LFS
Research Café

Eating the right foods to prevent disease

How your diet impacts DNA and gene functioning, and the link to long-term health outcomes

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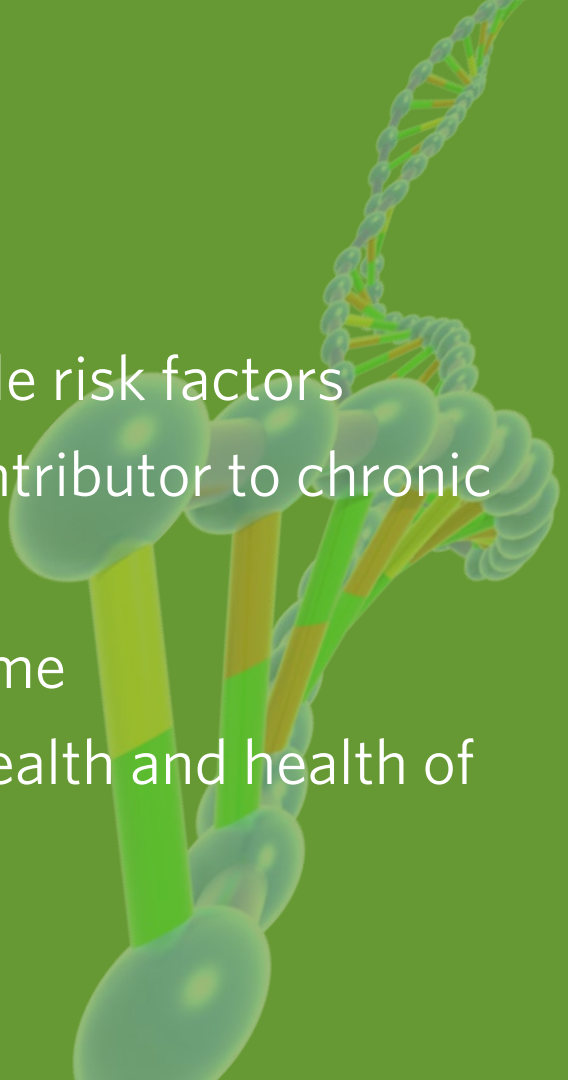
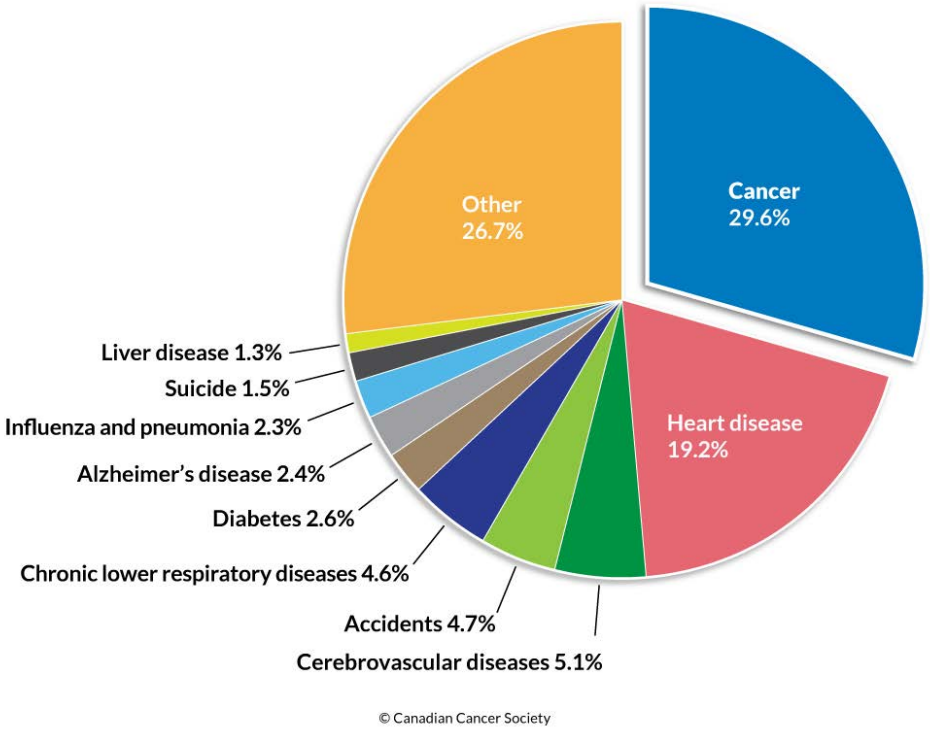
Today's Presentation

- Chronic disease and modifiable risk factors
- Epigenetic alterations as a contributor to chronic disease
- Impact of diet on the epigenome
- Diet as a factor shaping our health and health of next generations



