

Epigenetics trong hen và các bệnh dị ứng

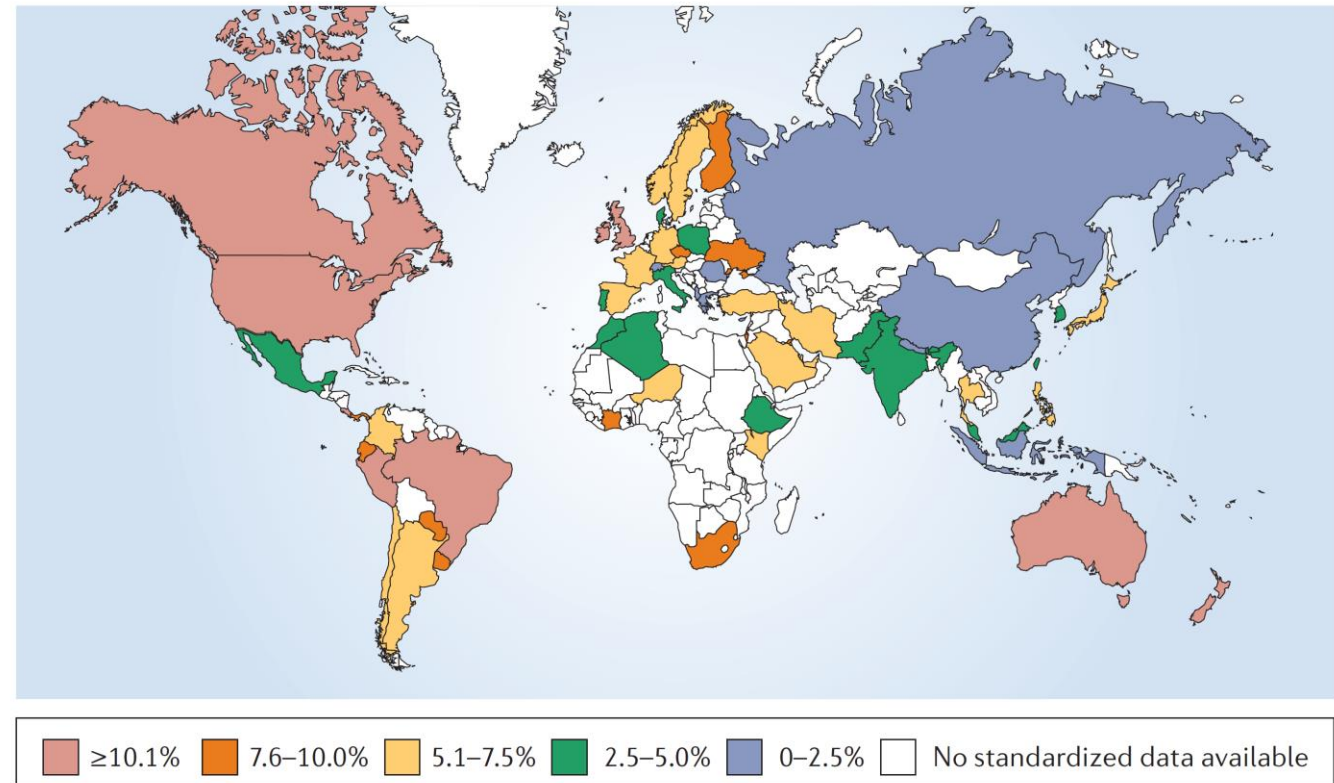
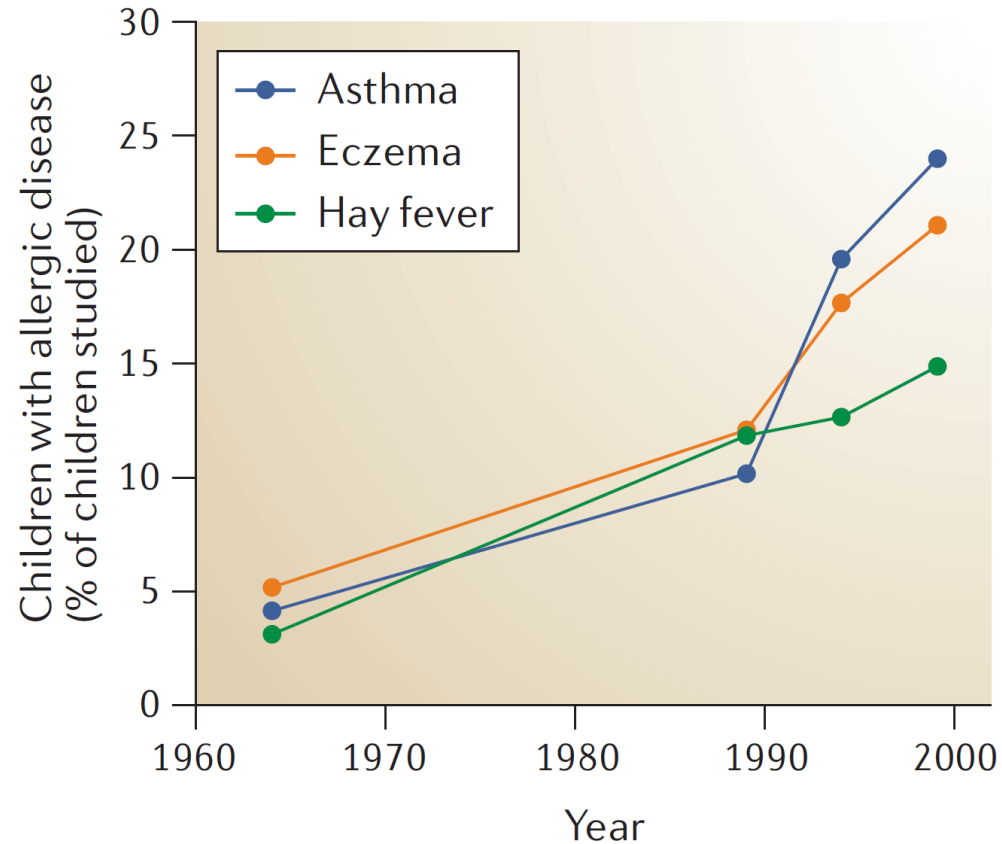
Đinh Xuân Anh Tuấn

Bệnh Viện Trung Ương Cochin
Đại Học Nha Y Dược Paris Cité



Tỷ lệ bệnh nhân hen suyễn và các loại bệnh dị ứng từ năm 1960

Graham Devereux





Di truyền (gen)

