# When and How to Address Significantly Elevated IgE Levels in Food Allergy

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# Learning Objectives

Upon completion of this learning activity, participants should be able to…

- Differentiate features of food allergy and elevated IgE which may be inborn errors of immunity/ primary atopic disorder from more routine atopy
- Plan an evaluation for children with food allergy and elevated IgE
- Describe how elevated specific IgE affects the diagnosis and prognosis and management of food allergy

# PBL: Noah, A 7-year-old with food allergies and comorbid asthma

**Food Allergy History**

- **Peanut** allergy since infancy (hives on first exposure; IgE positive)
- Strict avoidance of peanut; tolerates tree nuts
- Severe reaction to **sesame/tahini** 4 months ago → ED care with IM epinephrine, $O_2$, albuterol

**Asthma History**

- Onset age 4; **suboptimal control**
- ACT = **17**; albuterol ~3×/week
- 2 prednisone bursts/year
- On budesonide/formoterol 80/4.5, 2 puffs BID

**Atopic Comorbidities**

- Chronic itchy/runny nose; partial control on loratadine + fluticasone
- Infantile eczema, mild recurrence

# PBL: Noah, A 7-year-old with food allergies and comorbid asthma

**Old Allergy Records (3 months ago)**

- Total IgE: **1,000 IU/mL**
- Skin tests: >10 mm to **peanut**, **sesame**, HDM, cat, dog; negative to tree nuts
- Serum IgE: peanut **30 IU/mL**, sesame **20 IU/mL**
- Spirometry: normal
- FeNO: **45 ppb**
- Blood eosinophils: **600**
- C-ACT: **17**

**Environment**

- Lives with parents; dog + cat in home
- Bedroom HDM control; HEPA filter; pet restriction

# PBL: Noah, A 7-year-old with food allergies and comorbid asthma

**Medications**

- Epinephrine autoinjector 0.15 mg
- Budesonide/formoterol BID
- Albuterol PRN
- Loratadine; fluticasone nasal spray

**Exam**

- Vitals normal; clear rhinorrhea; Dennie–Morgan lines; Flexural erythema; lungs clear
- Weight 25kg

**Testing Today**

- Spirometry: normal
- FeNO: **45 ppb**
- ACT: **17**

# Differential Diagnosis of Elevated IgE

- Allergic, infectious, inflammatory, immunodeficiency causes

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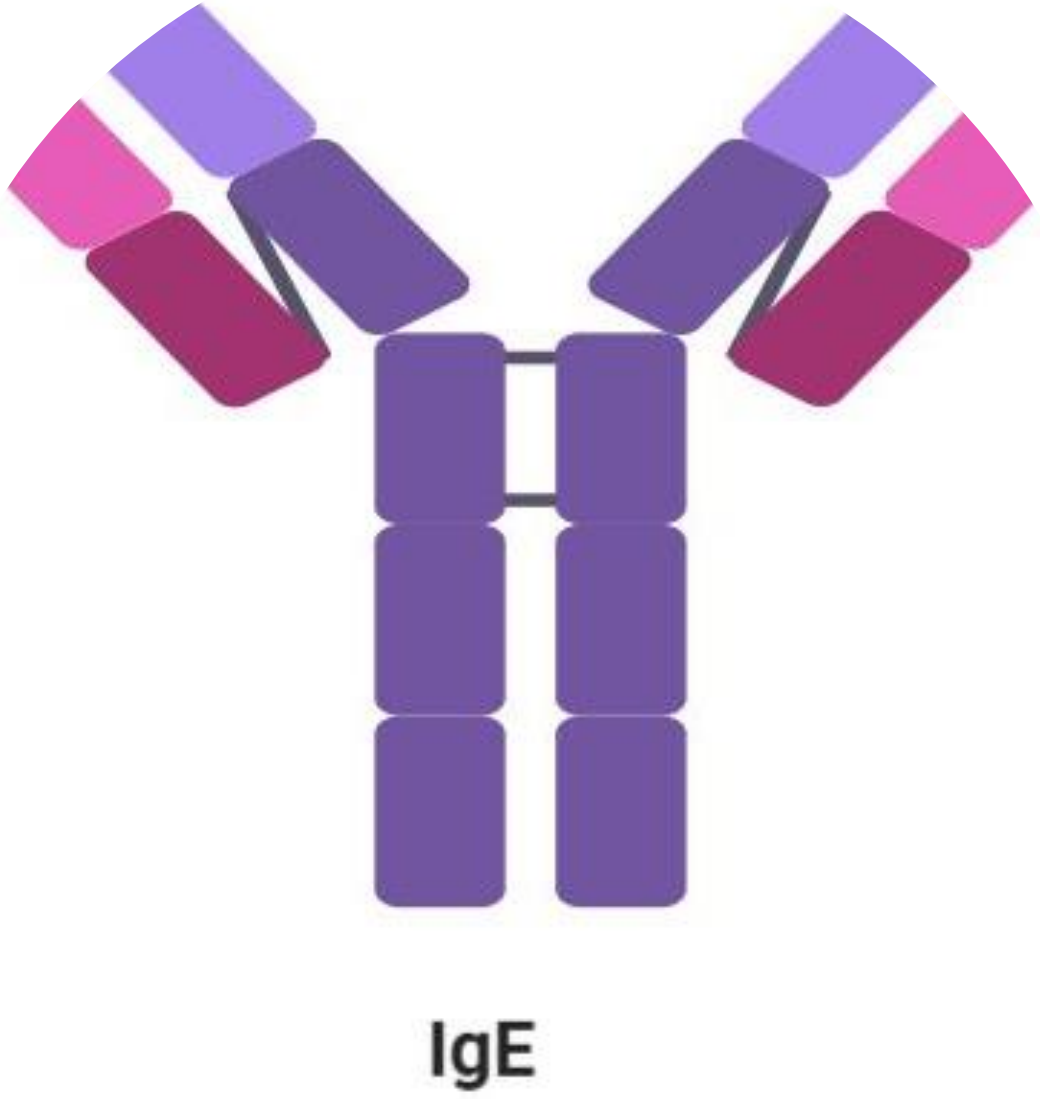
# Elevated Total IgE – What Does It Mean for Diagnosis?

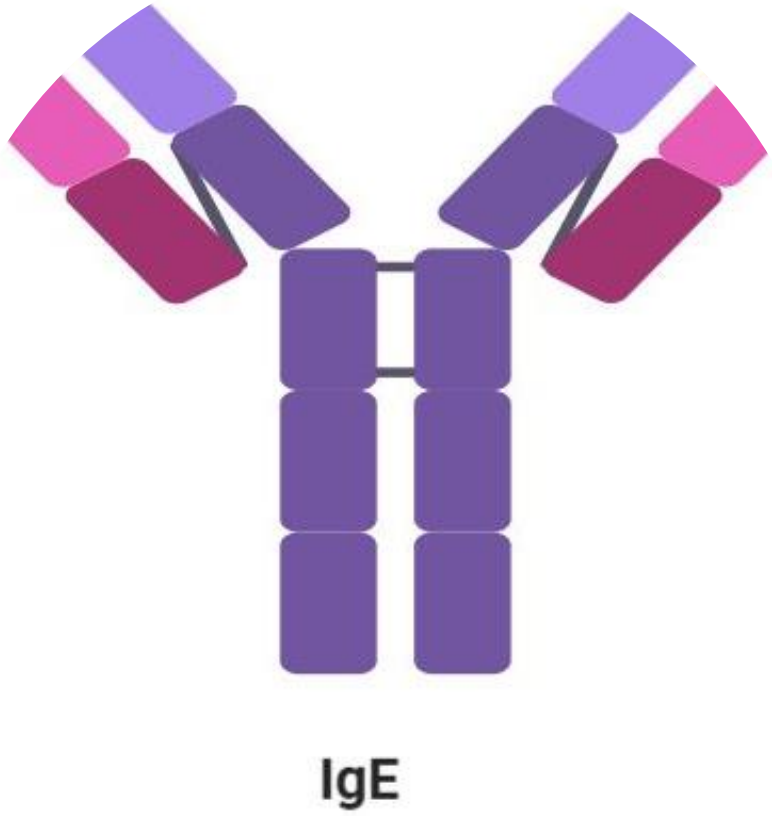
Rare but critical immunodeficiency/inflammatory or primary atopy syndromes

