



ACADEMY



OF ATHENS

ΑΝΟΣΟΠΟΙΗΤΙΚΟ ΣΥΣΤΗΜΑ ΚΑΙ ΑΝΟΣΟΘΕΡΑΠΕΙΑ: ΚΑΙΝΟΤΟΜΕΣ ΘΕΡΑΠΕΙΕΣ ΣΤΗΝ ΑΝΤΙΜΕΤΩΠΙΣΗ ΤΟΥ ΚΑΡΚΙΝΟΥ

Verginis Panos
Biomedical Research Foundation
Academy of Athens
pverginis@bioacademy.gr

The immune system protects from pathogens



Immune Regulation and Tolerance

Autoimmunity and Cancer

From Basic Immunology to Translational Research:



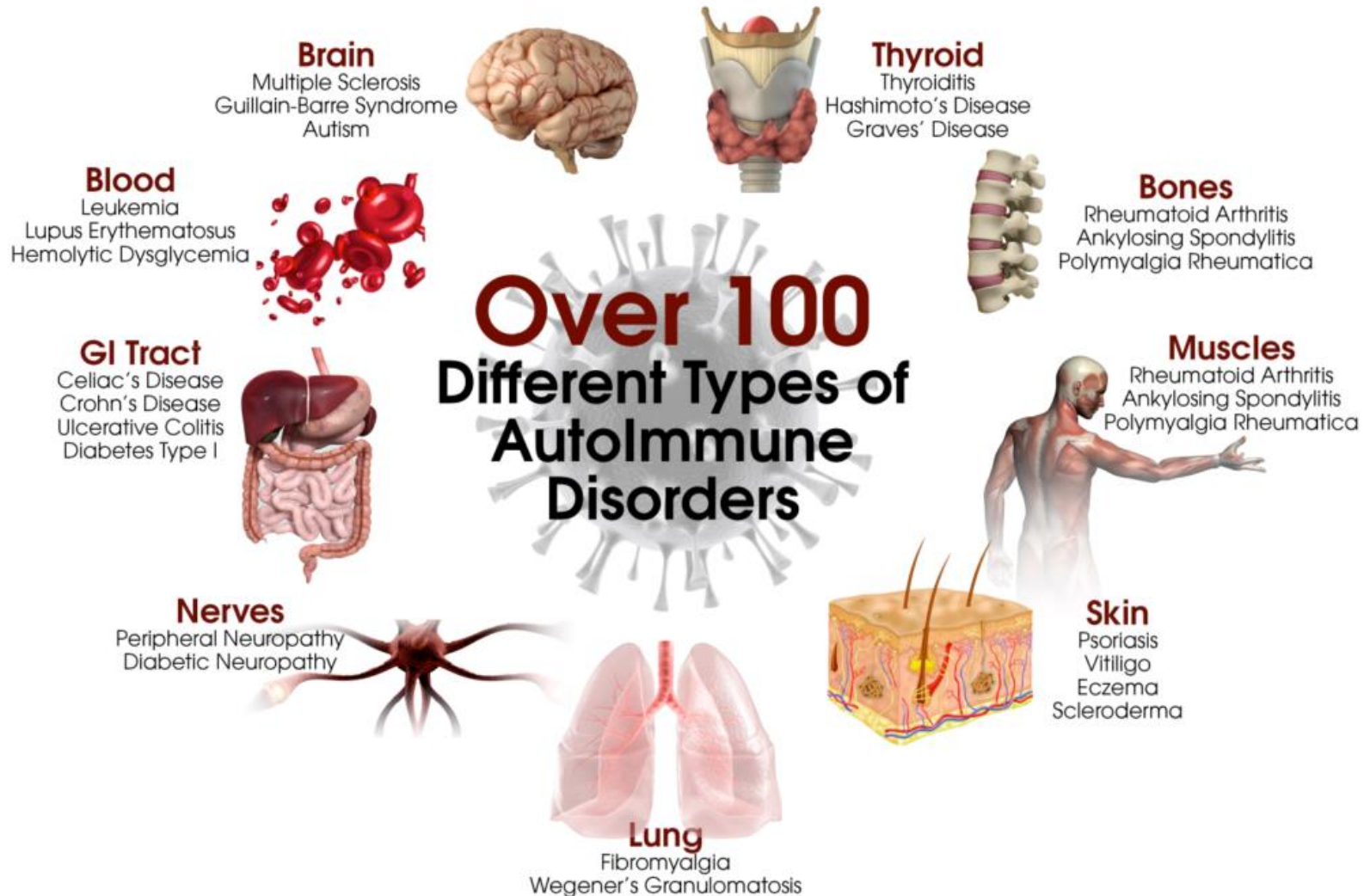
Selected publications of PI as corresponding author:

1. Alissafi T. et al. *J. Clin. Investigation* 2018
2. Girtzimanaki et al. *Cell Reports* 2018
3. Alissafi T. et al. *J. Clin. Investigation* 2017
4. Hatzioannou A. et al. *J. Leuko. Biol.* 2017
5. Hatzioannou A. et al. *Oncoimmunology*, 2016

