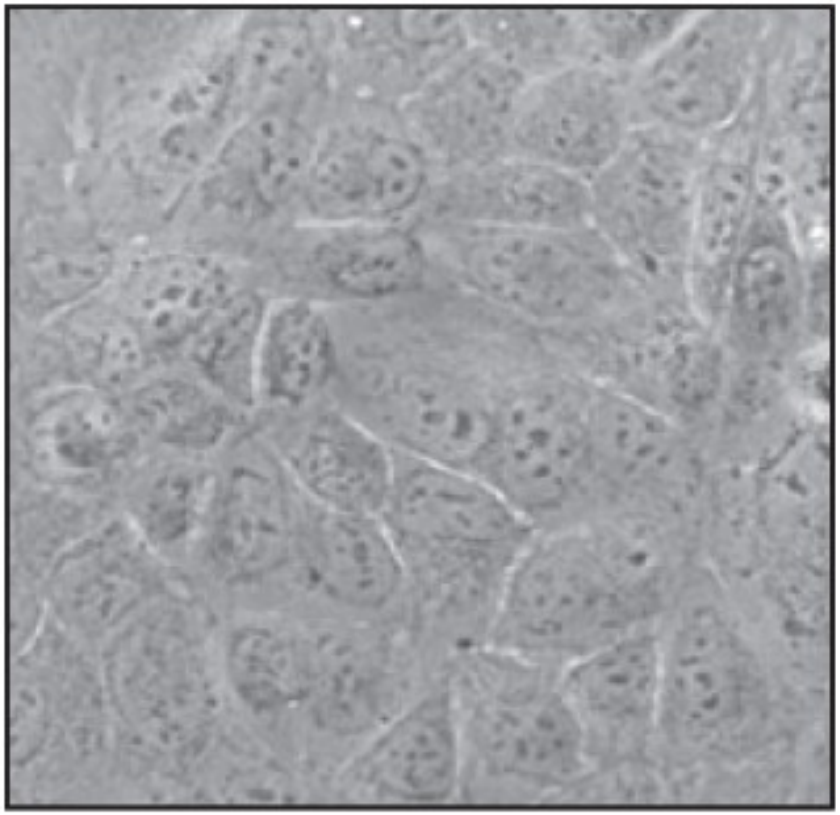


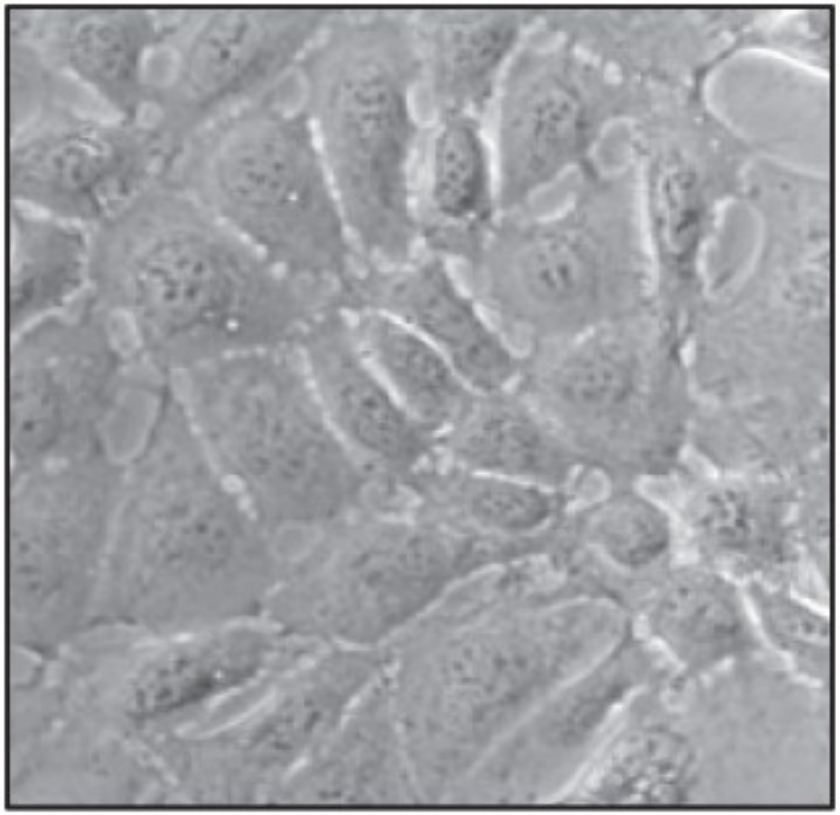
Gangl K, Reininger R, Bernhard D et al. Cigarette smoke facilitates allergen penetration across respiratory epithelium. Allergy 2009; 64:398-405.

Επίκτητη βλάβη του επιθηλίου-κάπνισμα

No CSE

8% C





Gangl K, Reininger R, Bernhard D et al. Cigarette smoke facilitates allergen penetration across respiratory epithelium. Allergy 2009; 64:398-405.

Επίδραση της ΜΔ στο επιθήλιο-οξειδωτικό στρες

Οξειδωτικό στρες ορίζεται η διαταραχή της ισορροπίας μεταξύ της παραγωγής και της αδρανοποίησης των δραστικών μορφών οξυγόνου ενός βιολογικού συστήματος ώστε να αποτρέπεται η επιθηλιακή βλάβη. Ιδιαίτερα βλαπτικό στην εγκυμοσύνη.

Πως διατηρείται ανέπαφο το επιθήλιο

Υπόθεση των αντιοξειδωτικών

Στις δυτικές δίαιτες η κατανάλωση αντιοξειδωτικών ουσιών έχει μειωθεί προκαλώντας την αύξηση των αλλεργιών αφού οι αντιοξειδωτικές ουσίες όπως βιταμίνη A, C and E τα καροτενοειδή, το σελήνιο και τα φλαβοειδή μπορούν να αντιπαλέψουν το οξειδωτικό στρες.

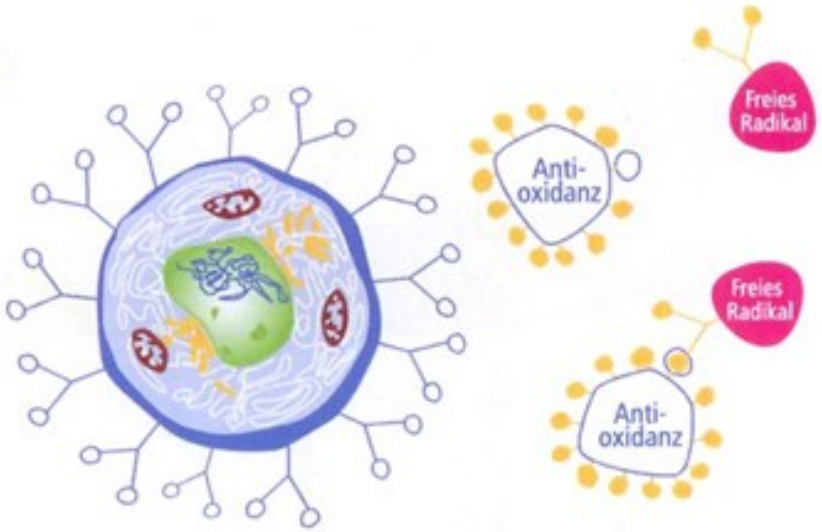
McKeever TM & Britton J (2004) Diet and asthma. Am J Respir Crit Care Med 170, 725–729.
Devereux G & Seaton A (2005) Diet as a risk factor for atopy and asthma. J Allergy Clin Immunol 115, 1109–1117; quiz 18.
Romieu I & Trenga C (2001) Diet and obstructive lung diseases. Epidemiol Rev 23, 268–287

- Moreover, the growth of airways during **pregnancy or childhood** may be vulnerable to oxidative exposures, while suboptimal antioxidant status during this critical period might result in oxidative airway damage,

