

Objectives

- To better understand the epigenetic field.
- To learn the different technical expressions about epigenetics.
- To gain knowledge about the epigenetic mechanisms.
- To learn the biochemical reactions that could happen in the organism related to epigenetics.
- To gain knowledge about the relationship between nutrition and epigenetics.
- To review the literature about nutritional studies related with epigenetics and to find their significance.

Epigenetics: science that studies the factors that affect the genetic material but that do not involve a change in the DNA sequence.

Nutrients

Folic acid: spinach, legumes, cauliflower... → Methyltransferase

Epigallocatechin gallate (EGCG): green tea → DNA methyltransferase inhibitor

Resveratrol: grape → Histone deacetylase inhibitor

DNA methylation

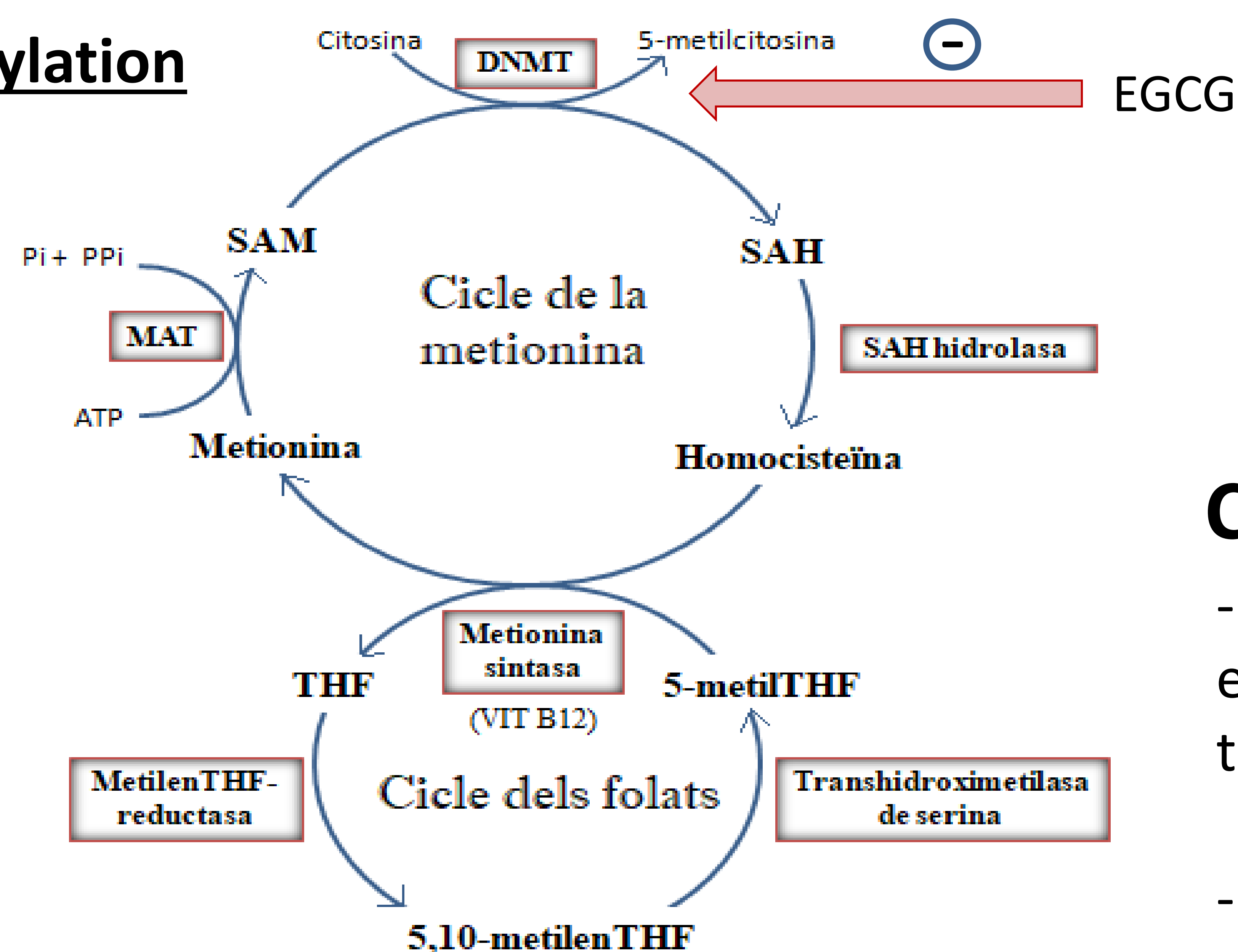


Figure 1. Methionine and folate cycle. Representation of methyl transfer to cytosine in DNA. **Reference:** own elaboration from: *Sánchez C et al., Planells E, Aranda P, Pérez De La Cruz A, Asensio C, Mataix J, Llopis J. 2007. Vitaminas B y homocisteína en la insuficiencia renal crónica. Nutr Hosp. 22:661–71.*