Autoimmune diseases

Deregulation of the immune system may lead to development of autoimmune diseases

AUTOIMMUNE DISEASES



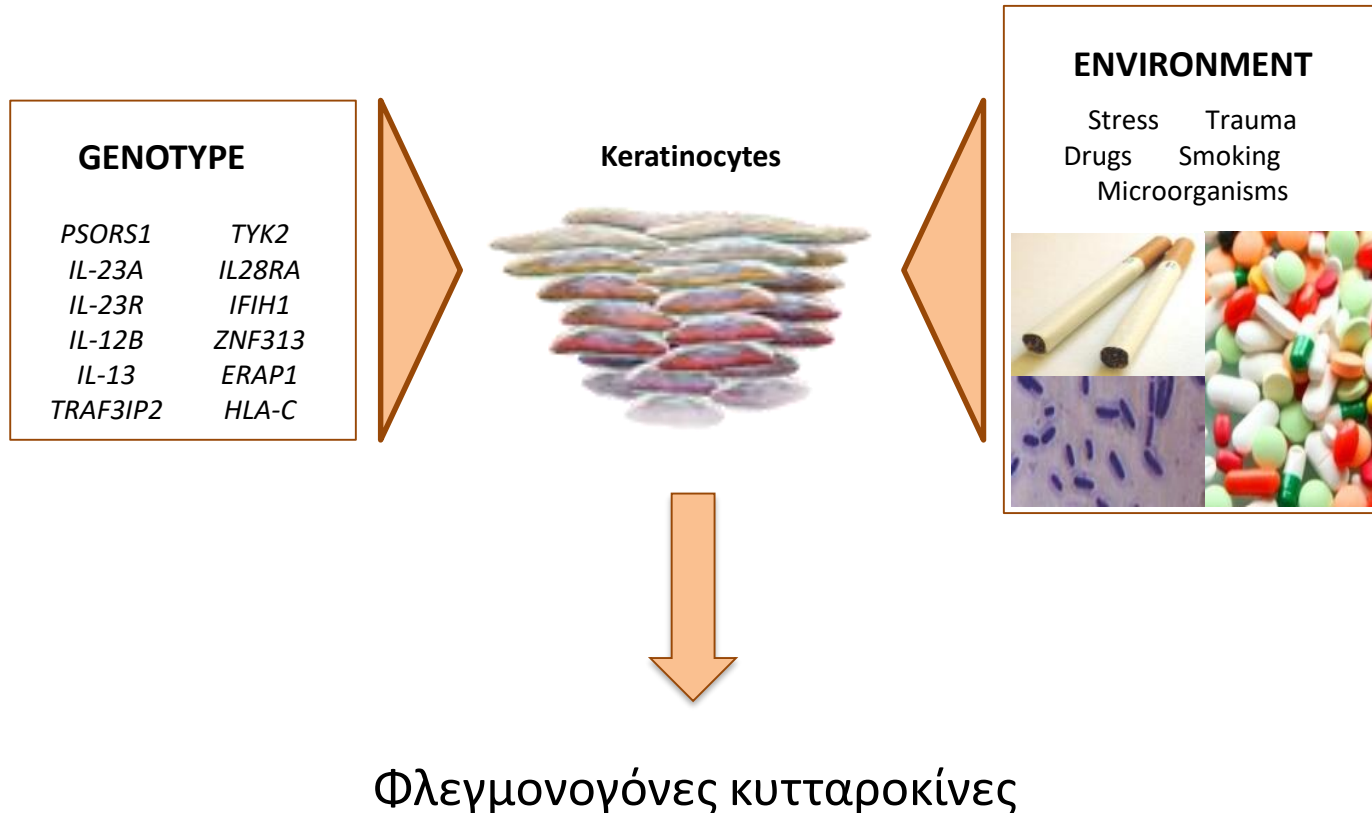
Η ψωρίαση είναι μια χρόνια και σοβαρή νόσος, ανοσολογικής αρχής που επηρεάζει κυρίως το δέρμα

- Η ψωρίαση είναι μια **χρόνια** νόσος, ανοσολογικής αρχής που επηρεάζει κυρίως το δέρμα.^{1,2}
- Προσβάλλει το 2-3% του πληθυσμού
- **Δεν είναι ιάσιμη**, υπάρχουν όμως θεραπείες που στοχεύουν στην ανακούφιση των συμπτωμάτων.³
- Ακόμα και με τις υπάρχουσες θεραπείες η νόσος παρουσιάζει **εξάρσεις** ή και **επιδείνωση**^{4,5}
- Εμφανίζεται συνήθως μεταξύ **15-25 ετών** αλλά μπορεί να εμφανιστεί σε οποιαδήποτε ηλικία.
- **35% ασθενών** έχουν οικογενειακό ιστορικό
- Το 1/3 ασθενών πάσχουν από μέτρια-σοβαρή ψωρίαση

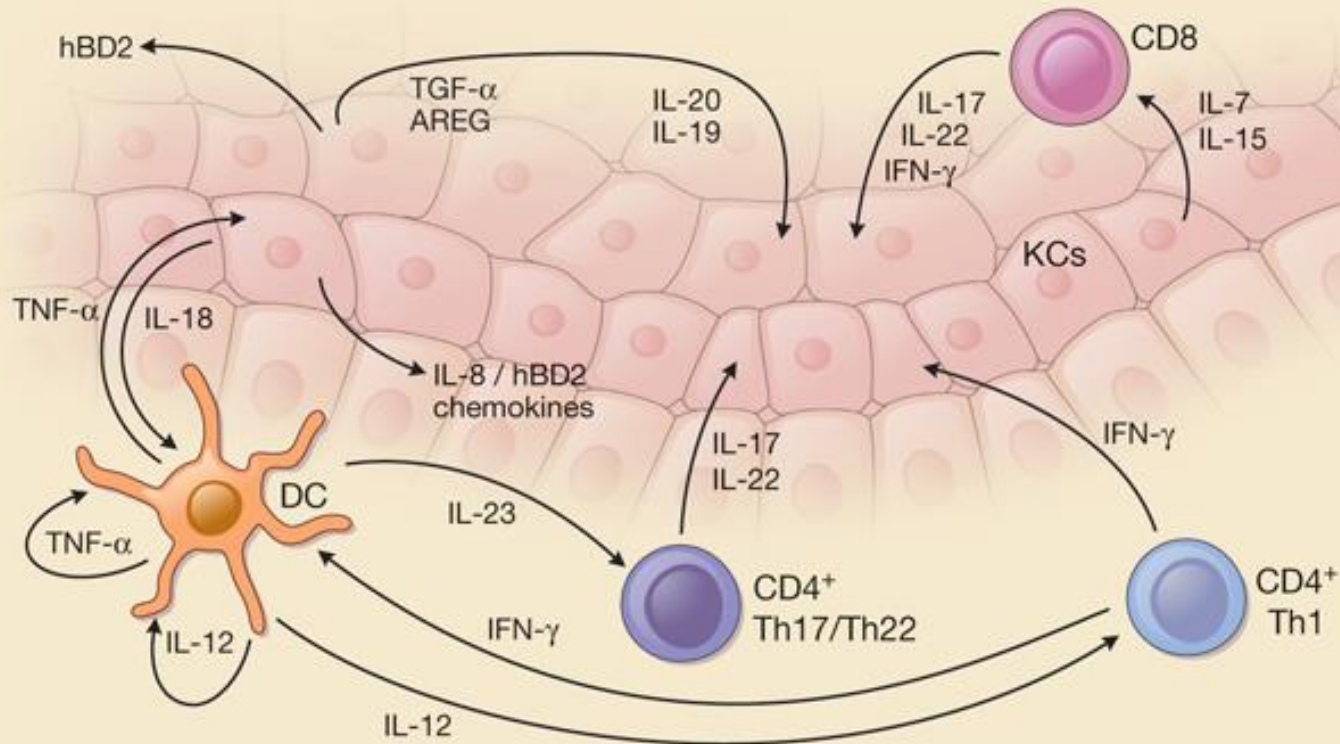


Photos adapted from Menter et al.