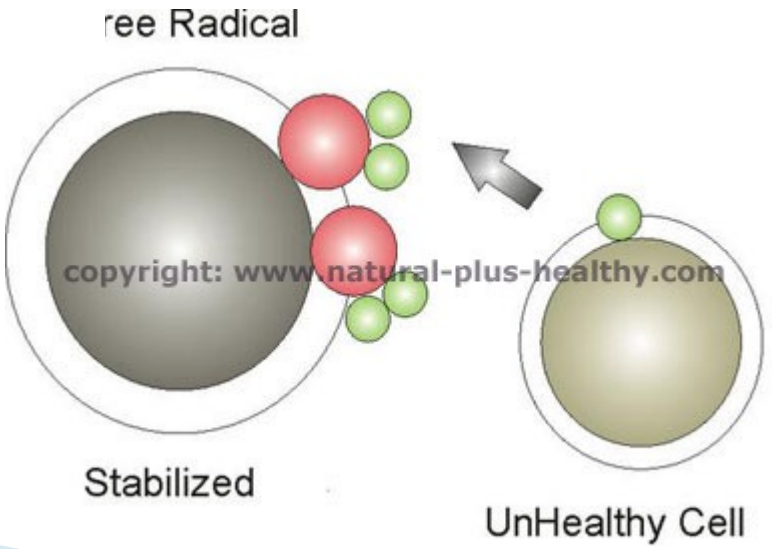
  reductions in airway compliance or both

Devereux G & Seaton A (2005) Diet as a risk factor for atopy and asthma. J Allergy Clin Immunol 115

Επίδραση της ΜΔ στο επιθήλιο- αντιοξειδωτικά



Τα αντιοξειδωτικά έχουν την ιδιότητα σε μικρές συγκεντρώσεις να συνδέονται εύκολα με τις ελεύθερες ρίζες οξυγόνου και άλλων βαρέων μετάλλων, ιδιότητα που οφείλεται στην παρουσία πολλών υδροξυλίων που χαρακτηρίζουν την χημική τους δομή



Αντιοξειδωτικά ΜΔς

- πρώτη φαίνεται να δραστηριοποιείται η βιταμίνη Ε (α-τοκοφερόλη) παγιδεύοντας τις ρίζες υπεροξειδίου και ακολουθεί η βιταμίνη C που δρά συνεργικά μαζεύοντας την υπεροξειδωμένη βιταμίνη Ε και άλλες ελευθερές ρίζες.

- Οι φυσικές φαινόλες φαίνεται να δρουν μέσω του Nrf2 (nuclear related factor 2) ο όποιος επιπλέον προστατεύει την έκφραση των αντίστοιχων δομικών γονιδίων.

Reiter E, Jiang Q, Christen S. Anti-inflammatory properties of alpha- and gamma-tocopherol. Mol Aspects Med 2007;28:668e91

Υπόθεση των λιπιδίων (Black and Sharpe 1997)

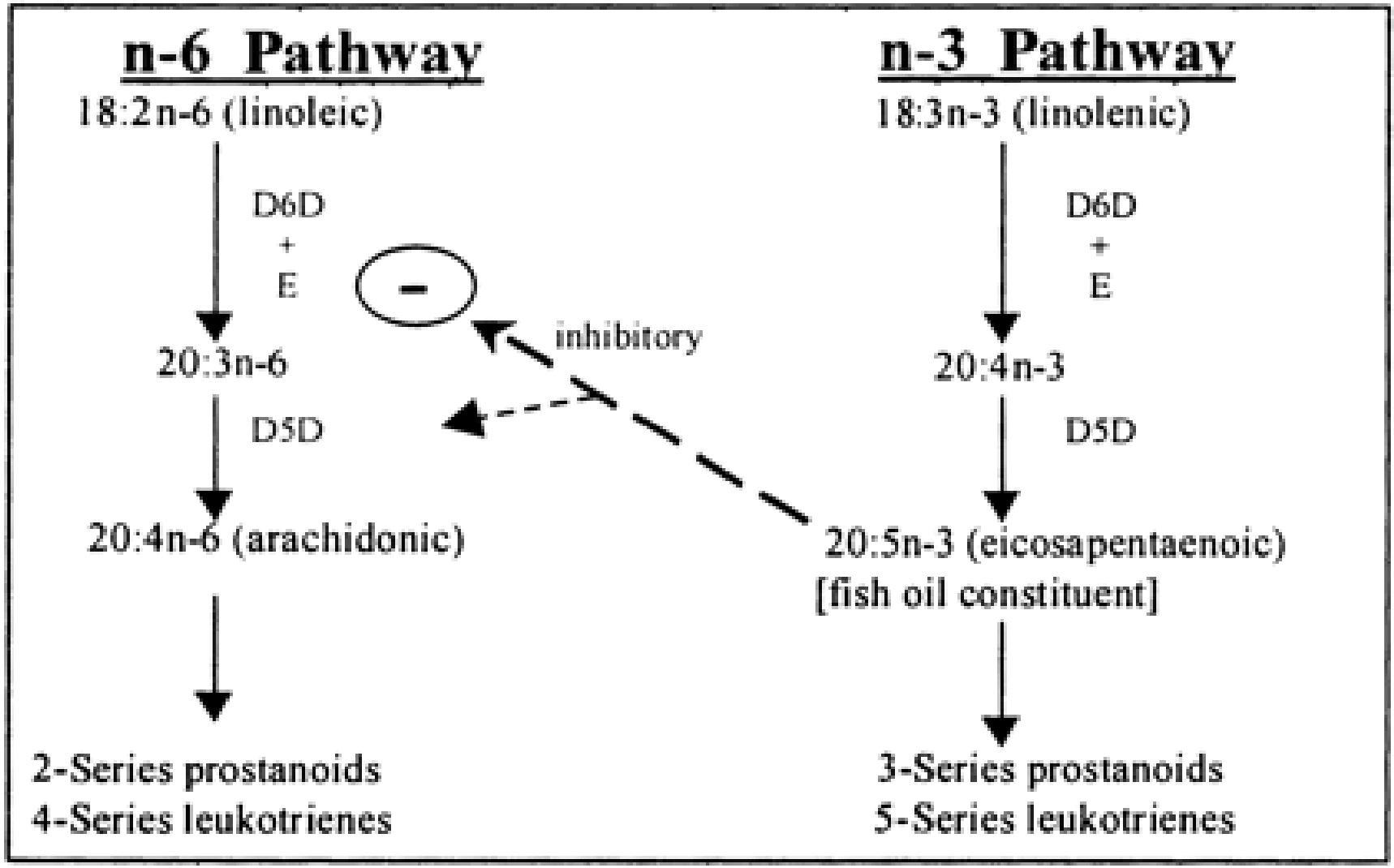
η αύξηση των αλλεργιών οφείλεται στη αύξηση των ω6 ΛΟ και στη μείωση των ω3. Η δομή και λειτουργία των ω3 διαφέρει σημαντικά από αυτή των ω6 και τα ανθρώπινα φλεγμονώδη κύτταρα έχουν αυξημένα ποσοστά ω6 και μειωμένα ω3. Τα ω6 διεγείρουν τους διαμεσολαβητές της οικογένειας των Εικοσανοειδών (προσταγλανδίνες, θρομβοξάνες λευκοτριένια) τα οποία έχουν προ- φλεγμονώδη δράση και ρυθμίζουν την παραγωγή των φλεγμονωδών κυτοκινών (TNF, IL-6).

Επίδραση της ΜΔ στο επιθήλιο- ω3 PUFA

- Στο ανθρώπινο σώμα τα ω3 και ω6 PUFA βρίσκονται σε σταθερή αναλογία
- μεταβολίζονται χρησιμοποιώντας κοινά ενζυμα όπως δέλτα-6-δεσατουράση.

- Η αφθονία των ω3 οδηγεί τον μεταβολικό δρόμο στην παραγωγή της σειράς 3 των προσταγλανδινών και της σειράς 5 των λευκοτριενιών (PGD_3, PGE_3, PGA_3, LTA_5, LTB_5, LTC_5, LTE_5) με ισχυρές αντιφλεγμονώδεις ιδιότητες αφού ρυθμίζεται ετσι η λειτουργία των Τ αντιγονοπαρουσιαστικών κυττάρων, η ρευστότητα της κυτταρικής μεμβράνης και ευοδώνεται η ανάπλαση των κυττάρων

