

PERSONALIZED MEDICINE

WHERE ARE WE IN ALLERGY (AND IN ECZEMA)?

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Personalized medicine

From Wikipedia, the free encyclopedia

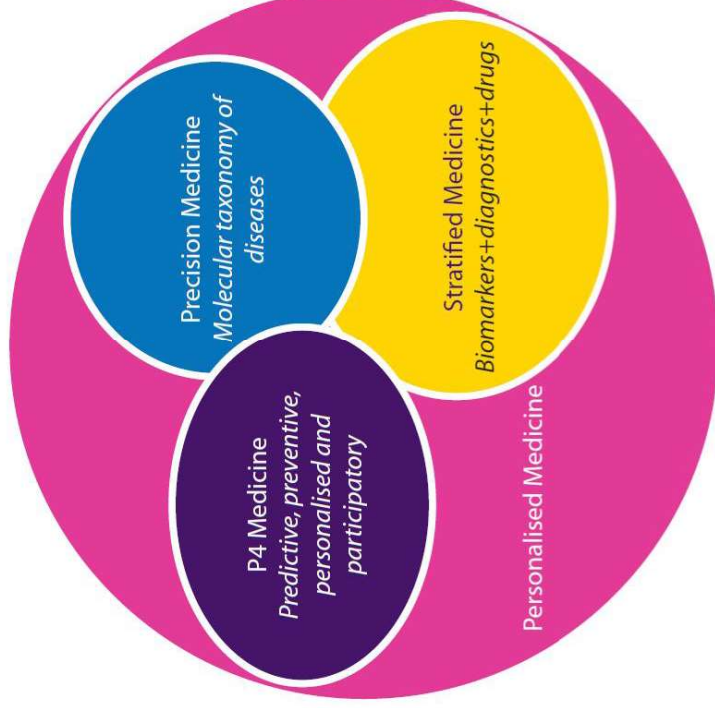
Personalized medicine, also termed **precision medicine**, is a medical procedure that separates patients into different groups—with medical decisions, practices, interventions and/or products being tailored to the individual patient based on their predicted response or risk of disease.^[1] The terms personalized medicine, precision medicine, **stratified medicine** and **P4 medicine** are used interchangeably to describe this concept^{[1][2]} though some authors and organisations use these expressions separately to indicate particular nuances.^[2]

Stratified medicine Matching therapies with specific patient population characteristics using clinical biomarkers. (Trusheim *et al*, 2007)

Precision medicine Integration of molecular research with clinical data from individual patients to develop a more accurate molecular taxonomy of diseases that enhances diagnosis and treatment and tailors disease management to the individual characteristics of each patient. (US Nat Acad of Sciences report, 2011)

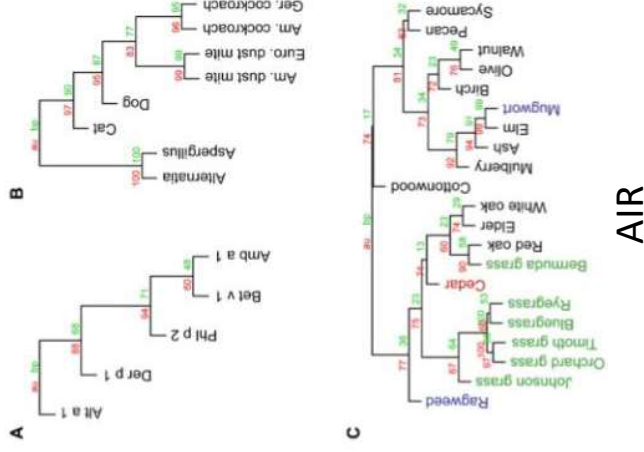
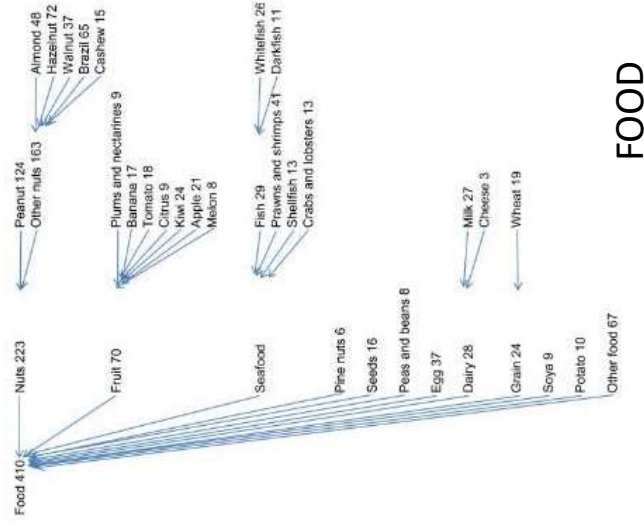
P4 medicine Clinical application of the tools and strategies of systems biology and medicine to quantify wellness and demystify disease for the well-being of an individual. (Hood, 2008)

