



Hoge Gezondheidsraad
Conseil Supérieur de la Santé



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Symposium online/en ligne – 20-04-2021

Omics-technologie in de gezondheidszorg: dreamix, realitix of promesix?

Technologies omiques dans les soins de santé : dreamics, realitics ou promesics ?

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Epigenomic profiling: Belgium at the forefront

Dr. Jana Jeschke
Laboratory of Cancer Epigenetics
Université libre de Bruxelles

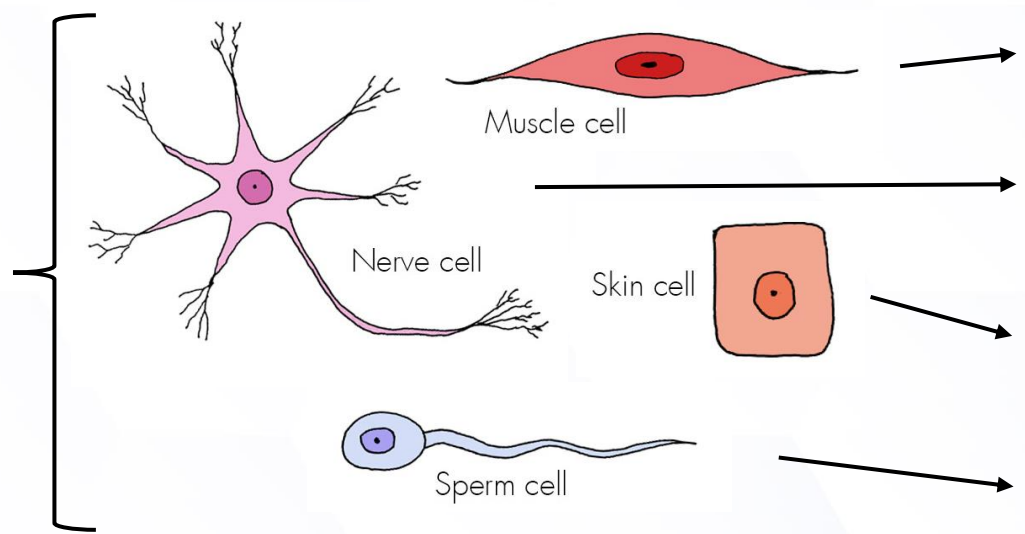
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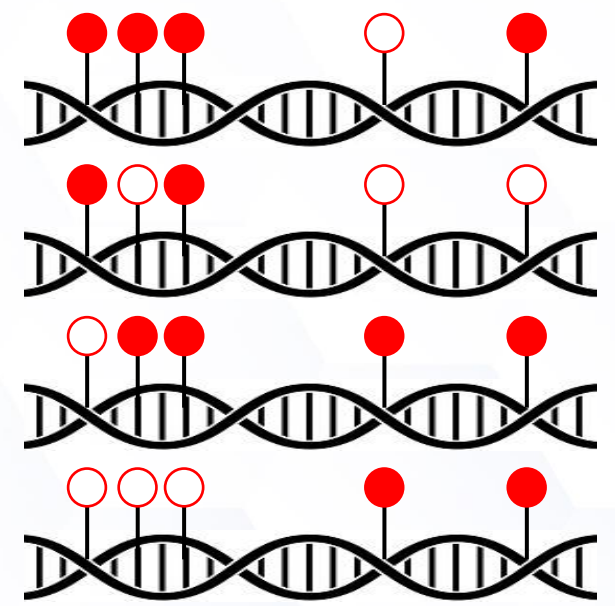
One Genome, many Epigenomes

210 cell types in our body!