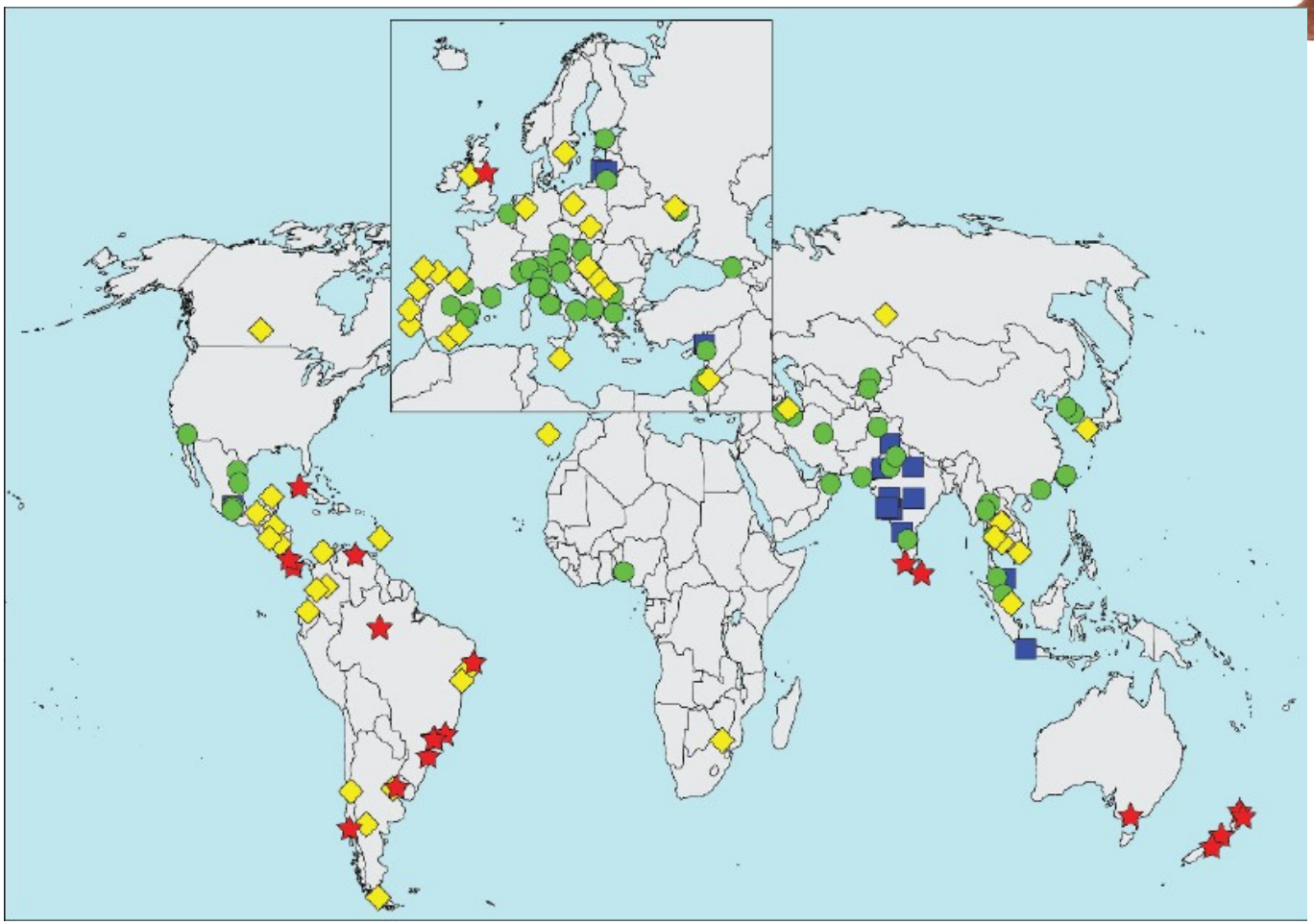
Calder PC. n-3 polyunsaturated fatty acids, inflammation, and inflammatory diseases. Am J Clin Nutr. 2006


n-6 Pathway
18:2n-6 (linoleic)
D6D
+
E
20:3n-6
D5D
20:4n-6 (arachidonic)
2-Series prostanoids
4-Series leukotrienes
inhibitory
n-3 Pathway
18:3n-3 (linolenic)
D6D
+
E
20:4n-3
D5D
20:5n-3 (eicosapentaenoic)
[fish oil constituent]
3-Series prostanoids
5-Series leukotrienes

Μεσογειακή διατροφή και αλλεργία

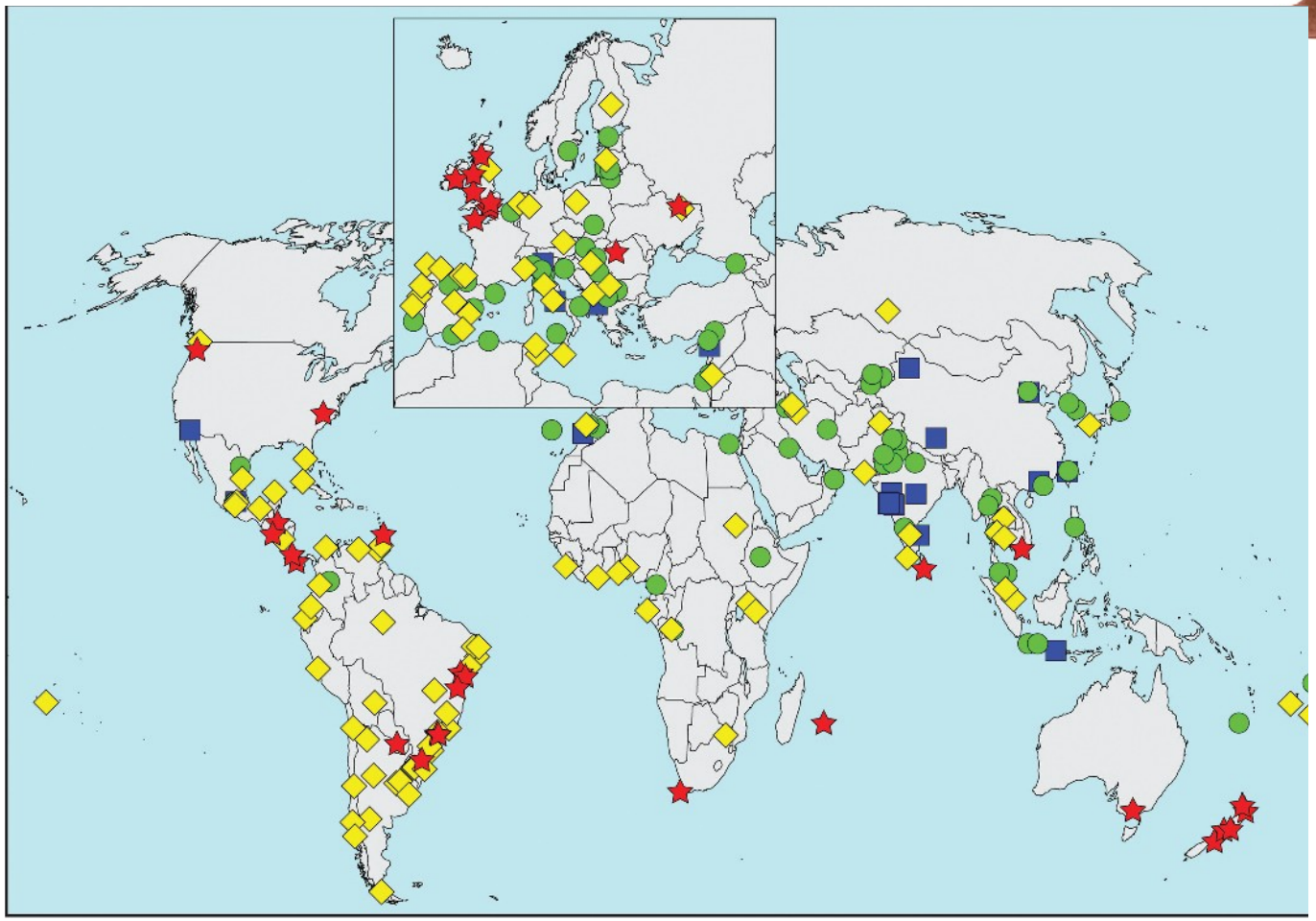
- Επιδημιολογικά δεδομένα
  - Άσθμα
  - Ρινοεπιπεφυκίτιδα
  - Ατοπική δερματίτιδα

