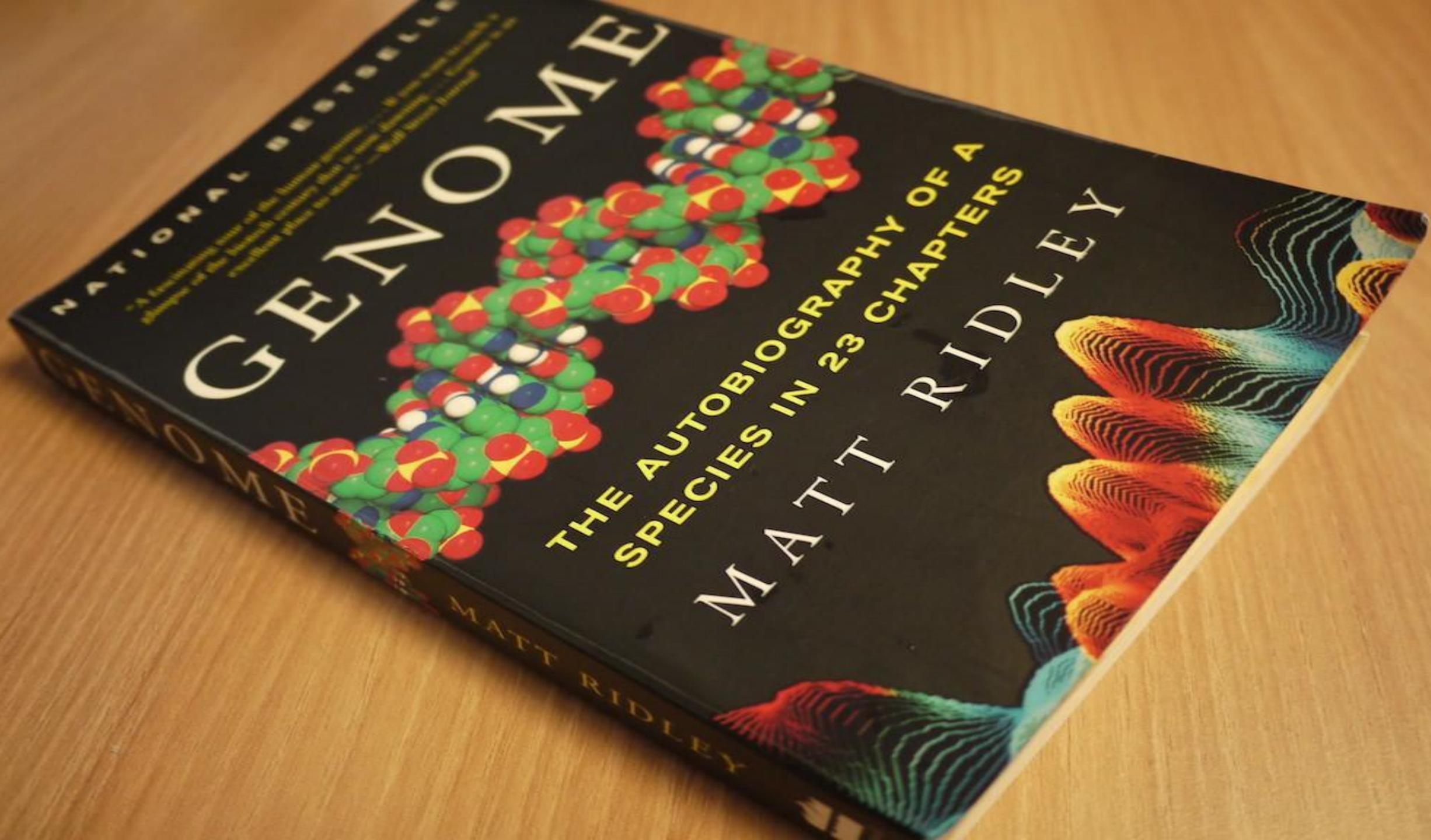




# не все в долонях ДНК: Епігенетика та імунні клітини

Гречуха Є.О., студент 5 курсу,  
10Ма

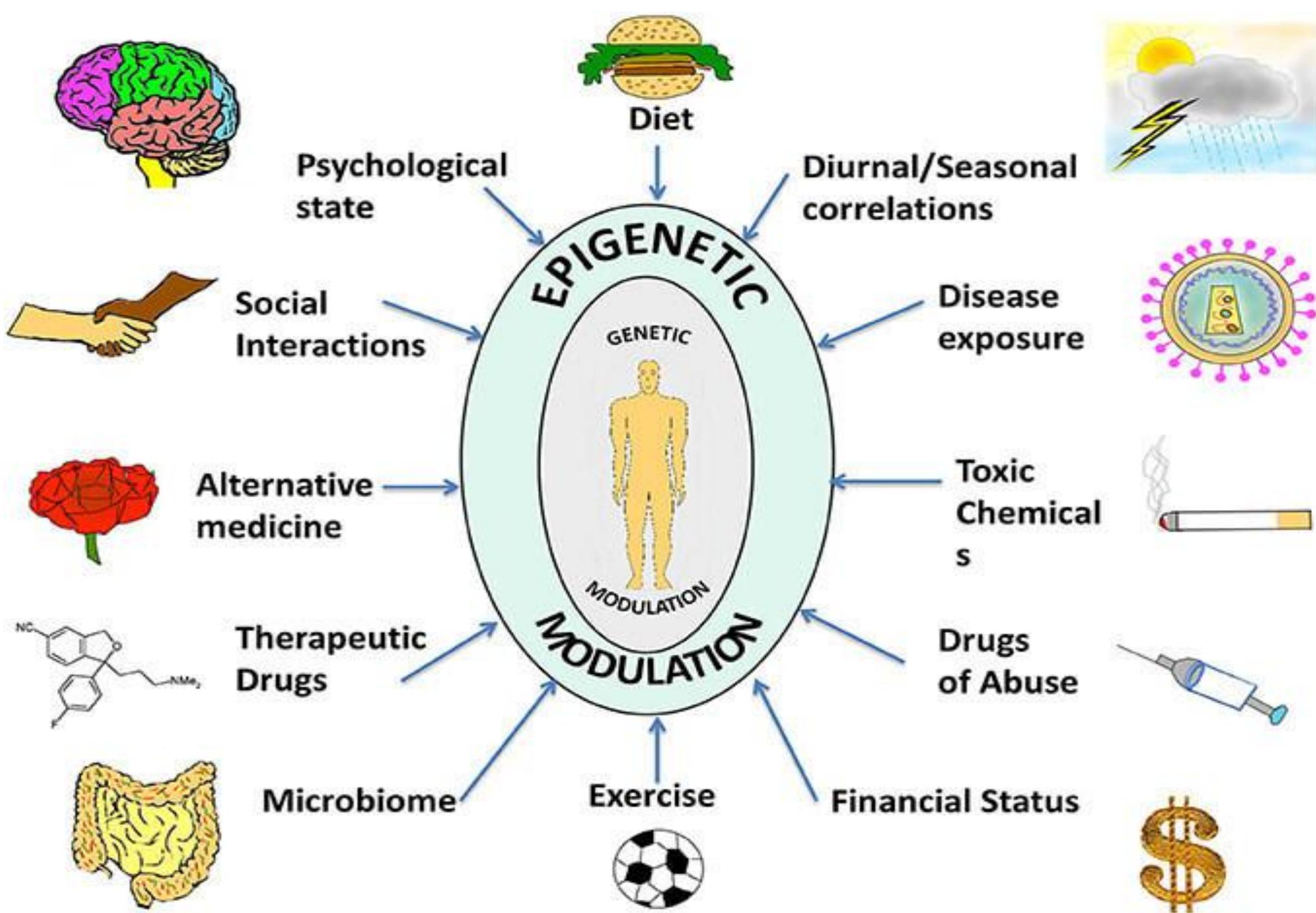




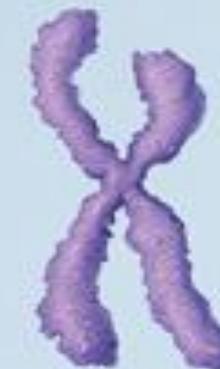


О величии  
Губочеса смиренного  
Адама в России  
и в наше время в гор-  
одской жизни чест-  
ные. Не знаю — в  
нашегда честные  
люди пребывают  
всюду

и в наше время в гор-  
одской жизни чест-  
ные. Не знаю — в  
нашегда честные  
люди пребывают  
всюду