One genome



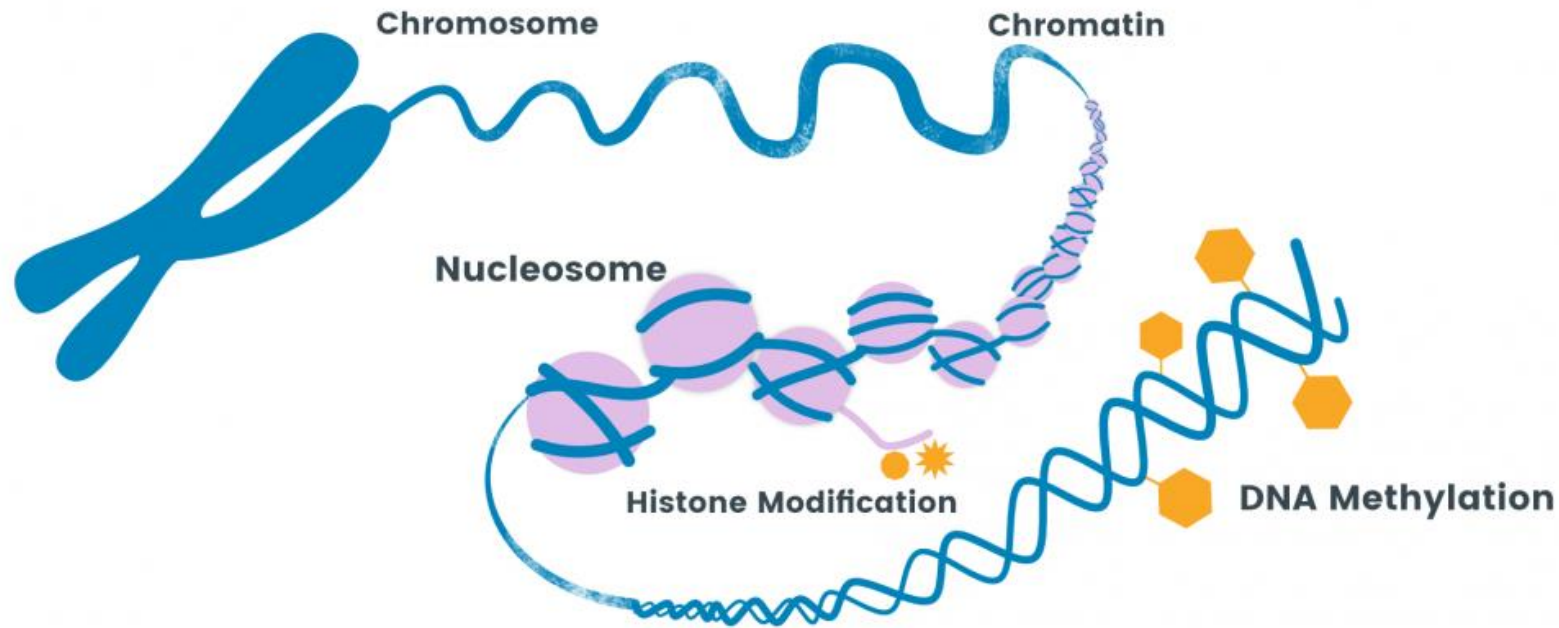
Many epigenomes



Different looks, different functions!



What is the Epigenome?



- Heritable
- On top of DNA sequence
- Gene switch: on/off
- Different epigenetic layers