Common allergic disorders



# Elevated Total IgE what is elevated?

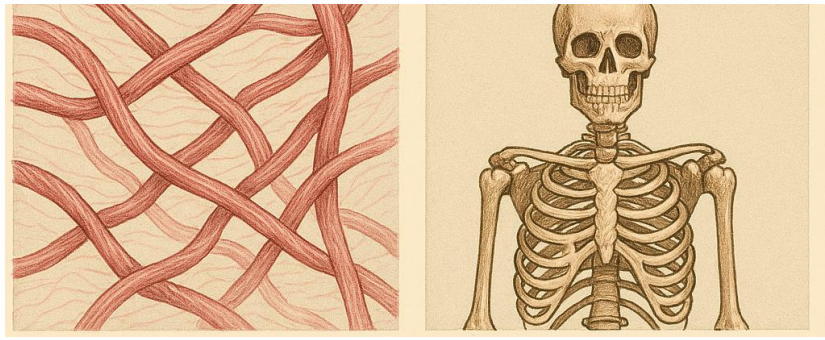
- Upper limit of normal for age values >100–200 IU/mL are typically considered elevated in children, and levels >1000 IU/mL are regarded as significantly elevated in both adults and children
- Reference ranges vary by age, sex, population and laboratory

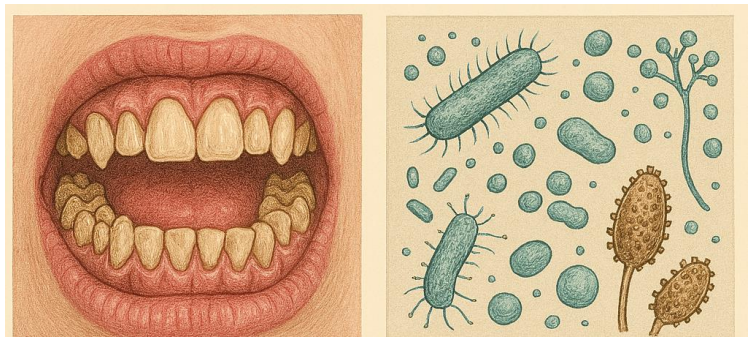


# Inborn Errors of Immunity

- Cytokine signalling
- Cytoskeleton
- T- cell defects
- Barrier

# Cytokine Signaling Defects (JAK-STAT Pathway)





Critical for cytokine-mediated immune responses and Th17 differentiation:

- **STAT3 deficiency** (AD-HIES): Prototype hyper-IgE syndrome with impaired IL-6, IL-10, IL-21, and IL-23 signaling, leading to defective Th17 immunity and susceptibility to Staphylococcus aureus and Candida infections
- **ZNF341 deficiency:** Phenotypically similar to STAT3 deficiency, as ZNF341 regulates STAT3 expression
- **PGM3 deficiency** (AR-HIES): Affects N-glycosylation pathways, impairing cytokine receptor function and multiple signaling cascades

# Cytokine Signaling Defects (JAK-STAT Pathway)

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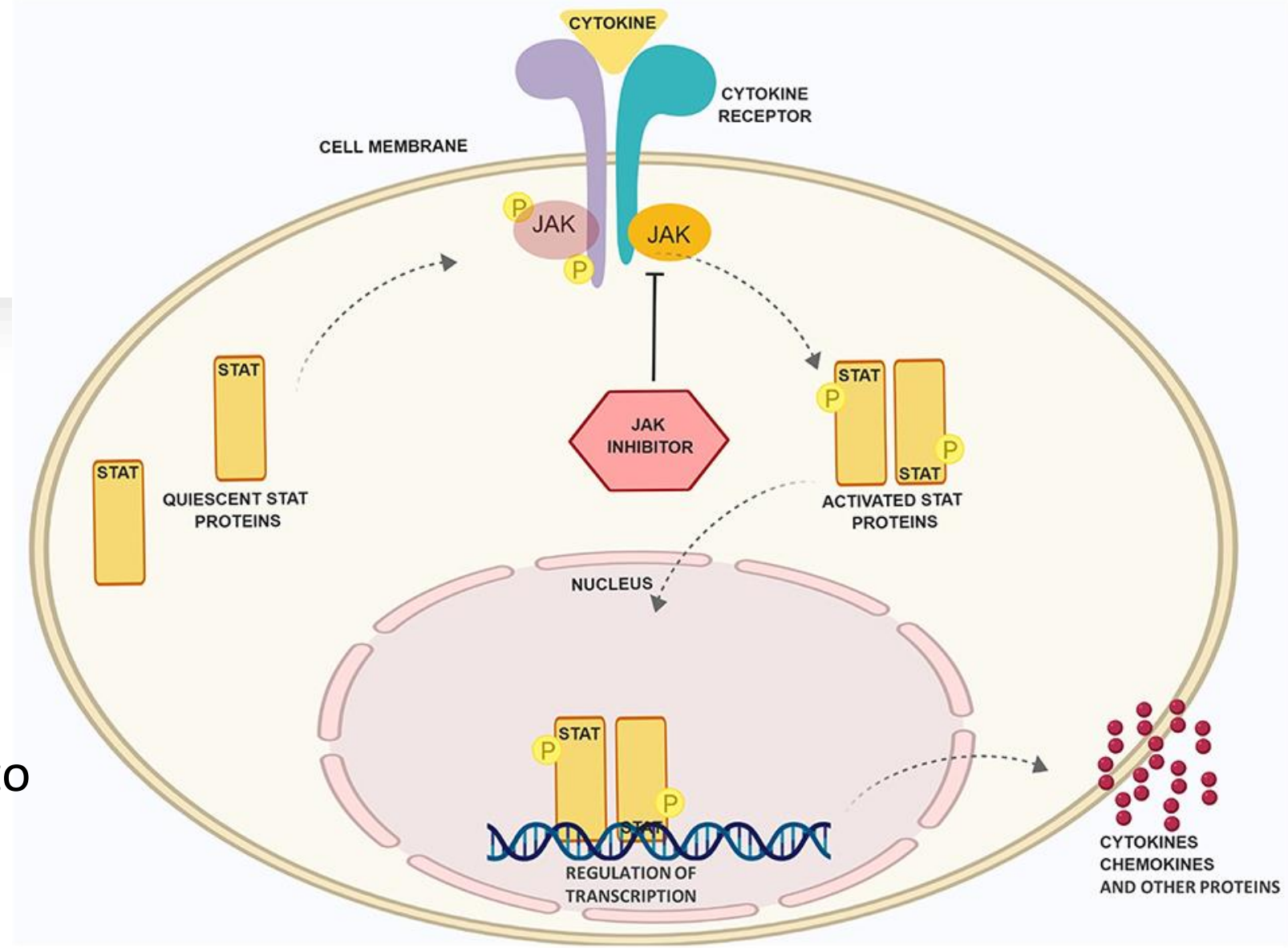
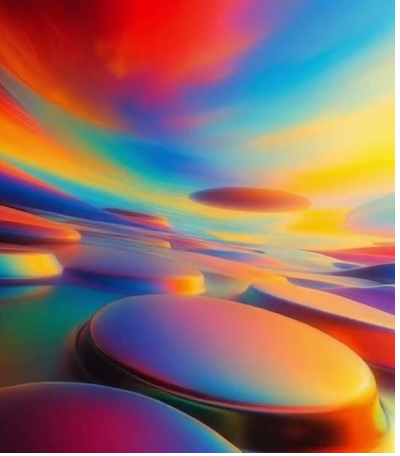


# STAT6 GOF

- Interleukin (IL)-4 and IL-13 are known to activate the STAT6 signaling pathway
- STAT6 GOF puts the TH2 pathway in hyperdrive



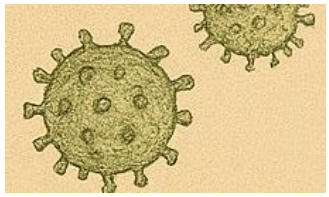
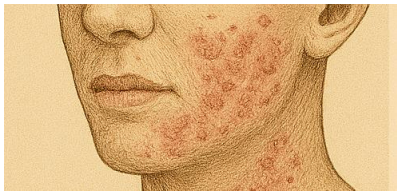
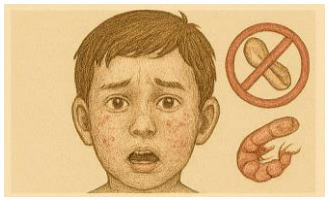
# STAT6 GOF

- Treatment-resistant dermatitis
- Food allergies
- Asthma
- Eosinophilic gastrointestinal disease
- Severe episodes of anaphylaxis including fatality

Non atopic features

- Recurrent skin, respiratory, and viral infections, although none had history of fatal infections
- Like HIES, short stature, skeletal issues such as pathologic fractures, and generalized hypermobility
- B cell lymphoma
- Fatality due to a cerebral aneurysm also occurred
- T, B, and natural killer cell numbers all typically in the normal range although clinical evidence of chronic systemic inflammation was documented (i.e., elevations in white blood cell counts, platelets, and serum immunoglobulin levels).