Chronic disease in Canada



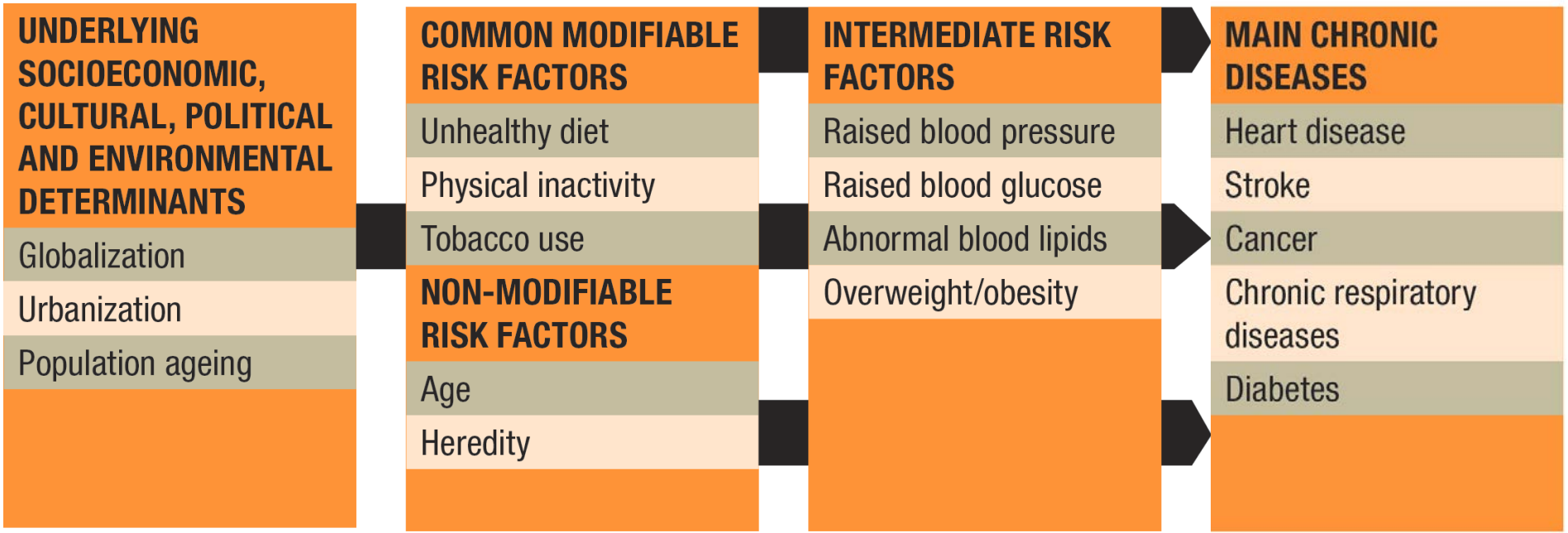
Chronic disease in Canada

Direct health care costs:
$70 billion a year

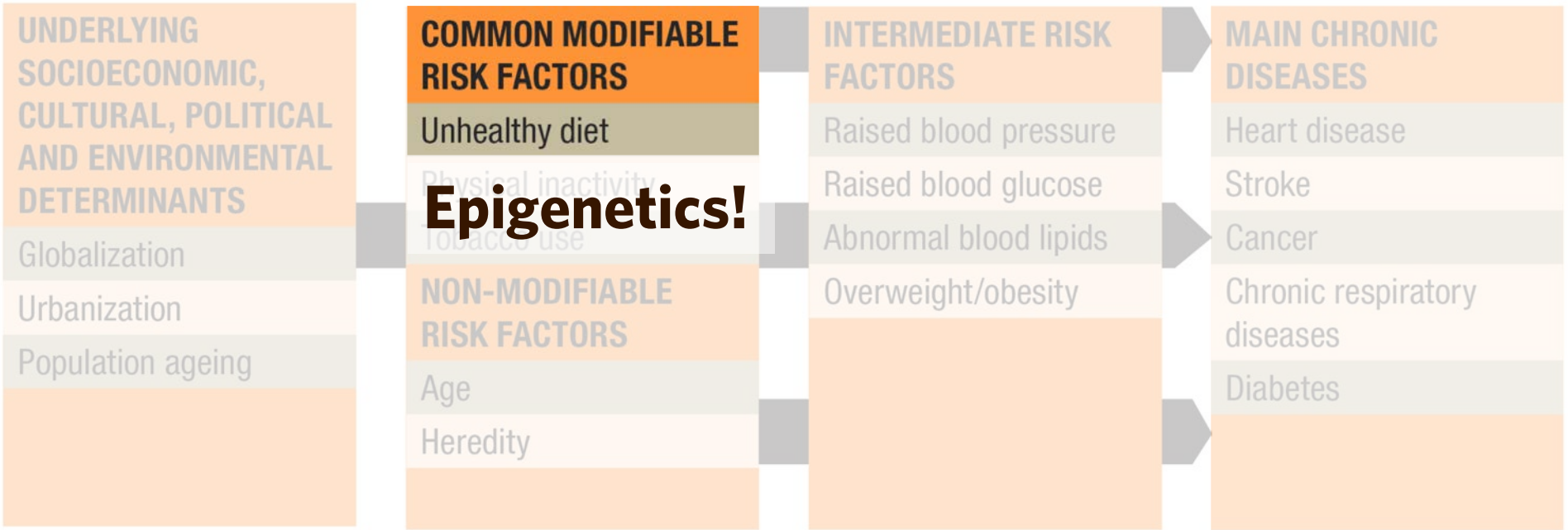
+

Indirect cost:
$55 billion a year
from loss of productivity and foregone income

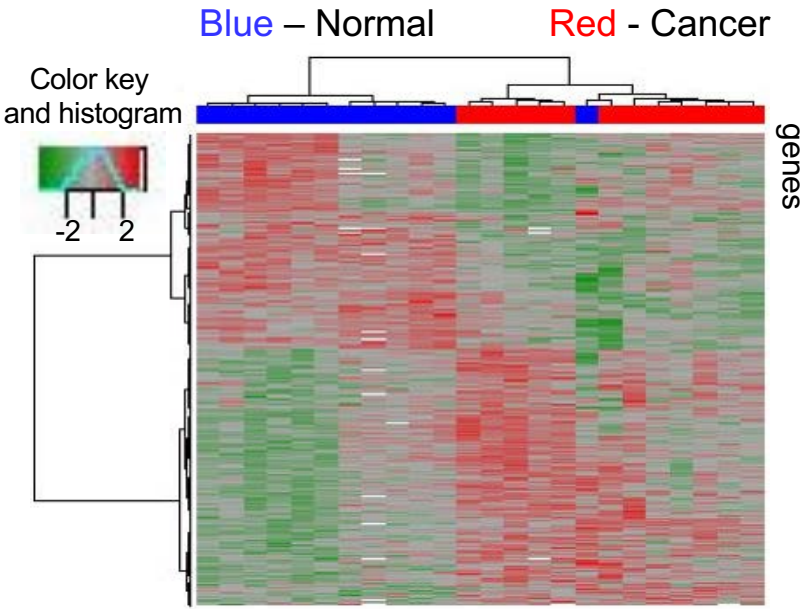
Chronic disease risk factors



Chronic disease modifiable risk factors



Altered epigenetic patterns in chronic disease