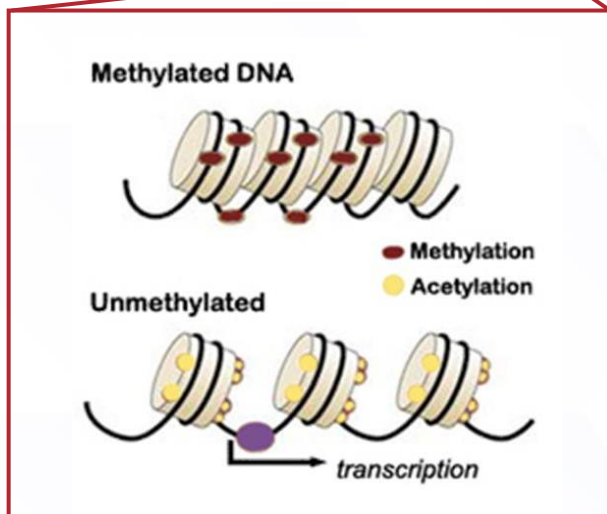


Epigenetic Gene Switch

- Unmethylated
- Methylated



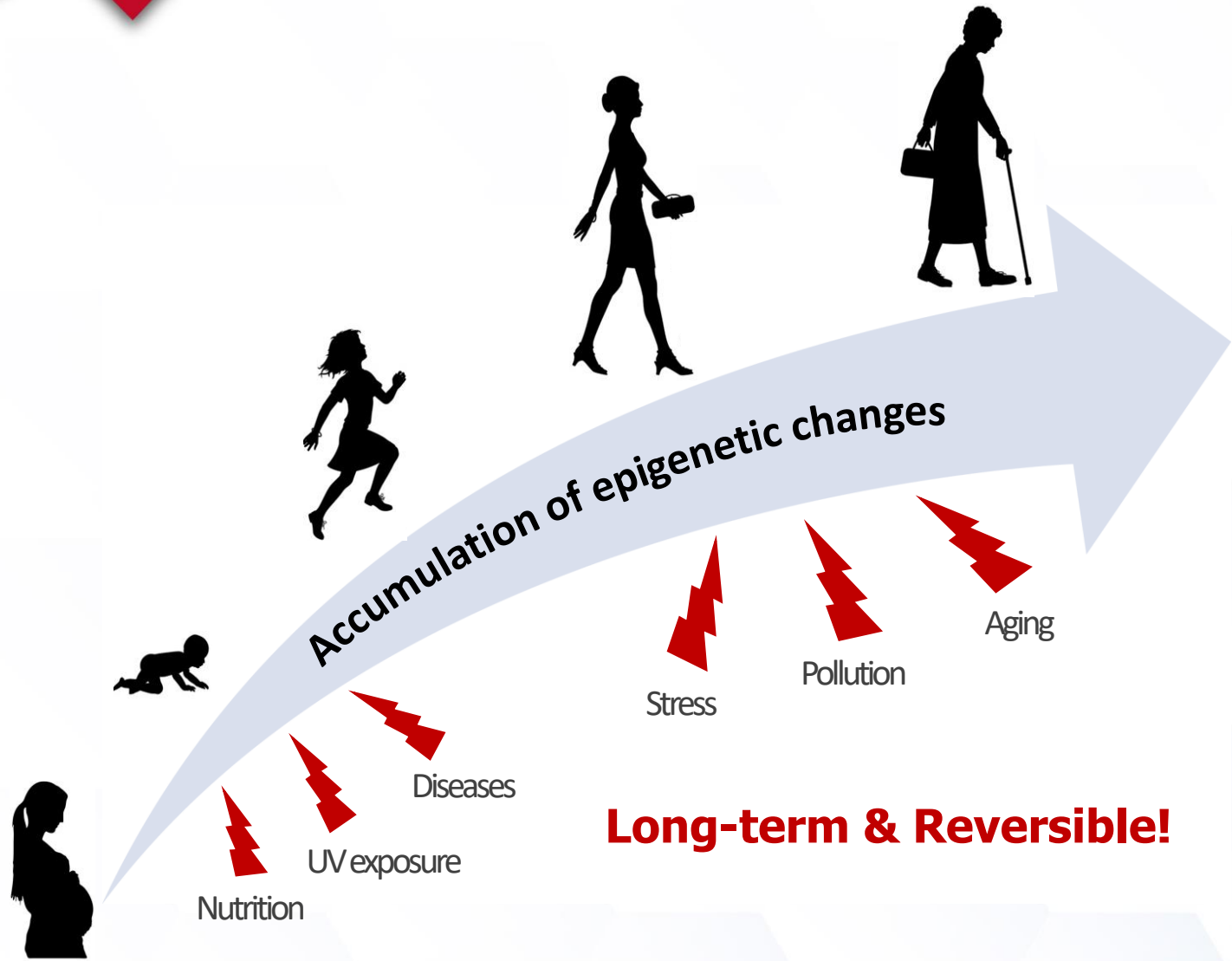
Cell identity and function!