# Cytoskeletal/Actin Regulation Defects

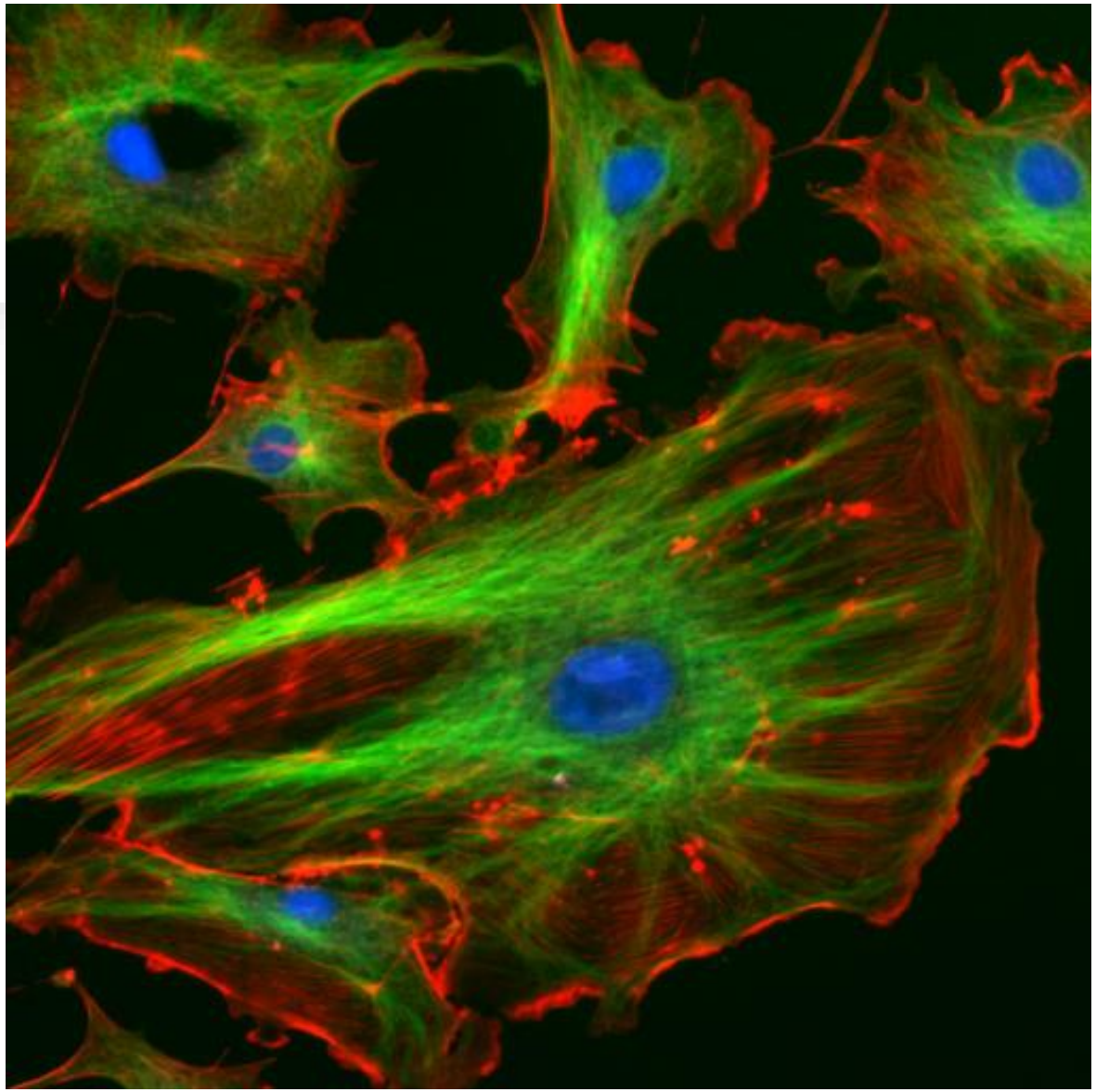

Severe viral infections, eczema, food allergies, autoimmunity, increased malignancy risk, and often thrombocytopenia

- **DOCK8 deficiency:** Impairs actin cytoskeleton reorganization in lymphocytes, leading to defective cell migration and immune synapse formation.
- **Wiskott-Aldrich syndrome** (WASp deficiency): Disrupts actin nucleation downstream of the ARP2/3 complex
- **ARPC1B deficiency** (ARP2/3 complex): Directly affects the actin-nucleating ARP2/3 complex

# Cytoskeletal/Actin Regulation Defects

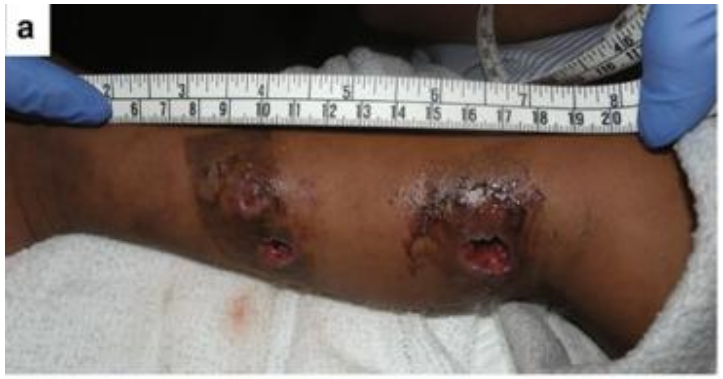
Defects in actin polymerization and cytoskeletal remodeling, critical for immune cell migration, synapse formation, and platelet function:

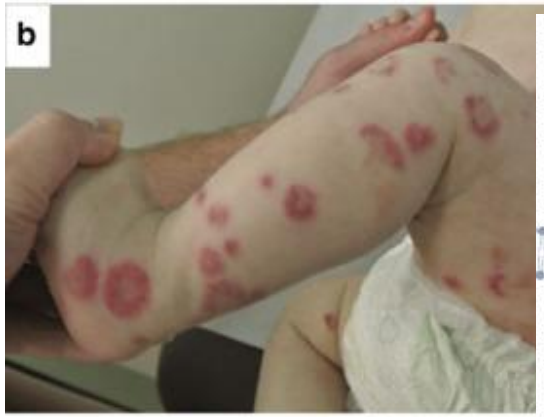
- **DOCK8 deficiency**
- **Wiskott-Aldrich syndrome**
- **ARPC1B deficiency (ARP2/3 complex)**

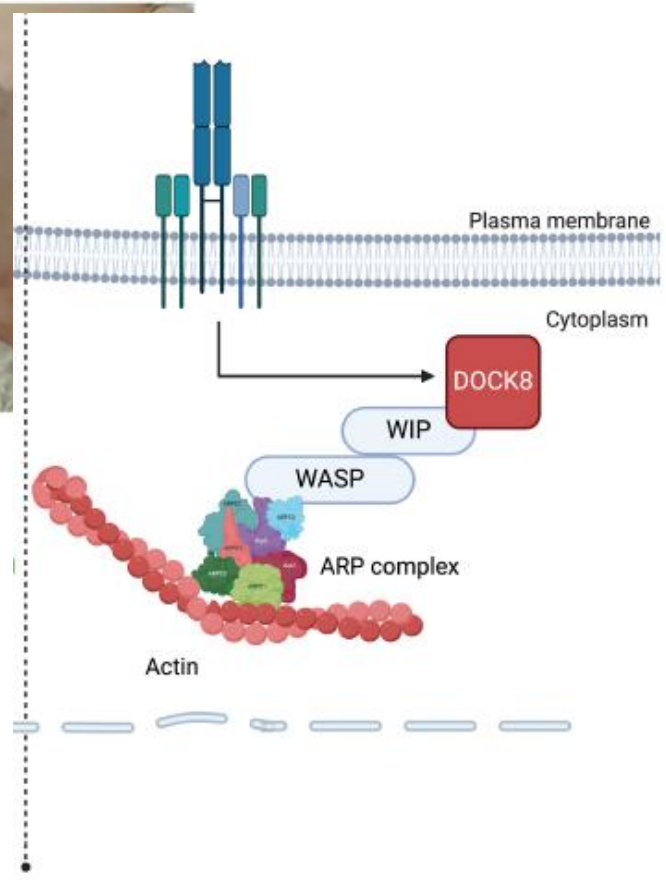


# Arp 2/3

- Similar to Wiskott Aldrich because is downstream of the WAS protein
- Autoimmunity
- Atopy
- High IgE, eosinophilia, Platelet counts normal

