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Vernon J Ebeboni, John M Dickenson, Shiva D Sivasubramaniam

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**Antioxidative effects of flavonoids and their metabolites against hypoxia/reoxygenation-induced oxidative stress in a human first trimester trophoblast cell line**

Vernon J Ebeboni<sup>1</sup>, John M Dickenson<sup>2</sup> and Shiva D Sivasubramaniam<sup>3</sup>✉

<sup>1</sup>[vernon.ebeboni@ntu.ac.uk](mailto:vernon.ebeboni@ntu.ac.uk); <sup>2</sup>[john.dickenson@ntu.ac.uk](mailto:john.dickenson@ntu.ac.uk) ;

<sup>3</sup>✉[shiva.sivasubramaniam@ntu.ac.uk](mailto:shiva.sivasubramaniam@ntu.ac.uk)

School of Science and Technology, Nottingham Trent University, Clifton Lane, Nottingham NG11 8NS, UK

**Abstract:**

This study aimed to investigate the cytoprotective effects of flavonoids, their metabolites alone or in combination against hypoxia/reoxygenation induced oxidative stress in the transformed human first trimester trophoblast cell line (HTR-8/SVneo).

Oxidative stress was achieved with hypoxia followed by reoxygenation and the following assays were performed: MTT, CellTox™ Green Cytotoxicity, CellTiter-Glo®, NADP/NADPH-Glo™, ROS-Glo™/H<sub>2</sub>O<sub>2</sub>, GSH/GSSG-Glo™ and Caspase-Glo® 3/7 assays.

HTR-8/SVneo cells, pre-treated for 24 h with flavonoids or their metabolites were protected significantly from oxidative stress. Flavonoids were associated with ROS modulation, reducing the generation of superoxide/hydrogen peroxide. The activities of caspases 3/7 were also significantly reduced significantly in HTR-8/SVneo cells pre-treated with flavonoids.

This study has shown for the first time that 24 h pre-treatment with flavonoids, their metabolites alone or in combination, protected against HR-induced oxidative stress in the trophoblast cell line. These data indicate that dietary flavonoids may be beneficial to placental health and invasion during early gestation.

**Keywords:** trophoblast, antioxidant, flavonoids, quercetin, hesperidin, Q3G, hesperetin oxidative stress, hypoxia/reoxygenation, HTR-8/SVneo

**Abbreviations:** HR- hypoxia/reoxygenation; Q3G- Quercetin 3-glucuronide

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