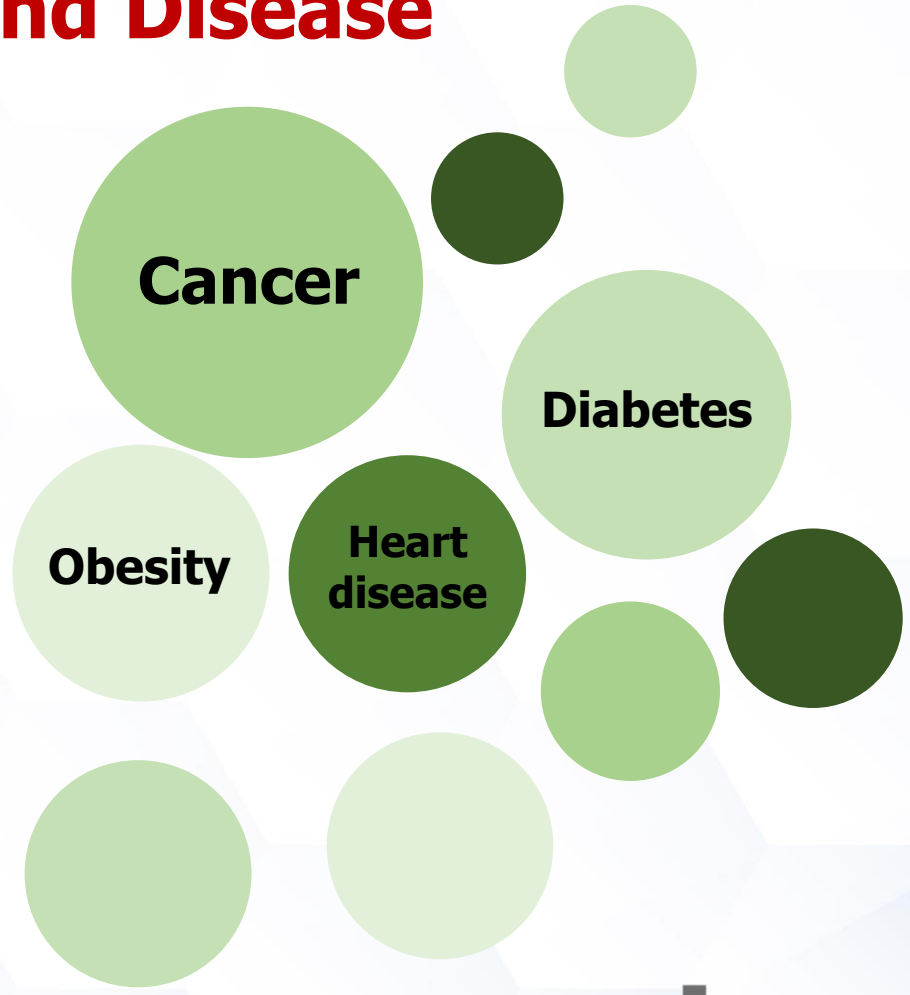
DNA methylation and **histone modifications** cooperate to regulate gene expression



Epigenetics, Environment and Disease



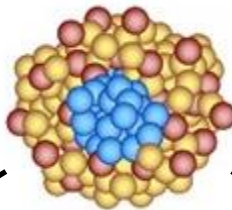
Long-term & Reversible!





Abnormal DNA methylation pattern

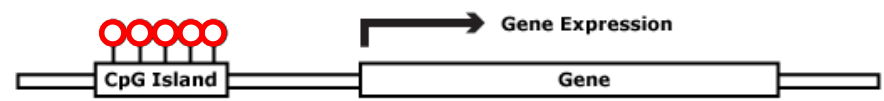
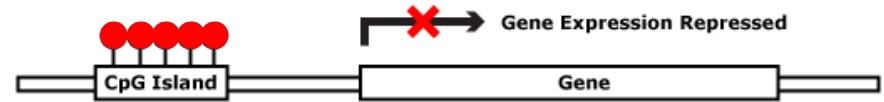
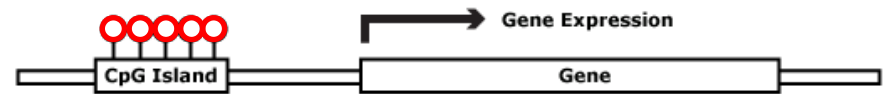
Cancer