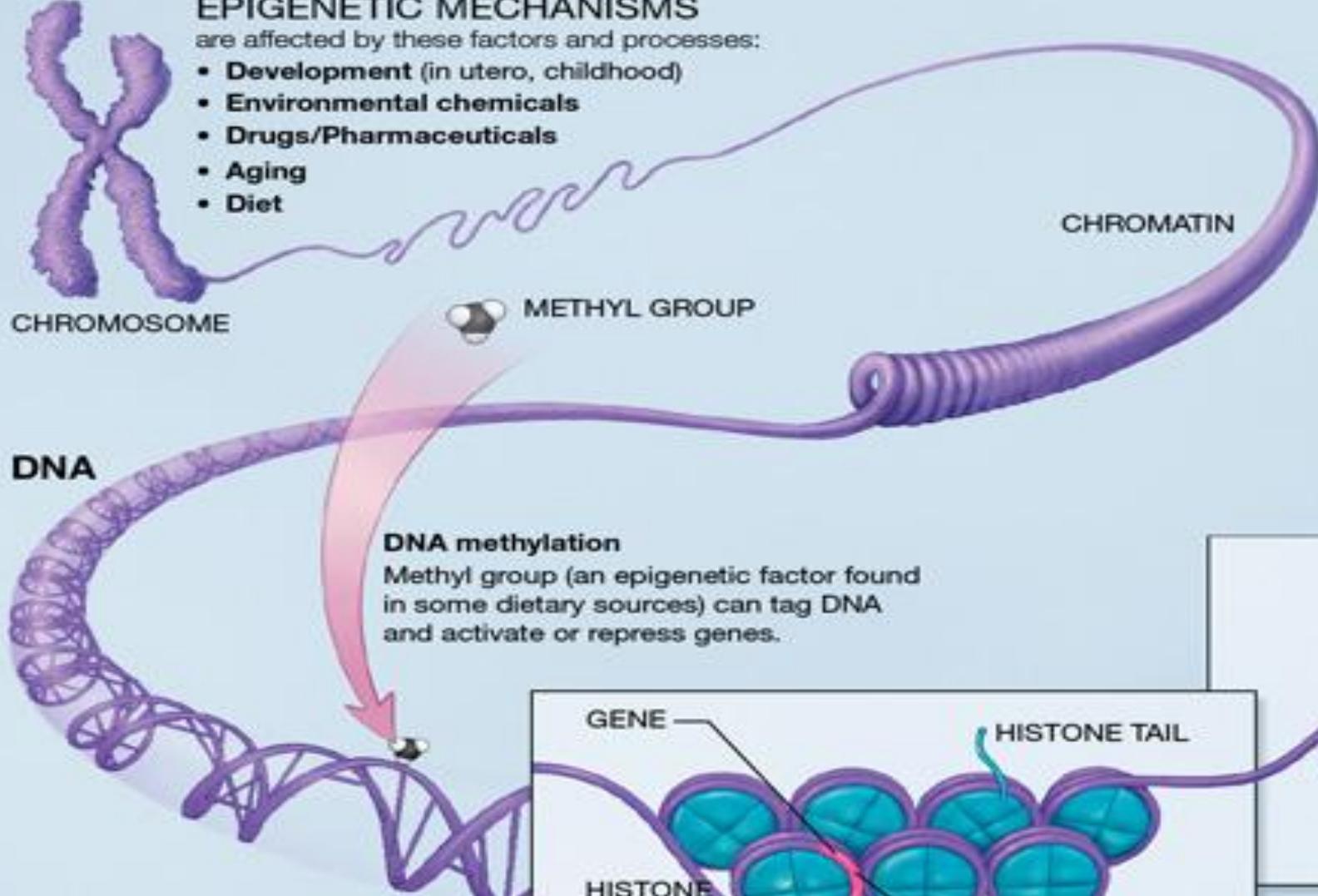




## EPIGENETIC MECHANISMS

are affected by these factors and processes:

- Development (in utero, childhood)
- Environmental chemicals
- Drugs/Pharmaceuticals
- Aging
- Diet



Histones are proteins around which DNA can wind for compaction and gene regulation.

CHROMATIN

METHYL GROUP

DNA

### DNA methylation

Methyl group (an epigenetic factor found in some dietary sources) can tag DNA and activate or repress genes.

GENE

HISTONE

HISTONE TAIL

DNA inaccessible, gene inactive

HISTONE TAIL

DNA accessible, gene active

### Histone modification

The binding of epigenetic factors to histone "tails" alters the extent to which DNA is wrapped around histones and the availability of genes in the DNA to be activated.

## HEALTH ENDPOINTS

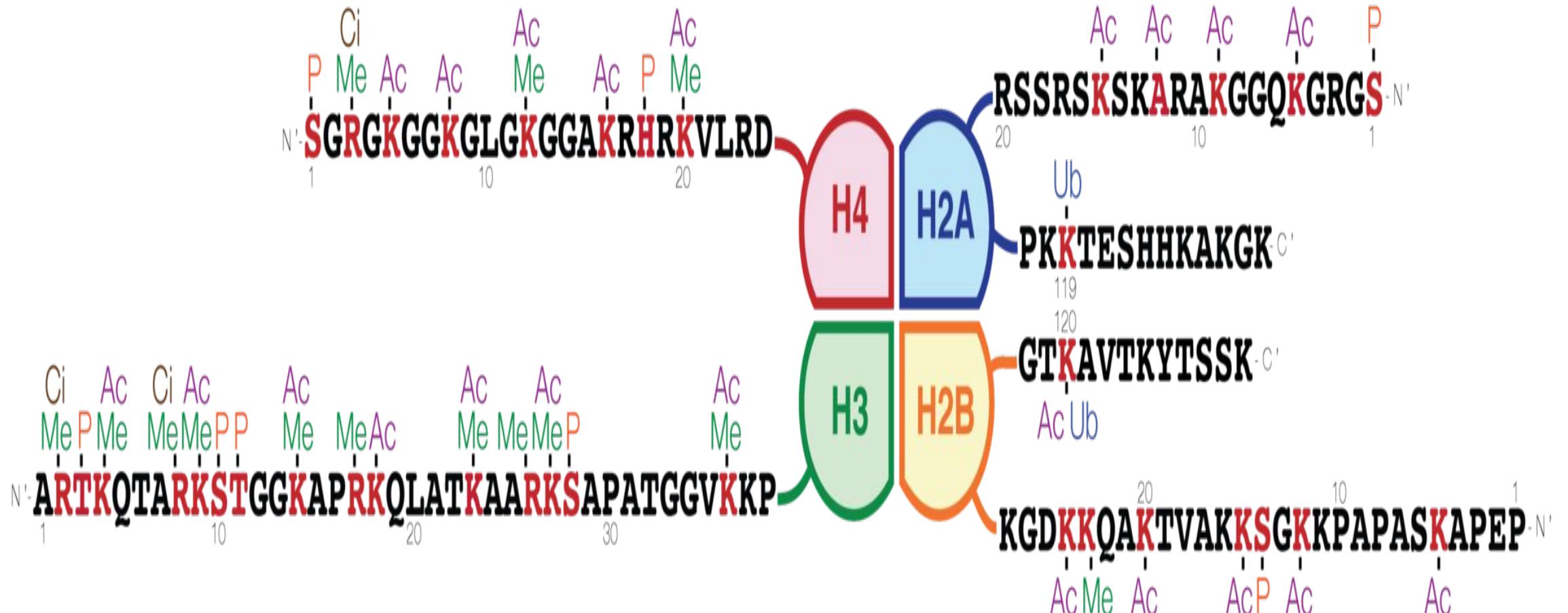
- Cancer
- Autoimmune disease
- Mental disorders
- Diabetes

