



## Effects of delphinidin on mitochondrial function in endothelial cells

Submitted by Raffaella Soleti on Mon, 06/01/2015 - 15:45

Titre	Effects of delphinidin on mitochondrial function in endothelial cells
Type de publication	Communication
Type	Communication avec actes dans un congrès
Année	2011
Langue	Français
Date du colloque	12-14/05/2011
Titre du colloque	Printemps de la cardiologie
Titre des actes ou de la revue	Archives of Cardiovascular Diseases
Volume	3, Suppl. 1
Pagination	65
Auteur	Duluc, Lucie [1], Iacobazzi, Francesco [2], Soleti, Raffaella [3], Simard, Gilles [4], Andriantsitohaina, Ramaroson [5]
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Ville	Lyon

Résumé en  
anglais

Delphinidine (delph), an anthocyanin with the same pharmacological profile than the total extract of red wine polyphenol, induces vasodilatation and possess anti-apoptotic property in endothelial cells (ECs) by mechanism involving nitric oxide (NO). The later can regulate mitochondrial (mt) function. However, the link between NO, mitochondria and the upstream target of delph including the alpha isoform of the estrogen receptor (ER $\alpha$ ) has never been assessed and is the aim of the present study. For this purpose, the effects of delph ( $3.10^{-5}$  M) and the ER $\alpha$  agonist propylpyrazole triol (PPT,  $10^{-5}$  M) were conducted at two time points, 10min and 48h, on mt respiration (R) by oxygraphy and on respiratory chain complexes activities by spectrophotometry in EaHy926 ECs. NO production was assessed by electron paramagnetic resonance at the early time. These experiments were performed with or without the ER antagonist, fulvestrant (fulv,  $3.10^{-5}$  M), or the NO synthase inhibitor, L-nitro-arginine (L-NA,  $10^{-4}$  M). As expected, delph and PPT induced an early increase of NO that was prevented by fulv. Delph time-dependently increased basal R and maximal R capacity but not the non-phosphorylative R by a mechanism insensitive to fulv but sensitive to L-NA. PPT did not affect basal and non-phosphorylative R but increased the maximal R capacity by a mechanism sensitive to fulv and L-NA. These effects were associated with increased cytochrome c oxidase activity. These data highlight the implication of both NO and cytochrome c oxidase activity on the modulation of mt R in response to delph and PPT in ECs. The lack of effect of ER blockade on the increase of mt R by delph supports the involvement of ER-independent mechanism although this receptor is implicated at the early increase of NO production. Thus, this study suggests a probable role of mitochondria in the effect of polyphenol in the regulation of endothelial function including vasodilatation and endothelial integrity.

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