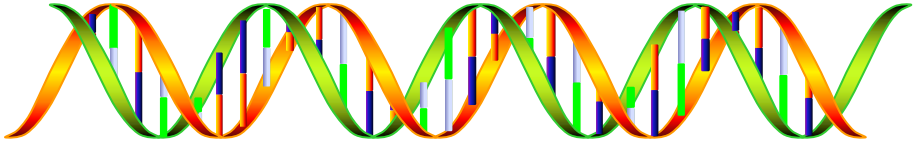


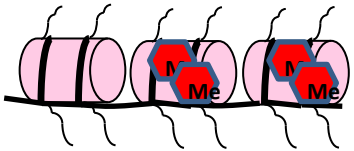
Liver

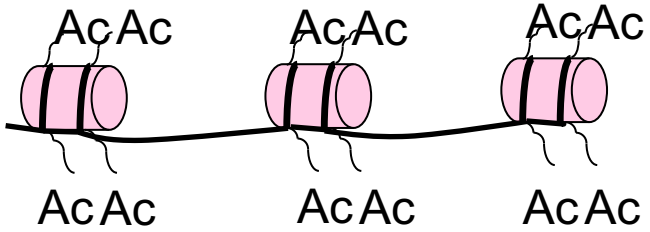
Twins

Lamarck got it right

Epigenetics & gene functioning

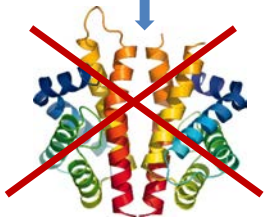






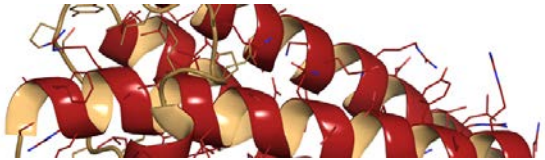
Condensed chromatin

Gene silenced



Open chromatin

Gene expressed



Dynamics of epigenetic modifications