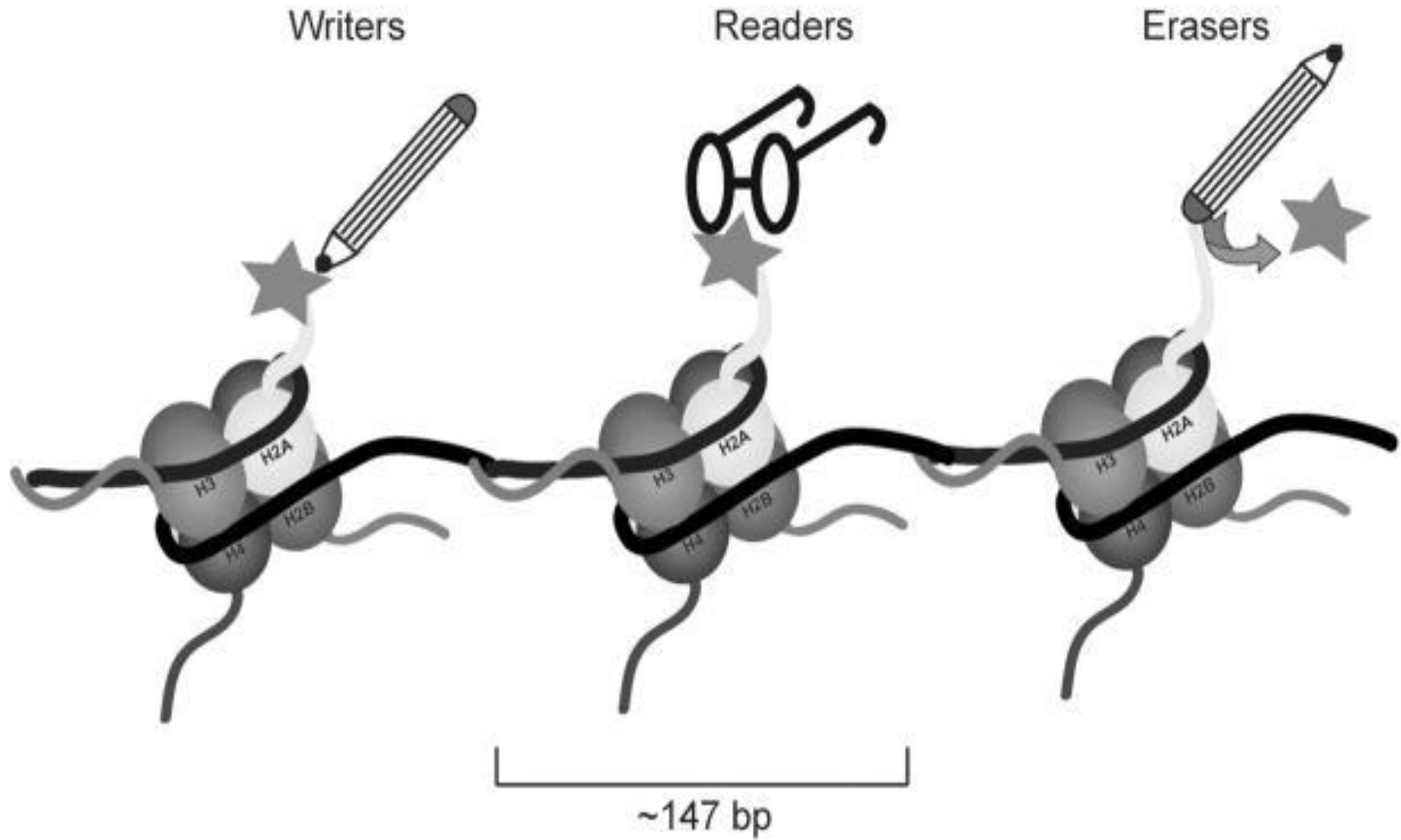
● EPIGENETIC FACTOR

# Епігенети

ка

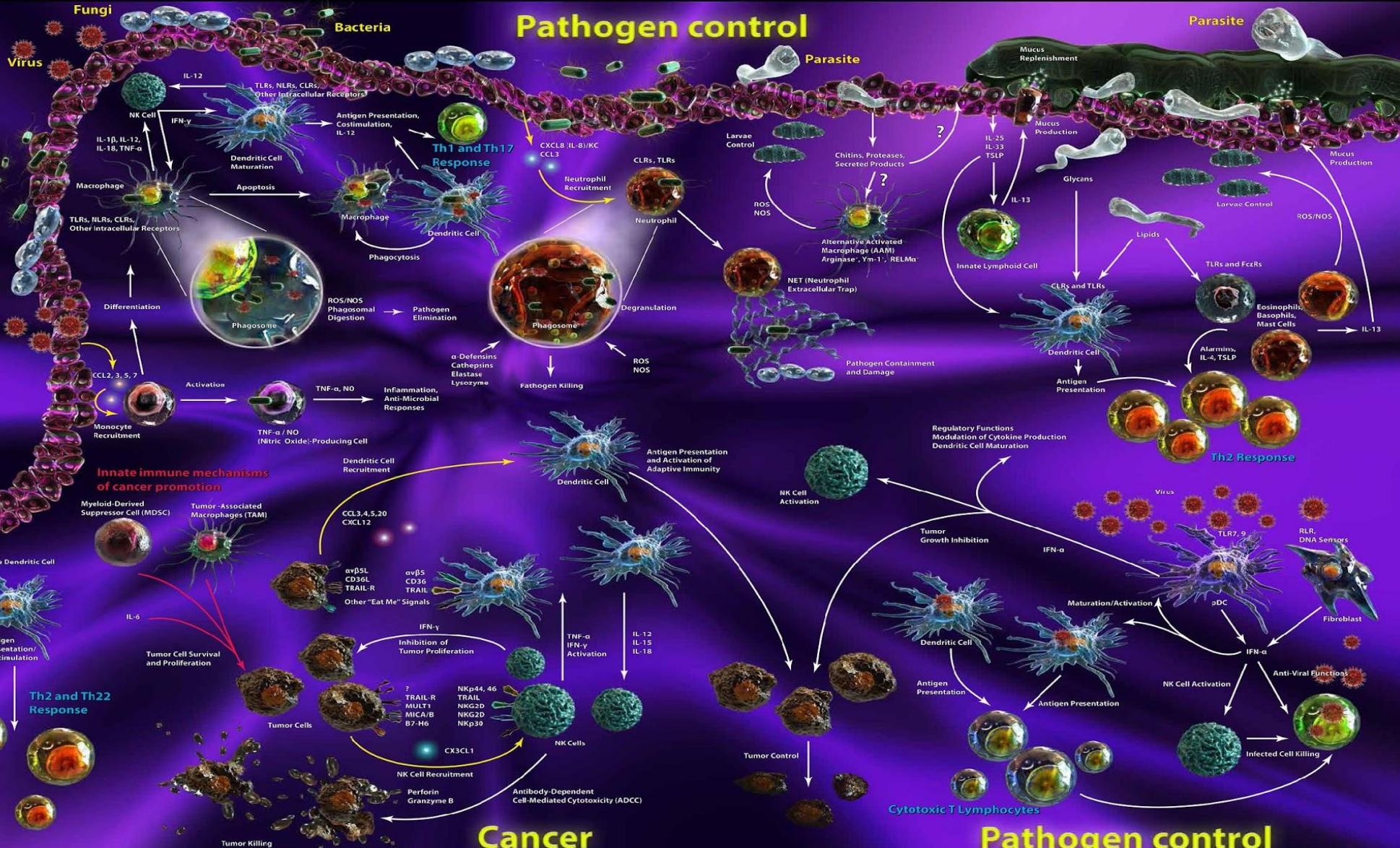
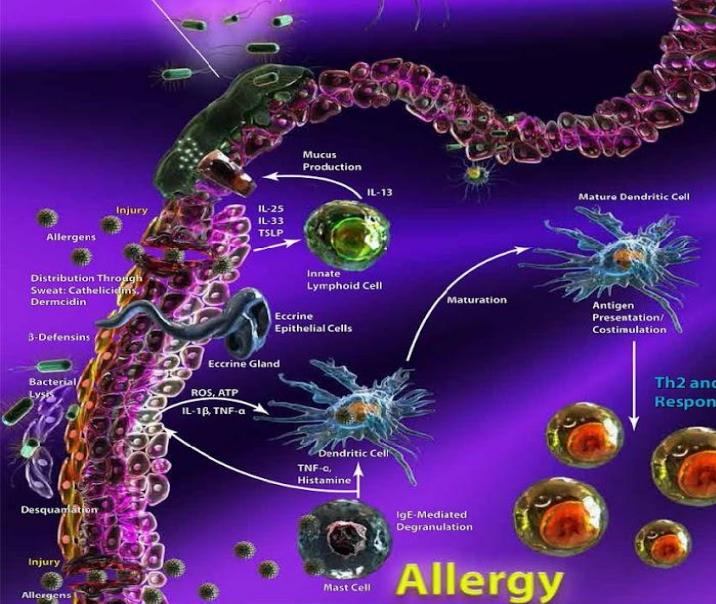
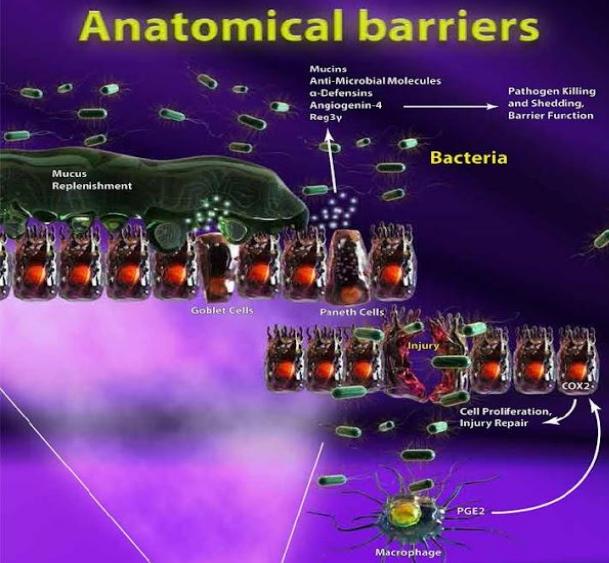
- Метилювання ДНК
- Модифікація гістонів
- Ремоделювання хроматину
- Пріони
- мікроРНК





# Innate Immunity

## Anatomical barriers



[biolegend.com](http://biolegend.com)

Interactive Poster: [biolegend.com/innateimmunity](http://biolegend.com/innateimmunity)

We would like to thank Dr. Ruslan M. Medzhitov of the Yale School of Medicine for his contributions to this poster.