Personalised medicine “Genomics+medical information technology+patient empowerment” (Millenson *et al*, 2006)



ALLERGY IS ALREADY PERSONALIZED MEDICINE

- IgE mediated (rhinitis, anaphylaxis, food allergy in young), anaphylactoid (ASA intolerance), delayed type allergy (contact allergy), immunocomplex mediated (drug exanthemas)






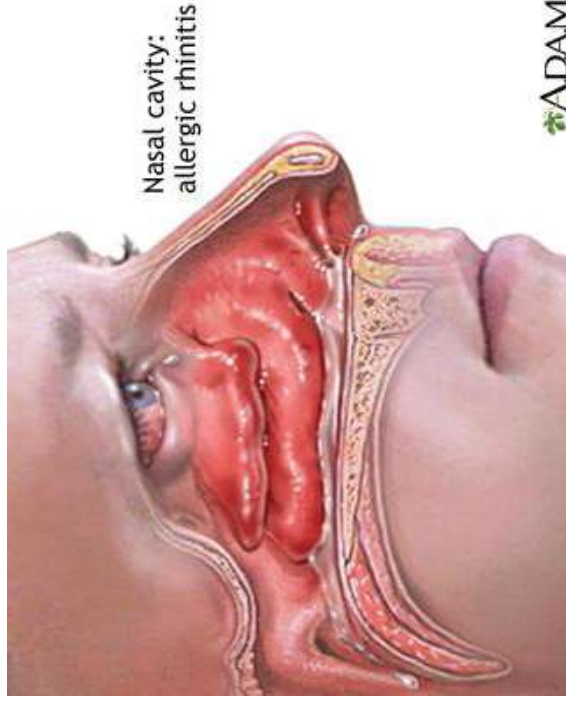
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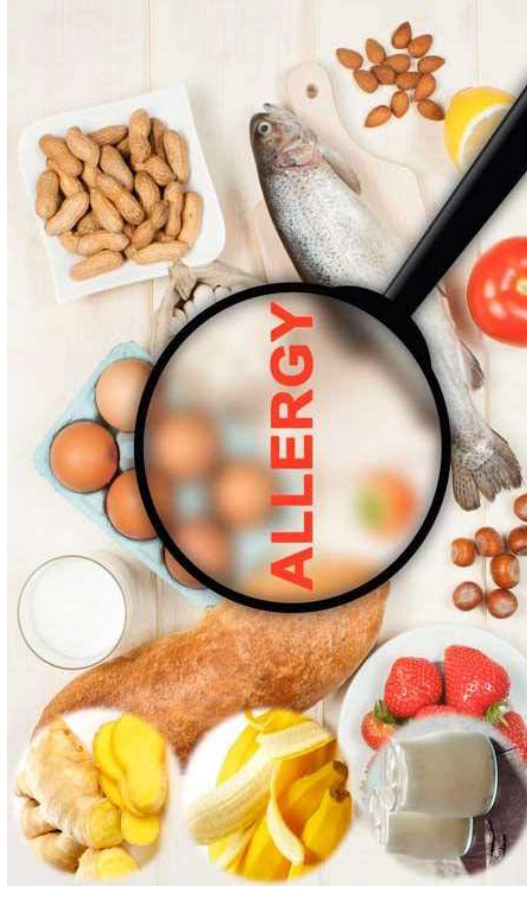
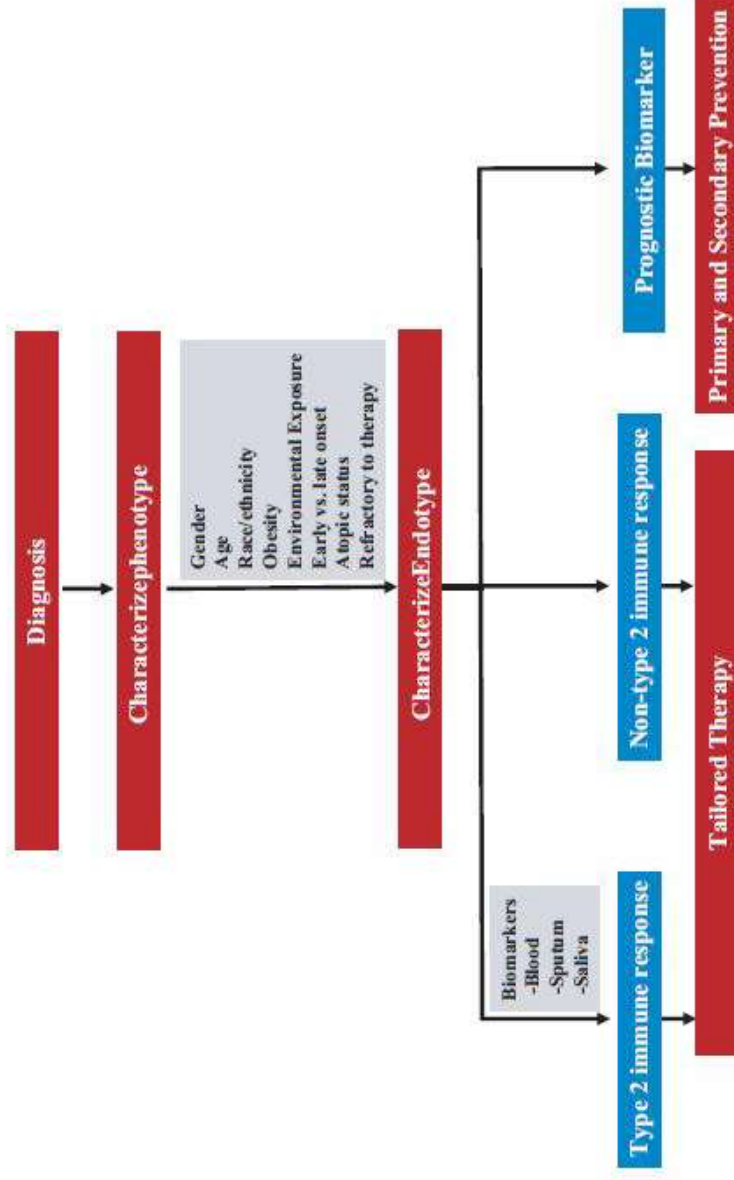
FOOD