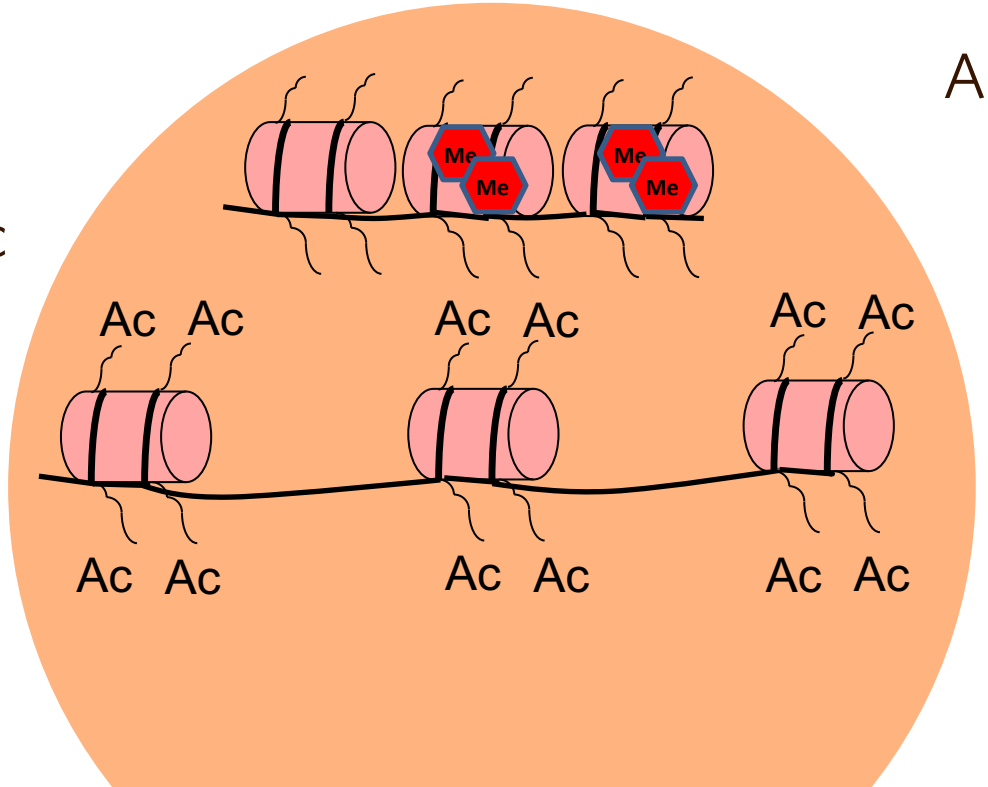
Diet

Viral infections

Social-Economic Status

Maternal care

Chemicals



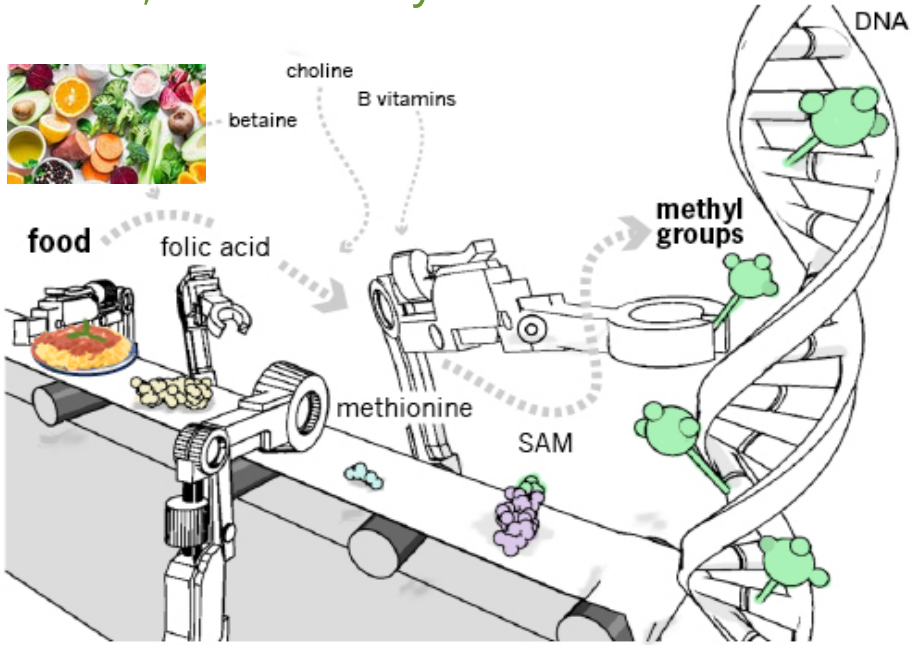
Abusive behaviour

Temperature

Radiation

Nutrition & the epigenome

SAM, the methyl donor



SAM reshapes the epigenome and protects from bone metastasis

Ctrl

SAM

Bioactive compounds

Disease prevention

Anthocyanins

Curcumin (turmeric)