Στην ψωρίαση μια σειρά από γενετικούς και περιβαλλοντικούς παράγοντες επάγουν την απελευθέρωση φλεγμονογόνων κυτταροκινών από το κερατινοκύτταρο



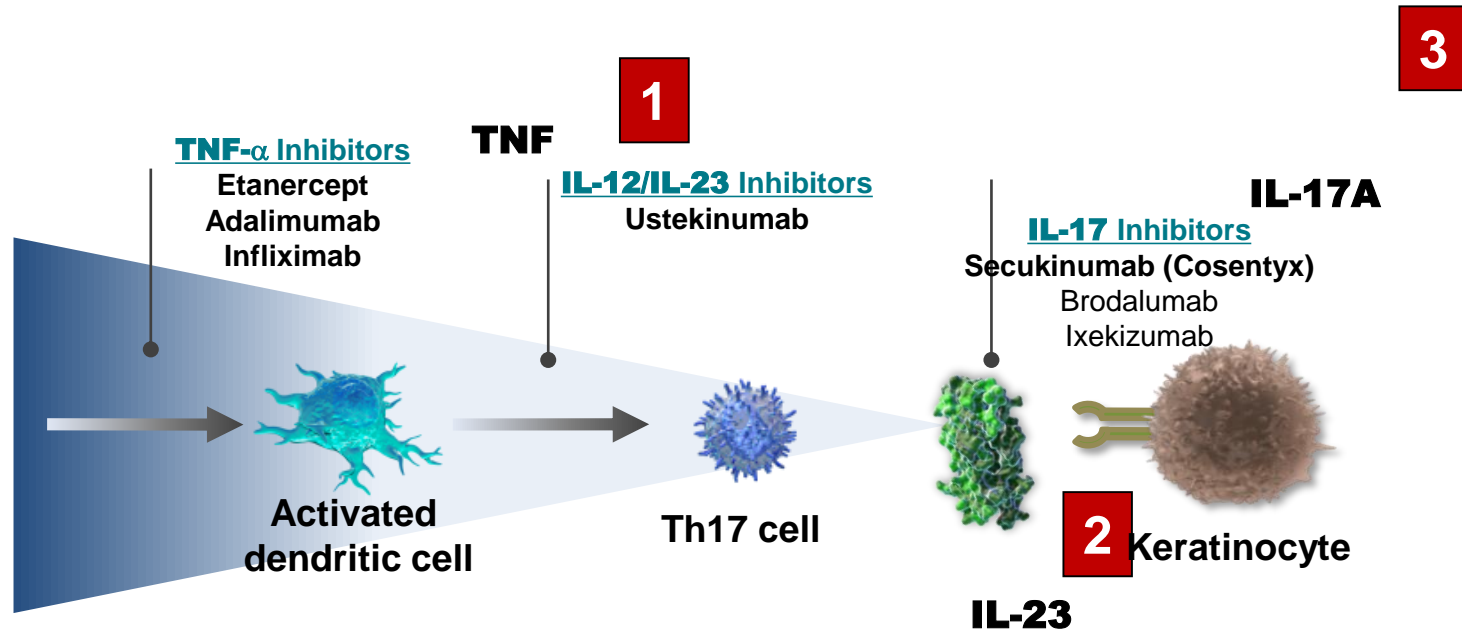
Cytokine network in psoriasis



Source: Goldsmith LA, Katz SI, Gilchrist BA, Paller AS, Leffell DJ, Wolff K: *Fitzpatrick's Dermatology in General Medicine, 8th Edition*: www.accessmedicine.com

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Η IL17A έχει πιο στοχευμένη δράση, γιατί δρα απευθείας στο κερατινοκύτταρο



IL, interleukin; Th, helper T cells; TNF, tumor necrosis factor.

Adapted from Nestle FO et al. N Engl J Med. 2009;361:496-509; Kopf M et al. Nat Rev Drug Discov. 2010;9:703-718; Garber K. Nat Biotechnol. 2011;29:563-566.