Nurture

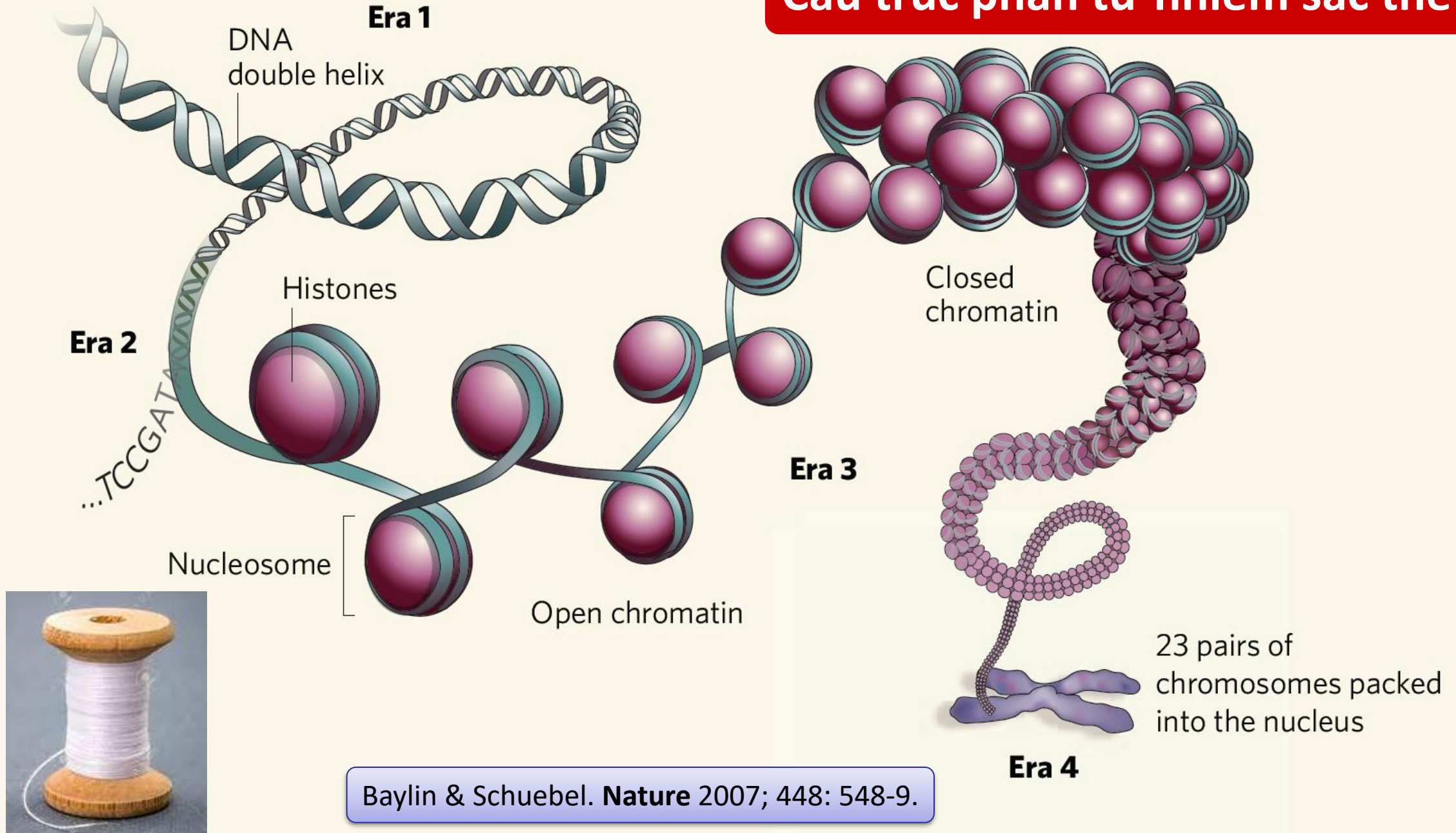
Nature

OR

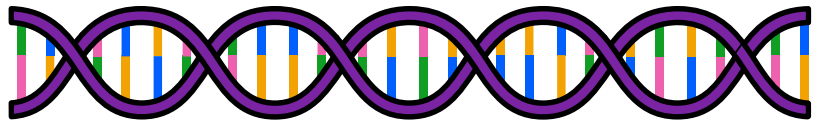


Môi trường

Cấu trúc phân tử nhiễm sắc thể



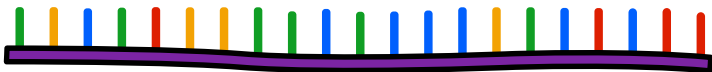
Baylin & Schuebel. *Nature* 2007; 448: 548-9.



Genes



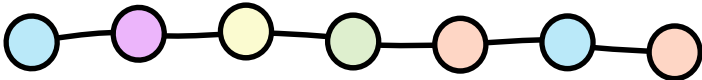
Phiên mã



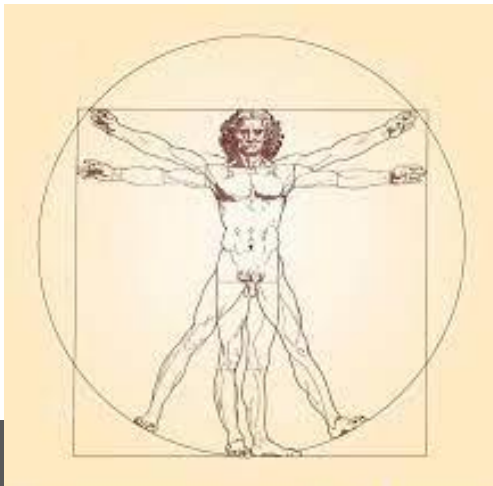
ARN thông tin



Giải mã



Proteins



Bí quyết
nấu ăn

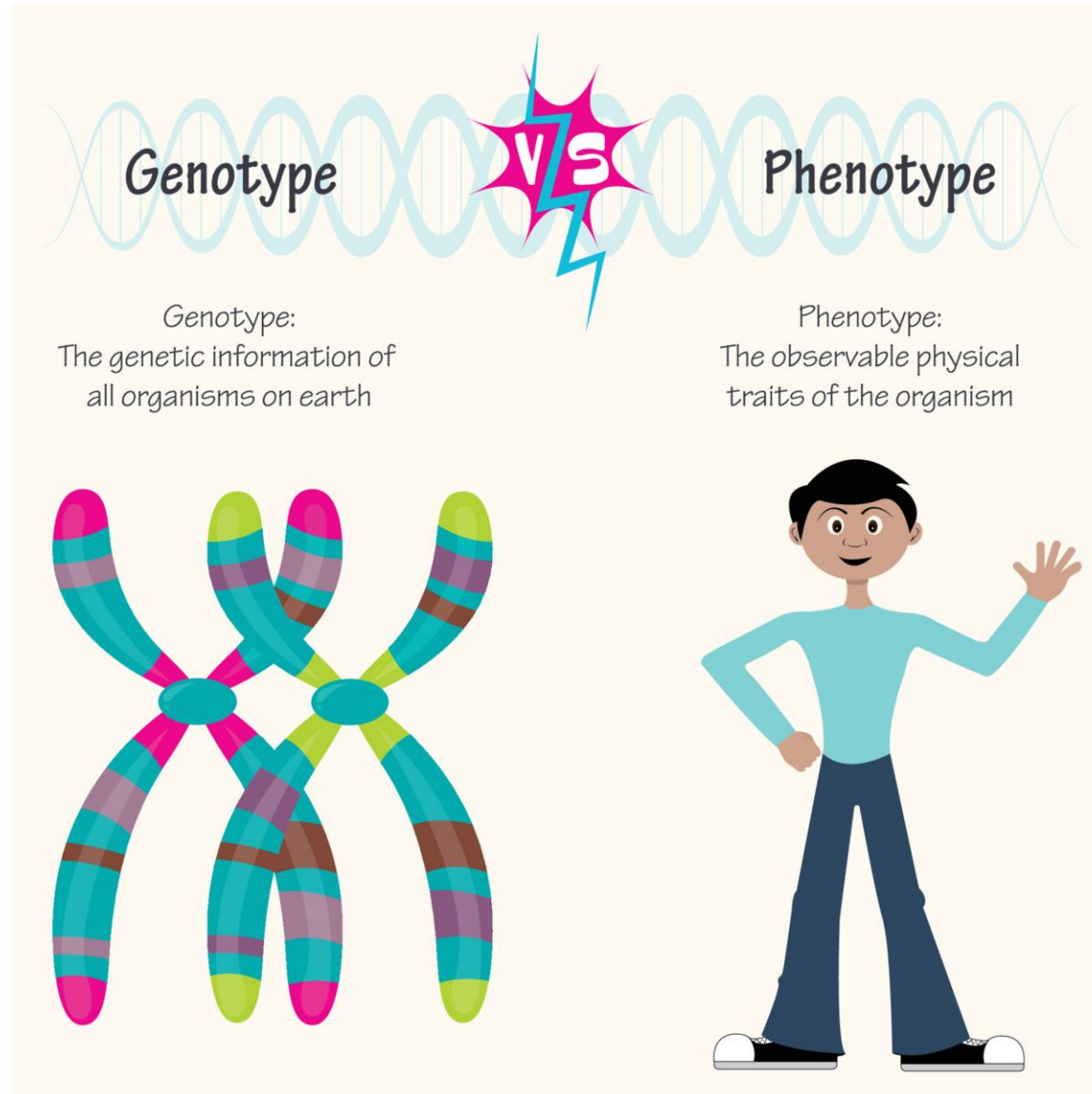


Món ăn



Bữa cơm

Genotype : tập hợp các thông tin đến từ mã di truyền (genetic code)