Epigallocatechin Gallate

Genistein

Lycopene

Organosulfides

Pterostilbene

Quercetin

Resveratrol

Sulforaphane

Vitamin A (ATRA)

Vitamin D (D3: Calcitriol)

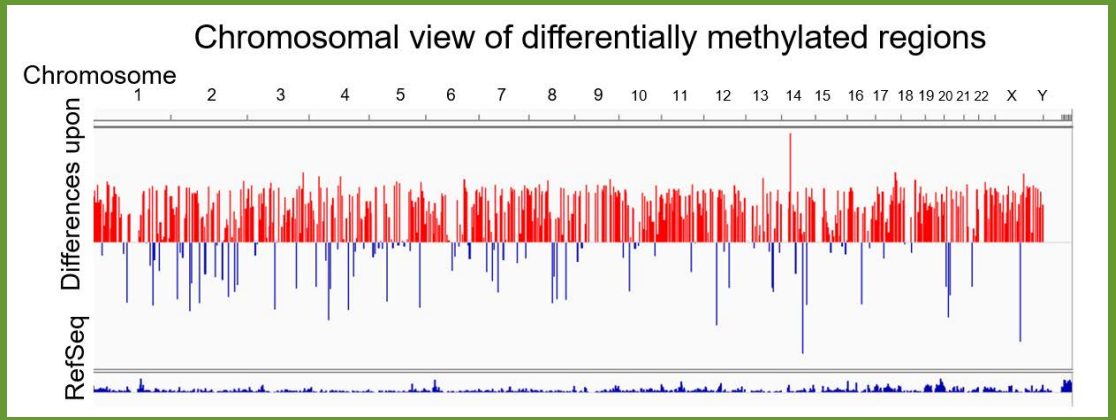
Bioactive compounds

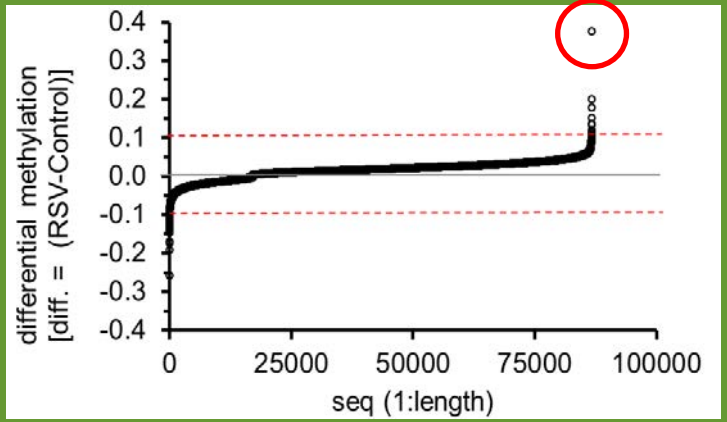
Disease prevention

Pterostilbene

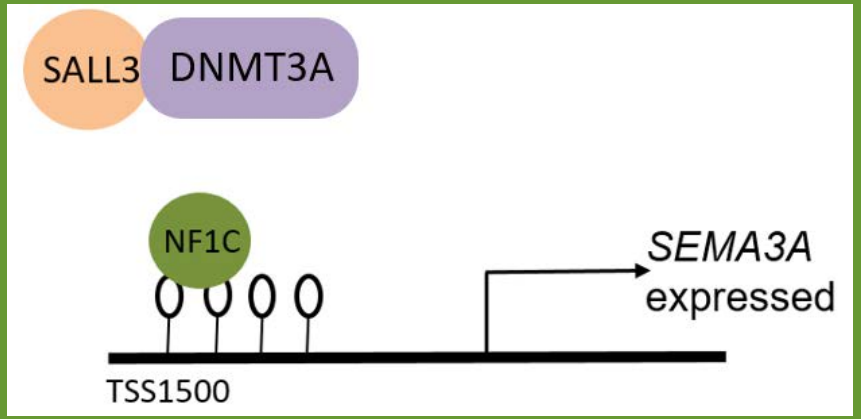
Resveratrol

Grapes and blueberries: Disease Prevention through epigenetics

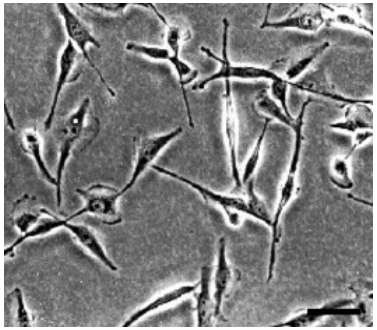


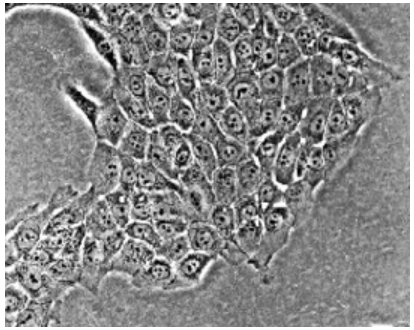


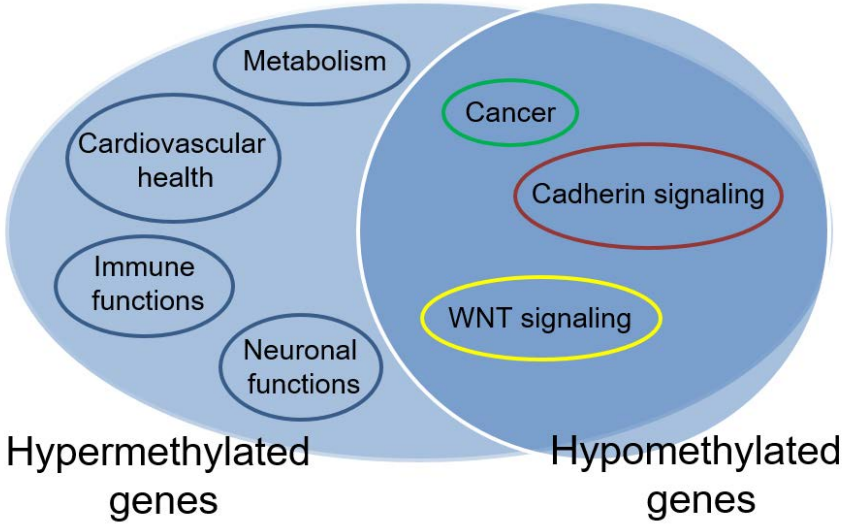
Grapes and blueberries: DNA-interacting proteins responsible for epigenetic activity