IL-17A a therapeutic target is psoriasis

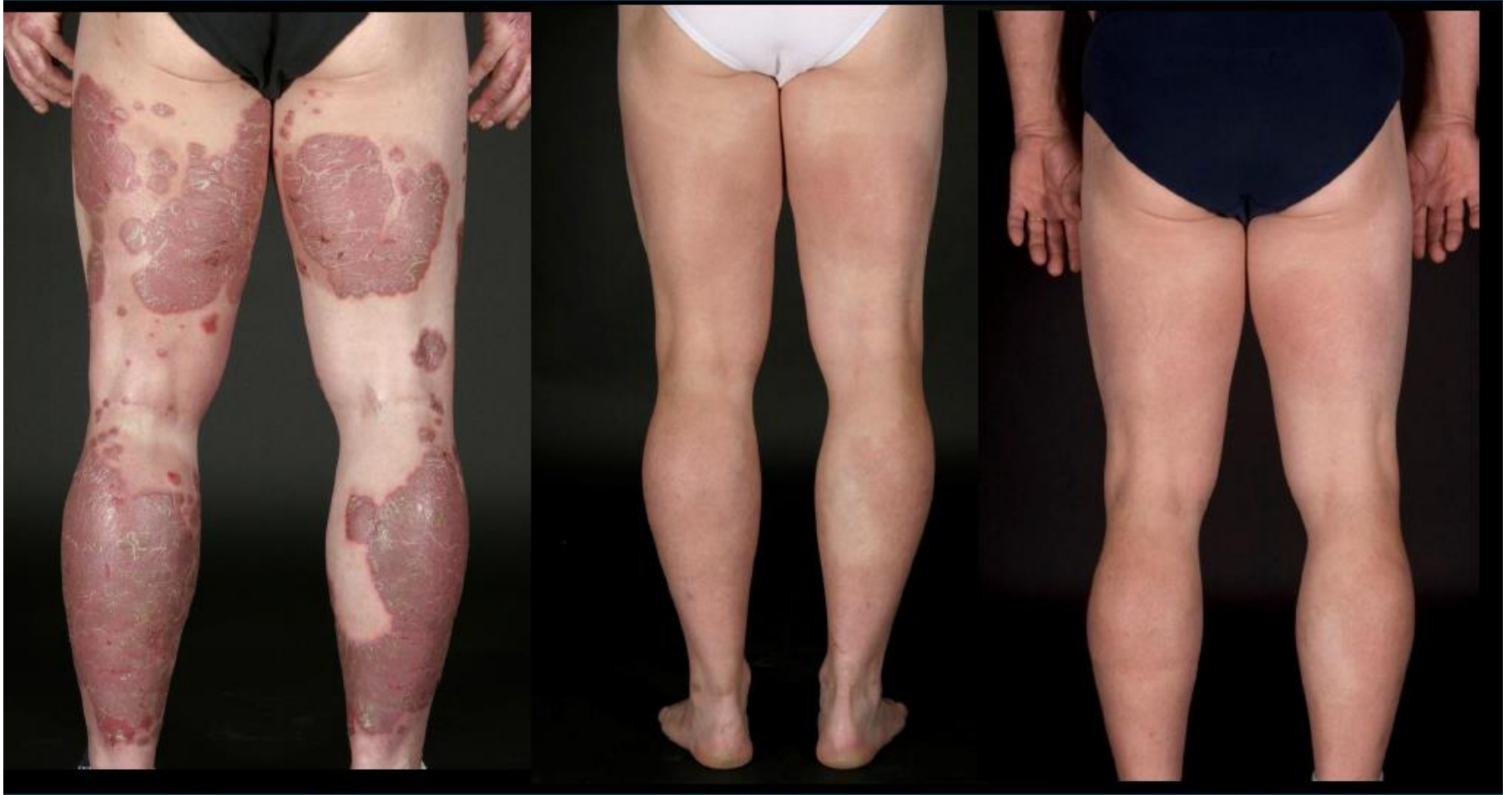


Baseline

PASI < 50

PASI > 50

IL-17A a therapeutic target is psoriasis



Baseline

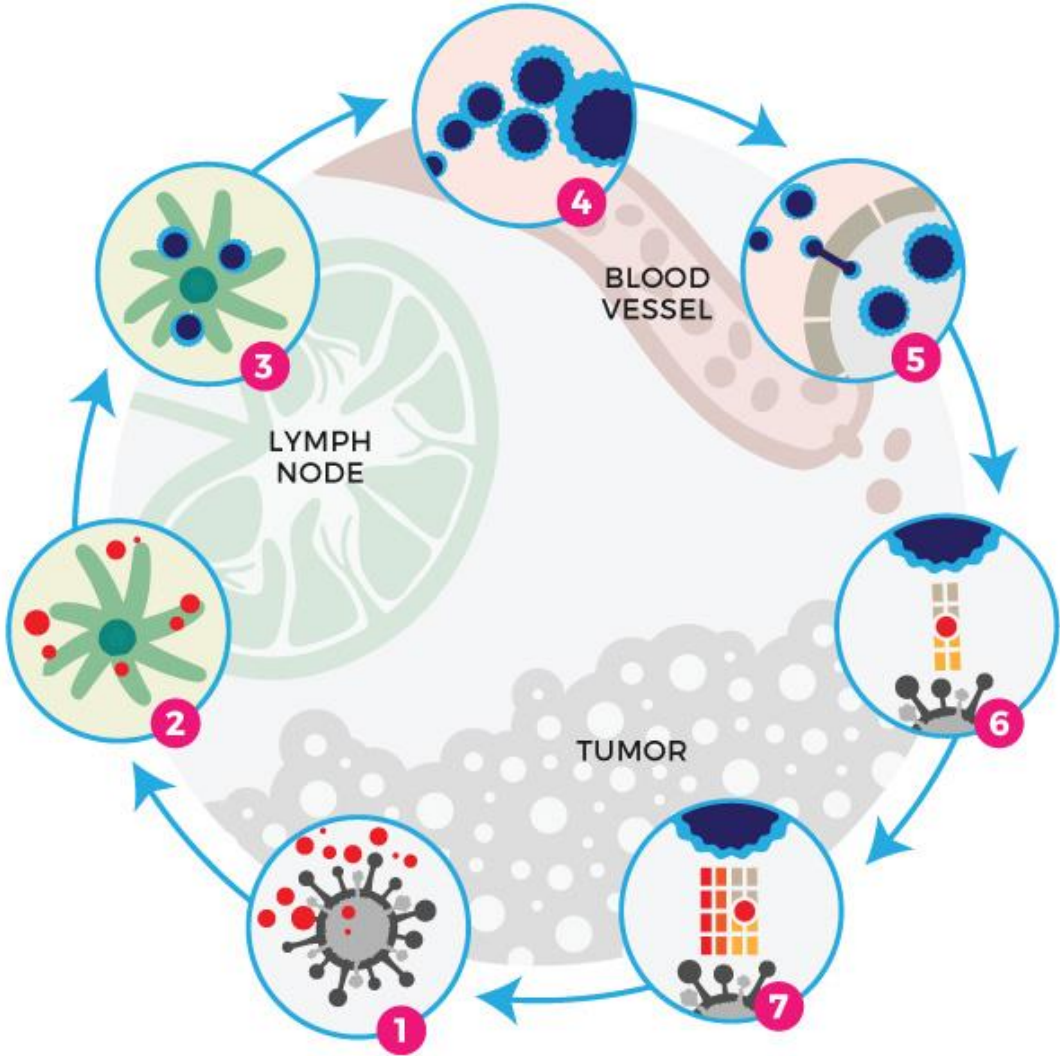
PASI >90

PASI >98

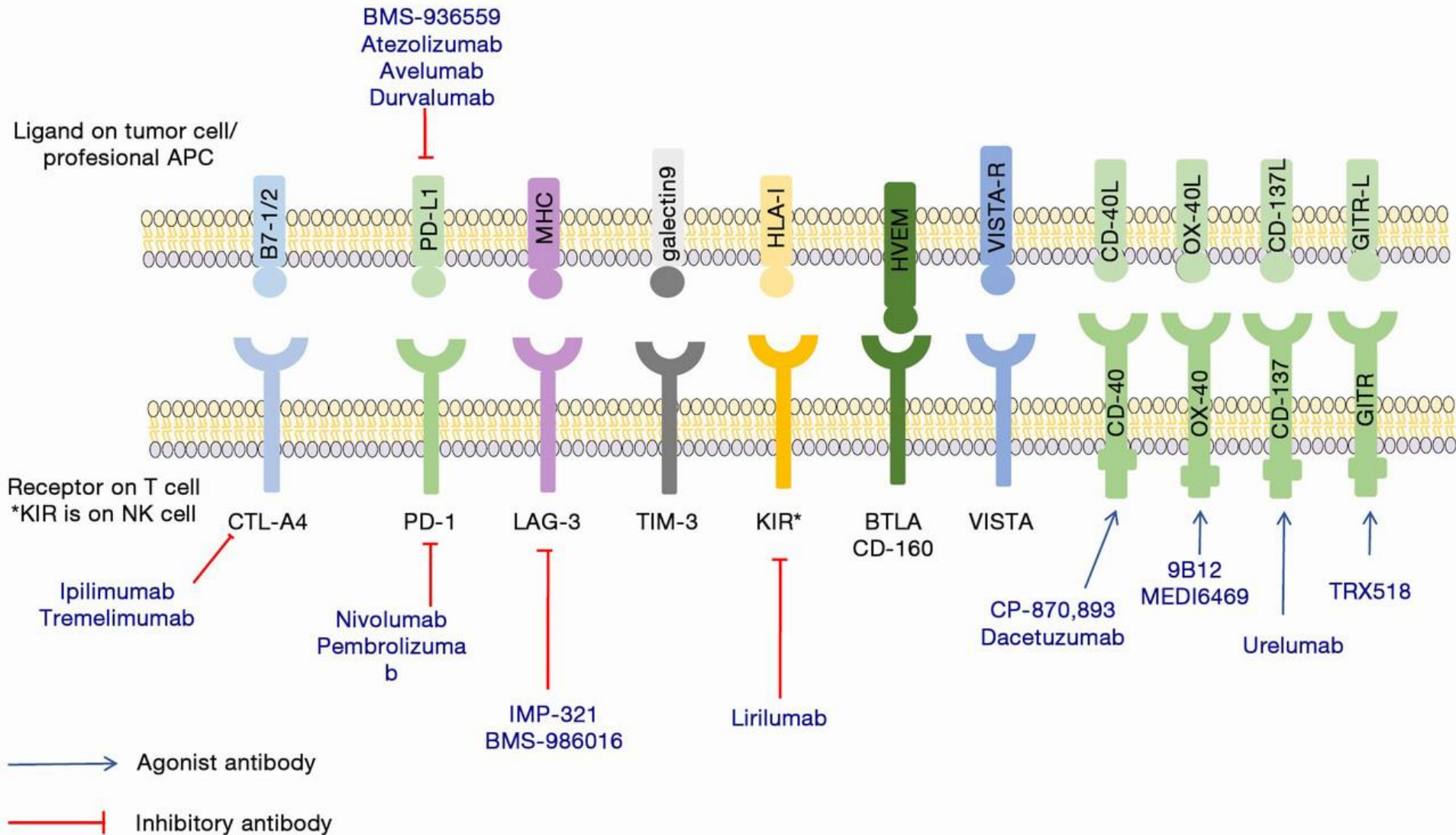
Cancer Immunology

The immune system is capable of fighting cancer