Phenotype (kiểu hình lâm sàng): tập hợp các đặc điểm lâm sàng

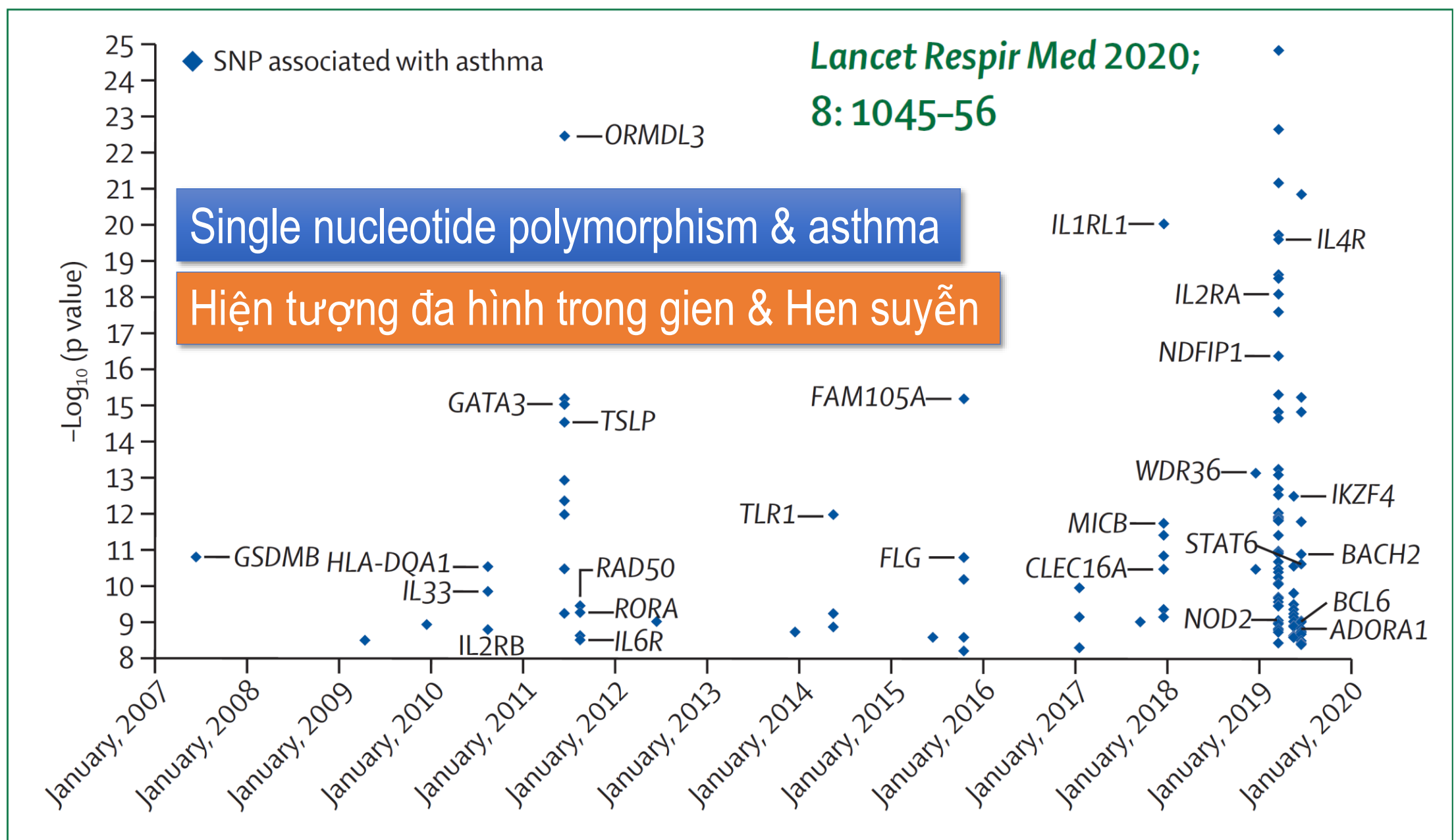
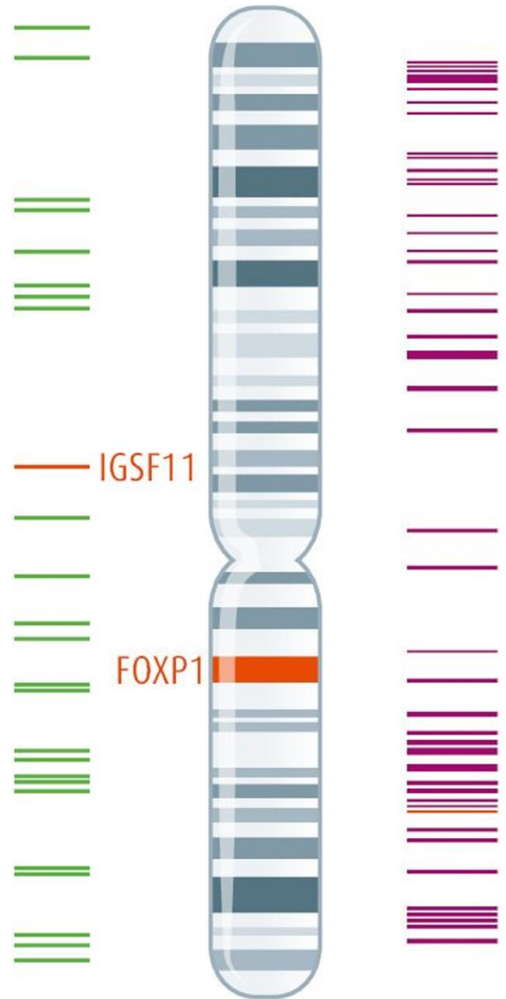


Figure 1: Top SNPs associated with asthma in GWASs of populations of European descent between 2007 and 2019

Yếu tố tăng nguy cơ ?



Gen



Yếu tố quyết định ?

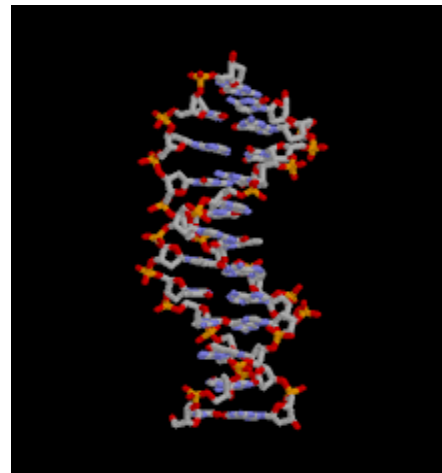
Chị em sinh đôi 60 tuổi



Môi trường A



Chị em sinh đôi 6 tháng

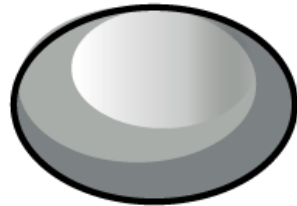
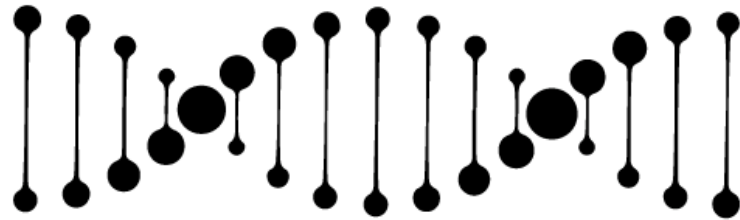


Môi trường B

Đột biến sinh học (gen)

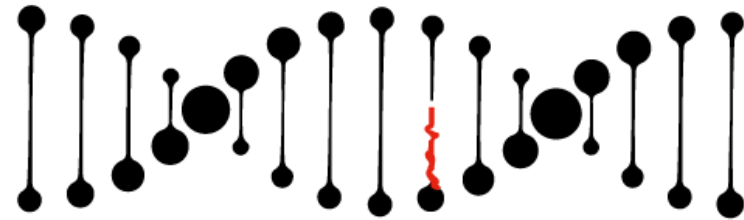
Thời gian : Thế kỷ / Ngàn năm

Gen bình thường



Protein bình thường

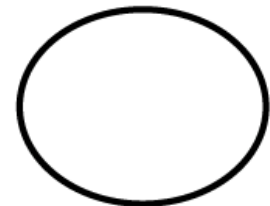
Gen **biến thể**



OU



Protein **khác**
thường



Không có
Protein



Di truyền (gen)

Nurture

Nature

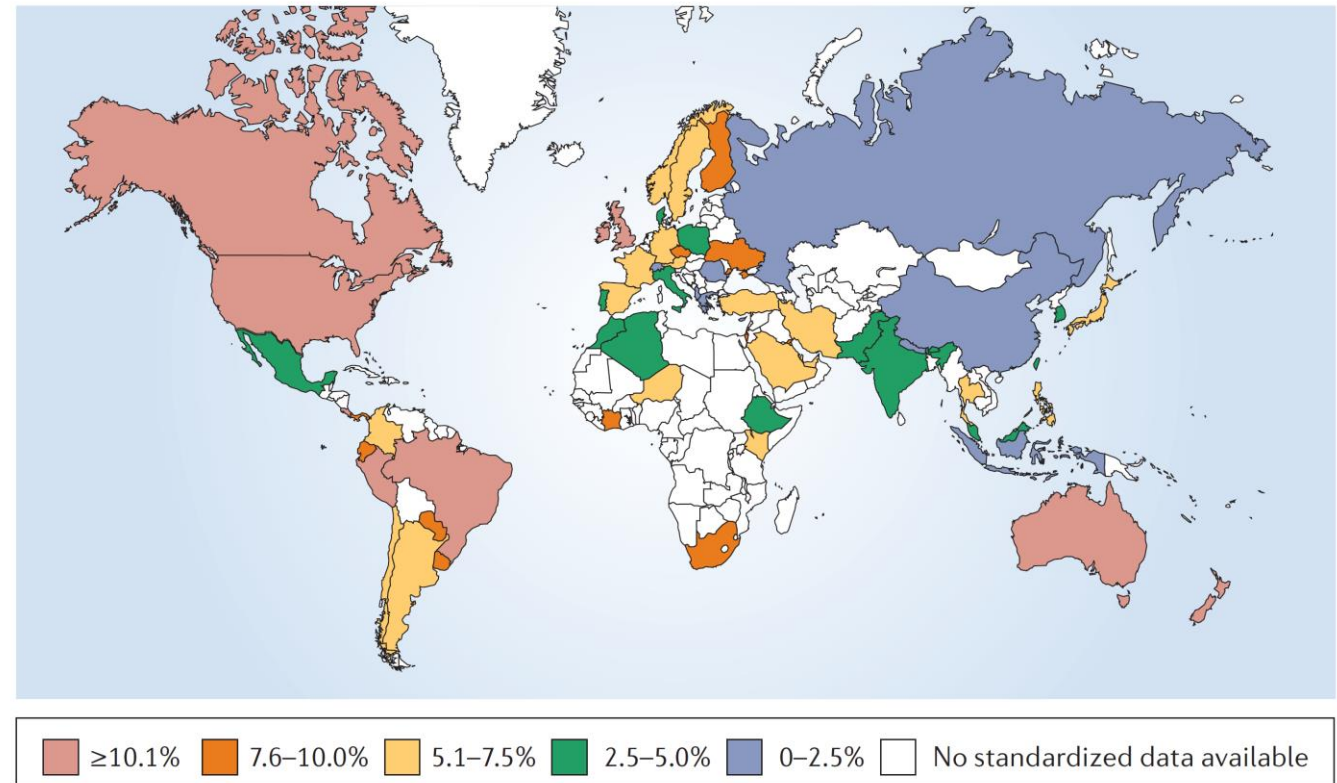
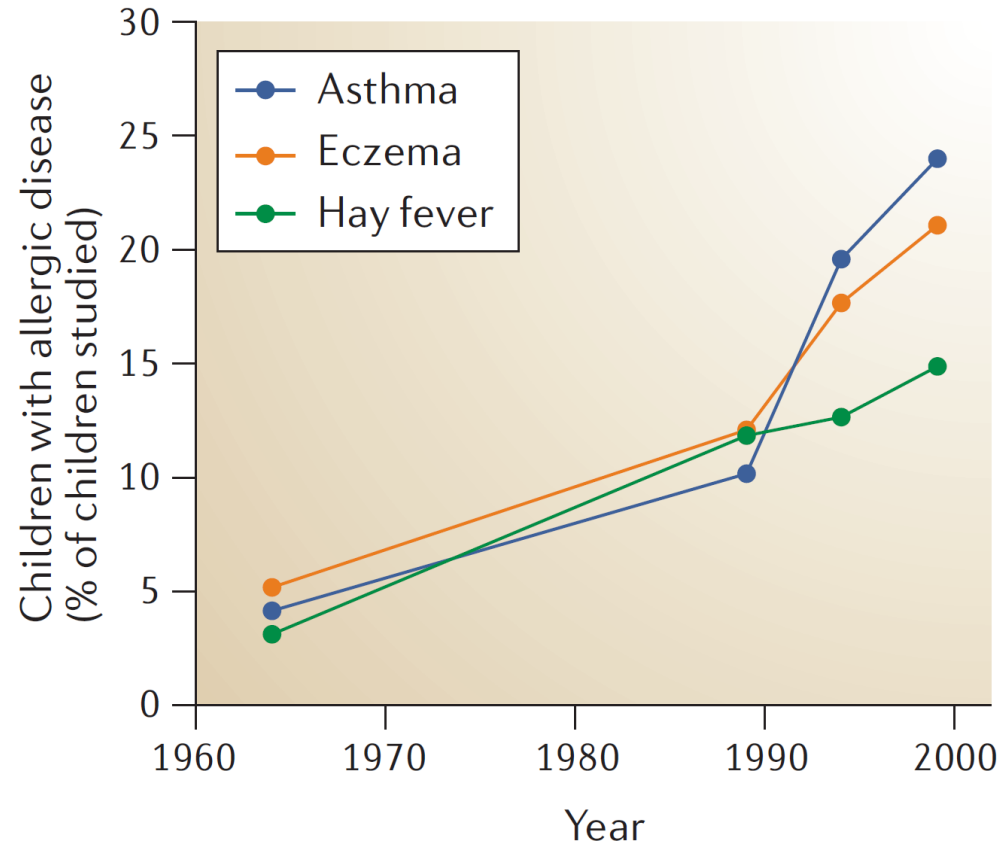
OR



