



## Understanding the roles and mechanisms of oxidative stress in diseases, tissue injury, and cell death in vivo and in vitro: Therapeutic possibilities of antioxidants



Reactive oxygen species (ROS) generated by endogenous and exogenous sources causes damage to the cell macromolecules including protein, lipids and nucleic acid at any level. In response to these damages, the healthy cell responds defensive mechanisms such as signaling molecule, transcriptional regulators, antioxidant genes and small molecules. Although ROS is an intrinsic part of the regular cellular process, especially in mitochondria, the defense mechanism to ROS is beneficial to the healthy cell. Thus, oxidative stress, a measure of ROS damage, is crucial in diseases, tissue injury and ultimate demise of cell whereas antioxidant defense or antioxidants have immense therapeutic opportunities.

In this special issue “Understanding the Roles and Mechanisms of Oxidative Stress in Diseases, Tissue Injury, and Cell Death in vivo and in vitro: Therapeutic Possibilities of Antioxidants” we received a significant number of manuscripts addressing this aspect and we are thankful to all scientists and clinicians, who submitted their manuscript and we could not accommodate so many of them.

### 1. Characterization of novel dietary compounds and its antioxidant properties

Mota NSRS shows the role of by-products of *Passiflora edulis* f. *flavicarpa* Deg. Rich in medium and long chain fatty acids in anti-tumor activity. 2018 Aug; 118:557–565. doi: 10.1016/j.fct.2018.06.010

Nivelle L et al. shows the differential antiproliferative activity of resveratrol, epsilon viniferin and labruscol on melanoma cells and normal dermal cells. 2018 Jun; 116:323–334.

In a clinical setting, Hirsch MM et al. shows behavioral alterations in autism model induced by valproic acid and translational analysis of circulating microRNA. 2018 May; 115:336–343.

Peralta MA et al. demonstrates the antioxidant activity of a prenyl flavonoid. 2018 Apr; 114:285–291.

Uysal S et al. shows insights of the multi-biological activities and chemical composition of *Bidens tripartita* L. (<https://doi.org/10.1016/j.fct.2017.11.058>)

Zengin G et al. describe phenolic components and assessment of biological properties of *Tchihatchewia isatidea* Boiss. Extracts (<https://doi.org/10.1016/j.fct.2017.11.055>)

Mocan A et al. characterize bioactive constituents from two Romanian Goji berries cultivars. 2018 May; 115:414–424

Hejazi II et al. shows antioxidative and anti-proliferative potential of *Curculigo orchoides* Gaertn. 2018 May; 115:244–259.

Boroja T et al. shows the phytochemical profile of Summer savory extract in cisplatin-induced liver, renal and testicular toxicity. 2018

Aug; 118:252–263.

Alves Santana Cesário FR et al. shows the antioxidant and gastro-protective activity of the hydroalcoholic extract of *Tocoyena formosa* leaves (<https://doi.org/10.1016/j.fct.2017.12.058>).

Sobeh M et al. characterize polyphenolics in the methanol extract of *Syzygiumsamarangense* leaves and its hepatoprotective activity. (<https://doi.org/10.1016/j.fct.2018.01.031>).

Escher GB et al. Chemical study, antioxidant, anti-hypertensive, and cytotoxic/cytoprotective activities of *Centaurea cyanus* L. petals aqueous extract. 2018 Aug; 118:439–453.

Fidelis M et al. examines a multivariate structure-activity study from compounds from camu-camu seed coat. 2018 Oct; 120:479–490.

Thabet AA et al. validate the antihyperglycaemic and hepatoprotective activity of the flavonoid-rich fraction of *Brachychiton rupestris*. 2018 Apr; 114:302–310.

### 2. Role of antioxidants in vitro

Almeer RS et al. *Ziziphus spina-christi* fruit extract suppresses oxidative stress and p38 MAPK expression in ulcerative colitis. 2018 May; 115:49–62. doi: 10.1016/j.fct.2018.03.002.

Lin SJ et demonstrates how Nano-diamino-tetrac (NDAT) inhibits PD-L1 expression which is essential for proliferation in oral cancer cells. 2018 Oct; 120:1–11. doi: 10.1016/j.fct.2018.06.058Abstract

Ho Y et al. shows how Resveratrol inhibits human leiomyoma cell proliferation via crosstalk between integrin  $\alpha\beta 3$  and IGF-1R. 2018 Oct; 120:346–355. doi: 10.1016/j.fct.2018.07.030.