ALLERGIC RHINITIS ENDOTYPES

RHINITIS ENDOTYPES				
NON-TYPE 2	TYPE 2	NEUROGENIC	EPITHELIUM	
	 Environment Life-style Microbiome Nasal anatomy			
Neutrophils IFN- γ IL-17 TNF	Eosinophils Mast cells ILC2 Specific IgE IL-5, IL-4/IL-13	SP NK TRP channels	TSLP IL-33 Barrier / ciliary dysfunction Remodeling	
	SYMPTOMS			
				Congestion Rhinorrhoea Hyposmia Sneeze Itch NHR
				GUSTATORY rhinitis
COMMON COLD				rhinitis of the ELDERLY
	ALLERGIC			IR with NHR
RHINITIS PHENOTYPES severity / duration / sensitization pattern / co-morbidities				

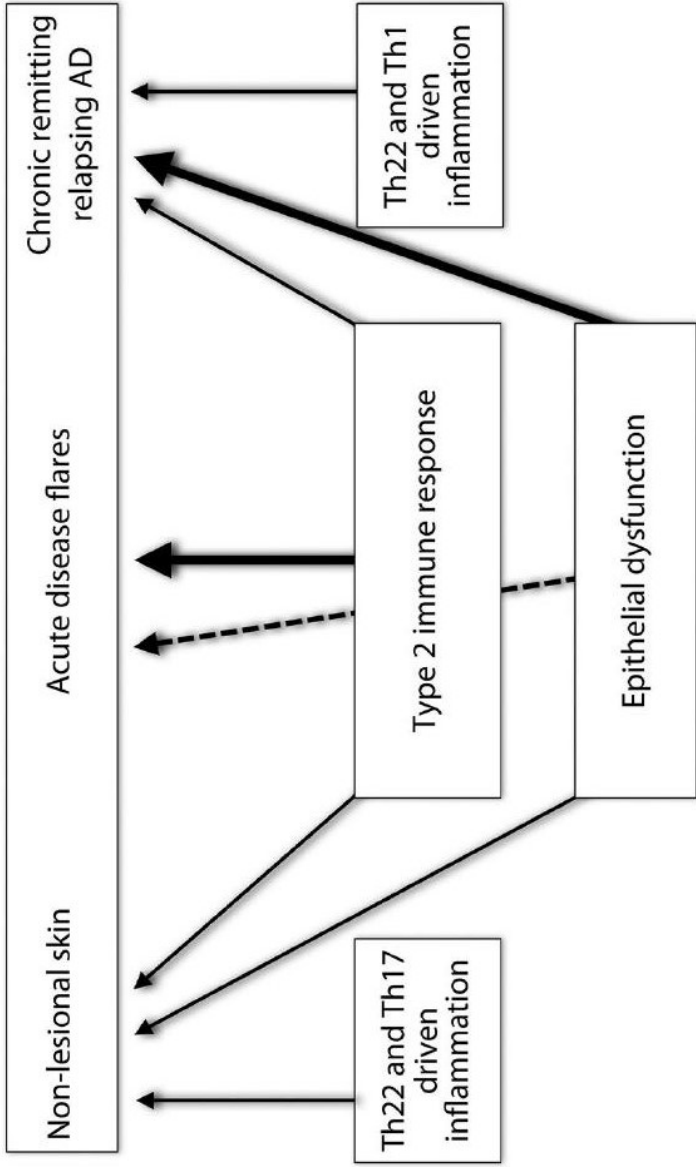


FOOD ALLERGY ENDOTYPES



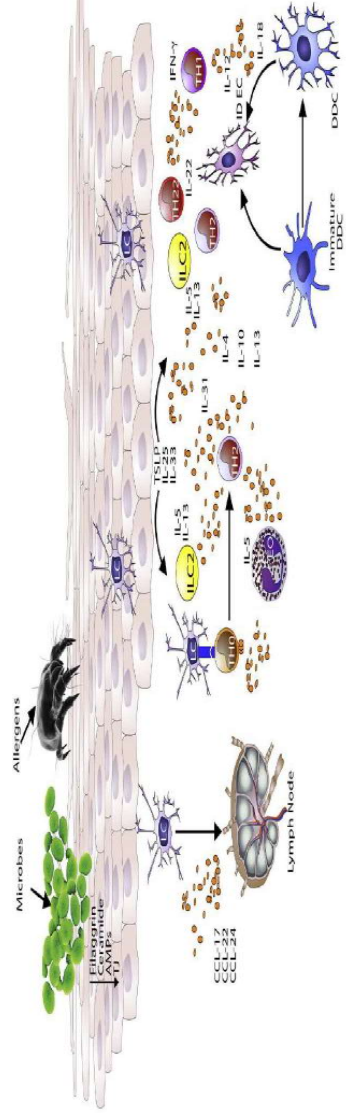
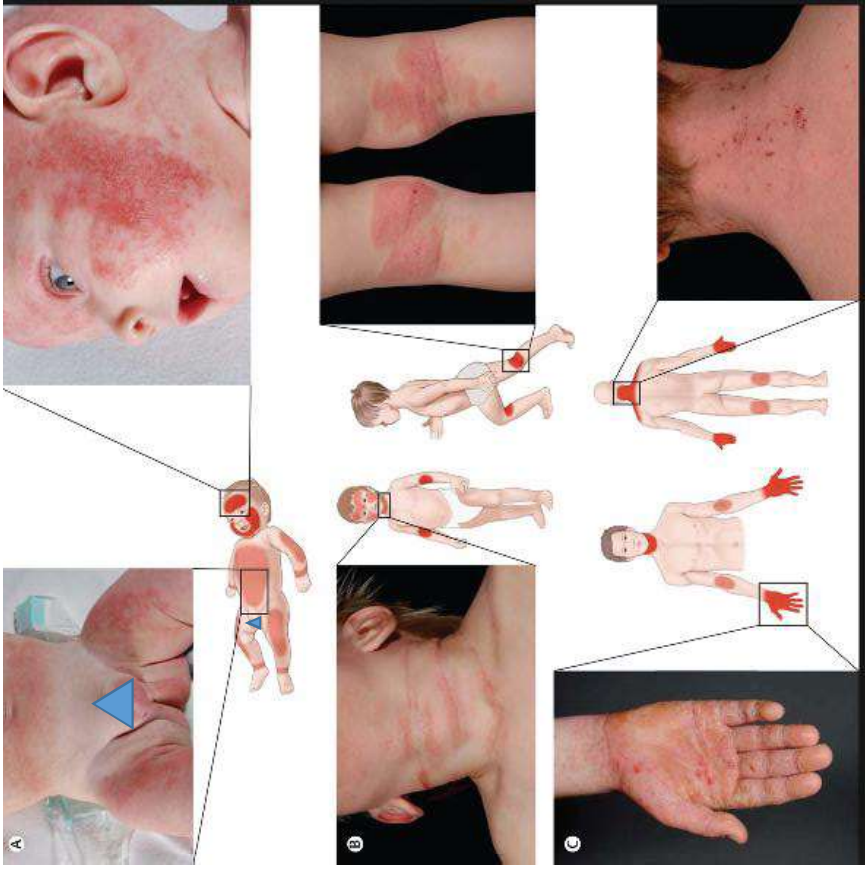
ATOPIC DERMATITIS ENDOTYPES