Επιπολασμός ενεργού άσθματος 6-7 χρ



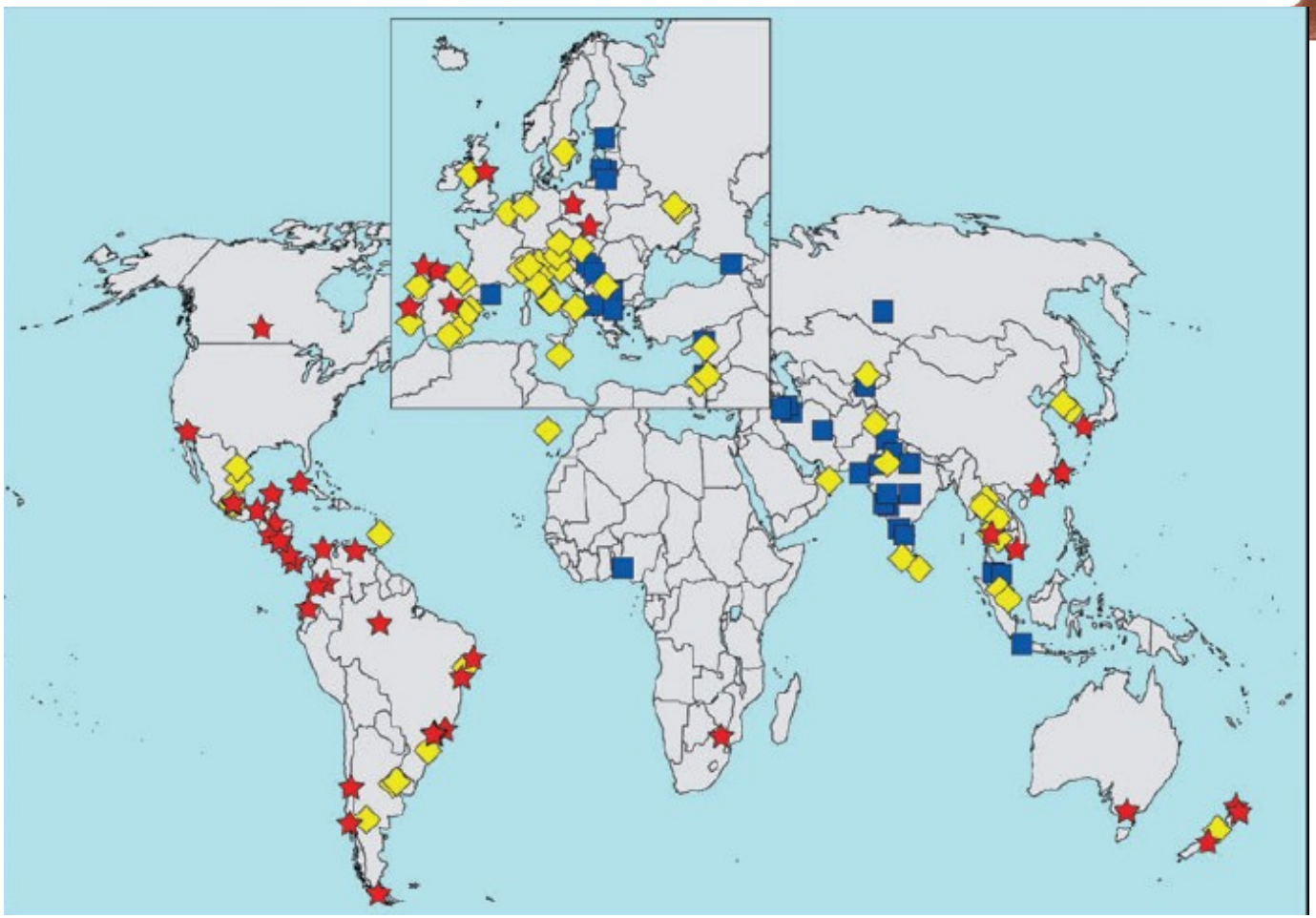
values <5% -blue squares, 5 to10% green circles, 10 to
% yellow diamond and .>20% red stars

Επιπολασμός ενεργού άσθματος 13-14 χρ

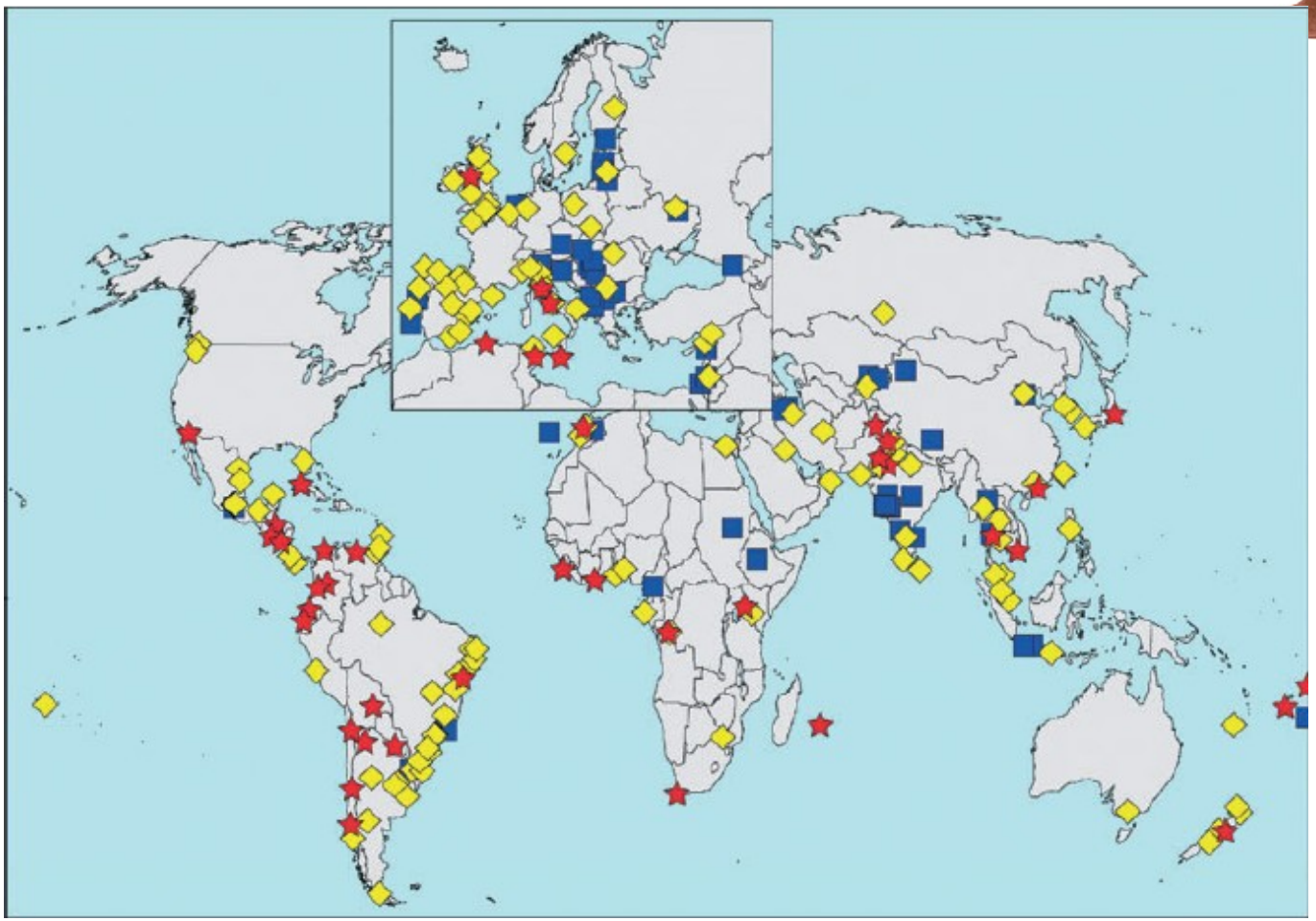


values <5% -blue squares, 5 to10% green circles, 10 to 20%
llow diamond and .>20% red stars