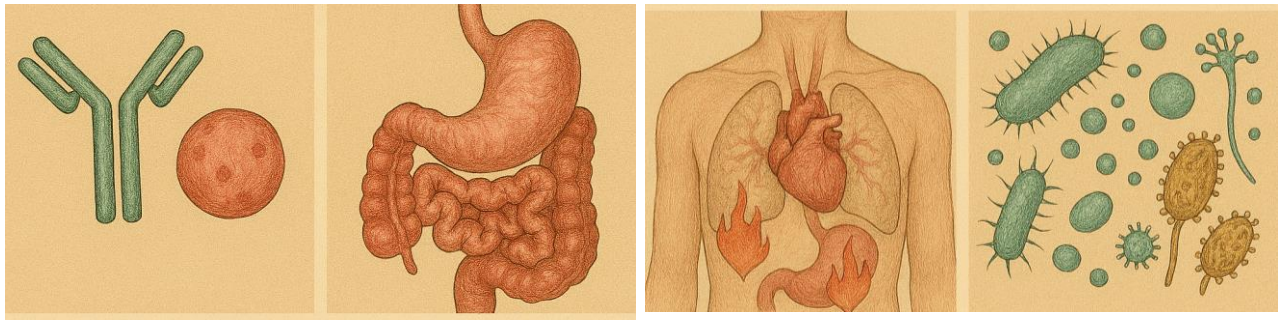



Kahr WH, Pluthero FG, Elkadri A, Warner N, Drobac M, Chen CH, Lo RW, Li L, Li R, Li Q, Thoeni C, Pan J, Leung G, Lara-Corrales I, Murchie R, Cutz E, Laxer RM, **Upton J,** Roifman CM, Yeung RS, Brumell JH, Muise AM. Loss of the Arp2/3 complex component ARPC1B causes platelet abnormalities and predisposes to inflammatory disease. Nat Commun. 2017 Apr 3;8:14816. doi: 10.1038/ncomms14816. PMID: 28368018; PMCID: PMC5382316.

# Immune Dysregulation/ T cell signalling defects



Defective regulatory T cell function or aberrant immune activation, leading to autoimmunity and inflammatory manifestations:

- **IPEX syndrome (FOXP3 deficiency):** Loss of regulatory T cell function causes multi-organ autoimmunity with enteropathy, endocrinopathy, and severe eczema.
- **Omenn syndrome**: Severe combined immunodeficiency (SCID) with oligoclonal T cell expansion, erythroderma, and lymphoproliferation.
- **CARD11 deficiency:** Impairs NF-κB signaling with variable presentations including atopy and combined immunodeficiency.
- **MALT1 deficiency:** Disrupts the CBM signalosome and NF-κB activation, causing combined immunodeficiency with Th2 skewing and decreased regulatory T cells
- **Atypical DiGeorge syndrome:** (rare-disease/22q112-deletion-syndrome): Thymic hypoplasia with variable immunodeficiency and occasional IgE elevation

# Immune Dysregulation/ T cell signalling defects

Defective regulatory T cell function or aberrant immune activation, leading to autoimmunity and inflammatory manifestations:

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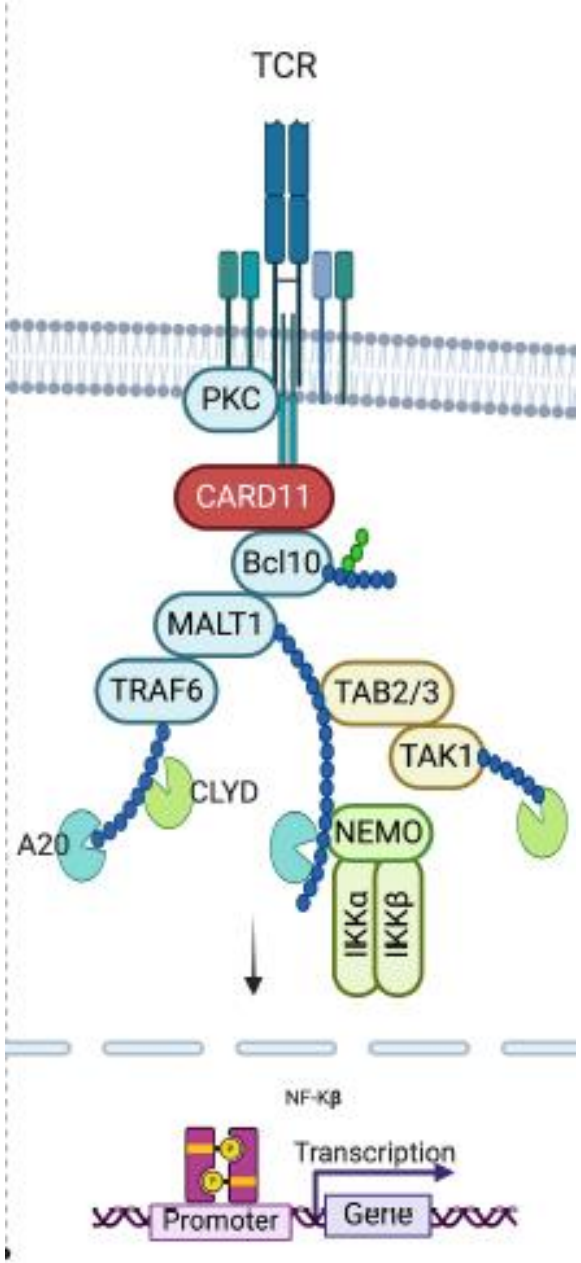
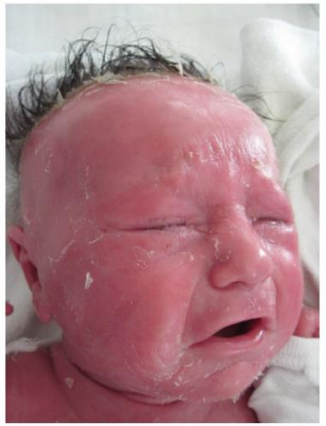
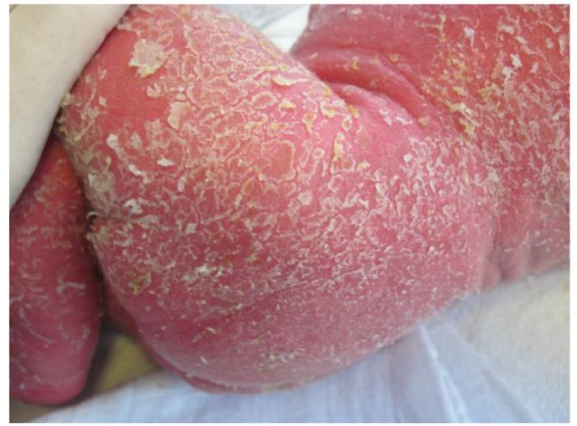
- **Omenn syndrome**
- **CARD11 deficiency**
- **MALT1 deficiency**