Healthy cells respond to foods through changes in the epigenetic patterns







Diet and health of future generations

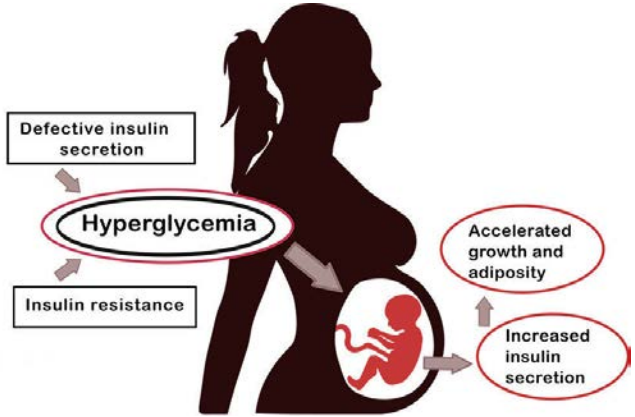
Diet

Environment

Lifestyle

Epigenetics

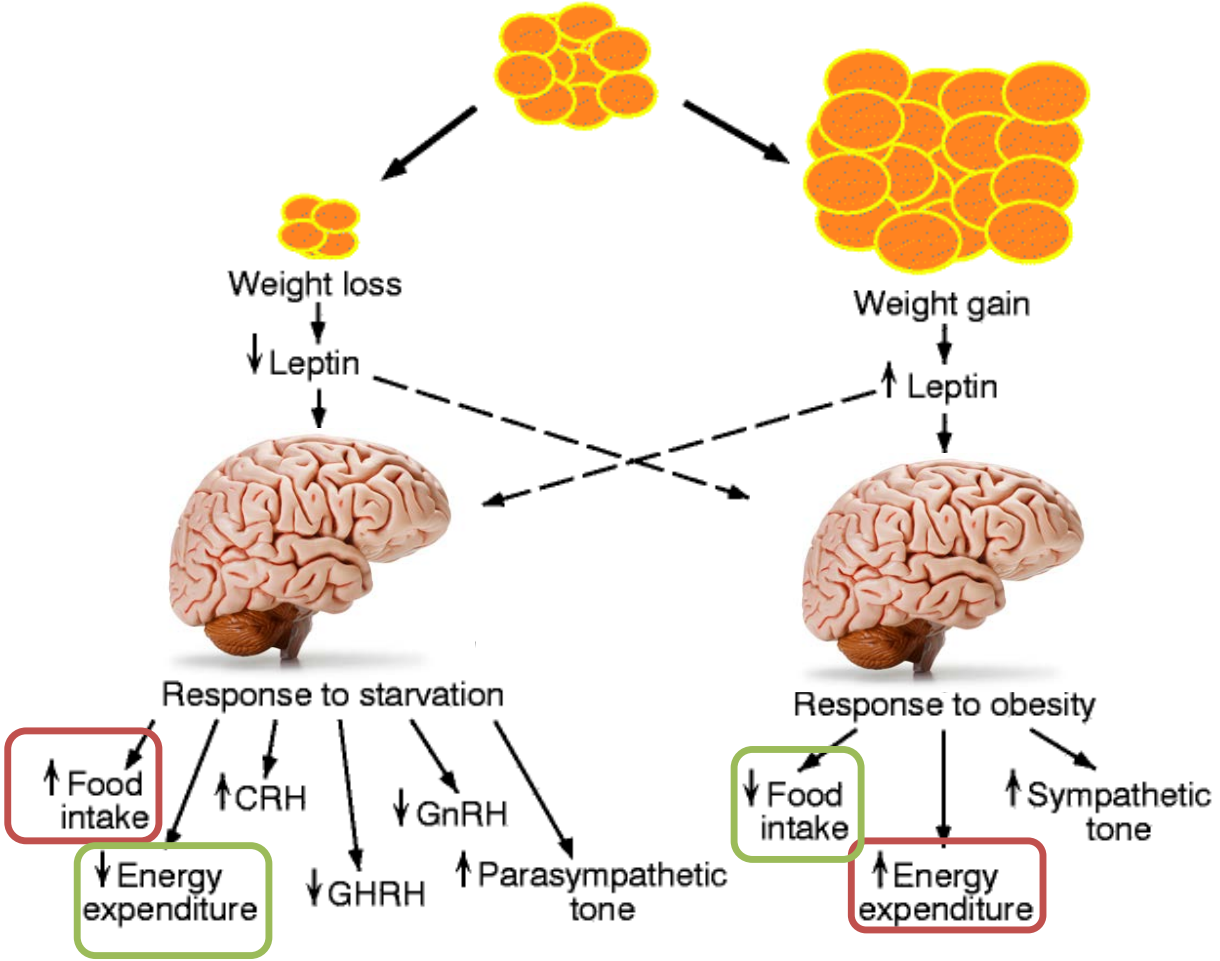
Gestational diabetes



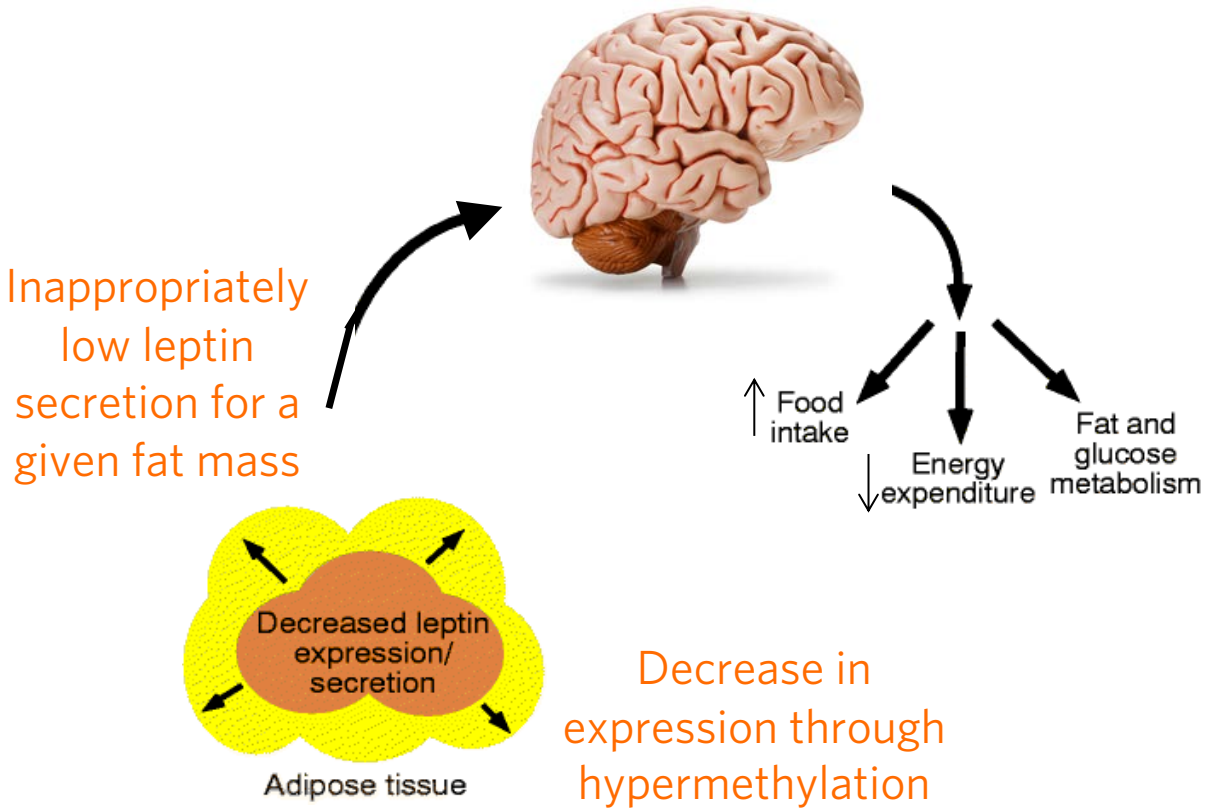
Predisposition of the offspring to diabetes