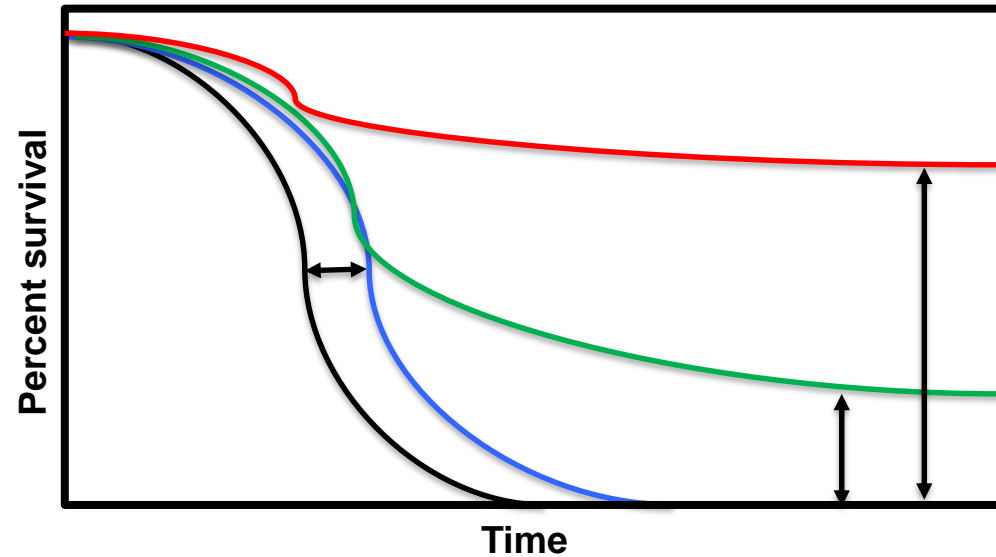
THE CANCER-IMMUNITY CYCLE



The Checkpoint Blocking/Agonist Antibodies in the treatment of Cancer



Combination therapy in cancer increases the IrAEs



Chemotherapy

Targeted therapy

Immune checkpoint therapy

Combination therapy

⇒ long lasting responses

⇒ applicable in various cancer types

⇒ increase in response rate?