NUTRITION AND EPIGENETICS

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Histone modification

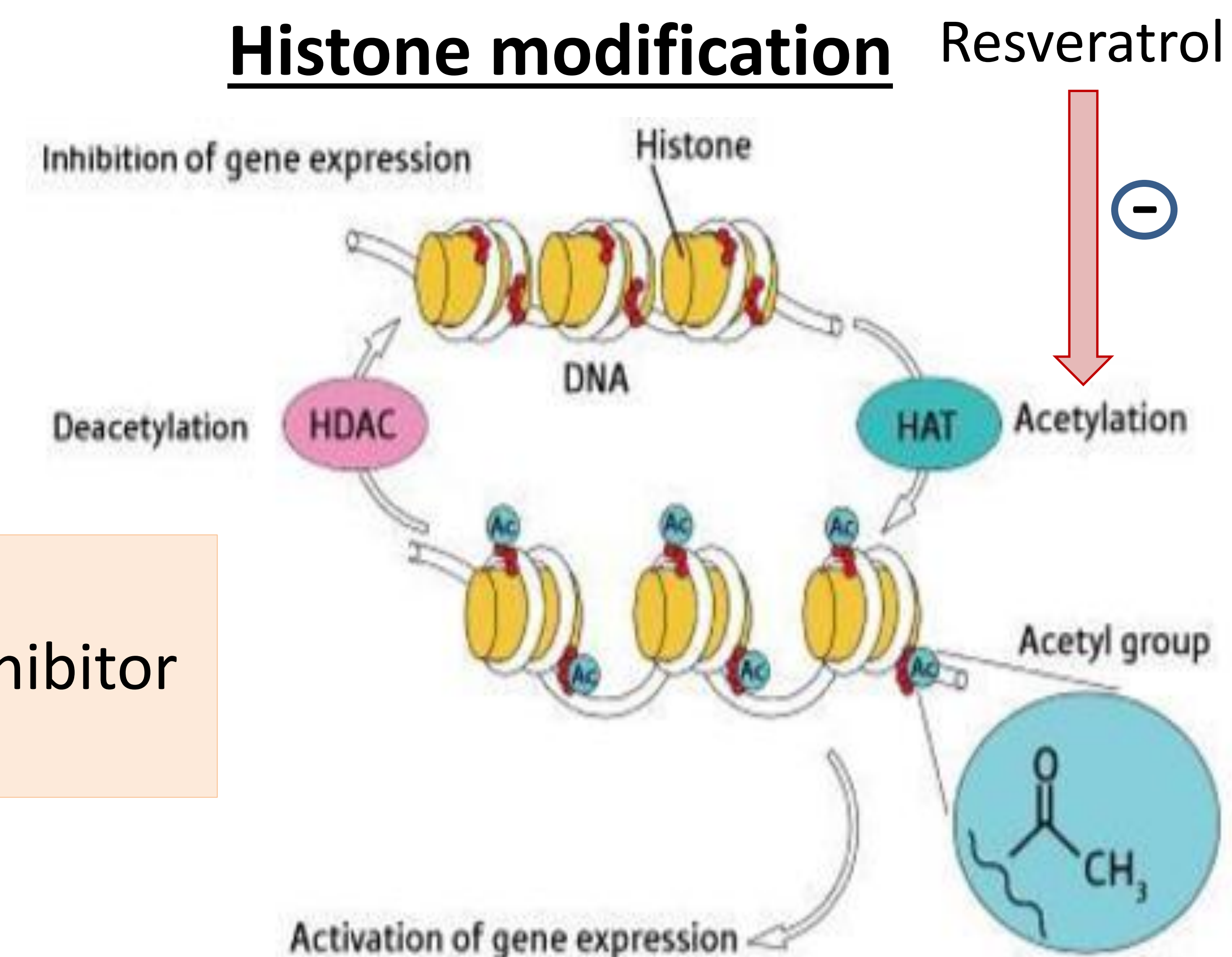


Figure 2. Acetylation and deacetylation process of histones by HAT and HDAC respectively. **Reference:** *Belmonte Fernández A. 2014. Las HDAC en la regulación de la expresión génica y el cáncer. MoleQla 13 (revista de Ciencias de la Universidad Pablo de Olavide)*

Conclusions

- A relationship has been found between the nutrients intake with the epigenetic mechanisms. Nevertheless, not enough scientific evidence that this intake can lead to health problems.
- There is a trend to create and sell new products as a possible solution of problems without enough scientific evidence.
- A better methodology is needed in order to determine the factors that are linked with epigenetic changes.