Môi trường

Tỷ lệ bệnh nhân hen suyễn và các loại bệnh dị ứng từ năm 1960

Graham Devereux



1942

Genetics



Epigenetics



Phenotype



Conrad Hall Waddington
(1905-1975)



epigenetics



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RESULTS BY YEAR

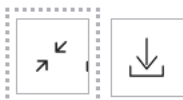
136,822 results

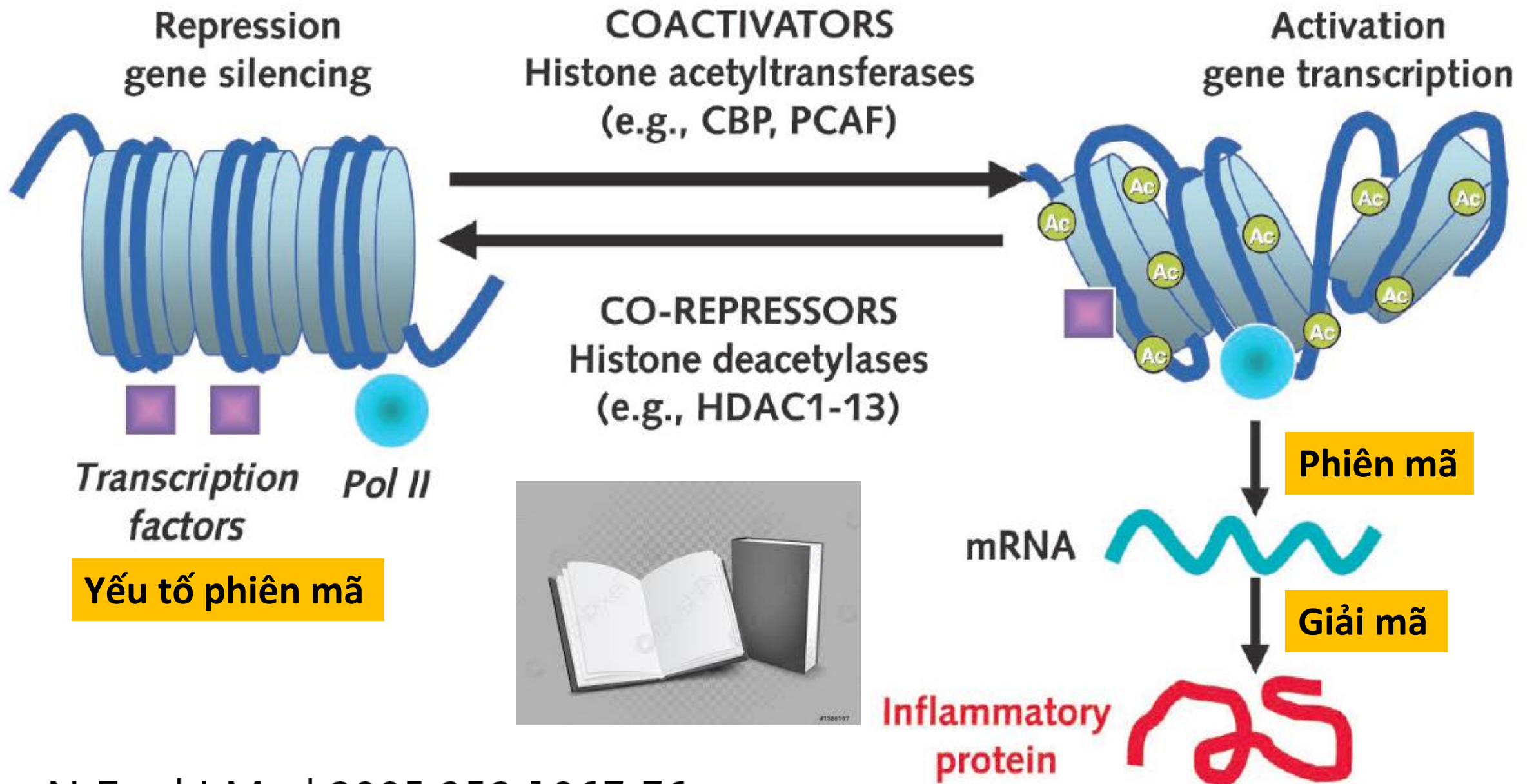


Page

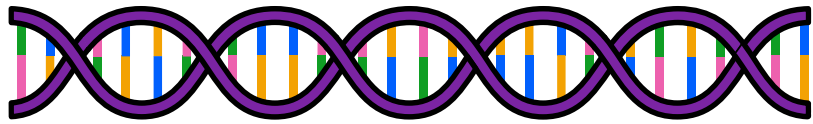
1

of 13,683





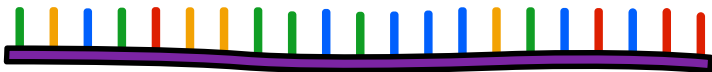
N Engl J Med 2005;352:1967-76.