Epigenetic silencing of Leptin

Diabetes type 2 in the offspring



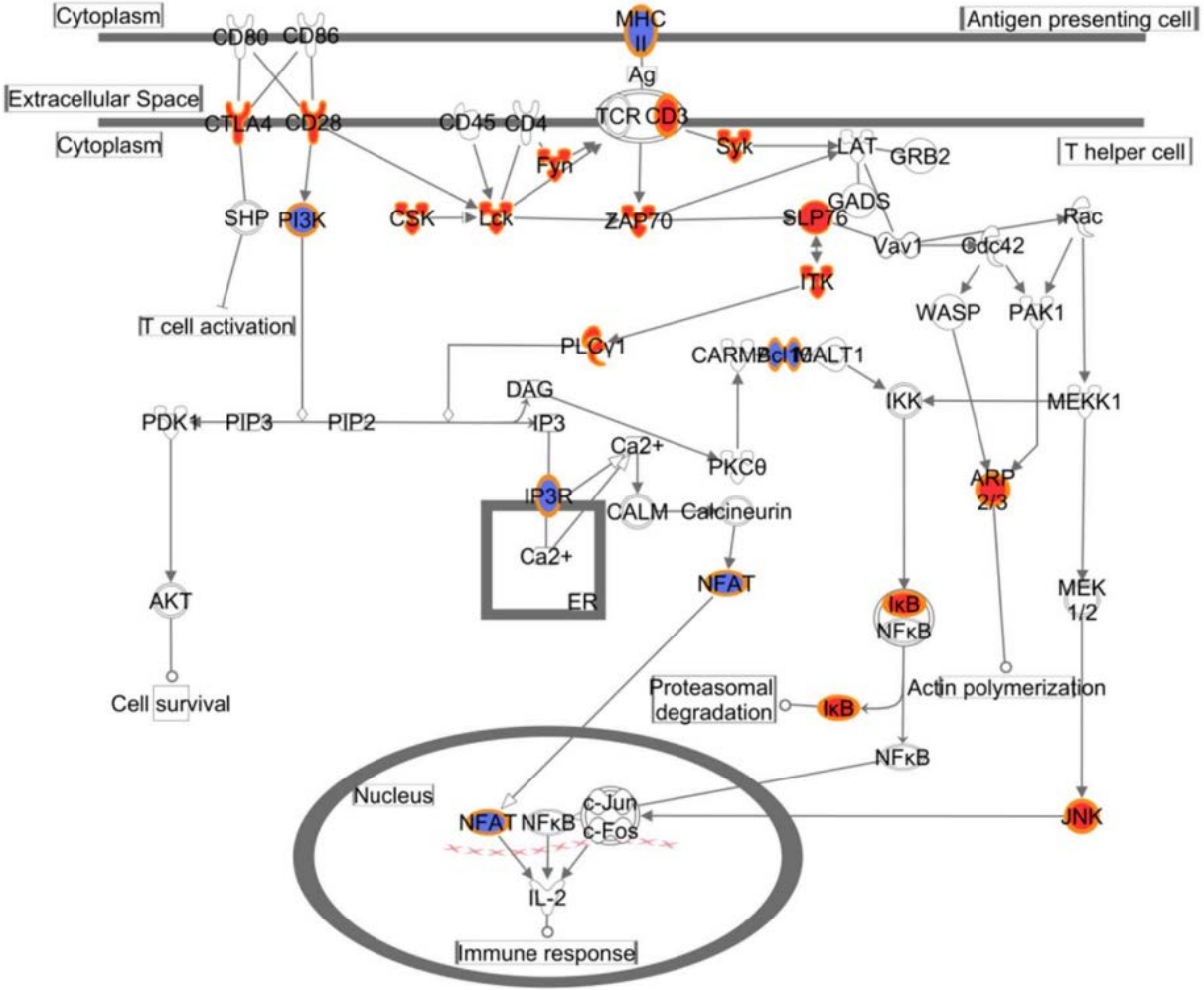
Leptin as a guardian of body weight



Gestational diabetes and epigenetics of leptin gene


Project Ice Storm
Quebec 1998

Project Ice Storm Quebec 1998



Animal models to track epigenetic effects

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