# Barrier/Structural/ connective tissue Defects:

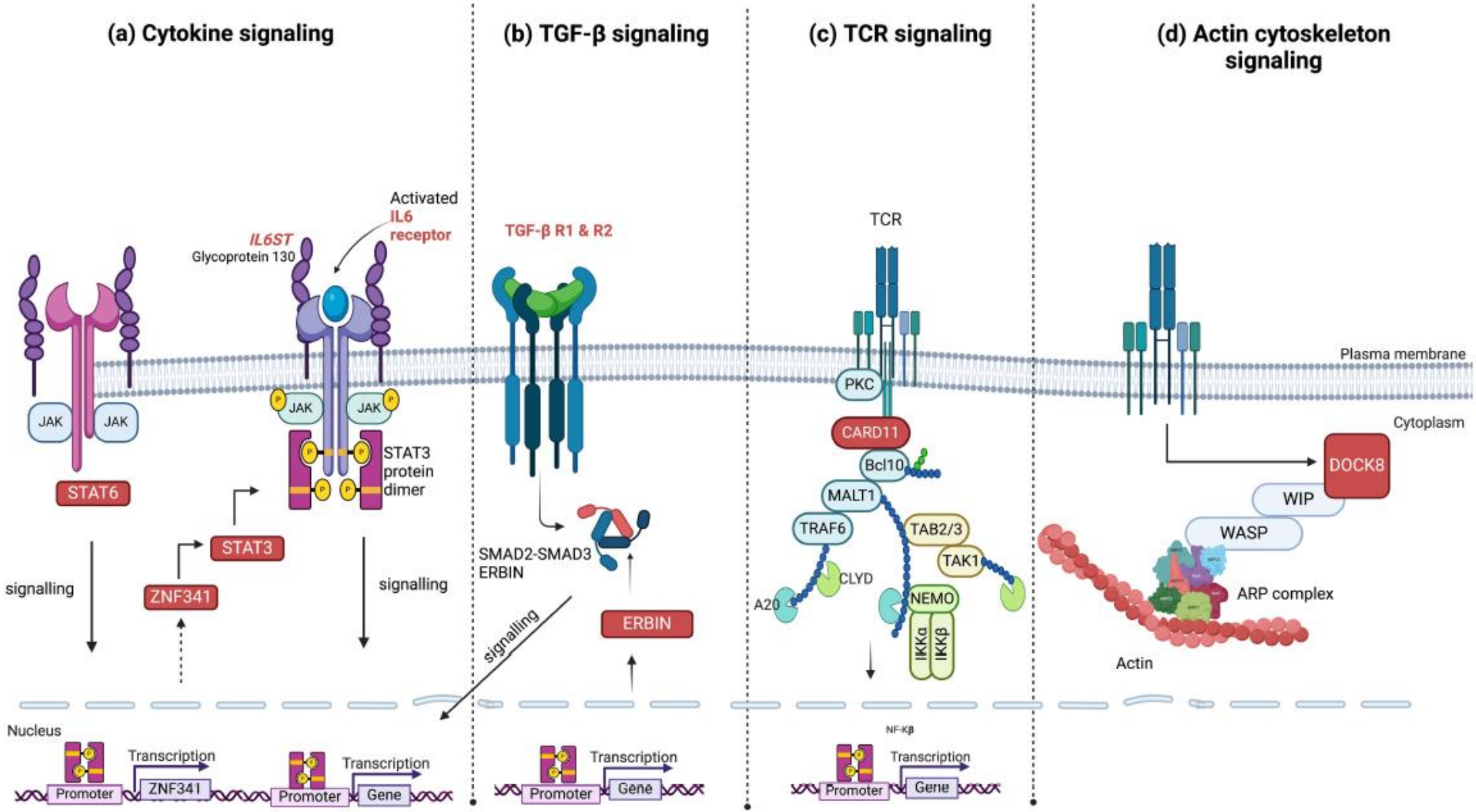




Skin barrier defect allows the allergens in

- **SPINK5 deficiency (Netherton syndrome):** Protease inhibitor defect causing severe barrier dysfunction with ichthyosis, hair shaft abnormalities, and atopic manifestations
- **Filaggrin loss of function:** Impaired barrier function
- **Desmoglein 1 deficiency:** Disrupts epithelial cell adhesion, leading to severe dermatitis and allergies
- **Loeys-Dietz syndrome** (rare-disease/loeys-dietz-syndrome) (TGFBR1/2 mutations): Connective tissue disorder with vascular abnormalities, skeletal features, and severe allergic manifestations

Niehues T, von Hardenberg S, Velleuer E. Rapid identification of primary atopic disorders (PAD) by a clinical landmark-guided, upfront use of genomic sequencing. Allergol Select. 2024 Oct 2;8:304-323. doi: 10.5414/ALX02520E. PMID: 39381601; PMCID: PMC11460323.



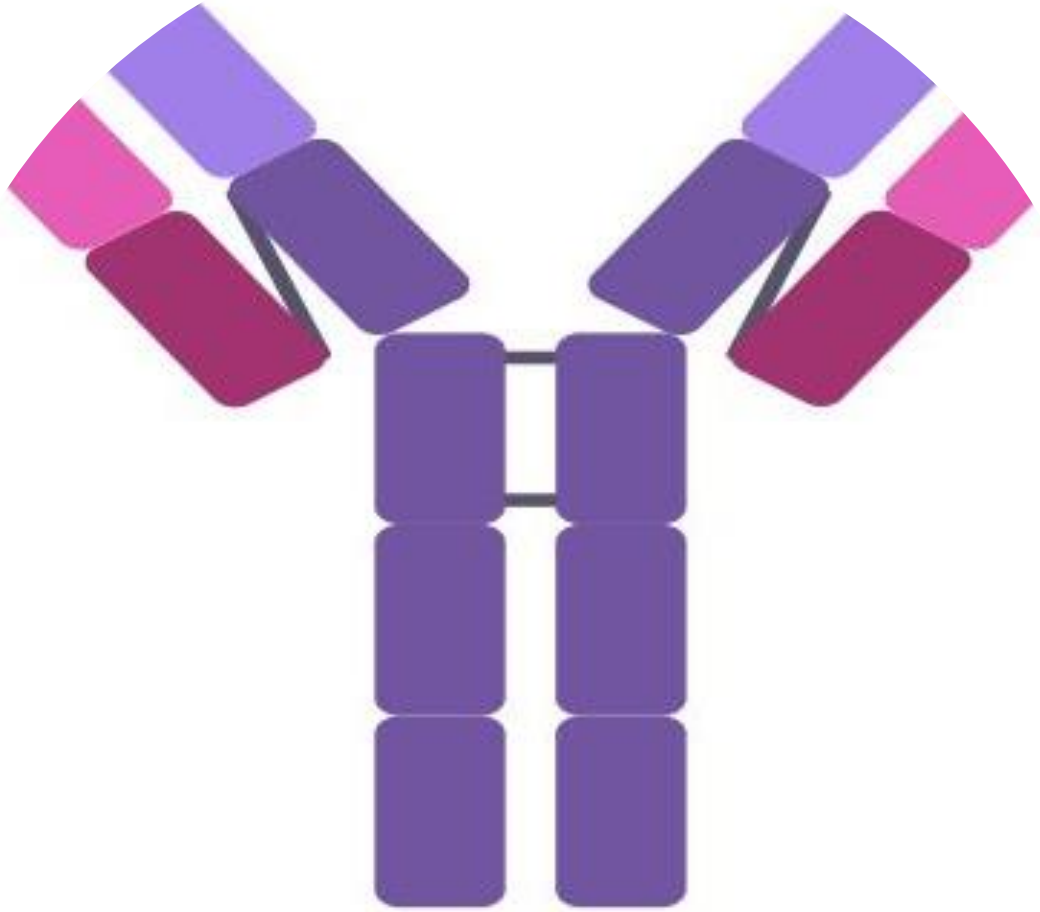

AlYafie R, Velayutham D, van Panhuys N, Jithesh PV. The Genetics of Hyper IgE Syndromes. Frontiers in Immunology. 2025;16:1516068.

https://doi.org/10.3389/fimmu.2025.1516068

# Elevated Total IgE – What Does It Mean for Diagnosis?

Rare but critical immunodeficiency or primary atopy syndromes

**Common allergic disorders**



IgE

# sIgE in Diagnosis of Food Allergy

| | | Likelihood of allergy from test results | | |
|---|---|---|---|---|
| | | Low | Intermediate | High |
| Likelihood of allergy from clinical history | High | *Possible allergy* | ***Probably allergic*** | ***Likely to be allergic*** |
| | Intermediate | *Possible allergy* | *Possible allergy* | ***Probably allergic*** |
| | Low | ***Unlikely to be allergic*** | *Possible allergy* | *Possible allergy* |

Santos AF, Riggioni C, Agache I, et al. EAACI guidelines on the diagnosis of IgE-mediated food allergy. *Allergy*. 2023; 78: 3057-3076. doi:**10.1111/all.15902**

# High IgE Food Allergy Diagnostic Considerations

- Total IgE is not a significant predictor of food allergy or food allergy severity prediction
- Specific IgE has a known association with statistical chance of food allergy
- Specific IgE does not have a clear relationship to food allergy severity

# Evaluation: history

- Detailed food exposure history: Timing of symptom onset after ingestion, specific foods implicated, reproducibility with re-exposure, and severity of reactions
- Atopic history: Personal and family history of eczema, asthma, allergic rhinitis, other food allergies
- Infection history: Recurrent bacterial infections (especially skin/lung abscesses), fungal infections, or unusual pathogens suggesting immunodeficiency

# Evaluation: physical exam and labs

- Quantitative IgE level: Extreme elevation (>2000 IU/mL) raises concern for hyper-IgE syndrome but can be seen in eczema
- Consider if need immune evaluation, viral testing
- Genetics
- Food-specific IgE testing or skin prick testing: Only if clinical history suggests high pretest probability
- Oral food challenge: Gold standard for confirming or excluding IgE-mediated food allergy when diagnosis is uncertain