Sun L et al. shows the synergistic effect of caffeic acid phenethyl ester with caspofungin against *Candida albicans* is mediated by disrupting iron homeostasis. 2018 Jun; 116(Pt B):51–58. doi: 10.1016/j.fct.2018.04.014

Lang F et al. demonstrates that apoptotic cell death was induced by Z-Ligustilide in human ovarian cancer cells. 2018 Nov; 121:631–638. doi: 10.1016/j.fct.2018.09.041.

Bustos et al. show how flavonoids function as protective agents against oxidative stress. 2018 Aug; 118:294–302. doi: 10.1016/j.fct.2018.05.030.

Carvalho DO et al. demonstrates the effect of Xanthohumol in cell proliferation and induces apoptosis in human thyroid cells. 2018 Nov; 121:450–457. doi: 10.1016/j.fct.2018.09.021.

Rastogi S et al. shows the comparative effect of melatonin and quercetin in counteracting LPS induced oxidative stress. 2018 Oct; 120:243–252. doi: 10.1016/j.fct.2018.06.062.

<https://doi.org/10.1016/j.fct.2019.02.040>

### 3. Role of antioxidants in an animal model of diseases

Lu D et al. summarizes the role of peroxiredoxins in inflammatory liver diseases such as alcoholic steatohepatitis and ischemic/reperfusion injury in liver transplantation (<https://doi.org/10.1016/j.fct.2018.01.025>).

Stefanello N et al. review the effects of coffee, caffeine, and CGA on the purinergic system 2018 Oct 3. pii: S0278-6915(18)30728-2.

Wang SW demonstrates the protection mechanism of Astilbin mediated cisplatin-induced nephrotoxicity. 2018 Apr; 114:227–236. doi: 10.1016/j.fct.2018.02.041.

Dutta S et al. shows how Melatonin attenuates arsenic-induced nephropathy via the regulation of oxidative stress and inflammatory signaling cascades in mice. 2018 Aug; 118:303–316. doi: 10.1016/j.fct.2018.05.032.

Li F et al. demonstrates the protection mechanism of Cyanidin in the endotoxin-induced myocardial toxicity 2018 Oct; 120:104–111. doi: 10.1016/j.fct.2018.05.053. .

Ameeramja J et al. shows how Protocatechuic acid methyl ester modulates fluoride induced pulmonary toxicity in rats. 2018 Aug; 118:235–244. doi: 10.1016/j.fct.2018.05.031

Al-Asmari AK demonstrates the protective effects of a natural herbal compound quercetin against snake venom-induced hepatic and renal toxicities. 2018 Aug; 118:105–110. doi: 10.1016/j.fct.2018.05.016.

Hassanein EHM shows the renoprotective effects of umbelliferone on methotrexate-induced renal injury 2018 Jun; 116(Pt B):152–160.

doi: 10.1016/j.fct.2018.03.041

Ali FEM demonstrates the hepatoprotective effects of diosmin and/or sildenafil against cholestatic liver cirrhosis. 2018 Oct; 120:294–304. doi: 10.1016/j.fct.2018.07.027.

Sun J et al. demonstrates how Anthocyanins isolated from blueberry ameliorates CCl<sub>4</sub> induced liver fibrosis 2018 Oct; 120:491–499. doi: 10.1016/j.fct.2018.07.048.

Cásedas G et al. shows the regulation of redox status in neuronal SH-SY5Y cells by blueberry juice, cranberry juice and cyanidin. 2018 Aug; 118:572–580. doi: 10.1016/j.fct.2018.05.066.

Ghosh S et al. shows the ameliorative role of ferulic acid against diabetes-associated oxidative stress in the spleen. 2018 Aug; 118:272–286. doi: 10.1016/j.fct.2018.05.029.

Britto RM demonstrates the protection mechanism of Myrtenol in myocardial ischemia-reperfusion injury. (<https://doi.org/10.1016/j.fct.2017.12.003>).

Mohamed Abdelmegeed

*Section of Molecular Pharmacology and Toxicology, Laboratory of Membrane Biochemistry and Biophysics, National Institute on Alcohol Abuse and Alcoholism, Bethesda, MD, USA*

Partha Mukhopadhyay\*

*Laboratory of Cardiovascular Physiology and Tissue Injury, NIAAA, National Institutes of Health, Bethesda, MD, 20852, USA*  
E-mail address: [mpartha@mail.nih.gov](mailto:mpartha@mail.nih.gov) (P. Mukhopadhyay),

\* Corresponding author.