- Unmethylated
- Methylated

Tumor suppressing gene

Tumor promoting gene

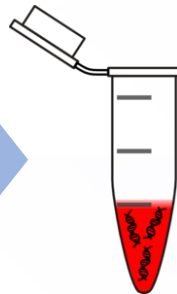




DNA methylation profiling



Biopsies



DNA



DNA
methylation



**Clinical
applications:**

Detection

Prognosis

Therapy

Monitoring

Etiology

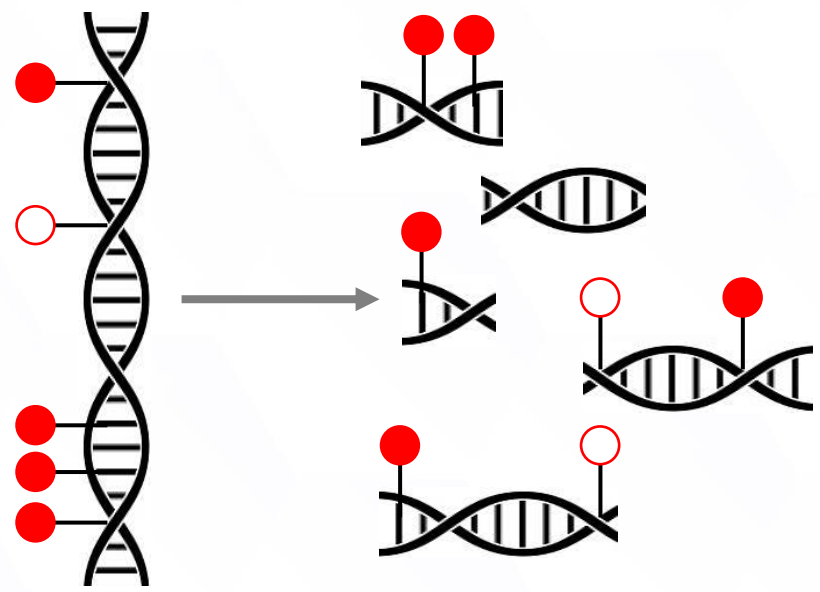
Prevention

Biology

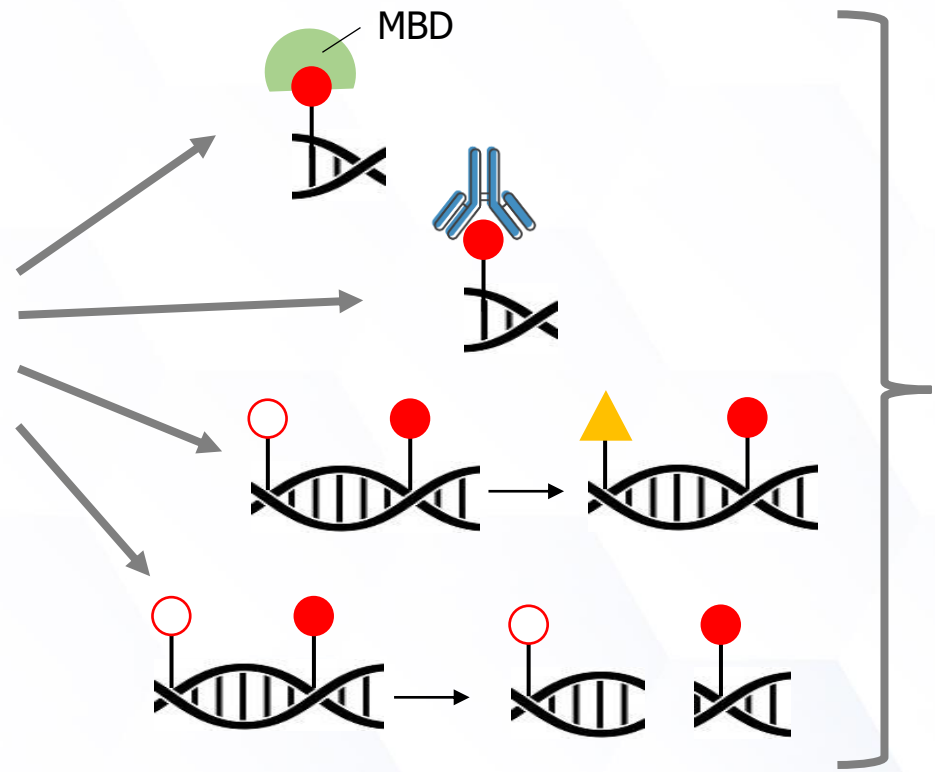


DNA methylation profiling technologies

1) DNA fragmentation



2) Distinction methylated/unmethylated DNA



3) Analysis



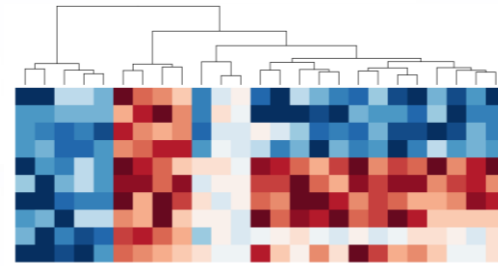
Sequencing (NGS)