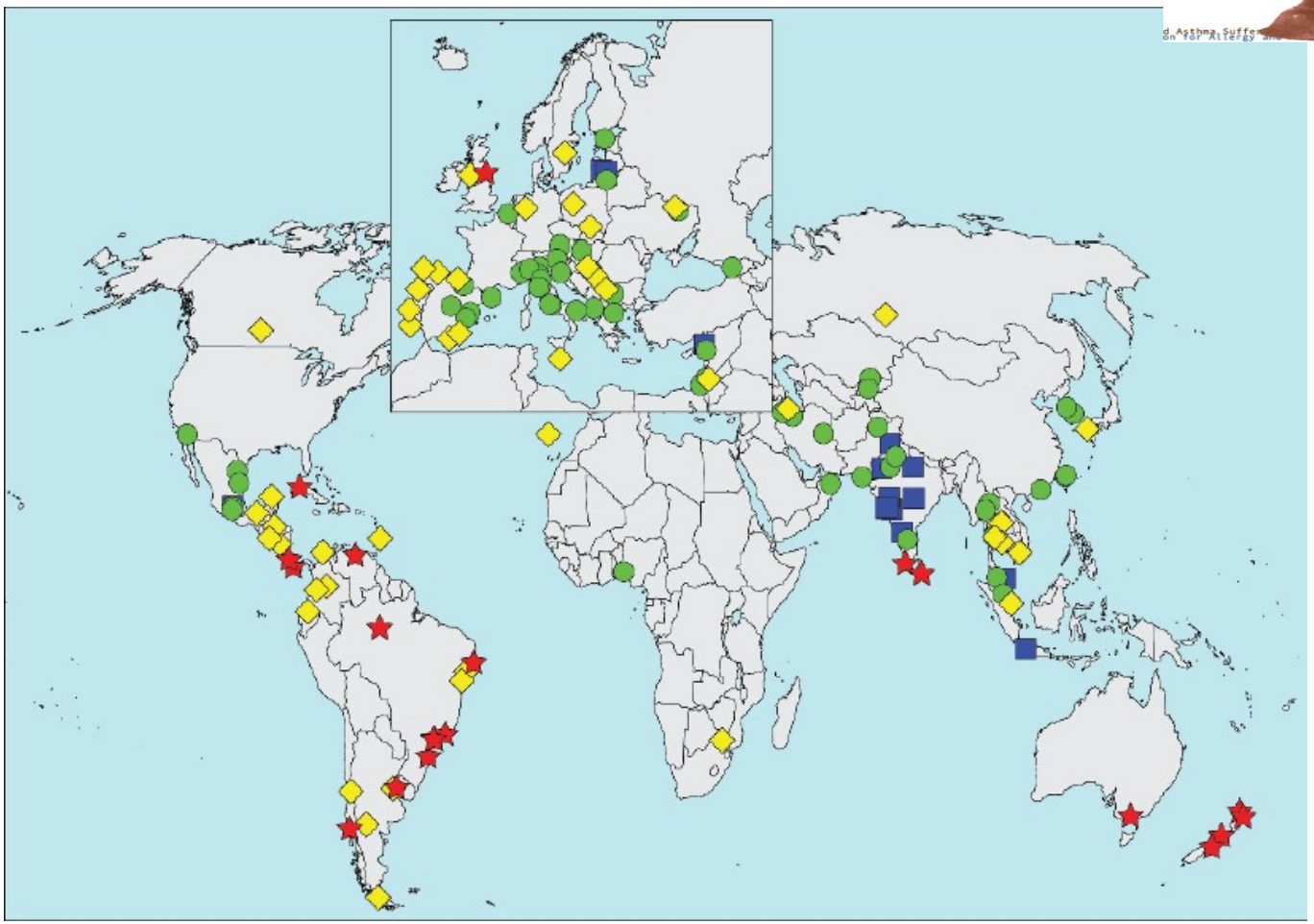
Επιπολασμός ρινοεπιπεφυκίτιδα 6-7 χρ



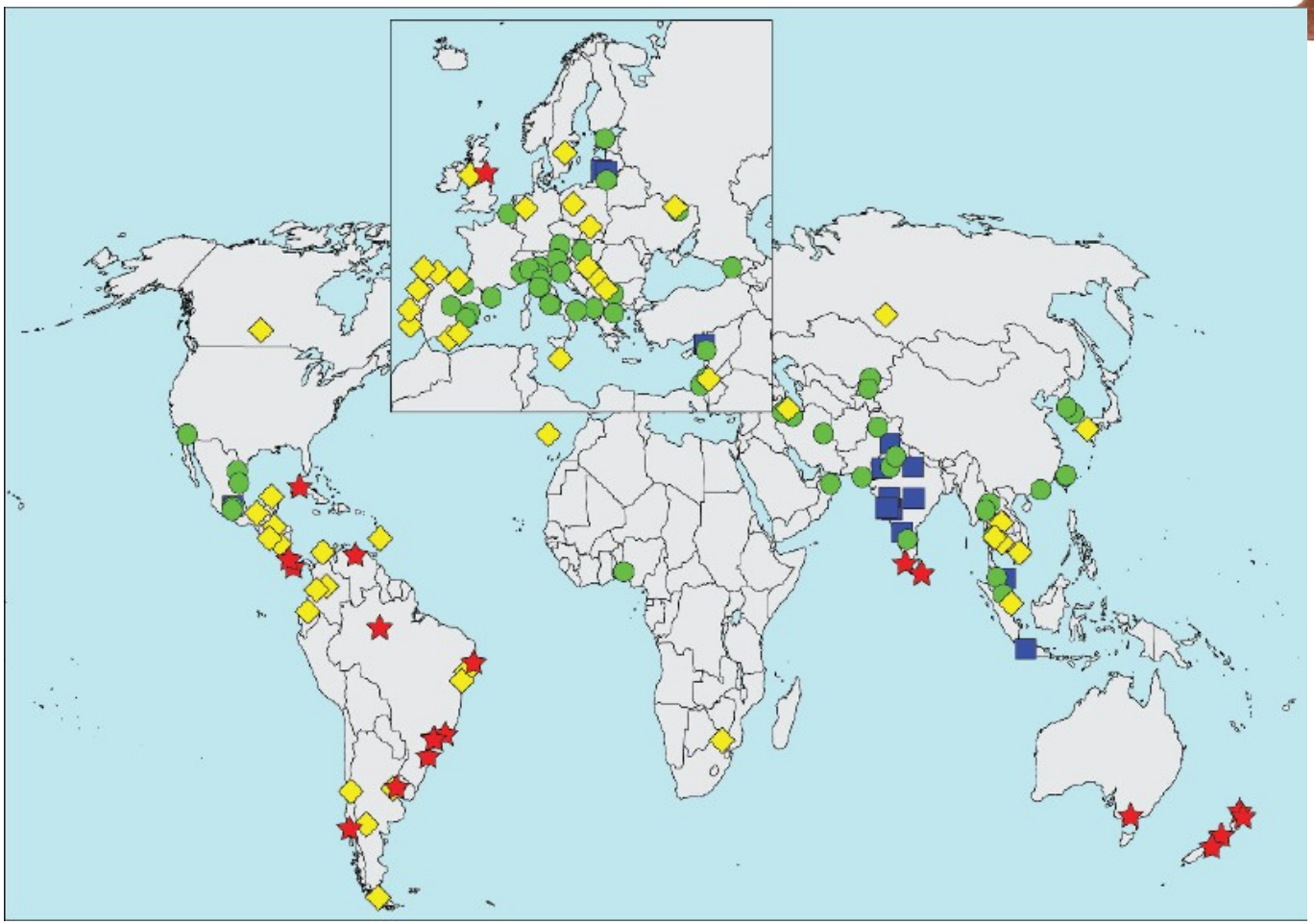
Επιπολασμός ρινοεπιπεφυκίτιδα 13-14 χρ



Επιπολασμος ατοπικής δερματίτιδας 6-7 χρ



Επιπολασμος ατοπικής δερματίτιδας 13-14 χρ



Diet and asthma, allergic rhinoconjunctivitis and atopic eczema
symptom prevalence: an ecological analysis of the International
Study of Asthma and Allergies in Childhood (ISAAC) data

Both age group showed a consistent pattern of decreases in symptoms of wheeze (current and severe), allergic rhinoconjunctivitis and atopic eczema, associated with increased per capita consumption of calories from cereal and rice, protein from cereals and nuts, starch, as well as vegetables and vegetable nutrients.

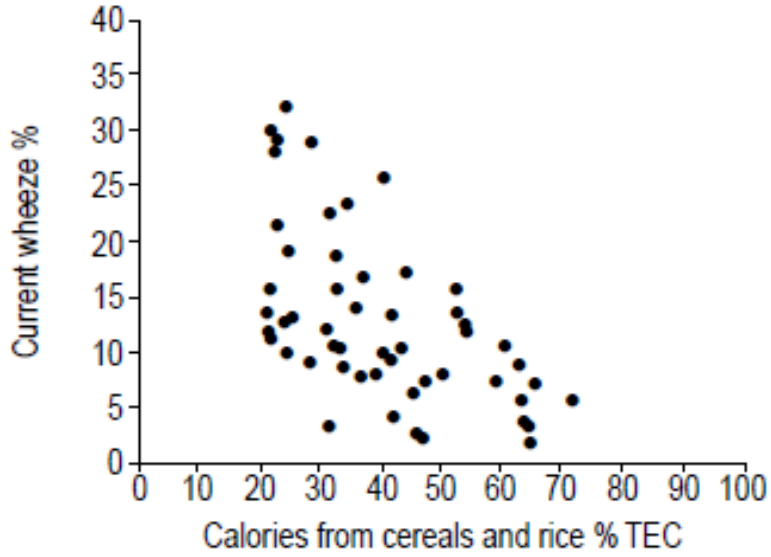


Fig. 2. – Current wheeze (%) against consumption of calories from cereal and rice (%TEC), 13–14 yr data. Each point represents a country, averaged from centre data.

