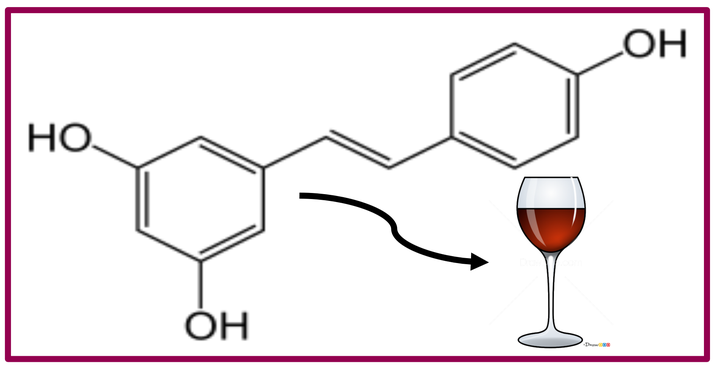
RESVERATROL AND ITS BENEFICIAL MOLECULAR HEALTH EFFECTS

OBJECTIVES

The objective of this study is to communicate the positive effects of resveratrol due to its regulation of 3 transcriptional process: nutrigenomics, microRNAs and epigenetics.

RESVERATROL

- Belongs to the family of stilbenes.
- The main way of consumption is through red wine.
- The active biological form is trans- (E) conformation.

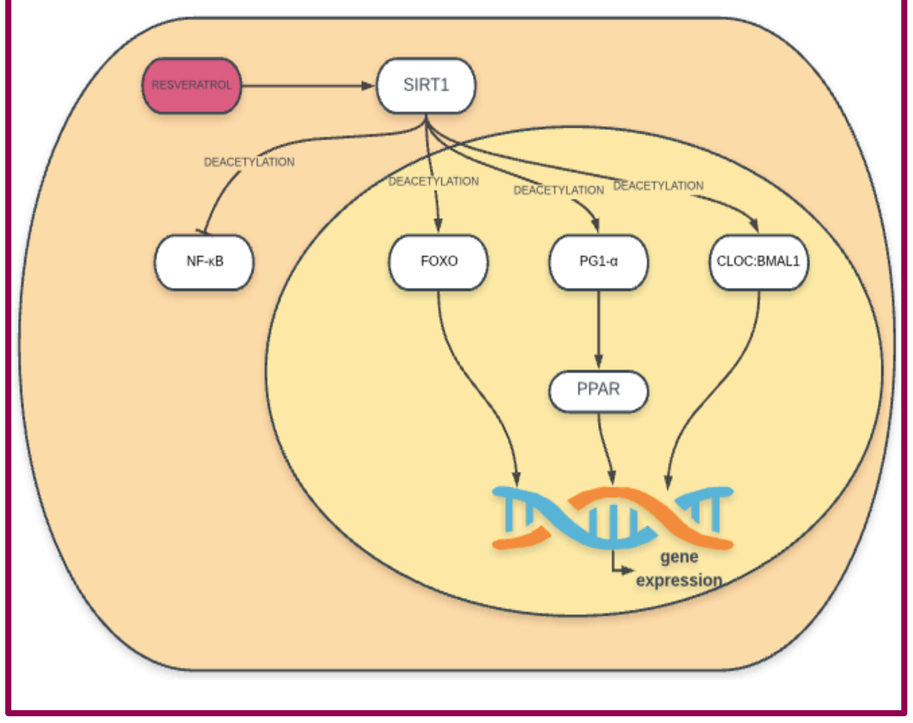


SIRT1

- Resveratrol increase SIRT1 activity.
- Deacetylates transcription factors and histones.