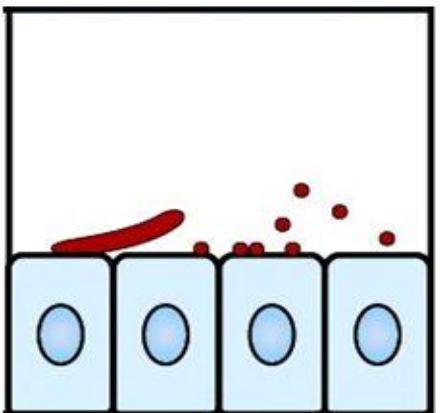
Contact BioLegend  
US & Canada Toll-free: 1.877.246.5343 (877-BIOLEGEND)  
International: 1.858.768.5800  
Fax: 1.877.455.9587  
email: [cs@biolegend.com](mailto:cs@biolegend.com), [techserv@biolegend.com](mailto:techserv@biolegend.com)

US Headquarters:  
San Diego, CA 92121

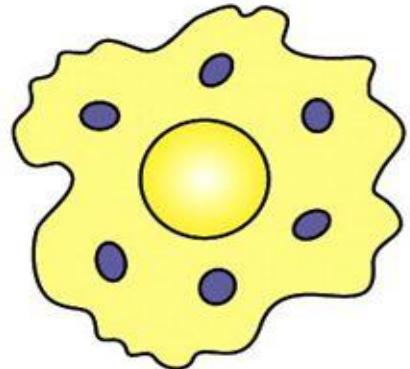
04-0029-00



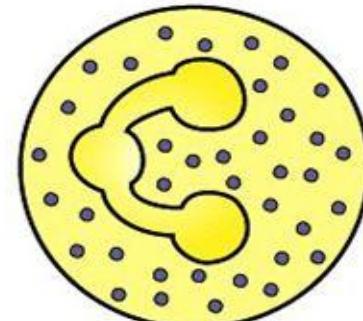
# Innate Immunity



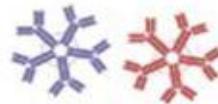
Epithelial barriers



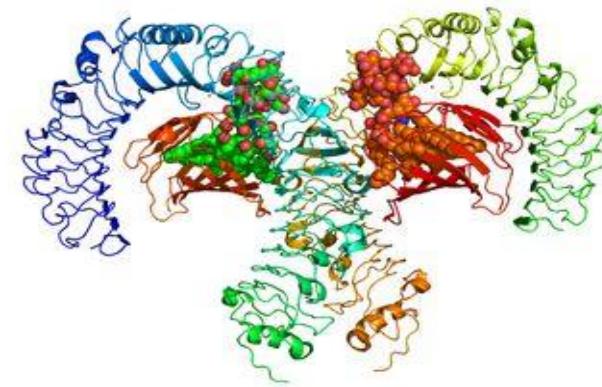
Macrophages



Neutrophils



Soluble molecules

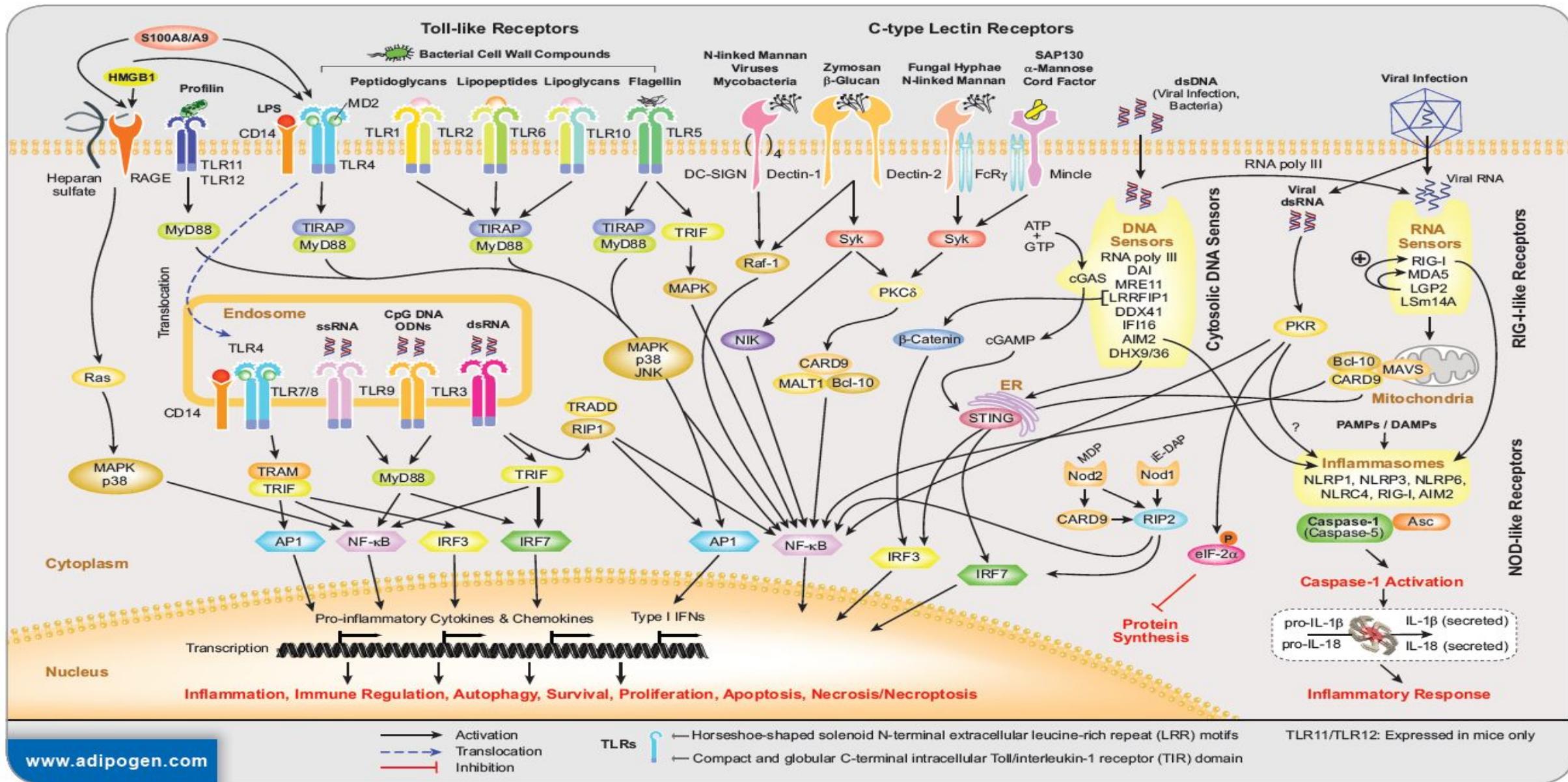