Potential endotypes for atopic dermatitis



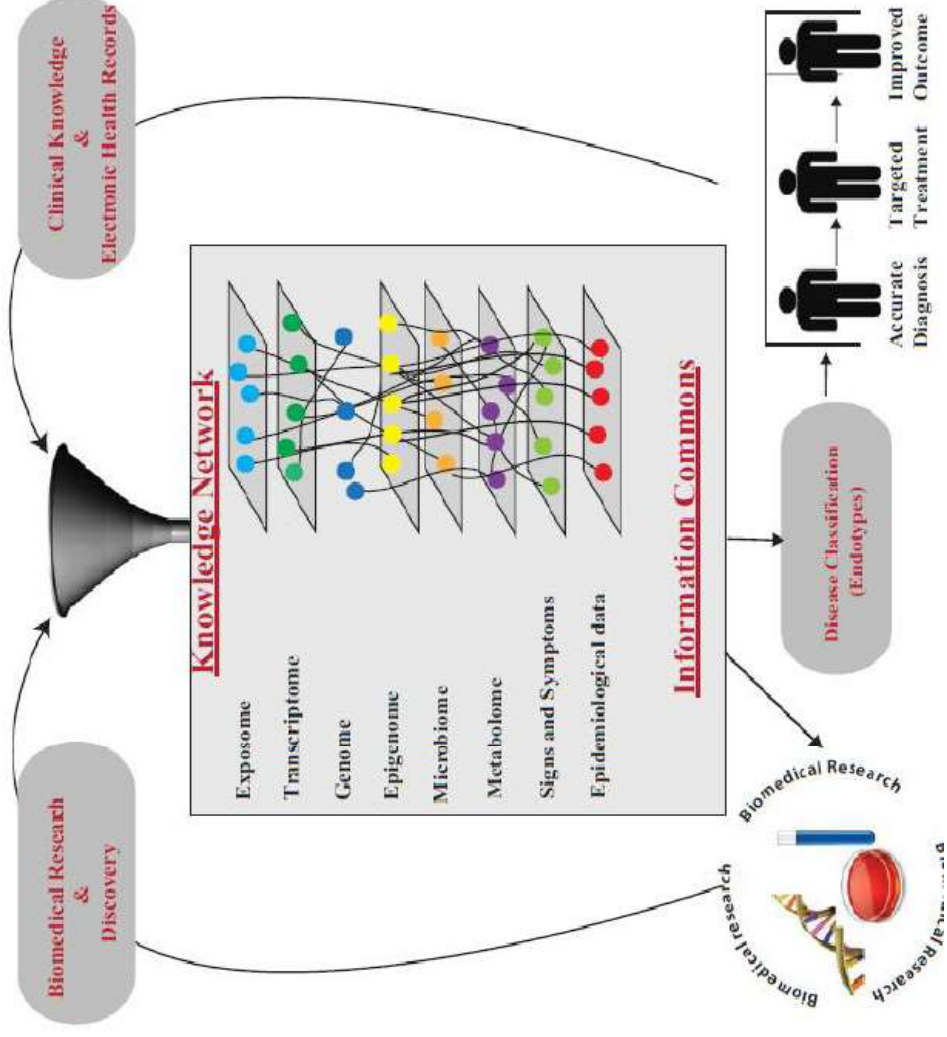
P H E N O T Y P E E E N D O T Y P E

AGE

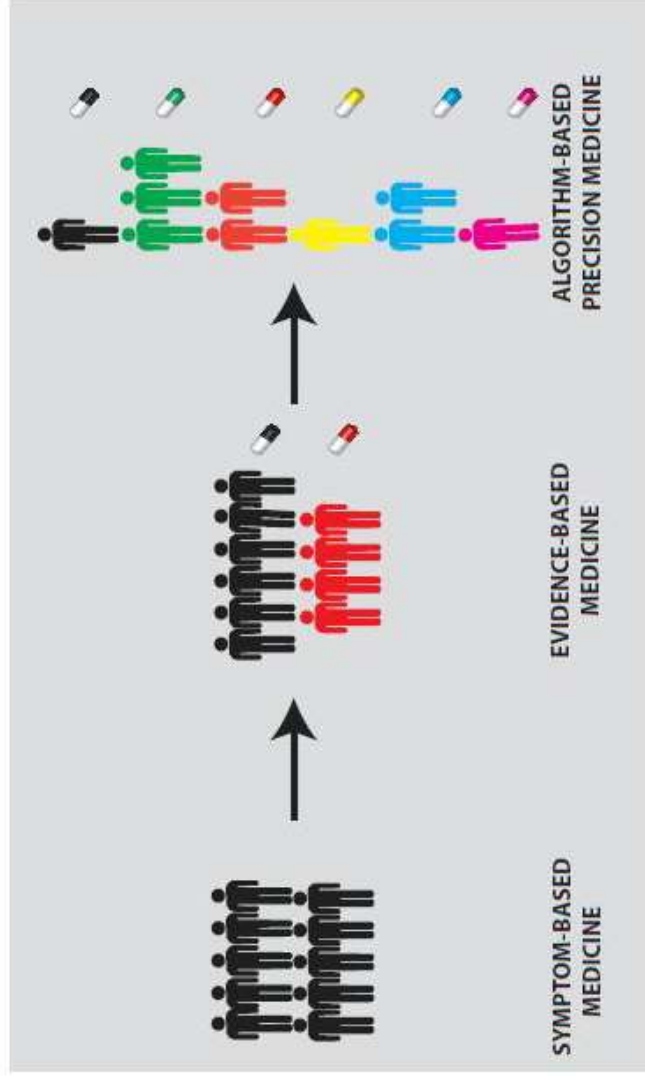
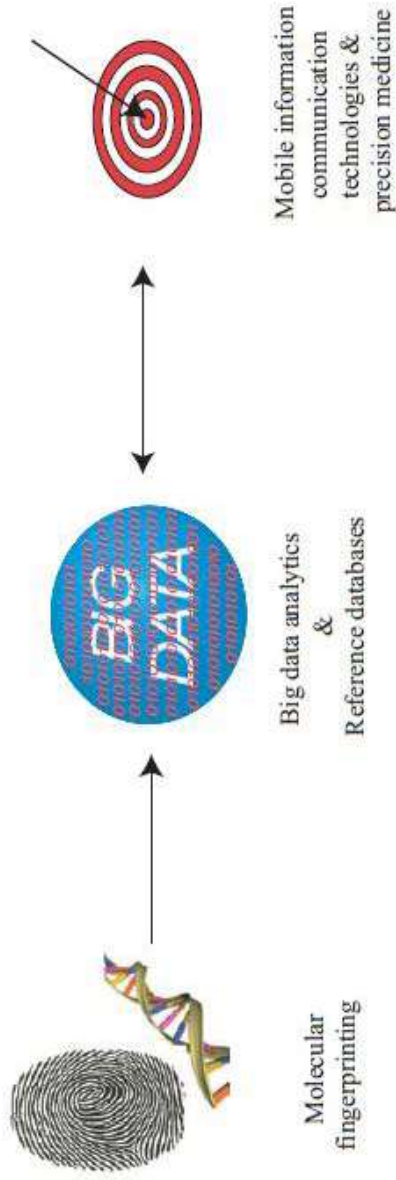


INITIATION → ACUTE ATOPIC DERMATITIS → CHRONIC ATOPIC DERMATITIS
 FIG 5. Pathogenesis of AD. The complexity of the clinical phenotype in patients with AD is underlined by