P. Ellwood Eur Respir J 2001

Effect of diet on asthma and allergic sensitisatio the International Study on Allergies and Asthma Childhood (ISAAC) Phase Two

- Between 1995 and 2005, cross-sectional studies were performed in 29 centres in 20 countries.
- data from 50 004 randomly selected schoolchildren (8-12 years,29 579 with skin prick testing) were analysed
- Food selection according to the ‘Mediterranean diet’ was associated with a lower prevalence of current wheeze and asthma ever ($p_{trend=}0.03$).
- Diet is not associated with allergic sensitisation

Gabriele Nagel,Thorax 2010

Antioxidant foods consumption and childhood asthma and other allergic diseases: the Greek cohorts of the ISAAC II survey

2023 children 9-10 years old , Athens –Thessaloniki

Isaac II

Antioxidants Eating index

AEI was inversely associated with lifetime asthma in either cities independently of other cofounders

No association with other allergic disease or sensitization was detected.

Papadopoulou A, Allerg Immunopath 2014

Relationship of asthma and rhinoconjunctivitis with obesity,exercise and Mediterranean diet in Spanish schoolchildren

- 20106 παιδιά 6-7 χρ.//ISAAC III
- Md score (0,1,2) fruit, fish, vegetables, pulses, cereals, pasta, rice and potatoes were considered ‘‘pro-Mediterranean’’

- A Mediterranean diet has a potentially protective effect in girls aged 6–7 years with Current Severe Asthma independent of obesity .

Luis Garcia-Marcos et al Thorax 2007

Mediterranean diet and asthma in Spanish schoolchildren.

- 14,700 children , 6-7 y

- Greater adherence to the MD is associated with a higher risk of severe asthma (odds ratios = 2.26, 95% CI: 1.21–4.22) in girls of 6–7 yr.
- There was no significant relationship for the other asthma categories in the population studied.
- The results of our study do not support a protective effect of the MD on the prevalence or severity of asthma

Gonzalez Barcala FJ et al, Pediatr Allergy Immunol 2010

Mediterranean diet and asthma in Spanish schoolchil

Table 4. Multivariate logistic regression analysis for factors relating to asthma symptoms in (a) boys aged 6–7 (b) girls aged 6–7

	Asthma ever OR (95% CI)	Current asthma OR (95% CI)	Severe asthma OR (95% CI)	Exercise-induced asthma OR (95% CI)
(a) boys aged 6–7				
Mediterranean diet score				
1st quartile	1	1	1	1
2nd quartile	0.88 (0.71–1.09)	0.85 (0.63–1.13)	1.25 (0.78–1.98)	1.21 (0.81–1.81)
3rd quartile	1.02 (0.82–1.26)	0.77 (0.58–1.04)	1.17 (0.73–1.89)	0.89 (0.58–1.39)
4rd quartile	1.12 (0.91–1.38)	0.94 (0.71–1.23)	1.18 (0.75–1.88)	1.21 (0.82–1.78)
(b) girls aged 6–7.				
Mediterranean diet score				
1st quartile	1	1	1	1
2nd quartile	0.89 (0.71–1.12)	1.17 (0.83–1.64)	2.26 (1.21–4.22)*	1.46 (0.90–2.38)
3rd quartile	0.91 (0.72–1.15)	0.82 (0.57–1.17)	1.63 (0.84–3.15)	1.25 (0.76–2.07)
4rd quartile	1.04 (0.84–1.30)	1.03 (0.74–1.44)	1.52 (0.79–2.94)	1.02 (0.61–1.71)

Results adjusted for BMI, parental smoking, and maternal education. OR, odds ratios.
*Significative results.

Gonzalez Barcala FJ et al, Pediatr Allergy Immunol 2010

Mediterranean diet and asthma in Spanish schoolchil

Επεξήγηση των αποτελεσμάτων

- families of children with more severe asthma try to improve the quality of their diet, as it is known that 2/3 of asthmatics with a normal weight modify their diets

- This possibility seems to be reinforced by the fact that more severe forms of the disease are produced in lower-aged children, whose diet is most influenced by their parents . A similar association is seen in a Japanese study, where a more frequent consumption of fish is associated with a higher asthma prevalence .

Mediterranean diet as a protective factor for wheezing in preschool children.

- 1784 preschoolers (mean age, 4.08 +/- 0.8 years).
- experienced wheezing (20.0%) or not in the previous year.
- A Mediterranean diet score was built according to the intake frequency of several foods.

- The Mediterranean diet is an independent protective factor for current wheezing in preschoolers, irrespective of obesity and physical activity.

Castro-Rodriguez JA J Pediatr 2008

Protective effect of fruits, vegetables and the Mediterranean diet on asthma and allergies among children in Crete

- 690 children aged 7–18 years in rural Crete
- A high level of adherence to the Mediterranean diet was protective for allergic rhinitis (OR 0.34; 95% CI 0.18 to 0.64)
- modest protection was observed for wheezing and atopy.

- Conclusion: The results of this study suggest a beneficial effect of commonly consumed fruits, vegetables and nuts, and of a high adherence to a traditional Mediterranean diet during childhood on symptoms of asthma and rhinitis. Diet may explain the relative lack of allergic symptoms in this population.

Table 7 Association between the level of adherence to the Mediterranean diet and wheezing, allergic rhinitis and atopy

	Average diet score (n = 235)	High diet score (n = 152)	p for trend
Wheezing ever	0.94 (0.64 to 2.02)	0.67 (0.34 to 1.32)	0.229
Wheezing ever with atopy	0.98 (0.45 to 2.79)	0.53 (0.16 to 1.80)	0.417
Current wheezing	0.92 (0.41 to 2.83)	0.64 (0.20 to 2.05)	0.564
Nocturnal cough (last 12 months)	0.68 (0.36 to 1.27)	0.49 (0.23 to 0.96)	0.095
Allergic rhinitis ever	0.70 (0.42 to 1.16)	0.34 (0.18 to 0.64)	0.004
Allergic rhinitis ever with atopy	1.14 (0.50 to 2.57)	0.39 (0.13 to 0.97)	0.102
Current allergic rhinitis	0.77 (0.43 to 1.39)	0.49 (0.24 to 0.99)	0.142
Current seasonal allergic rhinitis	0.63 (0.24 to 1.65)	0.51 (0.20 to 1.25)	0.321
Atopy	0.94 (0.51 to 1.72)	0.54 (0.21 to 1.99)	0.384

ORs with 95% CI derived from logistic regression models after adjusting for age, sex, body mass index, parental asthma and number of older siblings.
The reference group includes those subjects with a low Mediterranean diet score.

Leda Chatzi, Thorax 2007

Adherence to the Mediterranean type of diet is associated with lower prevalence of asthma symptoms, among 10–12 years old children: the PANACEA study.

- 700 children (323 male), 10-12 year-old, selected from 18 schools located in Athens
- KIDMED score
- Greater adherence to the Mediterranean diet was inversely associated with ever had wheeze (p=0.001), exercise wheeze (p=0.004), ever had diagnosed asthma (p=0.002) and with any asthma symptoms (p<0.001)

Table 4. Results from multiple logistic regression analysis that evaluated the KIDMED score with the prevalence of asthma symptoms (n=511).

	Odds Ratio	95% Confidence Interval
KIDMED score (per 1 unit)	0.86	0.75-0.98
Age (per 1 year)	0.99	0.75-1.31
Sex (boys vs. girls)	1.58	1.03-2.42
Body Mass Index (per 1 kg/m^2)	1.02	0.97-1.08
Physical activity (yes vs. no)	1.14	0.75-1.74
Energy (per 1 category)	0.92	0.77-1.11

Arvaniti F, Priftis KN Pediatr allergy Immunol 2011

Urban environment adherence to the Mediterranean diet and prevalence of asthma symptoms among 10- to 12-year-old children: The Physical Activity, Nutrition, and Allergies in Children Examined in Athens study.

- 1125 (529 boys), 10- to 12-year-old children were selected from 18 schools located in urban Athens area (n = 700) and from 10 schools located in rural areas of Ilia and Viotia (n = 425),
- KIDMED score ISAAC
- adherence to the Mediterranean diet was associated with lower likelihood of asthma in both urban and rural areas (urban, odds ratio [OR] = 0.81, 95% CI, 0.73-0.91; rural, OR = 0.87, 95% CI, 0.75-1.00). Urban environment seems to increase the likelihood of childhood asthma, whereas adherence to the healthy Mediterranean dietary pattern could mediate the aforementioned association and confers significant protection.