Genes



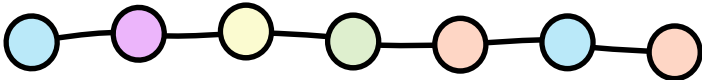
Phiên mã



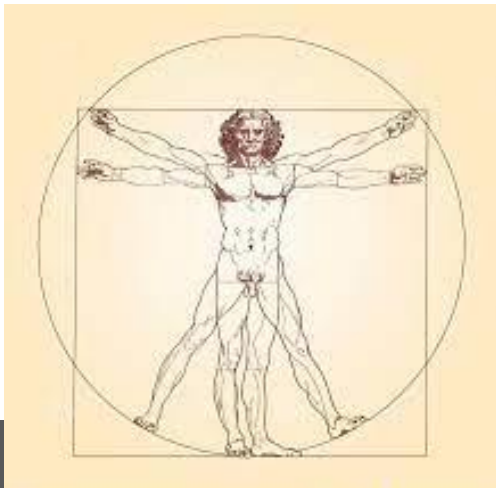
ARN thông tin



Giải mã



Proteins



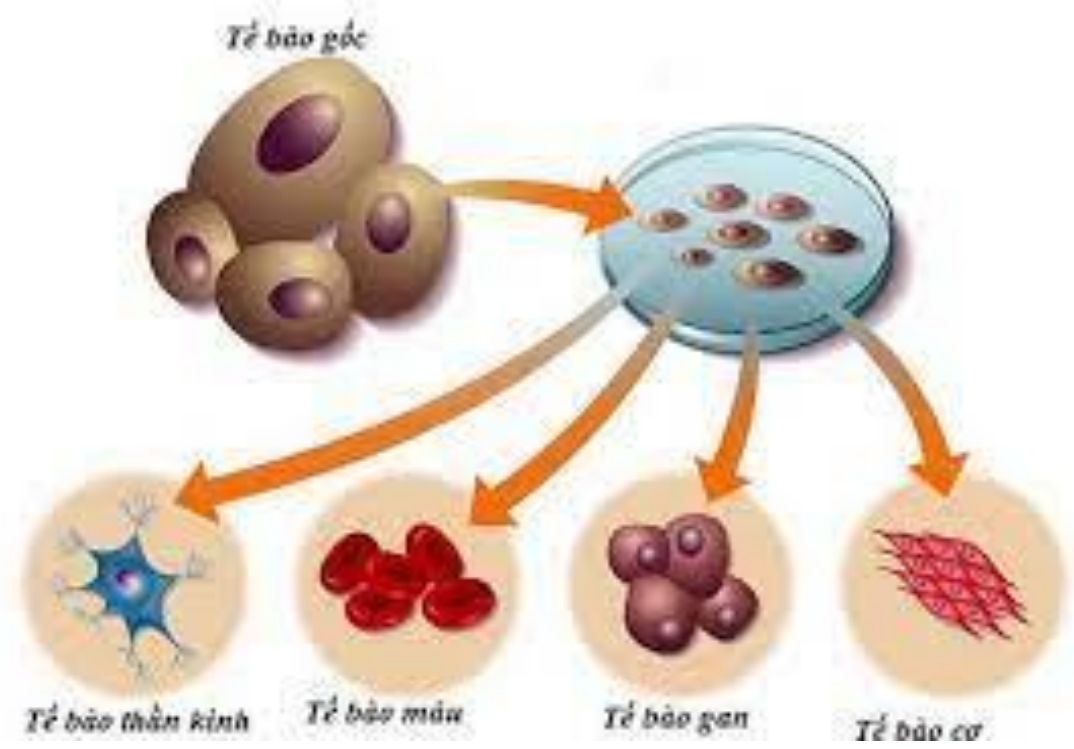
Bí quyết
nấu ăn



Món ăn



Bữa cơm



DE L'ÉCRITURE-SAINTE

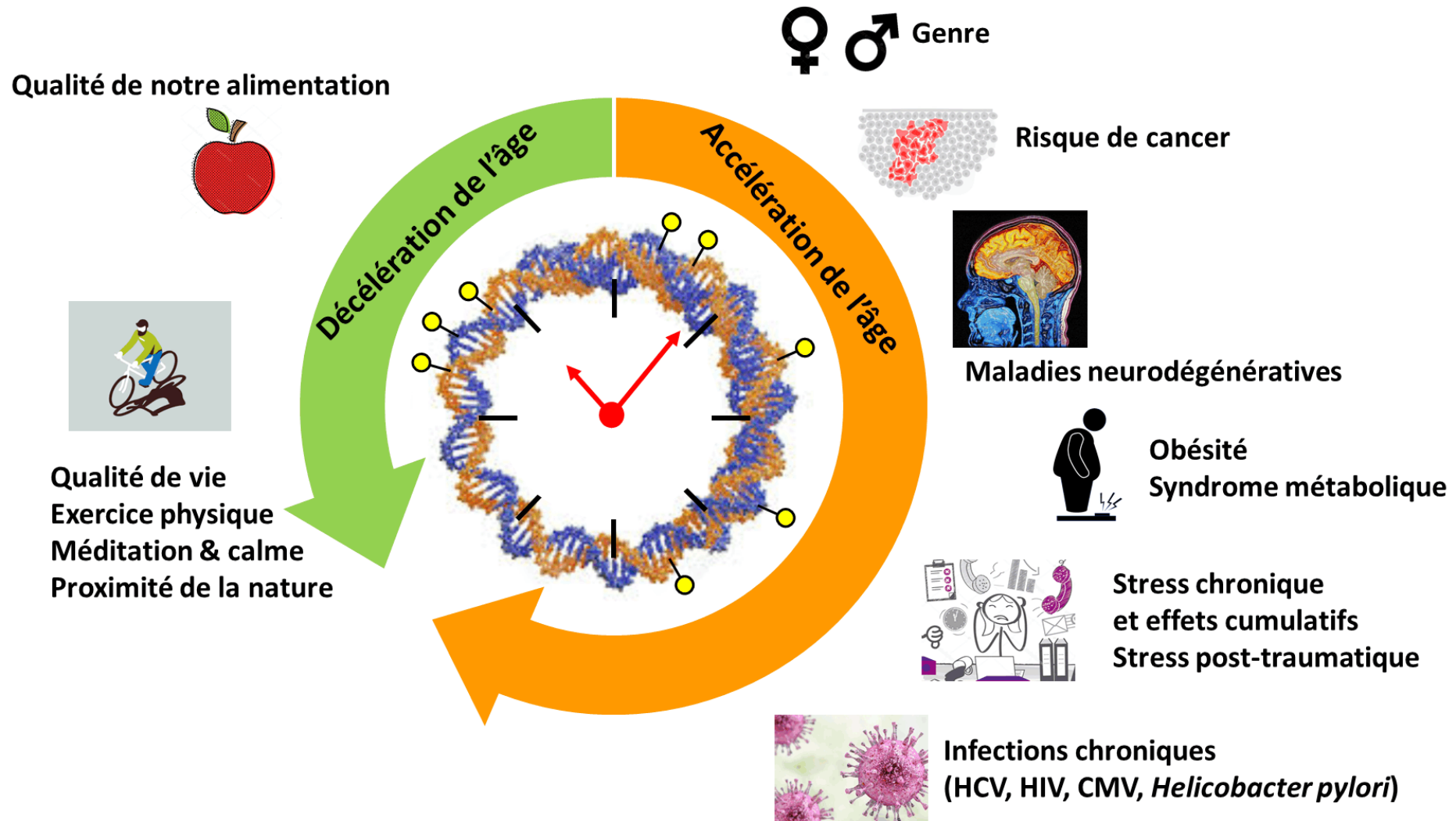
bits de Jurémon, & ce nom fut donné à cette
 par Abraham, en mémoire du traité de
 ce qu'il avoit fait avec Abimelech, Roi de
 are; elle étoit au couchant de la tribu de Si-
 n, vers le midi. L'écriture marque l'étendue
 la Terre Sainte par les deux villes de Dan &
 Bersabée, dont la première étoit au nord &
 che du Mont-Liban, & l'autre vers le midi
 la tribu de Siméon. Brocard nous apprend
 d'il y a quatre lieues de Bersabée jusqu'à Gaza.
 ong. 52 el. 6 min. Lat. 31 d. 20 min. (B. 9.)
 BESOR. Torrent qui borne la tribu de Si-
 éon au couchant & au midi, & qui va se dé-
 charger dans la Méditerranée au midi, & alla-
 roche de Gaza: il est probable que c'étoit
 orrent du Désert. Les Amalécites ayant
 viceleg, la pillèrent & y mirent le feu
 ait un riche butin. David, an-
 e Seigneur, les poursuivit
 orrent de Besor, rencontra
 ui servoit un Amalécite
 roit où étoient les

Josué,
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 s'est VII, 24

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Epigenetics và cơ chế của sự lão hoá



EPIGENETIC MECHANISMS

are affected by these factors and processes:

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

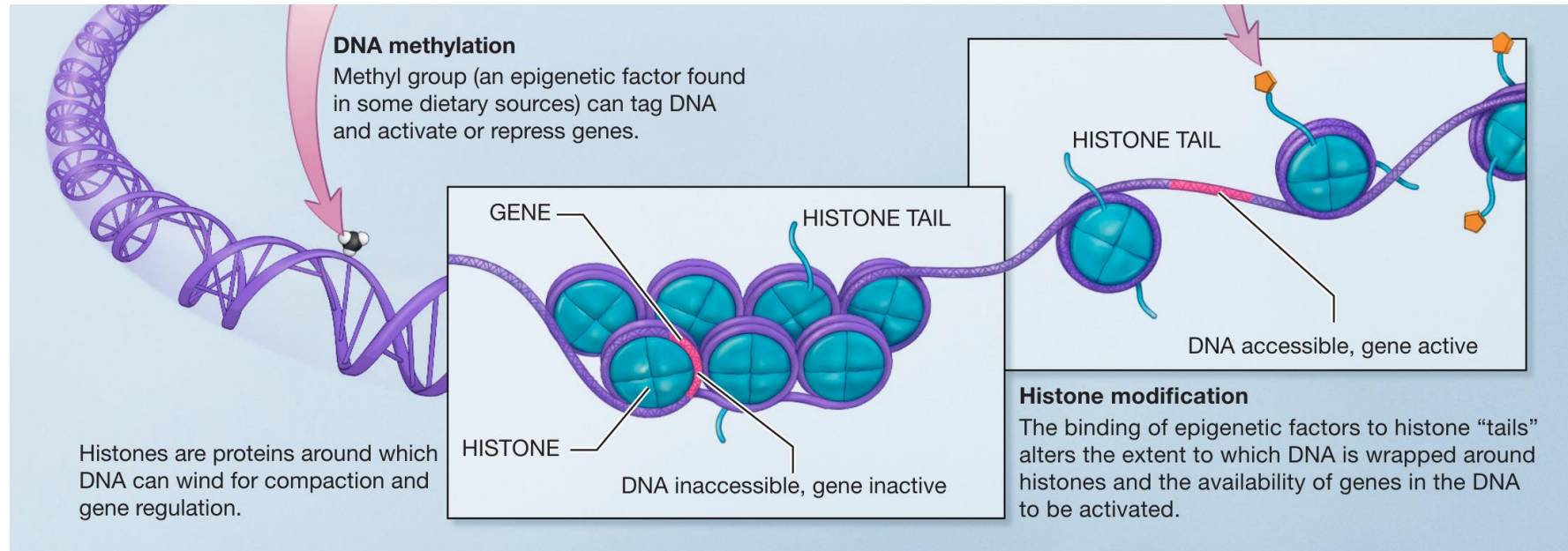


HEALTH ENDPOINTS

- **Cancer**
- **Autoimmune disease**
- **Mental disorders**
- **Diabetes**



EPIGENETIC
FACTOR



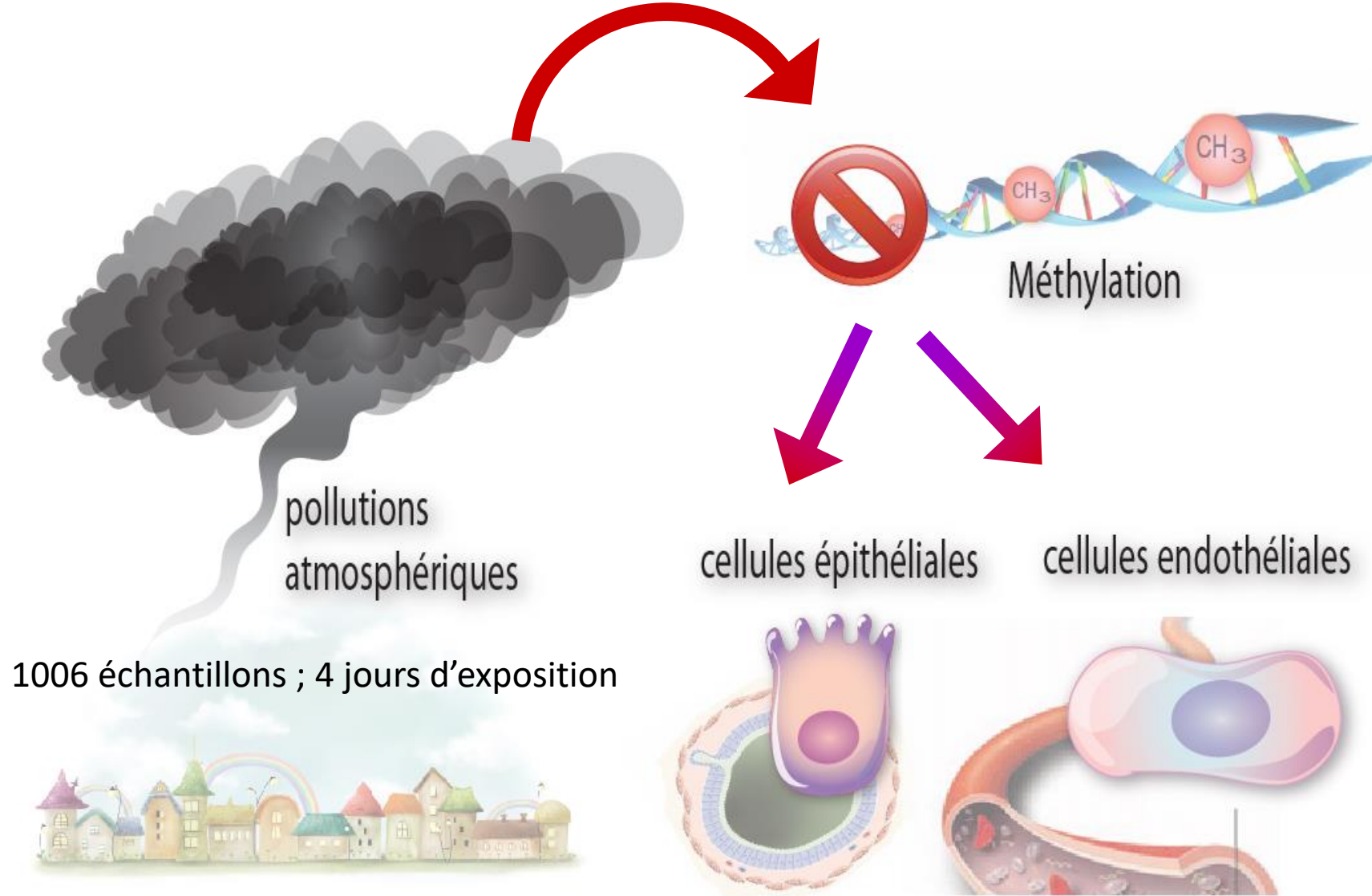
Environmental exposures and asthma

- Multiple environmental risk factors
 - Indoor and outdoor air pollution
 - Diet
 - Infection / microbial exposure
 - Allergens
 - Medications
 - Etc. etc. etc.....

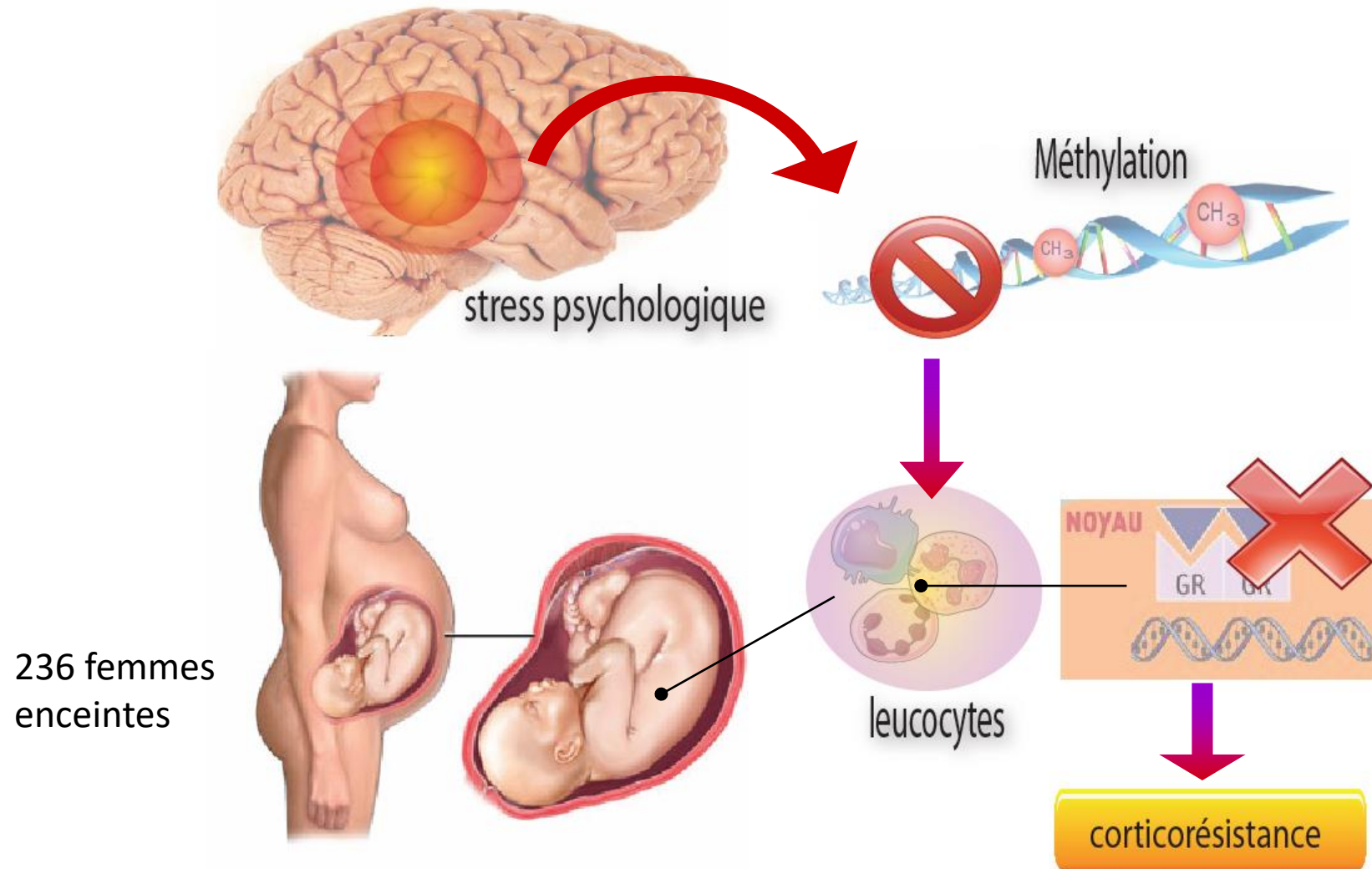


Dick S et al. A systematic review of associations between environmental exposures and development of asthma in children aged up to 9 years. *BMJ Open* 2014;4:e006554

Ô nhiễm môi trường và thay đổi biểu hiện gen qua cơ chế Epigenetics



Stress tinh thần nơi người phụ nữ mang thai và hen suyễn trẻ em



Wright *et al.* Am J Respir Crit Care Med 2008; 177: A265.