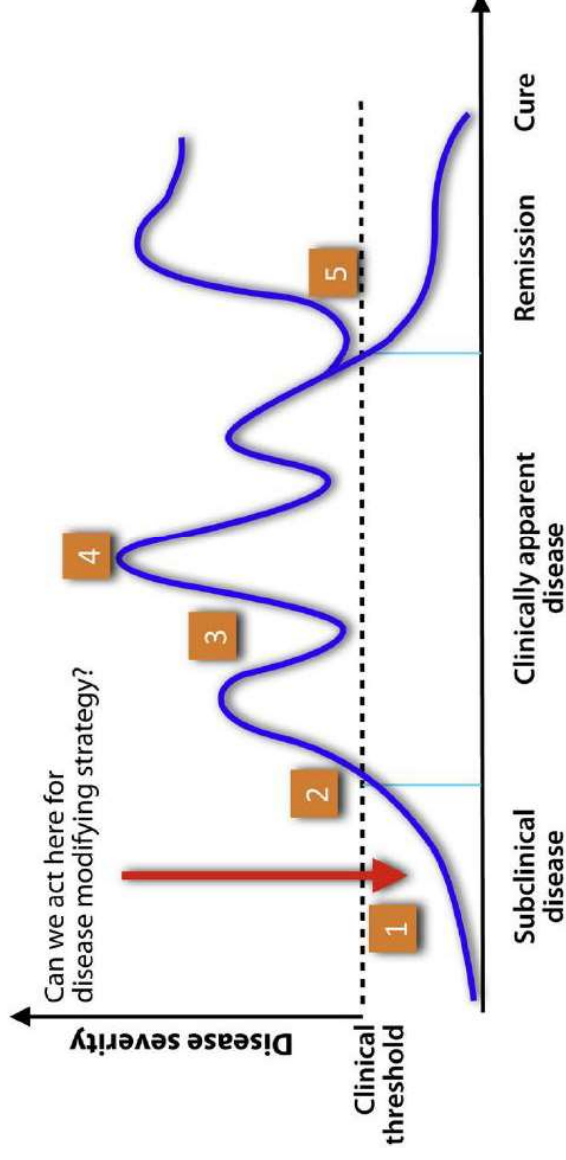
INCREASING KNOWLEDGE LEADS TO EVEN MORE ENDOTYPES



Shifting Towards Precision Medicine



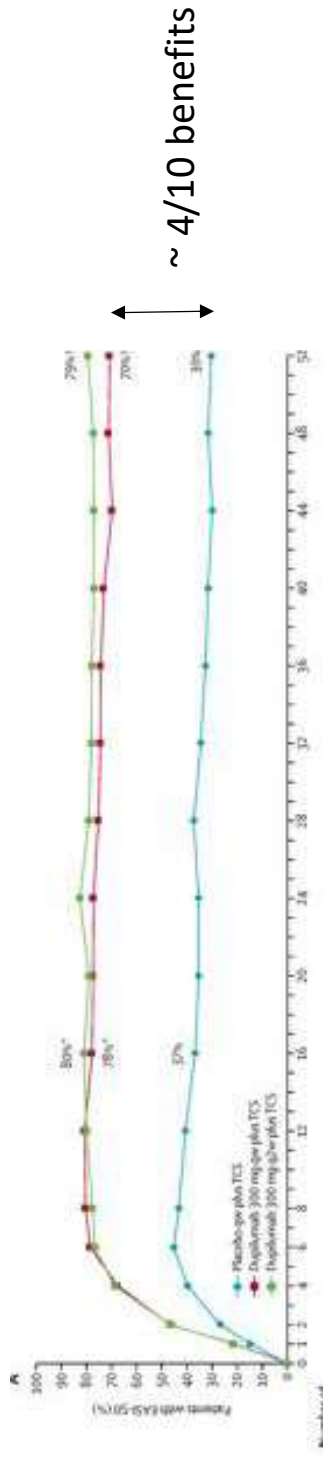
PRECISION MEDICINE IN FUTURE??