⇒ increase in efficiency?

THE NOBEL PRIZE IN PHYSIOLOGY OR MEDICINE 2018

Illustrations: Niklas Elmehed



James P. Allison • Tasuku Honjo

“for their discovery of cancer therapy by inhibition
of negative immune regulation”

THE NOBEL ASSEMBLY AT KAROLINSKA INSTITUTET

Cancer Immunotherapy: A paradigm shift in cancer treatment

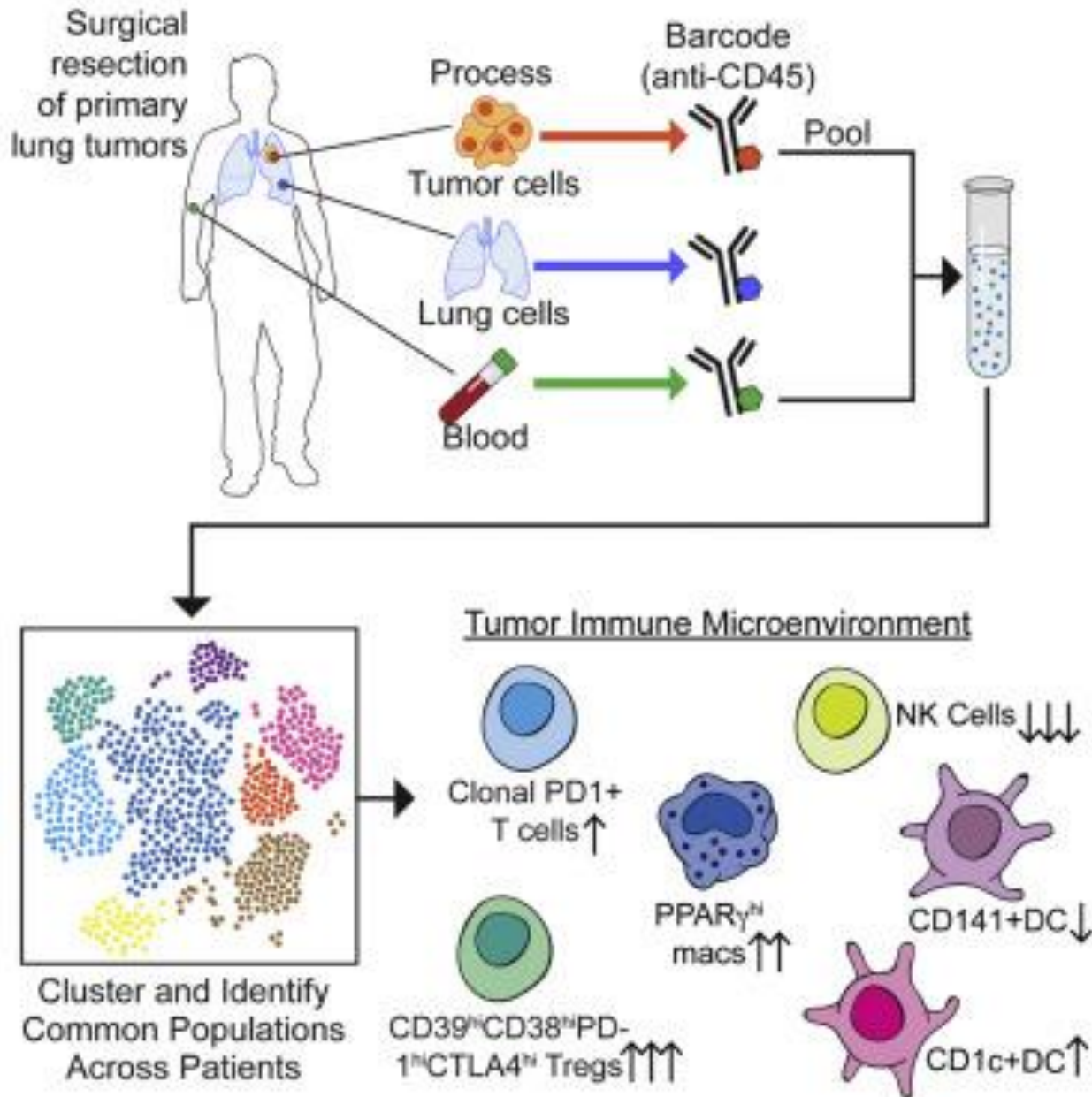
Caveats

- ❖ A low proportion of patients respond
- ❖ Life-threatening autoimmunity (IrAEs)