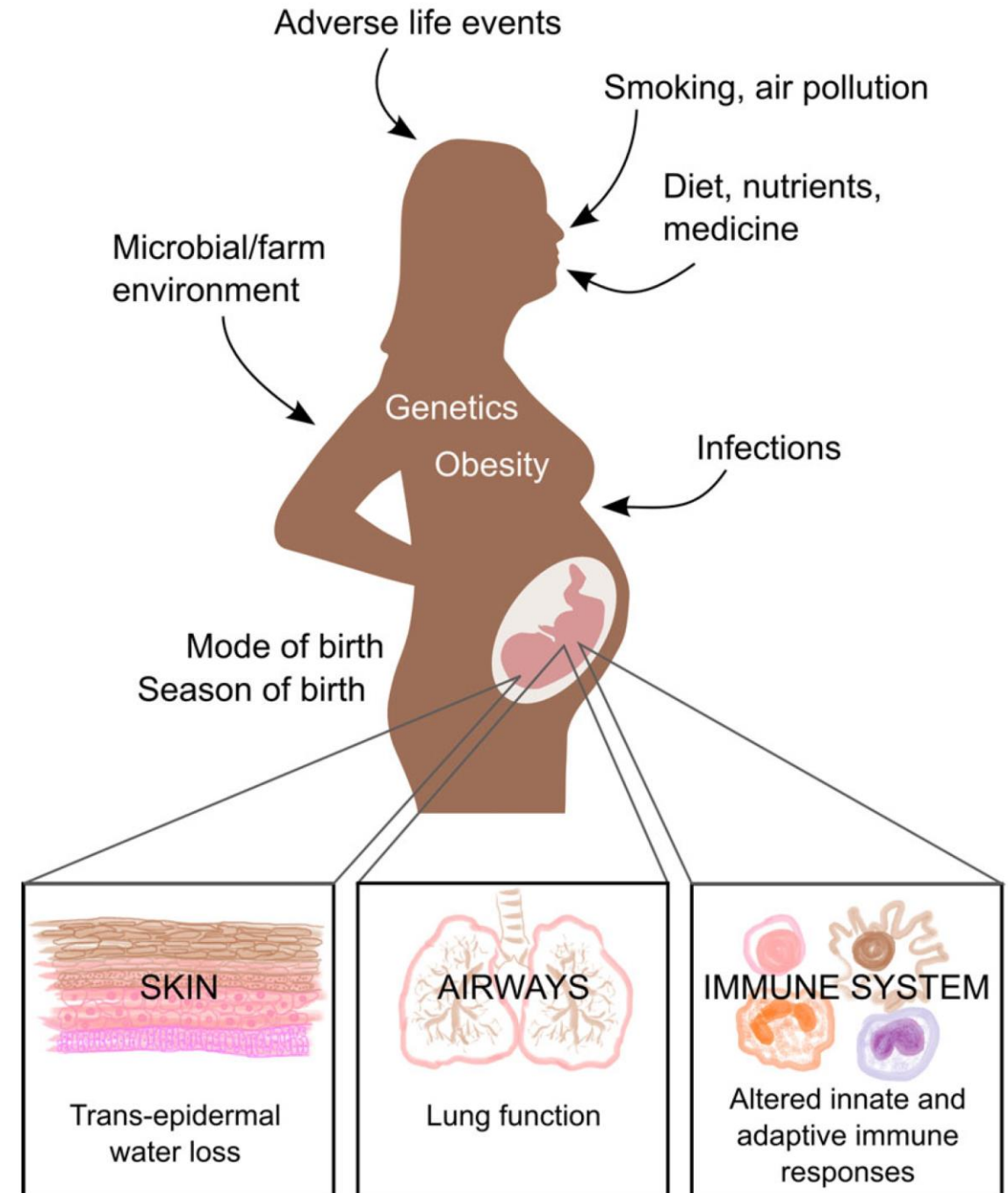
Quand débute-t-on une allergie ?

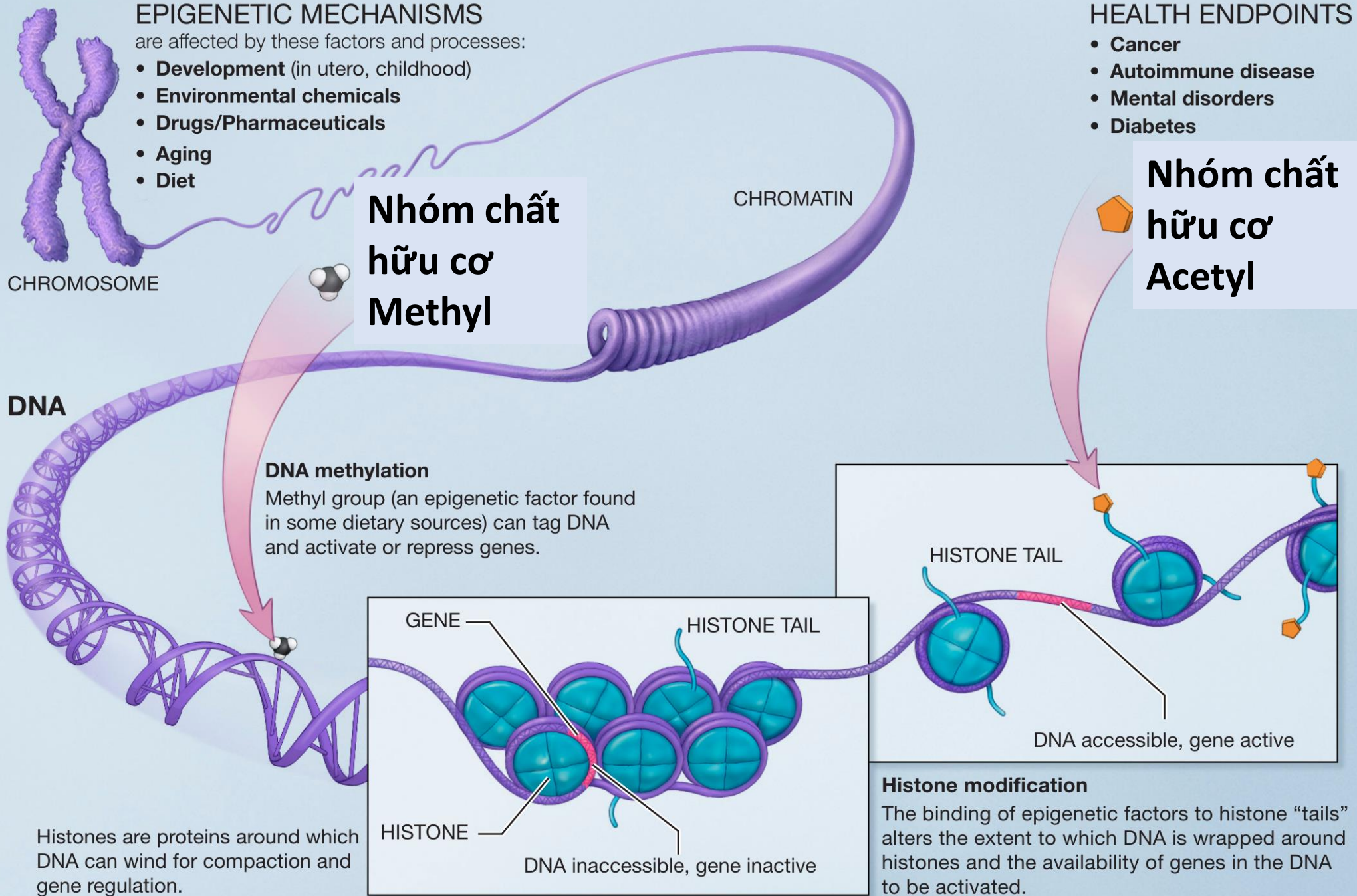
Does allergy begin *in utero*?

Gabrielle A. Lockett

Maternal environmental exposures *in utero*, have already influenced allergic disease trajectory by the time of birth