Grigoropoulou D, Priftis KN, Allergy Asthma Proc. 2011

Mediterranean diet is associated with reduced asthma and rhinitis in Mexican children.

- 1476 children (6- to 7-year old). Dietary data of children's intake in the last 12 months and their mothers' intake during pregnancy was collected.
- A Mediterranean diet score -Isaac questionnaire
- Both mothers and children reported high consumption of fruits and nuts, vegetables, and junk food and fat .
- The correlation between each component of the score in children and their mothers ranged from 0.42 to 0.64 ($P < 0.0001$ in all components)
- Children ‘ diet score was associated to ever asthma and rhinitis
- mothers’ pregnancy diet score was associated only to current sneezing

protective effect of following a healthy dietary pattern on asthma and allergic rhinitis in Mexican children.

de Batlle J Allergy 2008

Table 4. Association between children's current diet and wheezing

			Wheezing ever				
	*n**	*n* (%)	Crude OR (95% CI)	Adjusted† OR (95% CI)	*n* (%)	Crude OR (95%	
Children score	1326						
1st tertile (0–3)	588	126 (30.96)	1	1	40 (10.13)	1	1
2nd tertile (4)	367	64 (24.06)	0.71 (0.50–1.00)	0.76 (0.53–1.09)	29 (11.11)	1.11 (0.67–1.84)	1.22 (0.73–2.05)
3rd tertile (5–8)	371	47 (19.03)	0.52 (0.36–0.77)	0.52 (0.35–0.78)	20 (8.23)	0.80 (0.45–1.40)	0.80 (0.45–1.42)
1st tertile (0–3)	588	126 (30.96)	1	1	40 (10.13)	1	1
2nd & 3rd tertiles (4–8)	738	111 (21.64)	0.62 (0.46–0.83)	0.64 (0.47–0.87)	49 (9.72)	0.96 (0.62–1.48)	1.01 (0.64–1.58)

*The following variables had missing values: wheezing ever (406), current wheezing (427).
†All models have been adjusted for: gender, maternal education, physical exercise, current tobacco smoking at home, maternal asthma, and maternal rhinitis.

Table 5. Association between children's current diet and having ever reported rhinitis and sneezing

			Rhinitis ever			Sneezing ever	
	*n**	*n* (%)	Crude OR (95% CI)	Adjusted† OR (95% CI)	*n* (%)	Crude OR (95% CI)	Adjusted† OR (95% CI)
Children score	1326						
1st tertile (0–3)	588	39 (10.13)	1	1	134 (33.00)	1	1
2nd tertile (4)	367	9 (3.46)	0.32 (0.15–0.67)	0.29 (0.12–0.67)	71 (26.89)	0.75 (0.53–1.05)	0.79 (0.55–1.13)
3rd tertile (5–8)	371	15 (6.15)	0.58 (0.31–1.08)	0.55 (0.27–1.13)	70 (27.78)	0.78 (0.55–1.10)	0.79 (0.55–1.14)
1st tertile (0–3)	588	39 (10.13)	1	1	134 (33.00)	1	1
2nd & 3rd tertiles (4–8)	738	24 (4.76)	0.44 (0.26–0.75)	0.41 (0.22–0.77)	141 (27.33)	0.76 (0.58–1.01)	0.79 (0.59–1.07)

Maternal dietary pattern during pregnancy is not associated with recurrent wheeze in children

- 1376 mother-infant pairs
- Mediterranean diet score, Alternate Healthy Eating Index modified for pregnancy (AHEI-P), and principal components analysis to look at Western and Prudent diets

- dietary pattern during pregnancy is not associated with recurrent wheeze

NE Lange, J Allergy Clin Immunol 2010

Mediterranean diet in pregnancy is protective for wheeze and atopy in childhood

Menorca, Spain 460 children were included in the analysis after 6.5 years of follow-up. Maternal dietary intake during pregnancy and children's dietary intake at age 6.5 years were assessed
A high Mediterranean Diet Score during pregnancy was found to be protective for persistent wheeze and atopy at age 6.5 years after adjusting for potential confounders. Childhood adherence to a Mediterranean diet was negatively associated with persistent wheeze and atopy although the associations did not reach statistical significance

Table 4 Association of maternal adherence to a Mediterranean diet during pregnancy with wheeze and atopy in Menorcan children at age 6.5 years

	Maternal high Med Diet Score	
	OR (95% CI)	OR‡ (95% CI)
Persistent wheeze at 6.5 years* (n = 37)	0.23 (0.09–0.60)	0.22 (0.08–0.58)
Atopic wheeze at 6.5 years† (n = 20)	0.34 (0.12–0.97)	0.30 (0.10–0.90)
Atopy† (n = 70)	0.55 (0.32–0.97)	0.55 (0.31–0.97)

Chatzi L Thorax 2008

Sewell et al. Trials 2013, 14:173
http://www.trialsjournal.com/content/14/1/173

TRIALS

STUDY PROTOCOL Open Access

Investigating the effectiveness of the Mediterranean diet in pregnant women for the primary prevention of asthma and allergy in high-risk infants: protocol for a pilot randomised controlled trial

Dean A Sewell[1*], Victoria S Hammersley[1], Graham Devereux[2], Ann Robertson[3], Andrew Stoddart[4], Chris Weir[5], Allison Worth[6] and Aziz Sheikh[6]

Diet and prevalence of atopic eczema in 6 to 7-year-old schoolchildren in Spain: ISAAC phase III.

- 20 106 schoolchildren aged 6-7 years from 10 different areas of Spain
- Mediterranean diet score

no association between the Mediterranean diet score and AD

Suárez-Varela MM, J Investig Allergol Clin Immunol. 2010

Influence of Mediterranean diet on asthma in children:
A systematic review and meta-analysis

Group	Study name	Subgroup within study	Odds ratio	Lower limit	Upper limit	Z-Value	p-Value
	Garcia-Marcos L et al. (2007)	Asturias (ES)	0.720	0.537	0.965	-2.198	0.028
		Bilbao (ES)	0.960	0.709	1.299	-0.265	0.791
		La Coruña (ES)	1.260	0.893	1.777	1.318	0.188
		Madrid (ES)	0.670	0.452	0.994	-1.991	0.046
		San Sebastian (ES)	0.600	0.304	1.185	-1.471	0.141
	Nagel G et al. (2010)	Ankara (TR)	0.870	0.526	1.439	-0.542	0.588
		Madrid (ES)	1.010	0.570	1.790	0.034	0.973
		Mumbai (IN)	1.060	0.661	1.764	0.308	0.758
		Ramallah (IL)	1.370	0.632	2.970	0.798	0.425
		Reykjavik (IS)	1.180	0.658	2.115	0.556	0.578
		Riga (LV)	0.500	0.240	1.041	-1.853	0.064
		Tblisi (GE)	0.520	0.259	1.045	-1.836	0.066
		Tromso (NO)	0.890	0.660	1.200	-0.764	0.445
		Uruguaiana (BR)	1.370	0.765	2.454	1.059	0.290
		West Sussex (UK)	1.140	0.741	1.753	0.597	0.551
	Batlle L et al. (2008)		0.800	0.450	1.421	-0.761	0.447
Non-Mediterranean			0.906	0.783	1.048	-1.328	0.184
	Garcia-Marcos L et al. (2007)	Barcelona (ES)	0.790	0.561	1.112	-1.351	0.177
		Cartagena (ES)	0.840	0.591	1.193	-0.974	0.330
		Valencia (ES)	0.990	0.705	1.390	-0.058	0.954
	Nagel G et al. (2010)	Almeria (ES)	1.040	0.656	1.649	0.167	0.868
		Cartagena (ES)	0.960	0.610	1.510	-0.177	0.860
		Rome (IT)	0.800	0.477	1.342	-0.846	0.398
		Tirana (AL)	2.000	0.856	4.671	1.602	0.109
		Valencia(ES)	0.610	0.378	0.985	-2.024	0.043
	Castro-Rodriguez et al. (2008)		0.550	0.351	0.862	-2.607	0.009
	Sanchez-Solis et al (2006)		0.330	0.171	0.635	-3.316	0.001
	Chatzi L et al. (2007)		0.640	0.200	2.049	-0.752	0.452
	Chatzi L et al. (2008)		0.460	0.099	2.143	-0.989	0.323
Mediterranean			0.789	0.661	0.942	-2.616	0.009
Overall			0.854	0.747	0.976	-2.323	0.020