Microarrays



DNA methylation profiling technologies



Sequencing (NGS)



- WGBS
- MIRA-seq
- SMRT
- MC-seq
- MeDIP-seq
- RRBS
- Nanopore

Clinical application!

Microarrays



- **Infinium**
- MeDIP ChIP
- MBD-Chip

Coverage



Throughput



Cost





Epigenomics in Belgium

U-Gent
Epigenetics & Cancer (Neuroblastoma)
Environmental Epigenetics
Epigenetics Bioinformatics tools
NXTGNT
Nxt-Dx

ULB
Epigenetics & Cancer (Breast cancer)
Epigenetics & Immune system
EPICS profiling platform

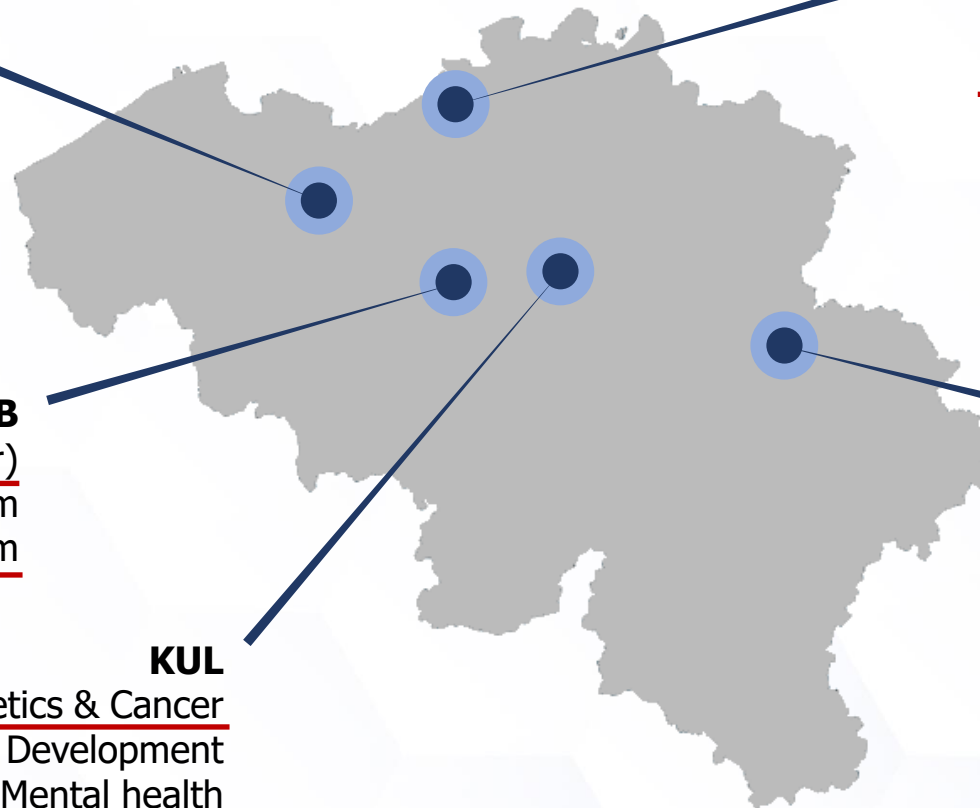
KUL
Epigenetics & Cancer
Epigenetics & Development
Epigenetics & Mental health
Environmental Epigenetics

UAntwerp

Epigenetics & cardiovascular disease,
asthma, obesity, inflammation, aging
Epigenetics & environment & cancer

ULg

Epigenetics & Cancer
Diagenode
MDxHealth





Thank you!

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