Pediatric Allergy and Immunology **26** (2015) 394–402







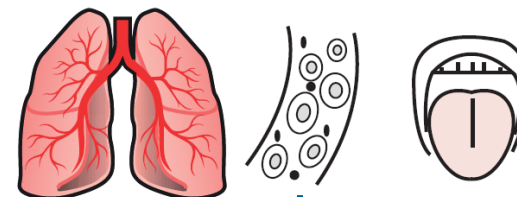
Early life
conditioning factors



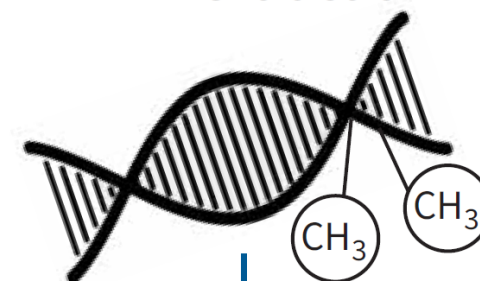
Mẫu tế bào



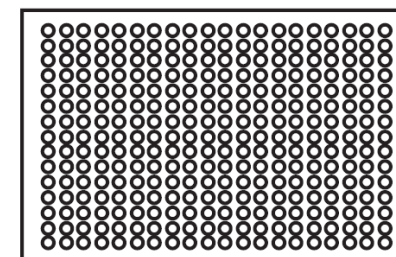
Tissue selection



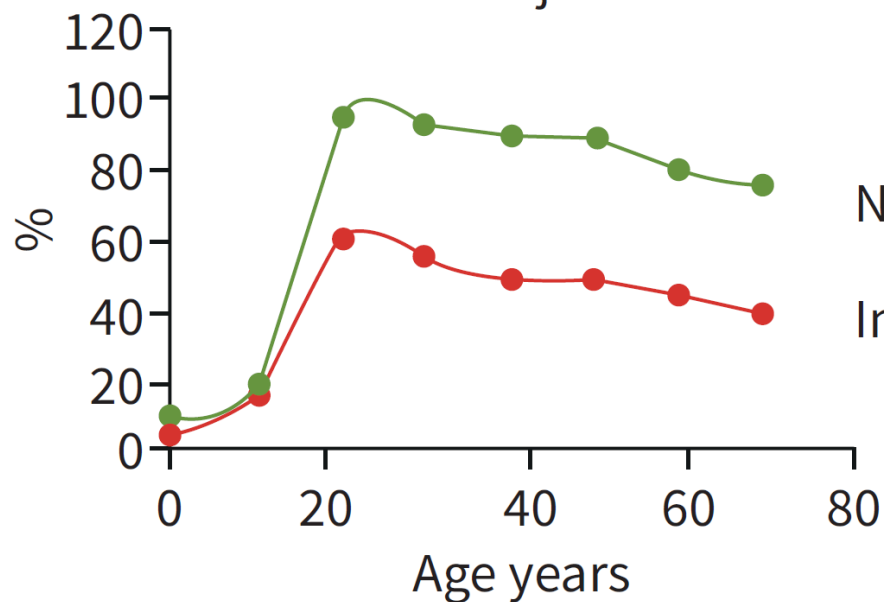
DNA extraction



Measurement of genome-wide
DNA methylation marks



Health trajectories



Dấu ấn
epigenetics
trên DNA

Normal

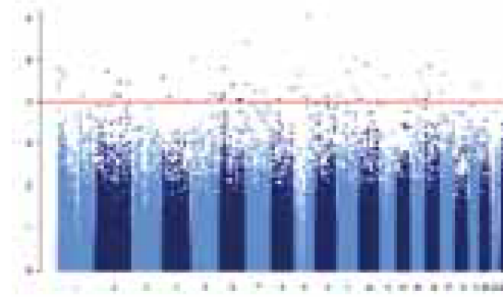
Impaired

Epigenome

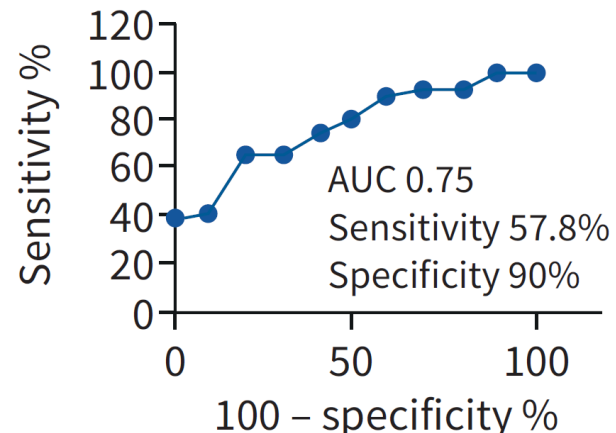
EWAS of health outcome trajectories

Account for sex/ancestry differences
Assessment of confounding factors
Address tissue and cell type
composition issues

Epigenome

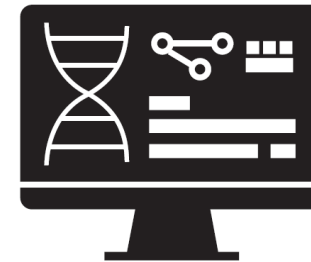


Developing epigenetic risk scores



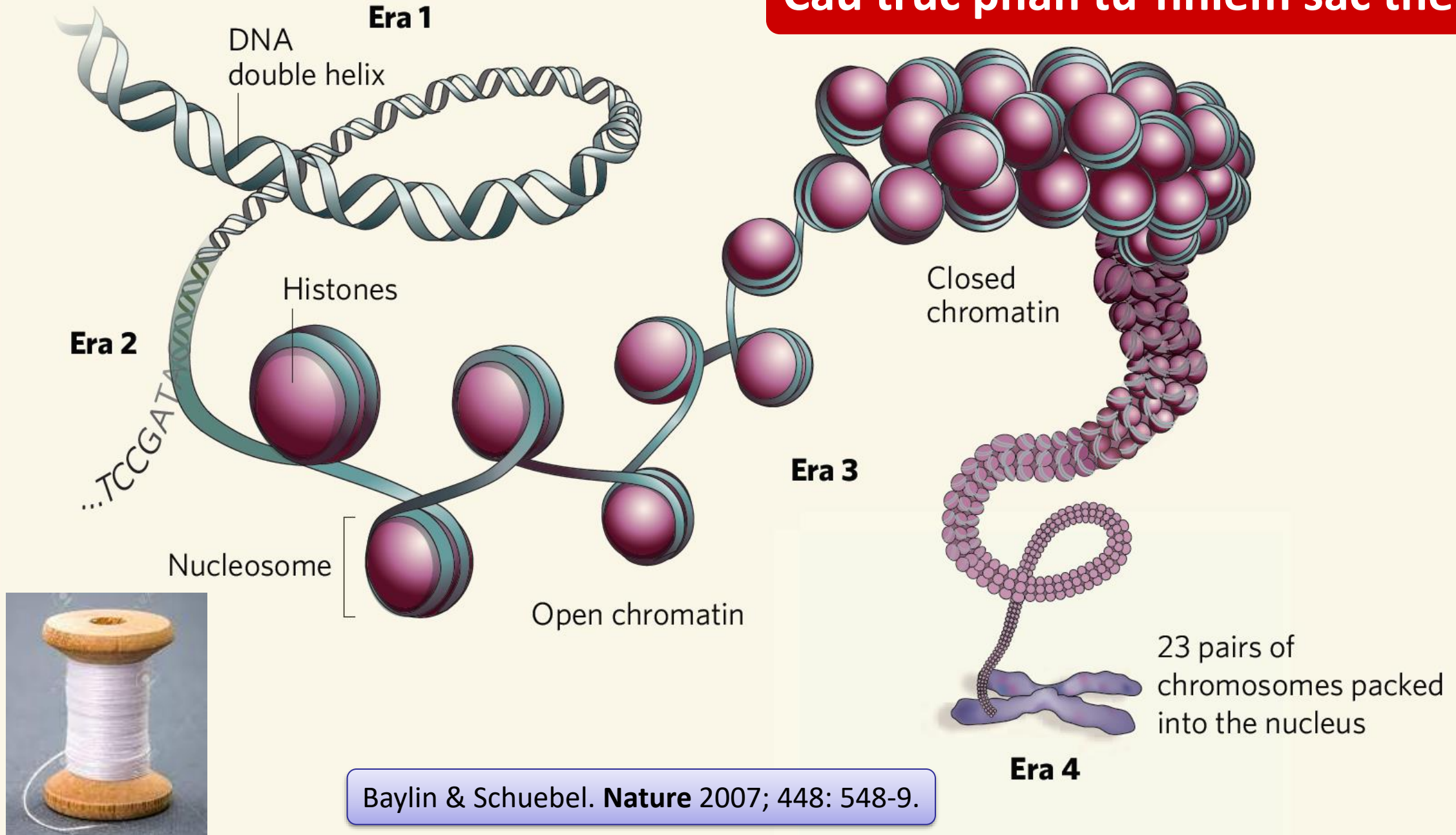
Understanding the underlying mechanisms
(integration with other omics data, *in vitro* studies,
causality, etc.)

Dịch tễ

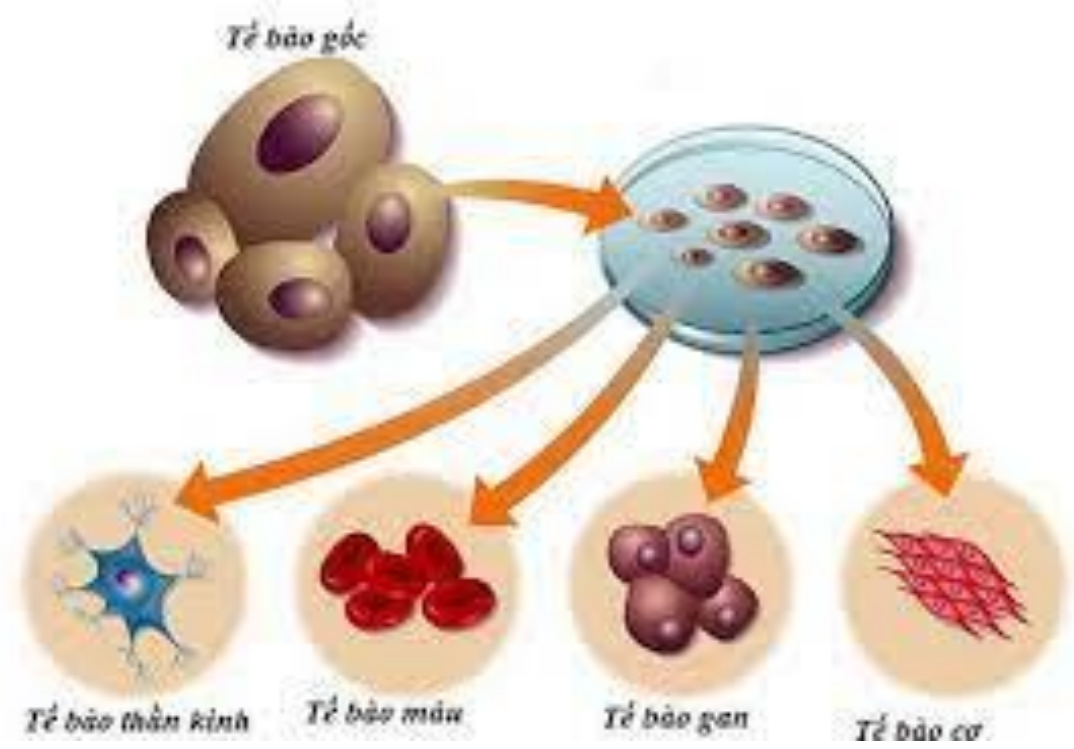


Y học cá thể

Cấu trúc phân tử nhiễm sắc thể



Baylin & Schuebel. *Nature* 2007; 448: 548-9.





Conrad H. Waddington
(Phôi Thai Học)

Epigenetics
1942

James Watson & Francis Crick

Cấu trúc DNA
Genetics
1953





Di truyền (gen)

Nurture

Nature

OR



Môi trường