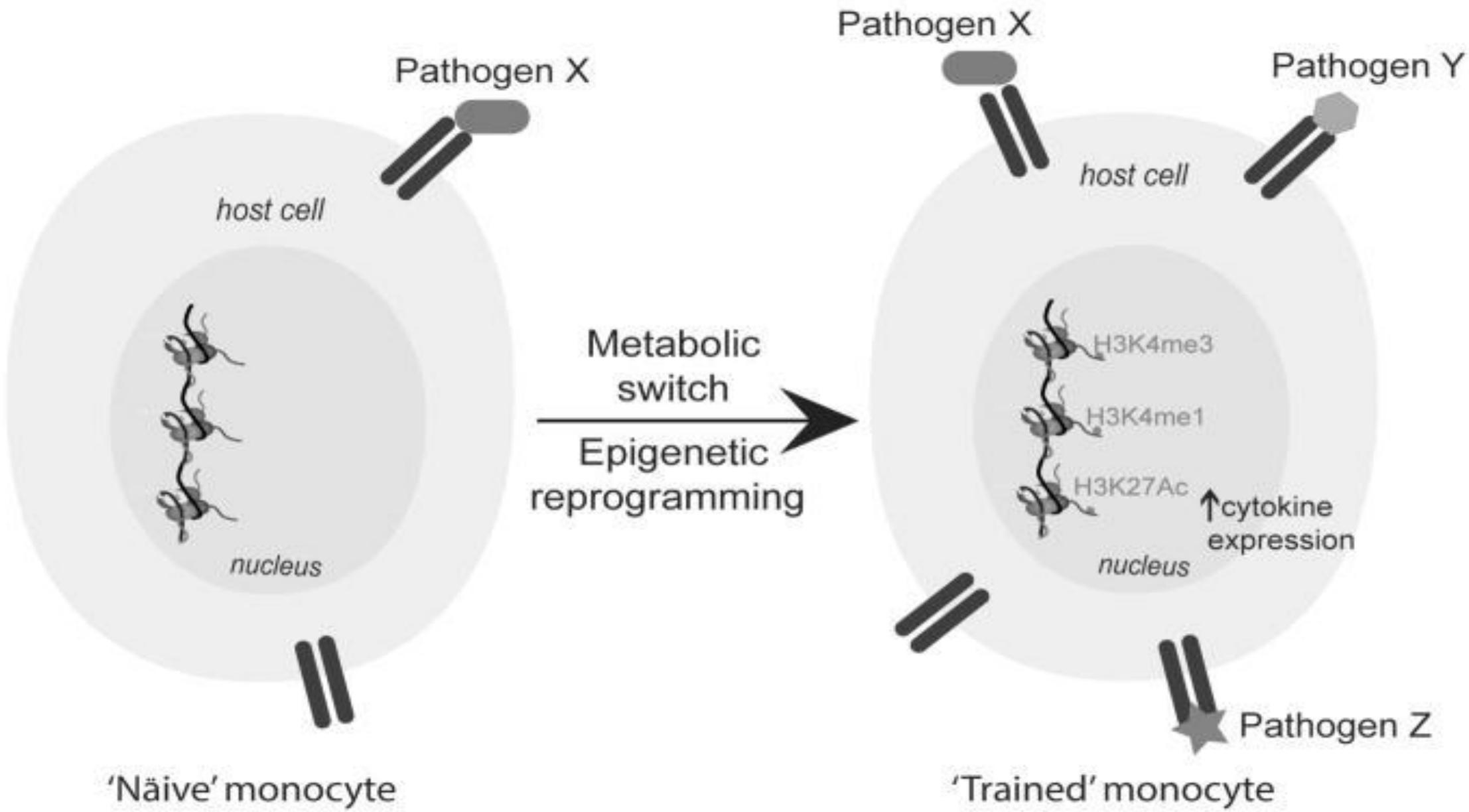
Pattern-recognition receptors:  
TLRs, NLRs, scavenger Rs,  
C-type lectin Rs

# Pattern Recognition Receptors (PRRs) Signaling Pathways

AdipoGen International  
Schützenstrasse 12 · CH-4410 Liestal · Switzerland  
TEL: +41-61-926-60-40 · FAX: +41-61-926-60-49  
E-Mail: info@adipogen.com · www.adipogen.com

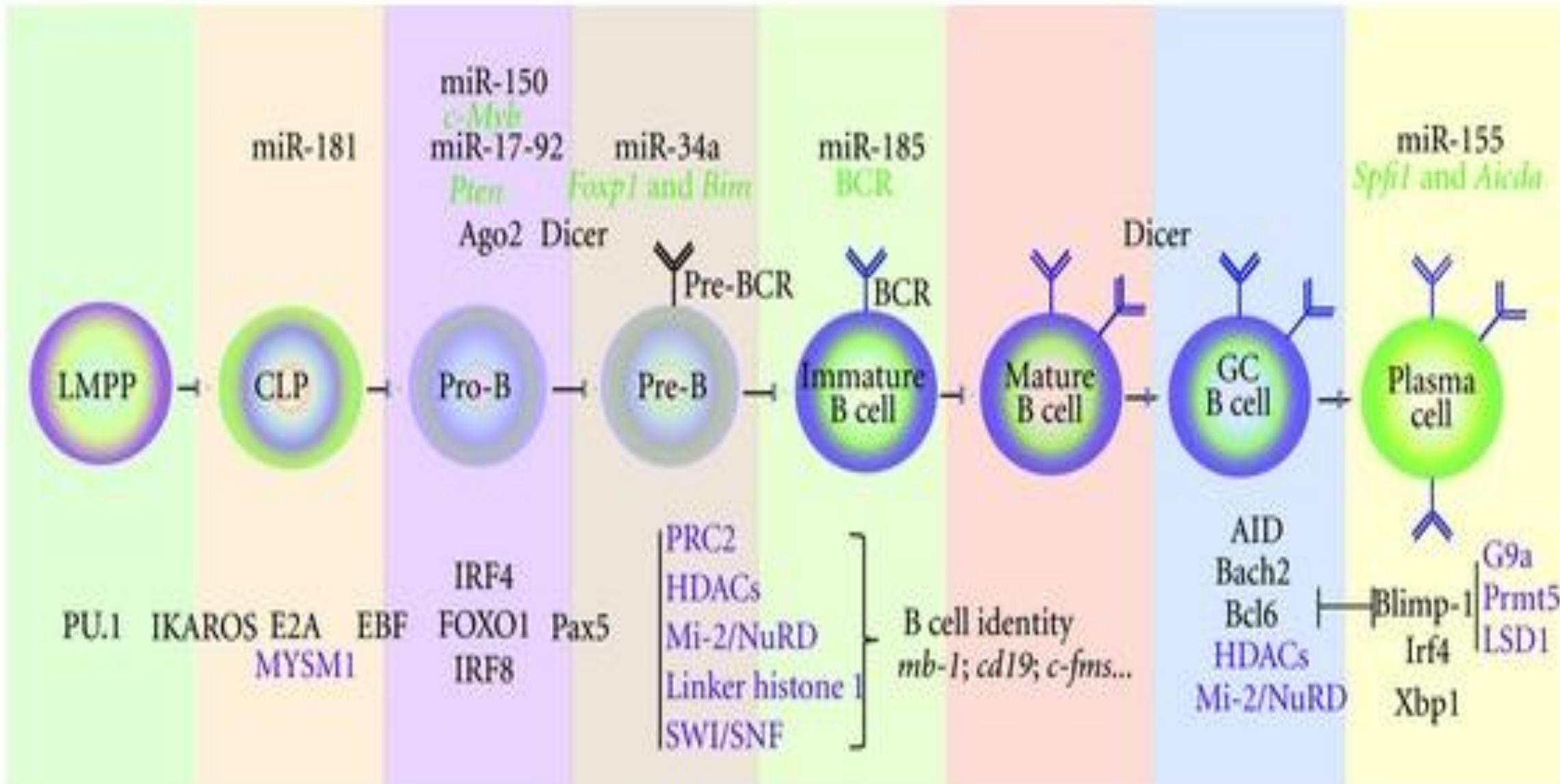
**AdipoGen®**  
Connecting Immunology to Metabolism™





# B- лімфоцити

Bruna Barneda-Zahonero “Epigenetic Regulation of B Lymphocyte Differentiation,  
Transdifferentiation, and Reprogramming”  
2012



1.