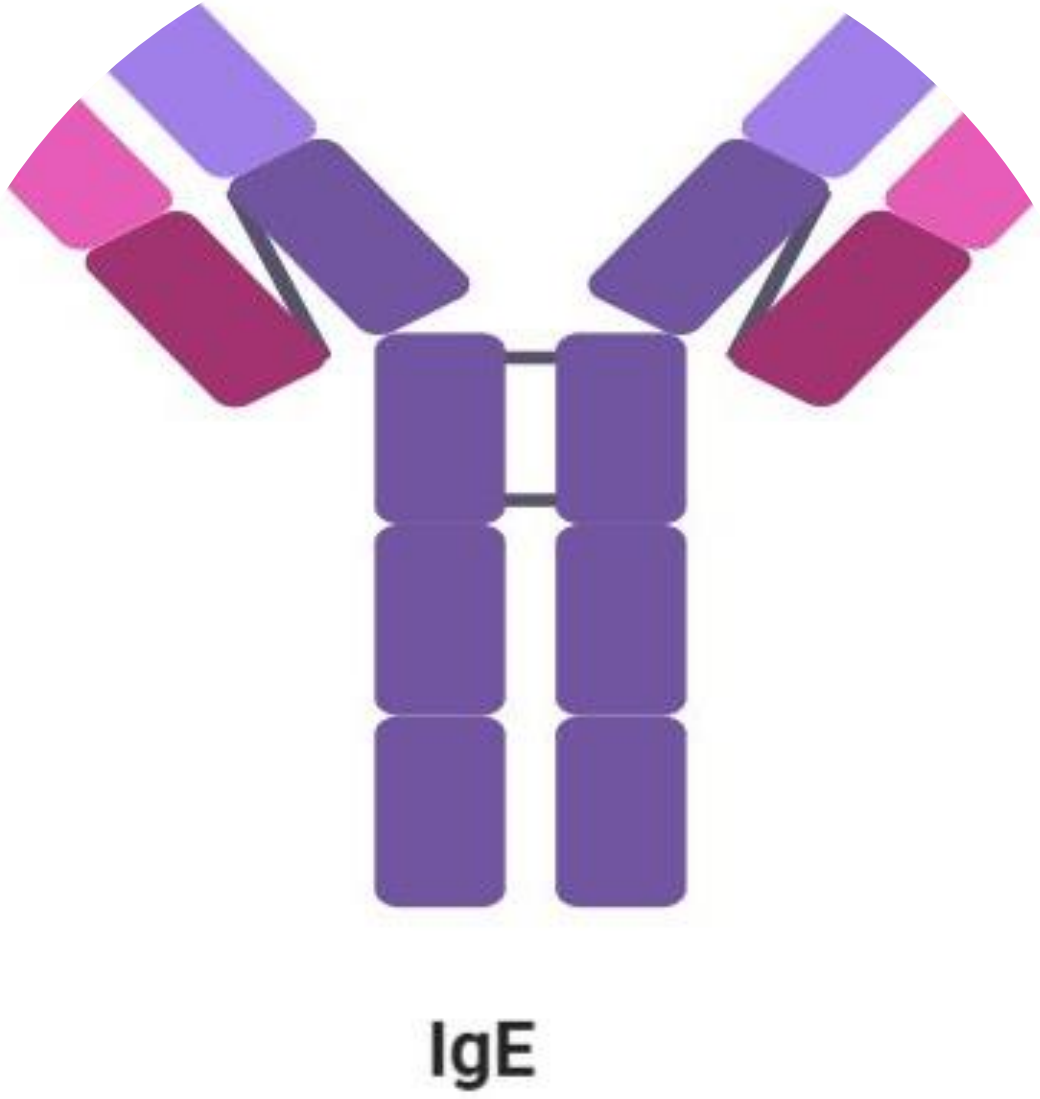
# Evaluation: physical exam and labs

- Physical examination: Assess for growth, eczema distribution/severity, dysmorphic features, dental abnormalities, skeletal findings

# Elevated Total IgE – What does it mean for management?

Severity prediction?

Management



# Are all the children with IEI “Treatment refractory?”

New Medications can work very well in the IEI

- Dupilumab
- Jak inhibitors

Some need a transplant so need to be careful

# High IgE Treatment Considerations

- Omalizumab now approved for food allergy in the USA
- Dosing is related to sIgE and can limits its use
- Dupilumab can be used to manage the other atopic conditions as approved and often drops the IgE
- Future studies may change support a weight based dosing approach

Langlois A, Lavergne M-H, Leroux H, … Upton J… Begin P. Protocol for a double-blind, randomized controlled trial on the dose-related efficacy of omalizumab in multi-food oral immunotherapy. Allergy, Asthma & Clinical Immunology 2020;16(1):25, doi:10.1186/s13223-020-00419-z

**Table 4. Subcutaneous XOLAIR Doses Every 2 or 4 Weeks* for Adult and Pediatric Patients 1 Year of Age and Older with IgE-Mediated Food Allergy**

| Pretreatment Serum IgE (IU/mL) | Dosing Freq. | Body Weight (kg) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ≥10-12 | >12-15 | >15-20 | >20-25 | >25-30 | >30-40 | >40-50 | >50-60 | >60-70 | >70-80 | >80-90 | >90 - 125 | >125 - 150 |
| | | Dose (mg) | | | | | | | | | | | | |
| ≥30 - 100 | Every 4 Weeks | 75 | 75 | 75 | 75 | 75 | 75 | 150 | 150 | 150 | 150 | 150 | 300 | 300 |
| >100 - 200 | | 75 | 75 | 75 | 150 | 150 | 150 | 300 | 300 | 300 | 300 | 300 | 450 | 600 |
| >200 - 300 | | 75 | 75 | 150 | 150 | 150 | 225 | 300 | 300 | 450 | 450 | 450 | 600 | 375 |
| >300 - 400 | | 150 | 150 | 150 | 225 | 225 | 300 | 450 | 450 | 450 | 600 | 600 | 450 | 525 |
| >400 - 500 | | 150 | 150 | 225 | 225 | 300 | 450 | 450 | 600 | 600 | 375 | 375 | 525 | 600 |
| >500 - 600 | | 150 | 150 | 225 | 300 | 300 | 450 | 600 | 600 | 375 | 450 | 450 | 600 | |
| >600 - 700 | | 150 | 150 | 225 | 300 | 225 | 450 | 600 | 375 | 450 | 450 | 525 | | |
| >700 - 800 | Every 2 Weeks | 150 | 150 | 150 | 225 | 225 | 300 | 375 | 450 | 450 | 525 | 600 | | |
| >800 - 900 | | 150 | 150 | 150 | 225 | 225 | 300 | 375 | 450 | 525 | 600 | | | |
| >900 - 1000 | | 150 | 150 | 225 | 225 | 300 | 375 | 450 | 525 | 600 | | | | |
| >1000 - 1100 | | 150 | 150 | 225 | 225 | 300 | 375 | 450 | 600 | | | | | |
| >1100 - 1200 | | 150 | 150 | 225 | 300 | 300 | 450 | 525 | 600 | | | | | |
| >1200 - 1300 | | 150 | 225 | 225 | 300 | 375 | 450 | 525 | | | | | | |
| >1300 - 1500 | | 150 | 225 | 300 | 300 | 375 | 525 | 600 | | | | | | |
| >1500 - 1850 | | | 225 | 300 | 375 | 450 | 600 | | | | | | | |

Insufficient data to Recommend a Dose

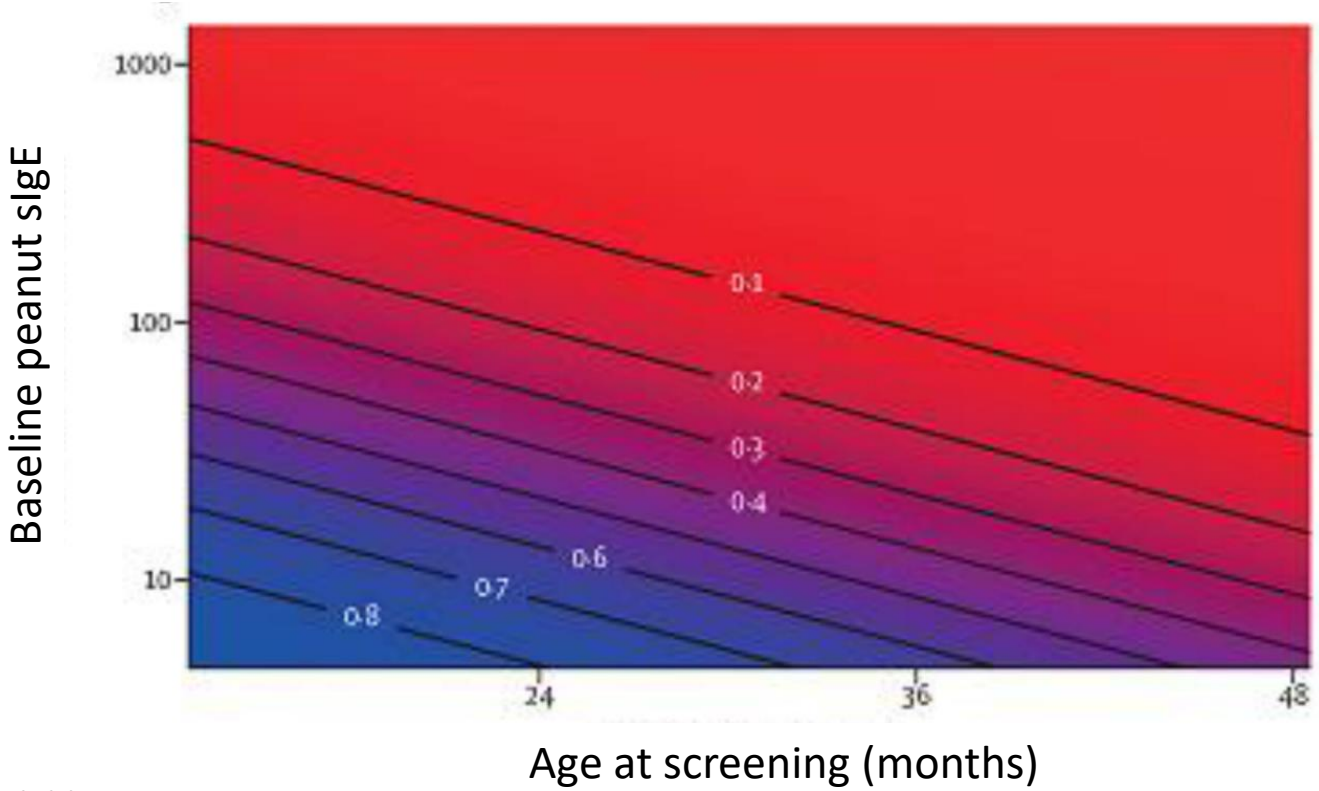
*Dosing frequency:

- ☐ Subcutaneous doses to be administered every 4 weeks
- ☐ Subcutaneous doses to be administered every 2 weeks

https://www.gene.com/download/pdf/xolair_prescribing.pdf

# High IgE Prognosis Considerations for food allergy

- IMPACT suggested that low sIgE and low age may give the best prognosis for oral immunotherapy to peanut




Values in blue show >50% probability of remission, while values in red show <50% probability of remission.

Jones SM et al. Efficacy and safety of oral immunotherapy in children aged 1-3 years with peanut allergy (the Immune Tolerance Network IMPACT trial): a randomised placebo-controlled study. *Lancet. 2022;399(10322):359-371 'doi:'10.1016/S0140-6736(21)02390-4.*

# What do we think of Noah's IgE?

- Asthma (uncontrolled)
- Allergic rhinitis
- Mild eczema
- We don't have other physical exam findings, cell counts, infectious hx, family hx but if negative then I would assume the cause is atopic (eczema especially)

- The significance here is related to **prognosis** and omalizumab dosing (if prescribed)

# Conclusions

- Elevated total IgE can be seen in atopy but also in inborn errors of immunity/primary atopy syndromes
- The IEI/PAS are largely related to Cytokine signalling, Cytoskeleton, T- cell defects, Barrier function and clinical features follow (family history, connective tissue, skeleton, growth, infections, autoimmunity)
- High sIgE increases likelihood of food allergy and is likely a prognostic factor for outgrowing and treatment
- High total IgE can limit omalizumab on label use

# References: IgE and IEI


- Bellanti JA. Selected inborn errors of immunity associated with severe atopic phenotypes: Implications for the practicing allergist. Annals of Allergy, Asthma & Immunology 2025;135(2):162-168, doi:10.1016/j.anai.2025.05.024
- Mogensen TH. Primary Immunodeficiencies With Elevated IgE. International Reviews of Immunology. 2016;35(1):39-56. doi:10.3109/08830185.2015.1027820.
- Al-Shaikhly T, Ochs HD. Hyper IgE Syndromes: Clinical and Molecular Characteristics. Immunology and Cell Biology. 2019;97(4):368-379. doi:10.1111/imcb.12209.
- Khan YW, Williams KW. Inborn Errors of Immunity Associated With Elevated Immunoglobulin E. Annals of Allergy, Asthma & Immunology : Official Publication of the American College of Allergy, Asthma, & Immunology. 2022;129(5):552-561. doi:10.1016/j.anai.2022.07.013.
- AlYafie R, Velayutham D, van Panhuys N, Jithesh PV. The Genetics of Hyper IgE SyndromesFrontiers in Immunology. 2025;16:1516068. doi:10.3389/fimmu.2025.1516068.
- Ponsford MJ, Klocperk A, Pulvirenti F, et al. Hyper-IgE in the Allergy Clinic--When Is It Primary Immunodeficiency?. Allergy. 2018;73(11):2122-2136. doi:10.1111/all.13578.
- Zhang Q, Boisson B, Béziat V, Puel A, Casanova JL. Human Hyper-IgE Syndrome: Singular or Plural? Mammalian Genome : Official Journal of the International Mammalian Genome Society. 2018;29(7-8):603-617. doi:10.1007/s00335-018-9767-2.
- Jacob M, Masood A, Abdel Rahman AM. Multi-Omics Profiling in PGM3 and STAT3 Deficiencies: A Tale of Two PatientsInternational Journal of Molecular Sciences. 2023;24(3):2406. doi:10.3390/ijms24032406.
- Smith KL, Dai D, Modi BP, et al. Inborn Errors of Immunity Associated With Type 2 Inflammation in the USIDNET Registry. Frontiers in Immunology. 2022;13:831279. doi:10.3389/fimmu.2022.831279.
- McAleer MA, Pohler E, Smith FJ, Wilson NJ, Cole C, MacGowan S, Koetsier JL, Godsel LM, Harmon RM, Gruber R, Crumrine D, Elias PM, McDermott M, Butler K, Broderick A, Sarig O, Sprecher E, Green KJ, McLean WH, Irvine AD. Severe dermatitis, multiple allergies, and metabolic wasting syndrome caused by a novel mutation in the N-terminal plakin domain of desmoplakin. J Allergy Clin Immunol. 2015 Nov;136(5):1268-76. doi: 10.1016/j.jaci.2015.05.002. Epub 2015 Jun 12. PMID: 26073755; PMCID: PMC4649901.
- Gao H, Kosins AE, Cook-Mills JM. Mechanisms for initiation of food allergy by skin pre-disposed to atopic dermatitis. Immunol Rev. 2024 Sep;326(1):151-161. doi: 10.1111/imr.13367. Epub 2024 Jul 15. PMID: 39007725.
- Niehues T, von Hardenberg S, Velleuer E. Rapid identification of primary atopic disorders (PAD) by a clinical landmark-guided, upfront use of genomic sequencing. Allergol Select. 2024 Oct 2;8:304-323. doi: 10.5414/ALX02520E. PMID: 39381601; PMCID: PMC11460323.
- Smith A et al. A patient with hyper IgE syndrome and significant atopy – a variation on presentation. Annals of Allergy, Asthma & Immunology. Volume 133, Issue 6, Supplement 2024, Page S181,
- Kostova P, Papochieva V, Miteva D, et al. Elevated IgE Levels-An Allergy or an Underlying Inborn Error of Immunity in Children with Recurrent Infections? Antibodies (Basel) 2023;12(4), doi:10.3390/antib12040070
- Castagnoli R, Lougaris V, Giardino G, et al. Inborn errors of immunity with atopic phenotypes: A practical guide for allergists. World Allergy Organ J 2021;14(2):100513, doi:10.1016/j.waojou.2021.100513
- Milner JD. Primary Atopic Disorders. Annu Rev Immunol 2020;38(785-808, doi:10.1146/annurev-immunol-042718-041553
- Su HC, Jing H, Angelus P, et al. Insights into immunity from clinical and basic science studies of DOCK8 immunodeficiency syndrome. Immunological Reviews 2019;287(1):9-19, doi:https://doi.org/10.1111/imr.12723
- Poli MC, Aksentijevich I, Bousfiha AA, et al. Human inborn errors of immunity: 2024 update on the classification from the International Union of Immunological Societies Expert Committee. Journal of Human Immunity 2025;1(1):e20250003, doi:10.70962/jhi.20250003
- Marbet L, Gujer E, Münger MH, et al. Allergic manifestations in inborn errors of immunity: a systematic scoping review. Front Immunol 2025;16(1666600, doi:10.3389/fimmu.2025.1666600