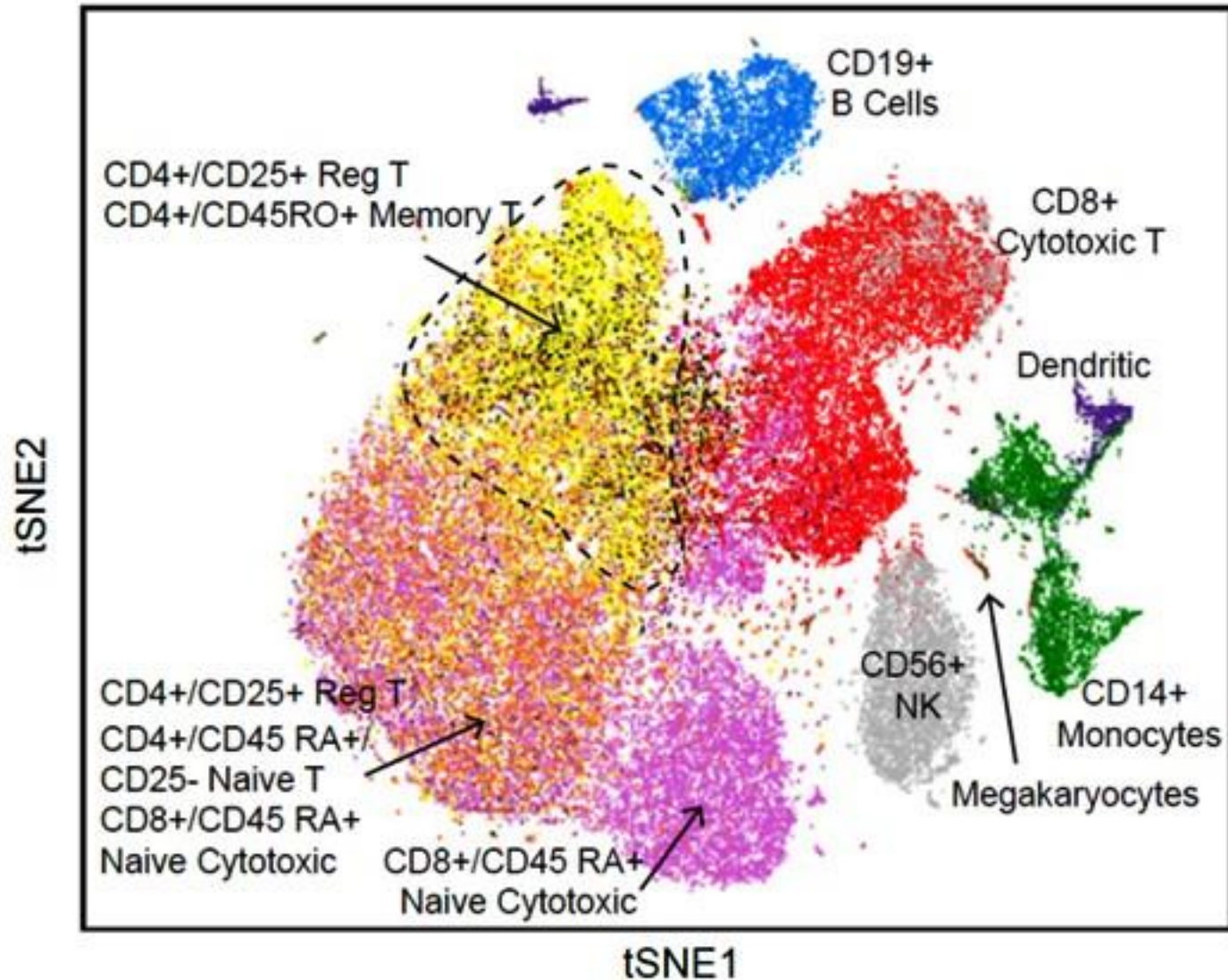


Lack of validated non-invasive biomarkers to reliably predict response to immunotherapy

Single cell mass cytometry analysis (CYTOF)