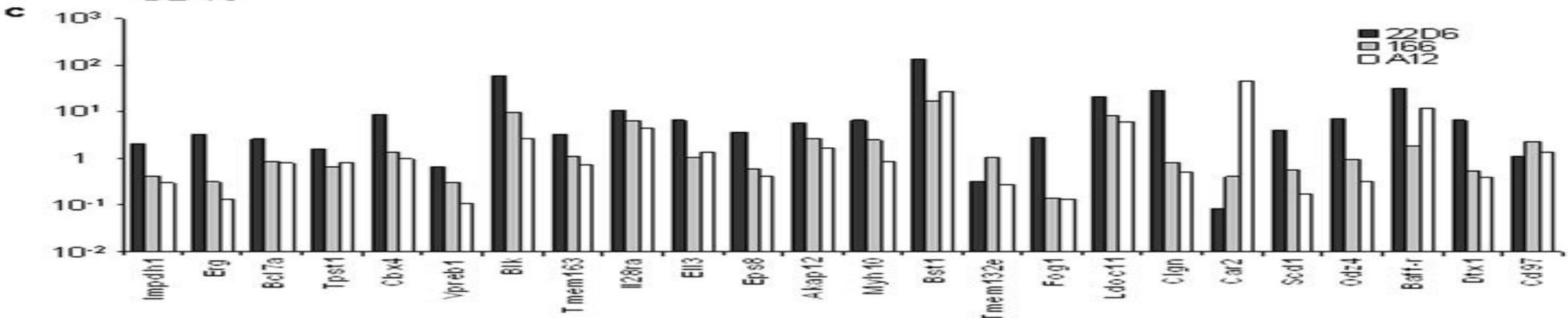
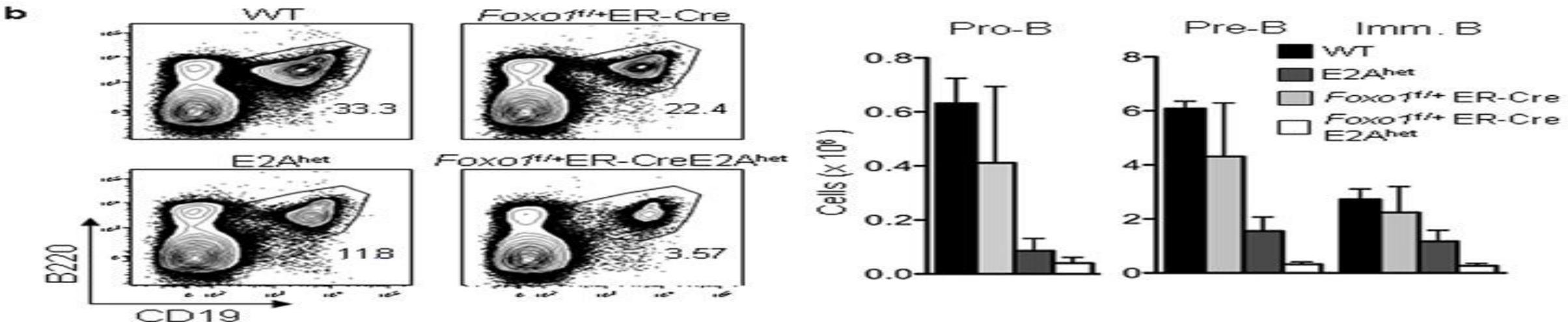
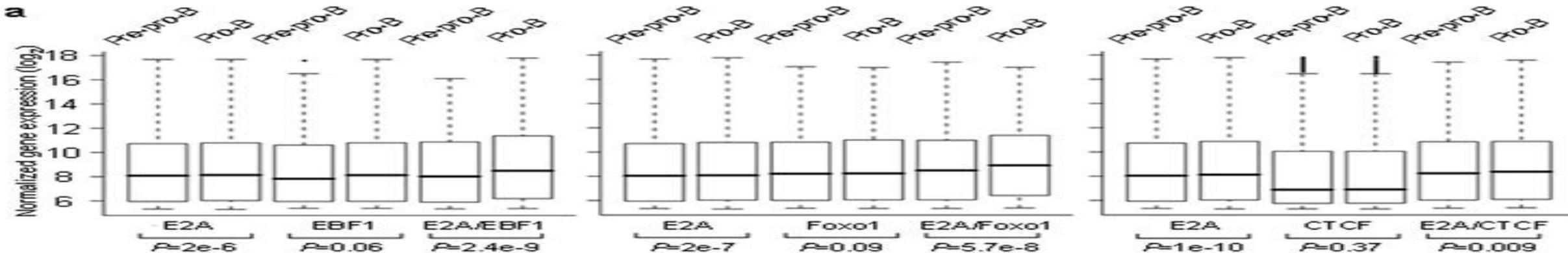
Клітина попередник лімфопоезу: для перетворення в В-лімфоцити мають подіяти транскрипційні фактори - *ikaros* та *PU*.

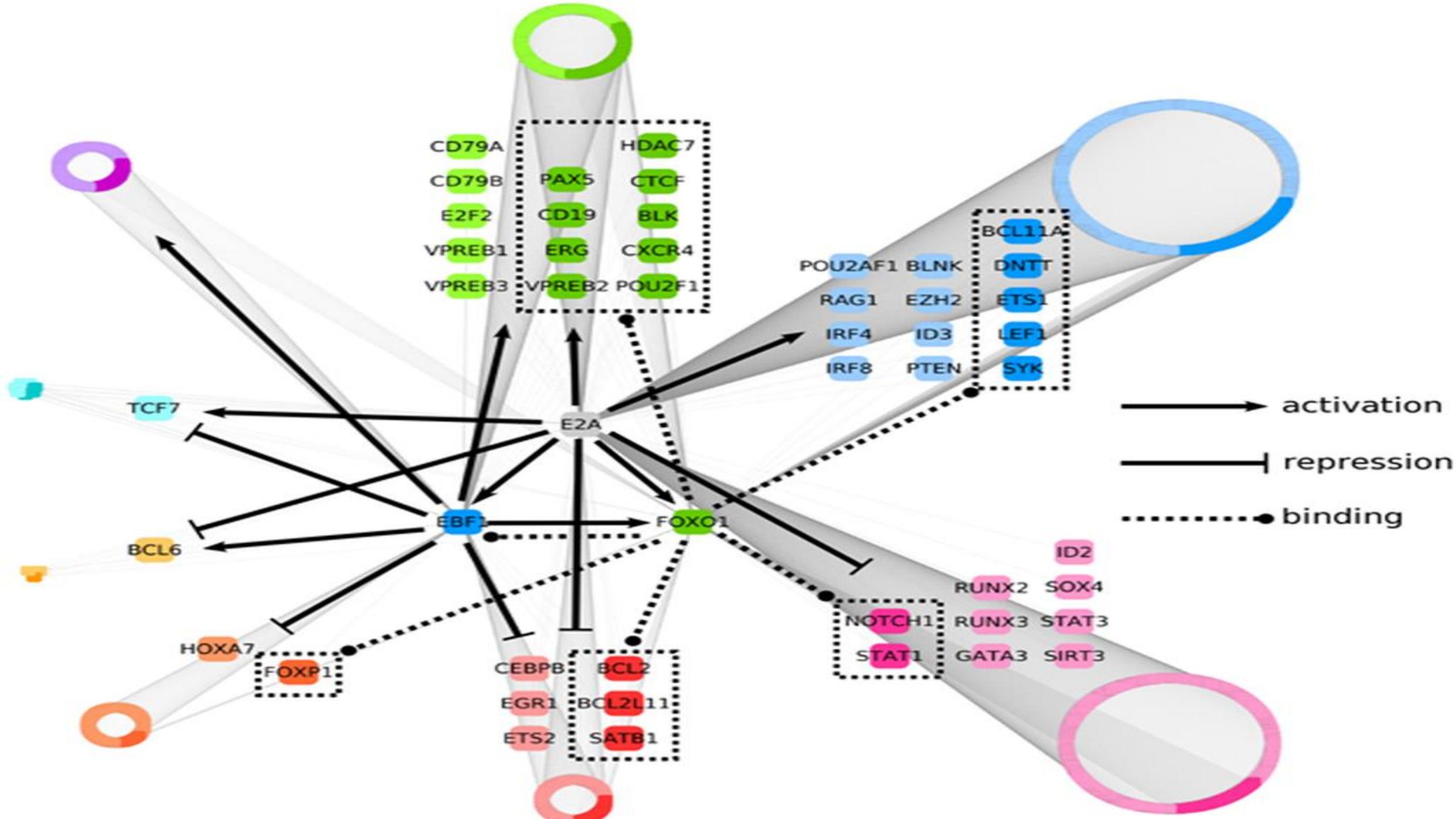
2.