1. Screening BM at preclinical stage
2. Diagnostic BM
3. Predictive BM for response and/or adverse reaction to therapy
4. Severity BM
5. Prognostic BM for remission or chronicity

PERSONALIZED MEDICINE IN ATOPIC DERMATITIS

– INDIVIDUAL PATIENT RESPONSE TO DUPIPILUMAB



~ 4/10 benefits

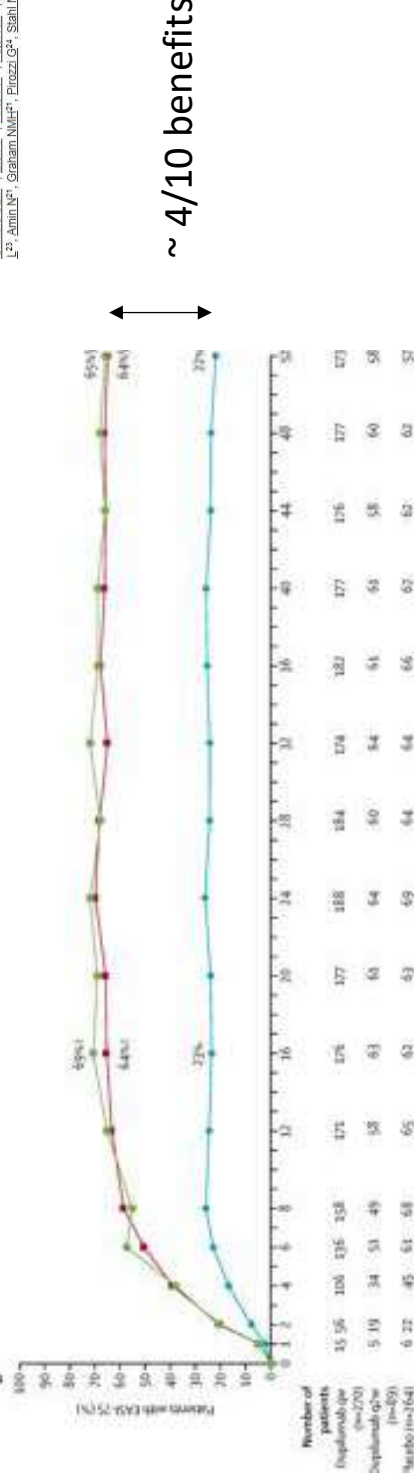
Number of patients

Week	0	4	8	12	16	20	24	28	32	36	40	44	48	52
Dupilumab q/w (n=270)	58	117	176	235	294	353	412	471	530	589	648	707	766	825
Dupilumab 350 mg q/w plus TCS (n=254)	20	41	61	81	101	121	141	161	181	201	221	241	261	281
Placebo (n=270)	39	71	104	137	170	203	236	269	302	335	368	401	434	467

Lancet. 2017 Jun 10;389(10086):2287-2303. doi: 10.1016/S0140-6736(17)31191-1. Epub 2017 May 4.

Long-term management of moderate-to-severe atopic dermatitis with dupilumab and concomitant topical corticosteroids (LIBERTY AD CHRONOS): a 1-year, randomised, double-blinded, placebo-controlled, phase 3 trial.

Blauevitt A¹, de Bruin-Waller M², Goodenham M³, Calver J⁴, Weisman J⁵, Patiser D⁶, Simpson EL⁷, Papp KA⁸, Honda HC⁹, Rubel D¹⁰, Foley P¹¹, Prens E¹², Griffin CE M¹³, Etoh T¹⁴, Pinto PH¹⁵, Szabolcsovics JC¹⁶, Eller K¹⁷, Elter K¹⁸, Kemény L¹⁹, Zhou X²⁰, Avinash B²¹, Hultsch T²², Mashev V²³, Gadian A²⁴, Eckert L²⁵, Amin N²⁶, Graham NM²⁷, Pirozzi G²⁸, Sahni N²⁹, Yancopoulos GD³⁰, Shumil B³¹.



~ 4/10 benefits

Number of patients

Week	0	4	8	12	16	20	24	28	32	36	40	44	48	52
Dupilumab q/w (n=270)	15	56	106	156	206	256	306	356	406	456	506	556	606	656
Dupilumab 350 mg q/w plus TCS (n=254)	5	19	34	51	69	88	107	126	145	164	183	202	221	240
Placebo (n=270)	6	22	45	61	78	95	112	129	146	163	180	197	214	231

CONCLUSIONS

- Allergies and allergic diseases are highly diverse and all patients have their unique profile
- Incoming precision medicine brings high expectations and will ultimately benefit patients especially in developed world
- Individual responses to treatments should, as well as prevention and diagnostic approaches, be carefully taken into account in treating patient
- Patients are themselves best experts on their disease. They should be empowered and will become so, but at the same time, reciprocally, compliance to treatments and mutual decisions on factors affecting health should be strengthened