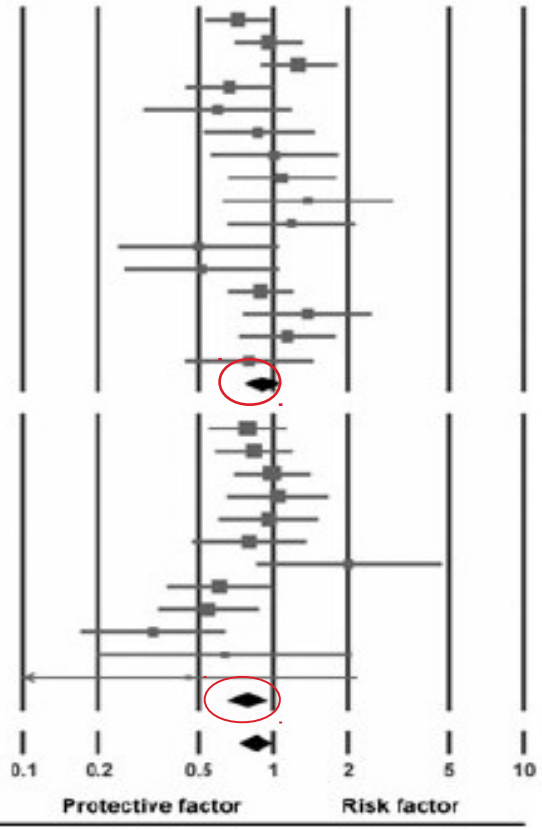


Figure 2 Summary plot of studies including 'current wheeze' as outcome. I^2: Non-Mediterranean centers 26.5%; Mediterranean centers 43.6%; total 35.4%. Q between groups 1.38; p = 0.24.

L. Garcia-Marcos Ped Aller Immun 2013

Influence of Mediterranean diet on asthma in children:
A systematic review and meta-analysis

Group	Study name	Subgroup within study	Odds ratio	Lower limit	Upper limit	Z-Value	p-Value
	Garcia-Marcos L et al (2007)	Asturias (ES)	0.840	0.641	1.101	-1.262	0.207
		Bilbao (ES)	0.890	0.700	1.131	-0.954	0.340
		La Coruña (ES)	1.320	0.941	1.852	1.607	0.108
		Madrid (ES)	0.930	0.628	1.376	-0.363	0.717
		San Sebastian (ES)	0.860	0.480	1.540	-0.507	0.612
	Nagel G et al (2010)	Madrid (ES)	0.790	0.449	1.388	-0.819	0.413
		Mumbai (IN)	1.070	0.631	1.814	0.251	0.802
		Ramallah (IL)	1.350	0.530	3.439	0.629	0.529
		Reykjavik (IS)	0.550	0.360	0.840	-2.766	0.006
		Riga (LV)	0.300	0.092	0.975	-2.003	0.045
		Tbilisi (GE)	0.530	0.178	1.575	-1.142	0.253
		Tromso (NO)	0.770	0.532	1.114	-1.386	0.166
		Uruguaiana (BR)	0.760	0.389	1.486	-0.803	0.422
		West Sussex (UK)	1.070	0.713	1.606	0.326	0.744
	De Batlle J et al (2008)		0.610	0.362	1.027	-1.860	0.063
Non-Mediterranean			0.860	0.753	0.983	-2.216	0.027
	Garcia-Marcos L et al (2007)	Barcelona (ES)	0.710	0.530	0.951	-2.301	0.021
		Cartagena (ES)	0.930	0.660	1.310	-0.415	0.678
		Valencia (ES)	1.210	0.848	1.726	1.051	0.293
	Sanchez-Solis M (2006)		0.840	0.459	1.537	-0.566	0.572
	Castro-Rodriguez JA et al (2008)		0.640	0.350	1.170	-1.450	0.147
	Chatzi L et al (2007)		0.670	0.340	1.320	-1.157	0.247
	Nagel G et al (2010)	Almeria (ES)	0.910	0.571	1.451	-0.396	0.692
		Cartagena (ES)	0.670	0.422	1.064	-1.696	0.090
		Rome (IT)	1.130	0.744	1.716	0.573	0.567
		Tirana (AL)	1.110	0.377	3.266	0.190	0.850
		Valencia(ES)	0.930	0.576	1.496	-0.299	0.765
	Arvaniti F et al (2011)		0.230	0.051	1.044	-1.904	0.057
Mediterranean			0.862	0.738	1.008	-1.861	0.063
Overall			0.861	0.778	0.953	-2.894	0.004

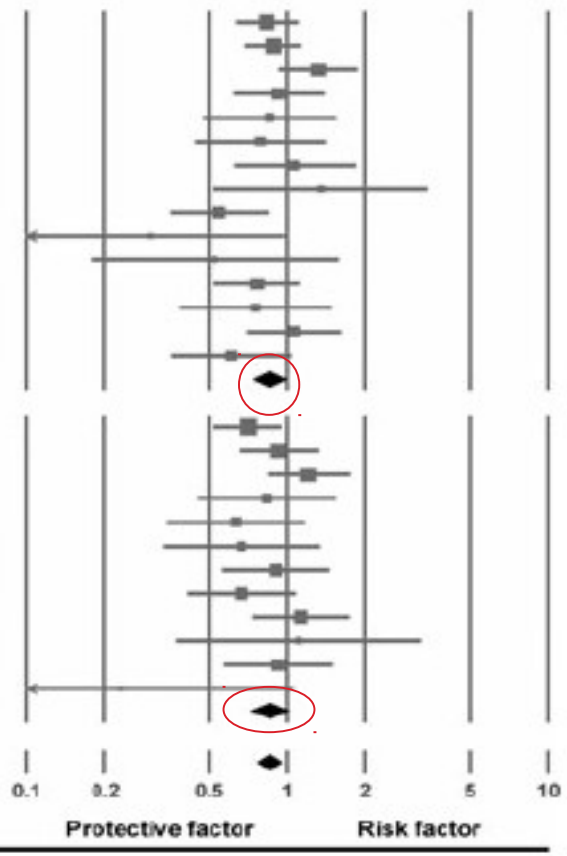


Figure 4 Summary plot of studies including 'asthma ever' as outcome. I^2: Non-Mediterranean centers 27.7%; Mediterranean centers 14.7%; total 19.4%. Q between groups 0.001; p = 0.98

συμπεράσματα

- Τα δεδομένα συνηγορούν για μια ευεργετική επίδραση της ΜΔ στο ασθμα στα παιδιά
- Η επίδραση στην αλλεργική ρινίτιδα και στην ευαισθητοποίηση είναι διφορούμενη
- Για την ατοπική δερματίτιδα τα αποτελέσματα όλων των μελετών είναι αρνητικά

Μεσογειακή διατροφή

- Η Μεσογειακή Διατροφή κατοχυρώνεται πλέον ως ολοκληρωμένο και πολυδιάστατο αγαθό, που το συνθέτουν τα τοπικά αγροτικά προϊόντα, οι μέθοδοι παραγωγής, το αγροτικό τοπίο, το κλίμα και το έδαφος, οι διατροφικές συνήθειες, η κοινωνικότητα, ο πολιτισμός, τα ήθη και έθιμα, η παράδοση.

Μεσογειακή δίαιτα ως τρόπος ζωής

Η Μεσογειακή Δίαιτα δεν είναι απλά μια δίαιτα.

Είναι ένας **τρόπος ζωής που δεν περιορίζεται μόνο στην διατροφή και στην άσκηση** .

Είναι μια κουλτούρα,
ένας πολιτισμός,
μια παράδοση .

Ένα πολυδιάστατο σύνολο ποιότητας ζωής που βοηθά
στη διατήρηση της υγείας και της ευεξίας.

United Nations
Educational, Scientific and
Cultural Organization

Mediterranean diet¨:
Intangible Cultural Heritage of Humanity

The Mediterranean diet involves a set of skills, knowledge, rituals, symbols and traditions concerning crops, harvesting, fishing, animal husbandry, conservation, processing, cooking, and particularly the sharing and consumption of food. Eating together is the foundation of the cultural identity and continuity of communities throughout the Mediterranean basin. It is a moment of social exchange and communication, an affirmation and renewal of family, group or community identity. The Mediterranean diet emphasizes values of hospitality, neighbourliness, intercultural dialogue and creativity, and a way of life guided by respect for diversity.

http://www.unesco.org/culture/ich/RL/00884

Σας ευχαριστώ πολύ