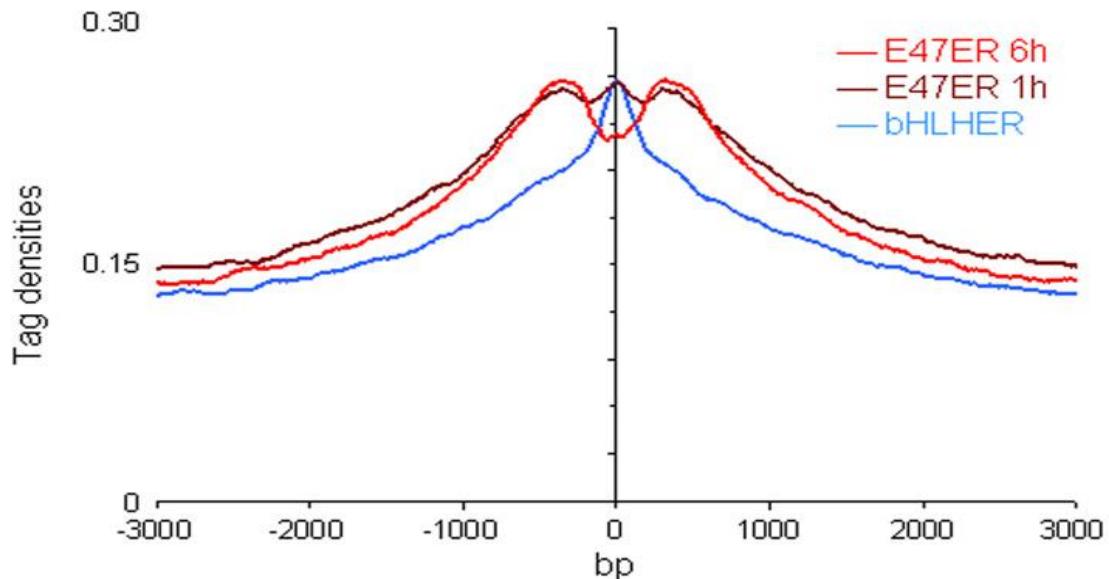
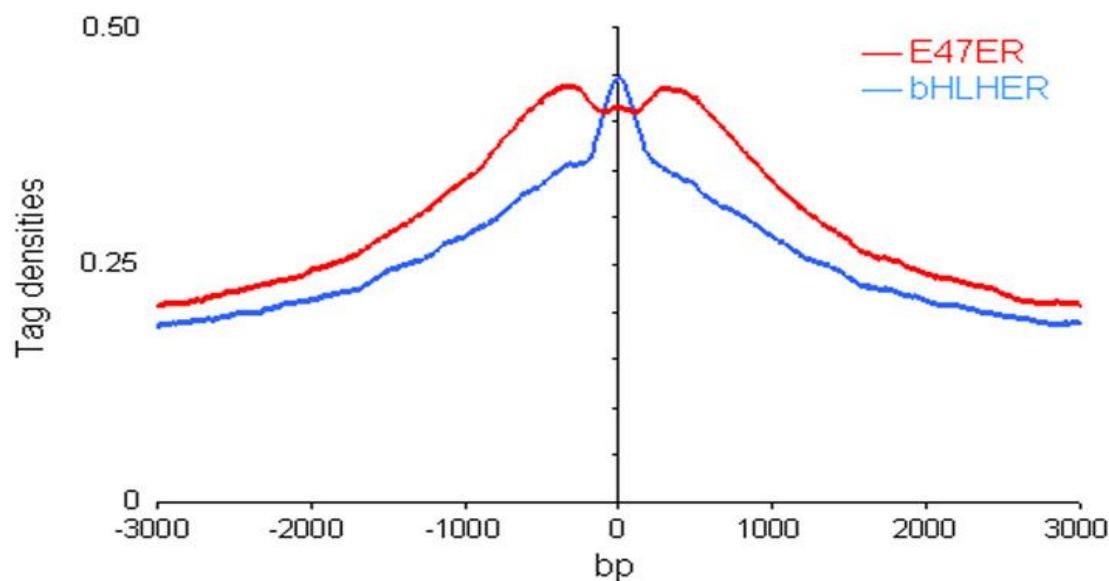
Рання «спеціалізація»: E2A, EBF, and FOXO1 ( а саме реанжерування генів V(D)J).

3.

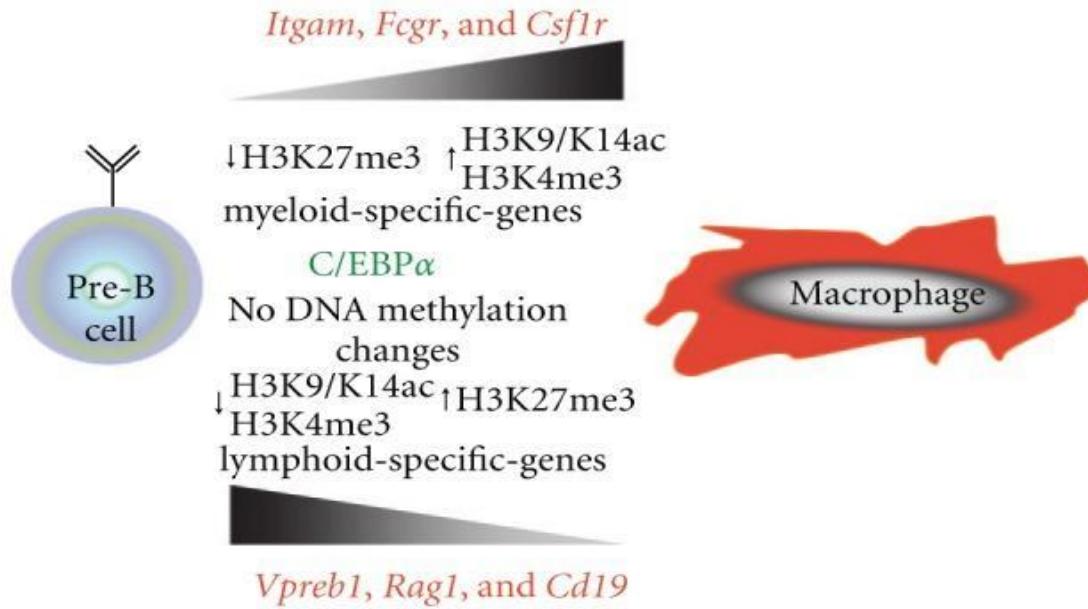
Фактори репресії транскрипції Bcl6 and Blimp-1 мають місце в перетворенні в плазматичні клітини.



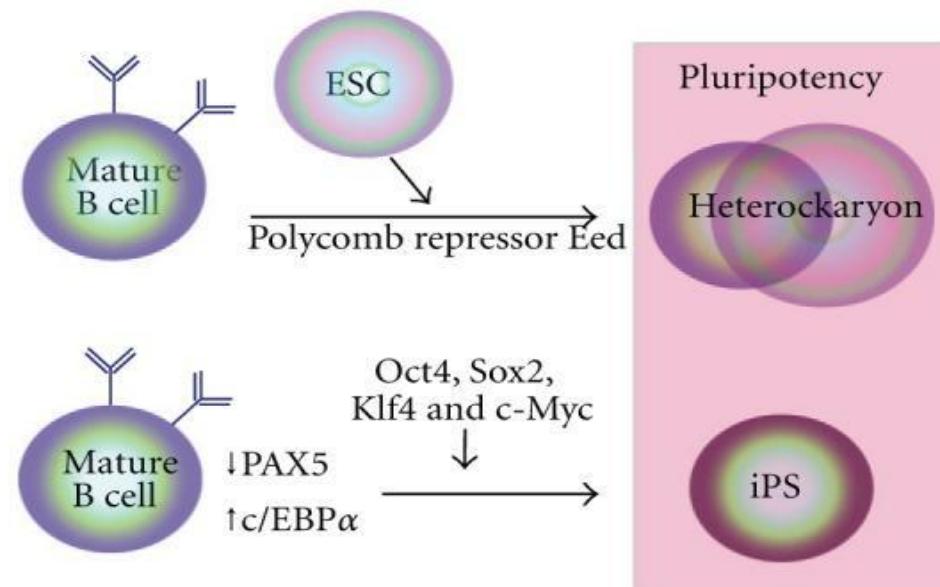


**a****b**

E47 DNA binding alters the pattern of H3K4 monomethylation. (a) Forced E47 expression in E2A-deficient pre-pro-B cells promotes the establishment of a bimodal distribution of H3K4me1 centered across E2A occupancy. E2A-deficient pre-pro-B cells were transduced with virus carrying the full-length coding DNA sequence of E47 fused to the estrogen receptor domain (E47ER). As a control, cells were transduced with virus expressing the E47 bHLH domain fused to the ER domain (bHLHER). Twenty-one hours post infection, cells were incubated with tamoxifen to induce E47 activity for either one or six hours, harvested, formaldehyde cross-linked, immunoprecipitated with an anti-E2A or anti-H3K4me1 antibody, and analyzed by ChIP-Seq. X-axis shows the genomic distance from E2A bound regions. Y-axis shows the individual immunoprecipitated mapped reads (or tags) per base pair. (b) Forced E47 expression in E2A-deficient T cells promotes the establishment of a bimodal distribution of H3K4me1 centered across E2A occupancy. E2A-deficient A12 cells were transduced with virus and analyzed by ChIP-Seq as described above.