NUTRIGENOMICS

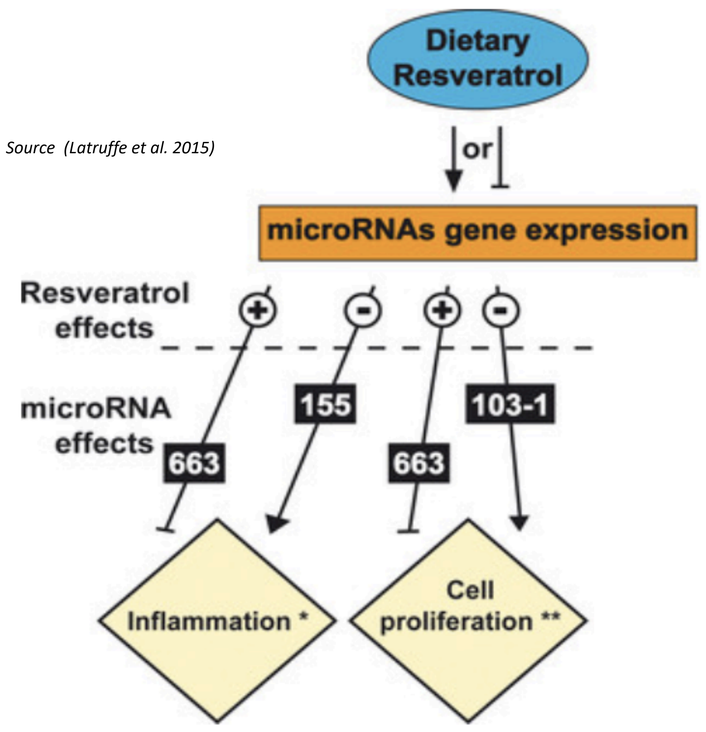
- The deacetylation of *Fork head box O* (FOXO), promotes the synthesis of anti-inflammatory proteins.
- The deacetylation of the complex that forms NF-κB, downregulates the synthesis of proinflammatory proteins
- The deacetylation of the factor PG1-α, increases the activity of the PPARs pathway, resulting an upregulation of anti-inflammatory and anti-hypertrophic proteins.
- The deacetylation of the CLOKC-BMAL1 complex, resulting in a proper regulation of circadian cycle and age-related diseases such as neurodegenerative events, cancer and chronic inflammations.



microRNAS

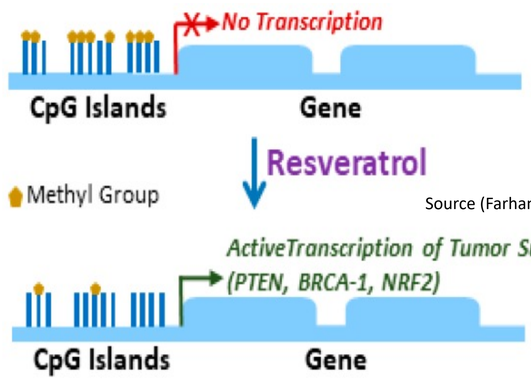
- Resveratrol increases miR-663, resulting in a gene silencing proinflammatory proteins. The miR-663 can interact with the TGFβ pathway resulting as an anticancer attribute.
- Resveratrol reduces the expression of mir-155, whose expression is related to the development of inflammatory and cancerous diseases.
- Resveratrol can reduce the synthesis of miR-17, miR-21, miR-25, miR-92a-2, miR-103-1 and miR-103-2, which have protumour activity.

Source (Latruffe et al. 2015)



EPIGENETICS

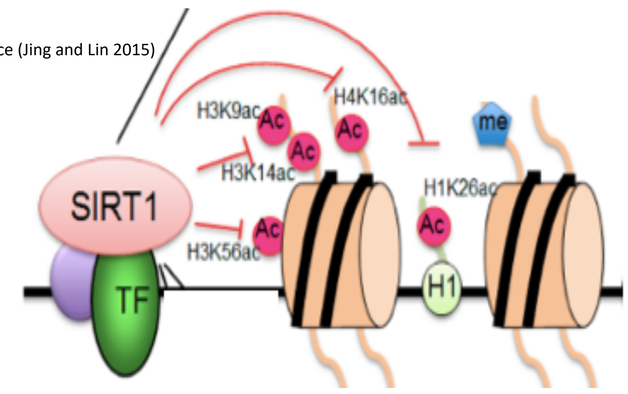
- The deacetylation of the DNMTs causes a demethylation of certain regions of the DNA is reduced → antitumor gens, PTEN, BRCA-1 and NRF2 are expressed.



Source (Farhan et al. 2019)

- The deacetylation of H3 and H4 histones, reduce the gene expression of the region. These silenced genes have been involved in the development of diseases such as cancer, hypercholesterolemia and type II diabetes.

Source (Jing and Lin 2015)



CONCLUSIONS

- Thanks to the nutrigenomic effects, resveratrol protects us from diseases such as hypertension, atherosclerosis, thrombosis, cardiovascular diseases, chronic inflammatory, cancer development and neurodegenerative disorders.
- The resveratrol upregulates miR-663 and downregulates miR-155, miR-17, miR-21, miR-25, miR-92a-2, miR-103-1 and miR-103-2, so it is achieved a protection against inflammatory diseases, leukaemia, breast, lung and stomach cancer, in addition, the probability of producing metastasis is reduced.
- The epigenetics effects of resveratrol, SIRT1 deacetylates DNMTs resulting an expression of tumour suppressors. SIRT1 also deacetylates histones H3 and H4, which makes a silencing gens involved in the development of diseases such as cancer, hypercholesterolemia, leukaemia and type II diabetes.
- Resveratrol has key properties for preventing or curing cancers and inflammatory diseases.

UAB
Universitat Autònoma de Barcelona
Facultat de Veterinària

PAU GASCON MARTÍ

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Ciència i Tecnologia dels Aliments