Detailed characterization of blood cells through CYTOF



Genomics: RNA sequencing

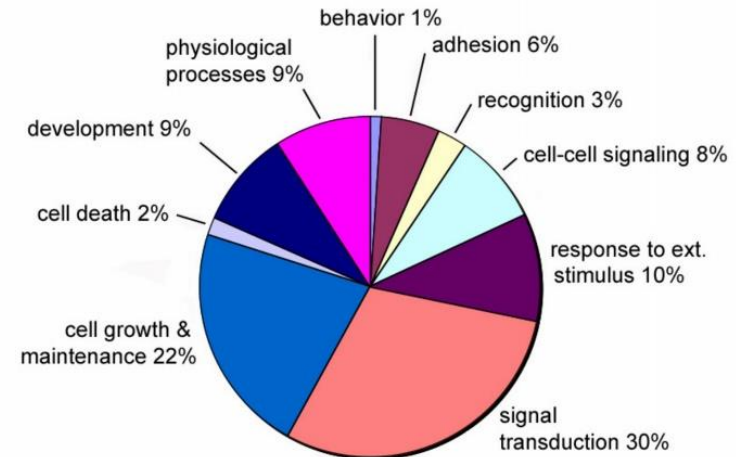
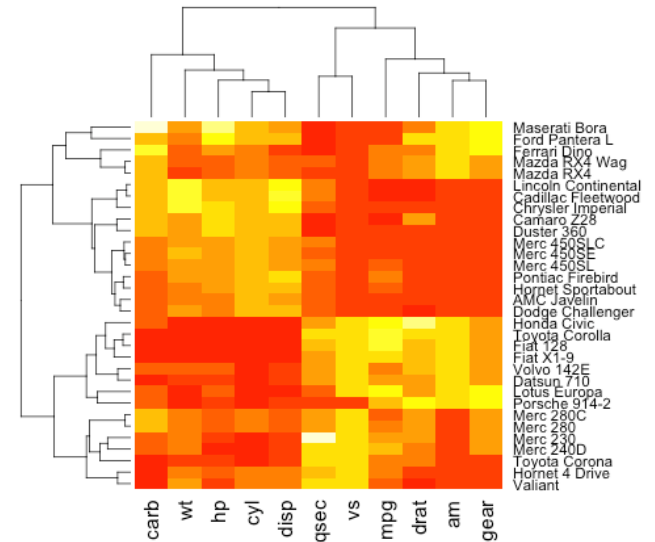
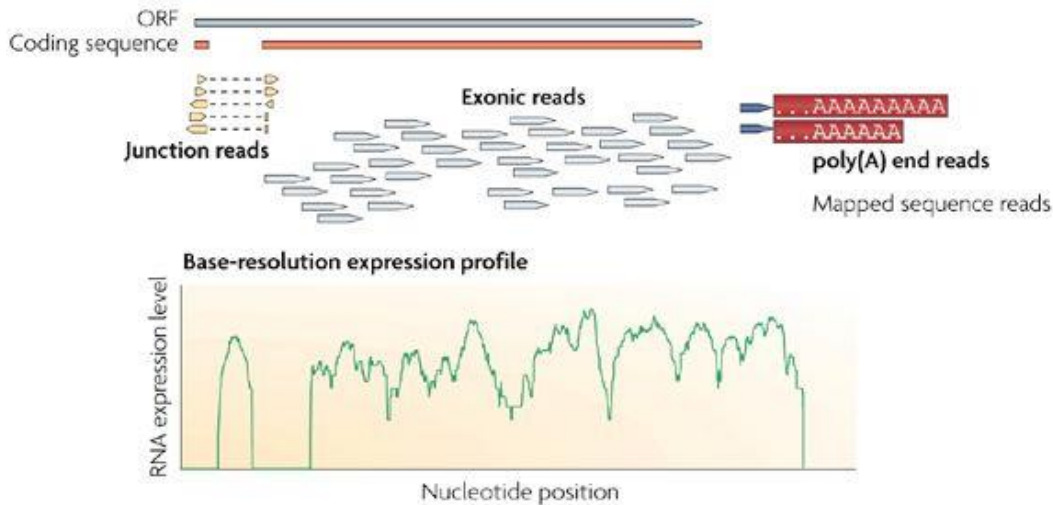
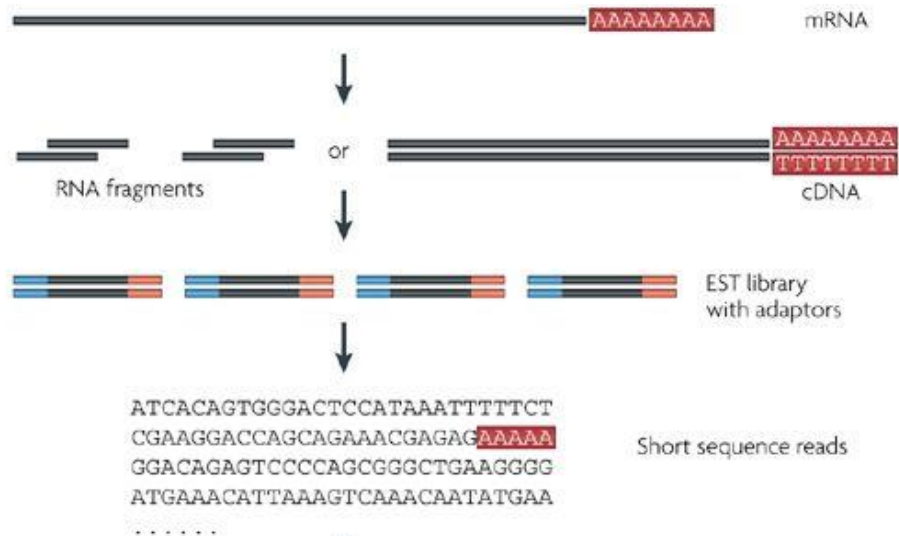
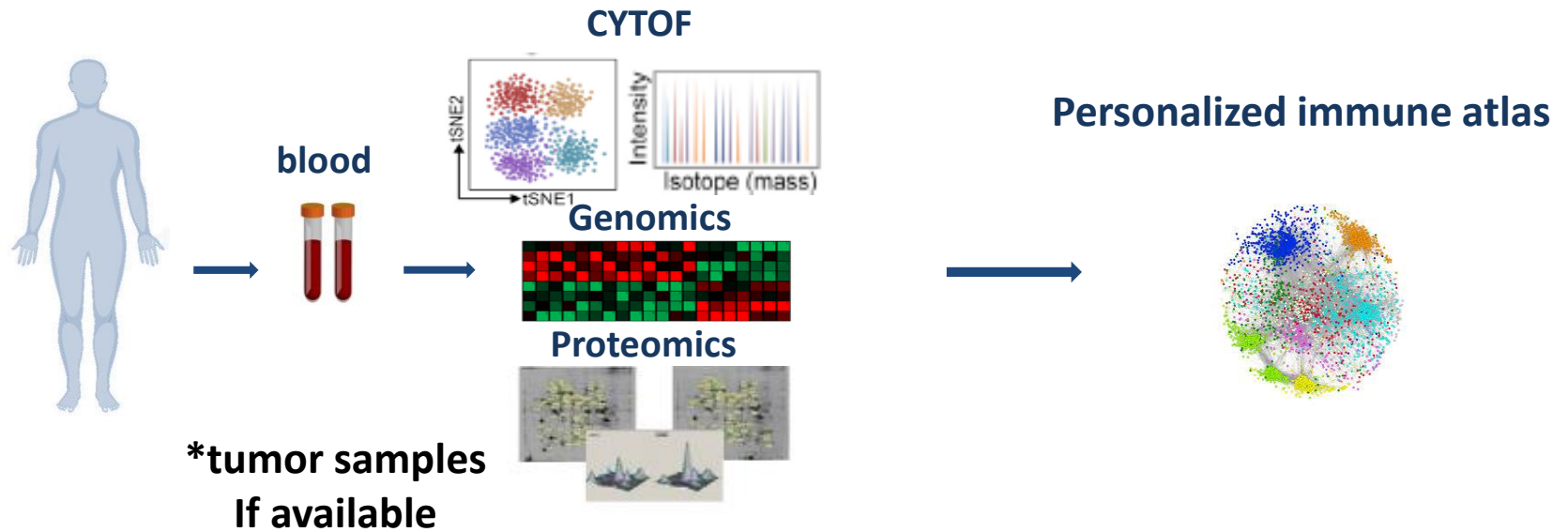


Figure 1

Multi-parametric immune profile of PBMCs from cancer patients: an approach for precision medicine (**IWAS**)



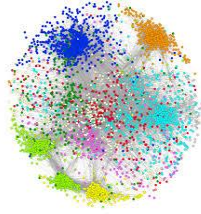
A. Single cell mass cytometry (CyTOF) in PBMCs

B. RNA-seq of PBMCs (or population of interest)

C. Proteomic/ Metabolomic analysis

Pipeline for “liquid” biopsy

Personalized immune atlas



Discovery Cohort



Immunotherapy

Responders Non-responders



Integration of data

immune fingerprint



Validation Cohort



“Liquid” biopsy



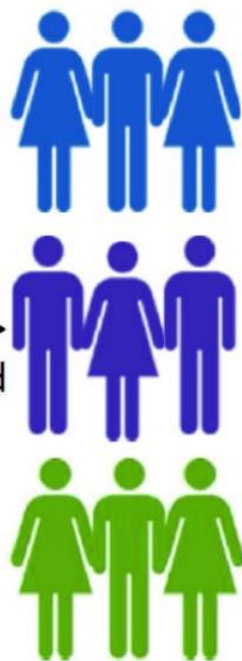
**One-size fits-all
medicine**



Stratification

Patients are grouped
by: Disease
Subtypes
Demographics
Clinical features
Biomarkers

Stratified medicine



Personalisation

Patient individual:
Preferences,
Clinical features
Medication history
Environment
Behaviours & habits
Biomarker

Precision medicine



Precision medicine



Acknowledgments

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