# References: IgE and food allergy


- Ramsey N, Berin MC. Pathogenesis of IgE-mediated food allergy and implications for future immunotherapeutics. Pediatr Allergy Immunol 2021;32(7):1416-1425, doi:10.1111/pai.13501
- Boyd H, Santos AF. Novel diagnostics in food allergy. Journal of Allergy and Clinical Immunology 2025;155(2):275-285, doi:10.1016/j.jaci.2024.12.1071
- Wong CY, Yeh KW, Huang JL, et al. Longitudinal analysis of total serum IgE levels with allergen sensitization and atopic diseases in early childhood. Sci Rep 2020;10(1):21278, doi:10.1038/s41598-020-78272-8
- Katsanakis N, Xepapadaki P, Koumprentziotis IA, et al. Total IgE Trends in Children with Allergic Diseases. J Clin Med 2024;13(13), doi:10.3390/jcm13133990
- Vinnes EW, Røys E, Renstrøm R, et al. A systematic review of total IgE reference intervals - A 2024 update. Clin Chim Acta 2025;566(120024, doi:10.1016/j.cca.2024.120024
- Martins TB, Bandhauer ME, Bunker AM, et al. New childhood and adult reference intervals for total IgE. Journal of Allergy and Clinical Immunology 2014;133(2):589-591, doi:10.1016/j.jaci.2013.08.037
- Nemet S, Elbirt D, Cohen R, et al. Clinical significance of very high IgE levels (≥1000 IU/mL): Population-based study of 118,211 adults. Journal of Allergy and Clinical Immunology: Global 2025;4(2):100403, doi:https://doi.org/10.1016/j.jacig.2025.100403
- Wu G, Hu H, Zhang T, et al. Profiles of sensitization and comorbidity in asthma patients with markedly increased serum total IgE (>1000kU/L). Allergy Asthma Proc 2022;43(2):124-132, doi:10.2500/aap.2022.43.210123
- Sharma M, Leung D, Momenilandi M, et al. Human germline heterozygous gain-of-function STAT6 variants cause severe allergic disease. J Exp Med 2023;220(5), doi:10.1084/jem.20221755
- PreventionGenetics. Inborn Errors of Immunity/Primary Immunodeficiency (PID) Panel. https://www.preventiongenetics.com/tests/pgmax-inborn-errors-of-immunity-primary-immunodeficiency-pid-panel; [Last Accessed; 26-11].
- Pettersson ME, Koppelman GH, Flokstra-de Blok BMJ, et al. Prediction of the severity of allergic reactions to foods. Allergy 2018;73(7):1532-1540, doi:10.1111/all.13423
- Al-Mughales JA. Diagnostic Utility of Total IgE in Foods, Inhalant, and Multiple Allergies in Saudi Arabia. J Immunol Res 2016;2016(1058632, doi:10.1155/2016/1058632
- Dodi G, Di Filippo P, Di Pillo S, et al. Total serum IgE levels as predictor of the acquisition of tolerance in children with food allergy: Findings from a pilot study. Front Pediatr 2022;10(1013807, doi:10.3389/fped.2022.1013807
- Esty B, Maciag MC, Bartnikas LM, et al. Predicting outcomes of baked egg and baked milk oral food challenges by using a ratio of food-specific IgE to total IgE. J Allergy Clin Immunol Pract 2021;9(4):1750-1752.e1, doi:10.1016/j.jaip.2020.11.004
- Bégin P, Waserman S, Protudjer JLP, et al. Immunoglobulin E (IgE)-mediated food allergy. Allergy, Asthma & Clinical Immunology 2024;20(3):75, doi:10.1186/s13223-024-00930-7
- Santos AF, Brough HA. Making the Most of In Vitro Tests to Diagnose Food Allergy. J Allergy Clin Immunol Pract 2017;5(2):237-248, doi:10.1016/j.jaip.2016.12.003
- Frischmeyer-Guerrerio PA, Rasooly M, Gu W, et al. IgE testing can predict food allergy status in patients with moderate to severe atopic dermatitis. Ann Allergy Asthma Immunol 2019;122(4):393-400.e2, doi:10.1016/j.anai.2019.01.001
- Yanagida N, Sato S, Takahashi K, et al. Increasing specific immunoglobulin E levels correlate with the risk of anaphylaxis during an oral food challenge. Pediatr Allergy Immunol 2018;29(4):417-424, doi:10.1111/pai.12896
- Karunakaran D, Chan ES, Zhang Q, et al. Risk factors associated with safety of preschool peanut oral immunotherapy. J Allergy Clin Immunol Glob 2023;2(2):100094, doi:10.1016/j.jacig.2023.100094
- Jones SM, Kim EH, Nadeau KC, et al. Efficacy and safety of oral immunotherapy in children aged 1-3 years with peanut allergy (the Immune Tolerance Network IMPACT trial): a randomised placebo-controlled study. Lancet 2022;399(10322):359-371, doi:10.1016/s0140-6736(21)02390-4
- Federly TJ, Jones BL, Dai H, et al. Interpretation of food specific immunoglobulin E levels in the context of total IgE. Ann Allergy Asthma Immunol 2013;111(1):20-4, doi:10.1016/j.anai.2013.05.012
- Ramírez-Marín HA, Singh AM, Ong PY, et al. Food allergy testing in atopic dermatitis. JAAD Int 2022;9(50-56, doi:10.1016/j.jdin.2022.08.004
- Smeekens JM, Kulis MD. Evolution of Immune Responses in Food Immunotherapy. Immunol Allergy Clin North Am 2020;40(1):87-95, doi:10.1016/j.iac.2019.09.006
- Garcia-Carmona Y, Curotto de Lafaille MA. Advances in Food Allergy Immunotherapy: Current Strategies and Role of Antibodies Isotypes. Cells 2025;14(12), doi:10.3390/cells14120900
- Azzano P, Paquin M, Langlois A, et al. Determinants of omalizumab dose-related efficacy in oral immunotherapy: Evidence from a cohort of 181 patients. J Allergy Clin Immunol 2021;147(1):233-243, doi:10.1016/j.jaci.2020.08.039
- Product Monograph - Xolair (Omalizumab): Dosing Guide. Genentech USA, Inc. and Novartis Pharmaceuticals Corporation: 2025.
- Wood Robert A, Togias A, Sicherer Scott H, et al. Omalizumab for the Treatment of Multiple Food Allergies. New England Journal of Medicine 2024;390(10):889-899, doi:10.1056/NEJMoa2312382
- Langlois A, Lavergne M-H, Leroux H, et al. Protocol for a double-blind, randomized controlled trial on the dose-related efficacy of omalizumab in multi-food oral immunotherapy. Allergy, Asthma & Clinical Immunology 2020;16(1):25, doi:10.1186/s13223-020-00419-z
- Santos AF, Riggioni C, Agache I, et al. EAACI guidelines on the management of IgE-mediated food allergy. Allergy 2025;80(1):14-36, doi:10.1111/all.16345
- Assa'ad AH, Ding L, Duan Q, et al. Total Serum IgE in a Cohort of Children With Food Allergy. J Allergy Clin Immunol Pract 2025;13(4):803-813.e3, doi:10.1016/j.jaip.2024.12.029
- Froidure A, Mouthuy J, Durham SR, et al. Asthma phenotypes and IgE responses. Eur Respir J 2016;47(1):304-19, doi:10.1183/13993003.01824-2014
- Wollenberg A, Thomsen SF, Lacour JP, et al. Targeting immunoglobulin E in atopic dermatitis: A review of the existing evidence. World Allergy Organ J 2021;14(3):100519, doi:10.1016/j.waojou.2021.100519
- Hu Y, Liu S, Liu P, et al. Clinical relevance of eosinophils, basophils, serum total IgE level, allergen-specific IgE, and clinical features in atopic dermatitis. J Clin Lab Anal 2020;34(6):e23214, doi:10.1002/jcla.23214
- Kiiski V, Karlsson O, Remitz A, et al. High serum total IgE predicts poor long-term outcome in atopic dermatitis. Acta Derm Venereol 2015;95(8):943-7, doi:10.2340/00015555-2126
- Chua GT, Mack DP, Shaker MS, et al. Oral food immunotherapy in patients with atopic dermatitis. Ann Allergy Asthma Immunol 2024;133(3):278-283, doi:10.1016/j.anai.2024.05.022
- Chinthrajah RS, Sindher SB, Nadeau KC, et al. Dupilumab as an Adjunct to Oral Immunotherapy in Pediatric Patients With Peanut Allergy. Allergy 2025;80(3):827-842, doi:10.1111/all.16420
- .Sindher SB, Nadeau KC, Chinthrajah RS, et al. Efficacy and Safety of Dupilumab in Children With Peanut Allergy: A Multicenter, Open-Label, Phase II Study. Allergy 2025;80(1):227-237, doi:10.1111/all.16404
- van der Rijst LP, Hilbrands MS, Zuithoff NPA, et al. Dupilumab induces a significant decrease of food specific immunoglobulin E levels in pediatric atopic dermatitis patients. Clin Transl Allergy 2024;14(7):e12381, doi:10.1002/clt2.12381