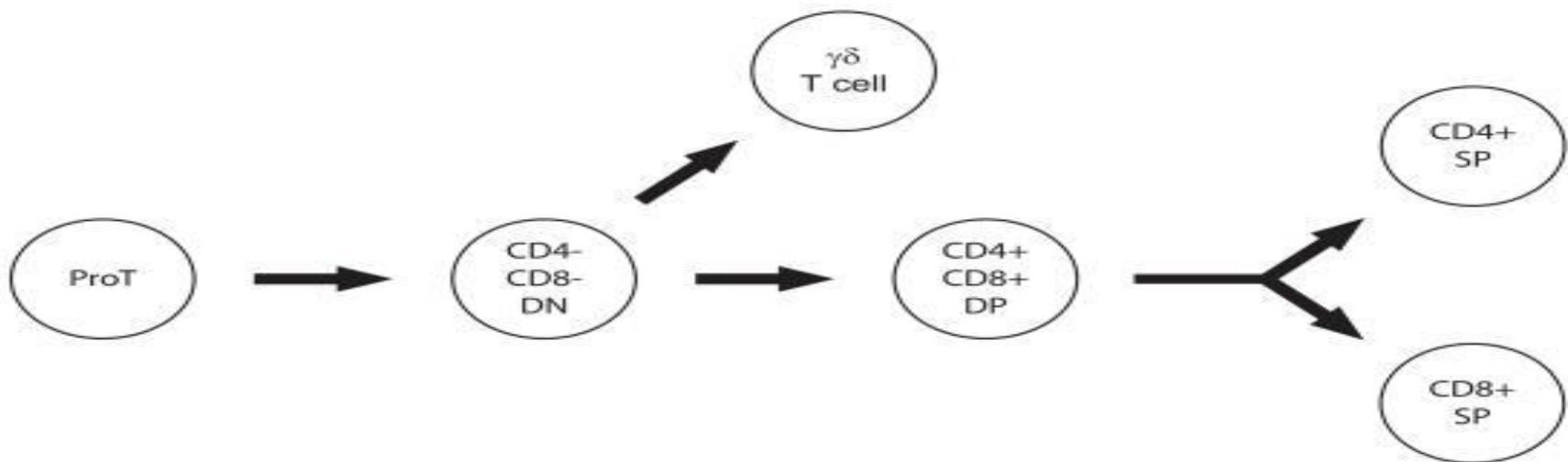
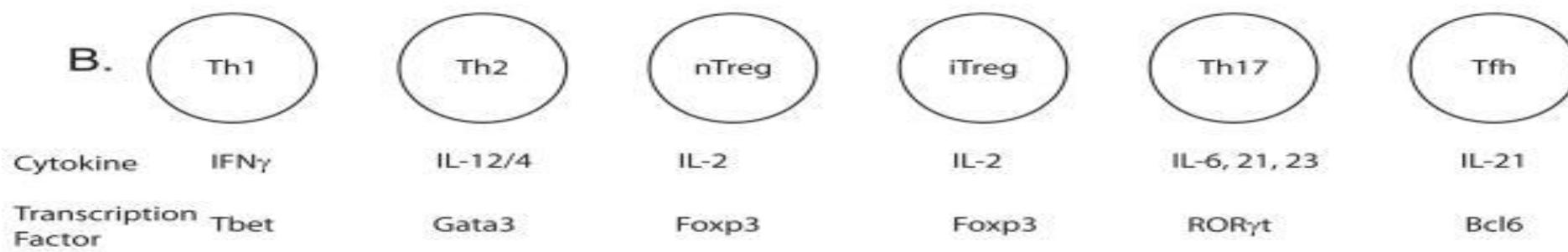
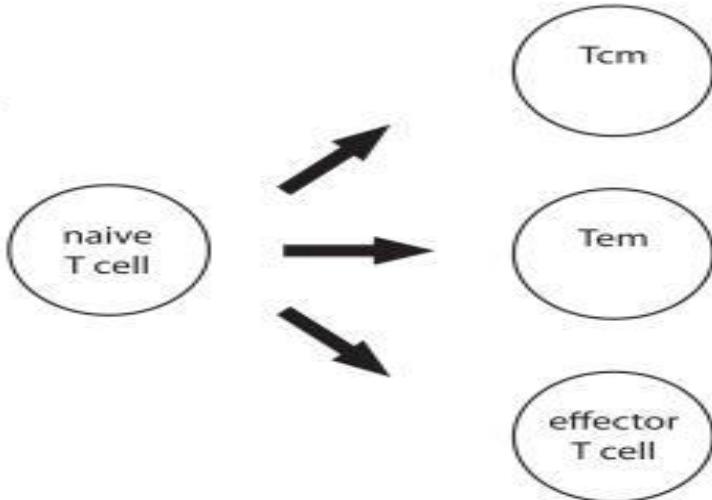
(a) Transdifferentiation

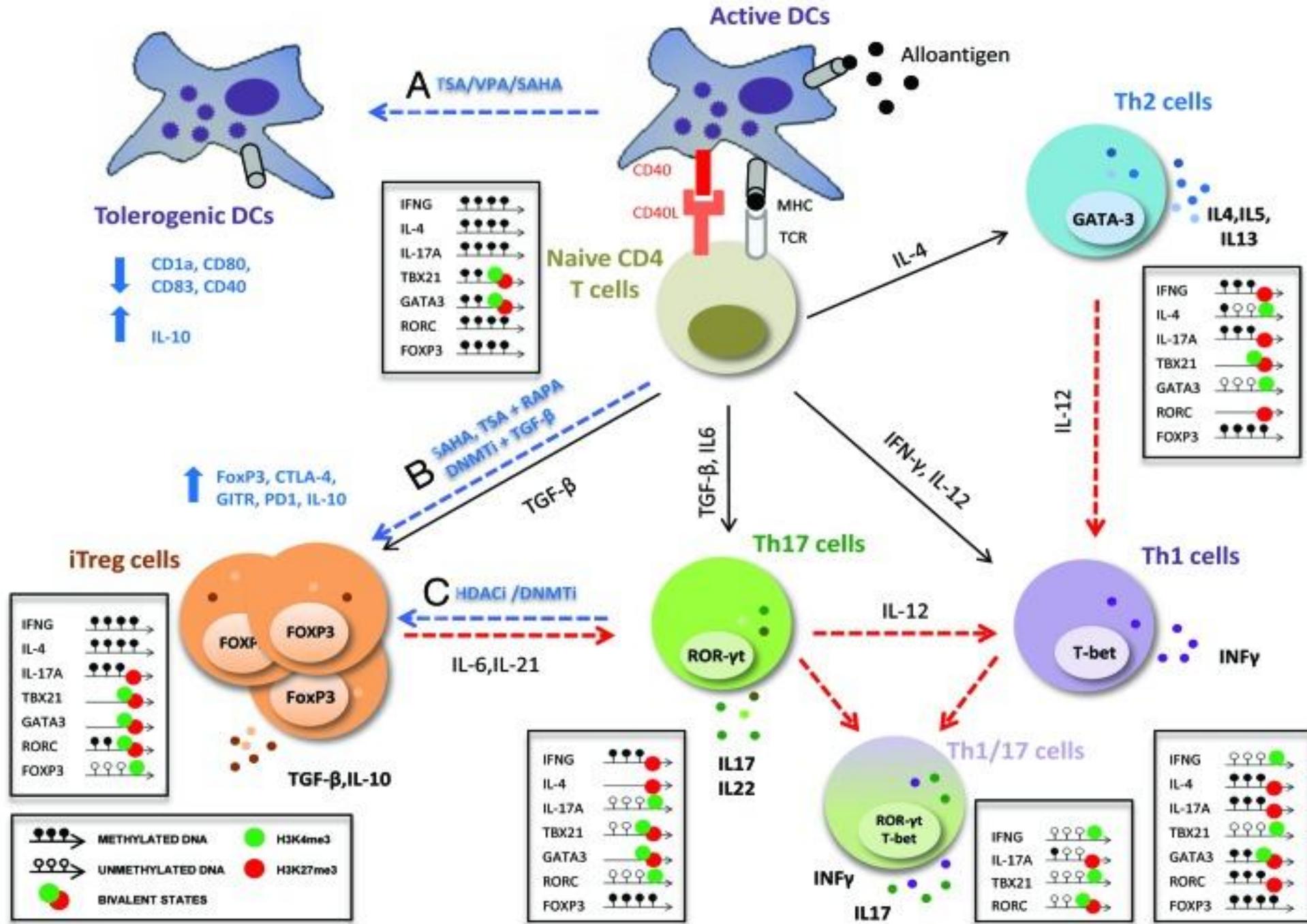


(b) Reprogramming to pluripotency

# Т- лімфоцити

Brendan E. Russ: «*T cell immunity as a tool for studying epigenetic regulation of cellular differentiation*»  
2013

**A.****B.****C.**



**<https://www.encodeproject.org/>**

**<http://www.roadmapepigenomics.org/>**