



Implen Journal Club | April Issue

Welcome to our April issue of the #Implen #JournalClub in 2022.

Plant-based Medicine Issue

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A Preliminary Study of the Effect of Quercetin on Cytotoxicity, Apoptosis, and Stress Responses in Glioblastoma Cell Lines

Magdalena Kusaczuk, Rafał Krętowski, Monika Naumowicz, Anna Stypułkowska, and Marzanna Cechowska-Pasko

The first issue of the Implen NanoPhotometer® Journal Club focuses on the utilization of natural substances as potential cytostatic agents representing a strong trend in current oncopharmacology. Currently, it is widely recognized that natural compounds are a class of promising anticancer agents capable of counteracting tumor development while simultaneously being relatively non-toxic to normal cells. Various phytochemicals have already been tested in countless in vitro and in vivo studies presenting promising results against many types of malignancies, with quercetin (QCT) being one such compound, as there is increasing evidence

indicating that dietary polyphenols show protective effects against various cancers. In response to the clear need for well-established alternative therapies to prevent and effectively treat glioblastoma, Kusacuzuk et al. recently reported in the International Journal of Molecular Sciences that quercetin has potential to be considered as an anti-glioblastoma agent due to its cytotoxic effects evoking cell death via activation of apoptosis in brain tumor cells. These findings suggest that QCT is worth further investigation as a potential pharmacological agent in therapy of brain tumors.

The NanoPhotometer® was used in this study to perform spectrophotometric measurements to evaluate the quality and quantity of the extracted RNA.

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Echinacea purpurea Alleviates Cyclophosphamide-Induced Immunosuppression in Mice

Ha-Rim Kim, Ye-Seul Kim, Dong-Ryung Lee, Bong-Keun Choi, Kang-Beom Kwon and Gi-Sang Bae

The second issue of the Implen NanoPhotometer® Journal Club Club is highlighting another potential plant-based therapeutic. Echinacea purpurea (EP) has been valuable for its healthy properties and various pharmacological activities, such as exerting anti-inflammatory and immunostimulation effects. Kim et al. recently published in the journal of Applied Sciences the results of a study focused on EP as an immune-enhancing agent against immunosuppression. Immunosuppression is a temporal or permanent lack of immunity and can sensitize the body to outer pathogens making it an active area of interest for discovering immune-enhancing agents of medicinal plant origins for the treatment of immunosuppressive diseases. Their reported findings suggest that EP could function as an effective immunostimulatory agent in patients with immunosuppression induced by cyclophosphamide (CP), an important chemotherapeutic drug used widely in the treatment of tumors. Taken together, these findings suggest that EP could be used to enhance health and immunity in immunosuppressed conditions.

The NanoPhotometer® was used in this study to measure the concentration of total RNA isolated from the spleen.

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Curcumin Supplementation (Meriva®) Modulates Inflammation, Lipid Peroxidation and Gut Microbiota Composition in Chronic Kidney Disease

Pivari F, Mingione A, Piazzini G, Ceccarani C, Ottaviano E, Brasacchio C, Dei Cas M, Vischi M, Cozzolino MG, Fogagnolo P, Riva A, Petrangolini G, Barrea L, Di Renzo L, Borghi E, Signorelli P, Paroni R, Soldati L.

Next plant-based medicine issue is addressing the topic developing over the last decade the growing awareness that the gut microbiota (GM) can play a pivotal role in controlling the pathogenesis of systemic inflammatory state and chronic kidney disease (CKD) progression. To ameliorate the quality of life in CKD subjects, the use of dietary supplements has increased over time. Among those, curcumin has demonstrated significant anti-inflammatory properties. Ceccarani et al. recently reported in the Journal of Nutrients, a pilot study to assess the effects of curcumin supplementation in CKD patients through a multifaceted analysis of the nutritional status, dietary intakes, inflammation status, and oxidative stress, and gut microbiota composition. Notably, curcumin supplementation showed an anti-inflammatory effect with significantly reduced plasma pro-inflammatory chemokine mediators. Regarding gut microbiota analysis, after 6 months of curcumin supplementation, CKD's alpha-diversity showed a significant trend toward values similar to the healthy ones. In addition, no adverse events were observed in the supplemented group, confirming the good safety profile of curcumin phytosome after long-term administration.

The NanoPhotometer® NP80 was used in this study to quantify the extracted DNA.

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Induction of apoptosis by *Eleutherine bulbosa* (Mill.) Urb. bulb extracted under optimised extraction condition on human retinoblastoma cancer cells (WERI-Rb-1)

Kamarudin AA, Sayuti NH, Saad N, Razak NAA, Esa NM.



The last plant-based medicine issue of the Implen NanoPhotometer® Journal Club is covering the therapeutic potential of the bulb of *Eleutherine bulbosa* (Mill.) Urb., an indigenous medicinal plant traditionally used among Dayak people, which has been reported to have a potent anti-cancer potential. Kamarudin et al. recently published in the International Journal of Molecular Studies, the first study to examine the chemotherapeutic potential of the *E. bulbosa* ethanolic bulb extract on retinoblastoma cancer cells. Their findings indicated that the *E. bulbosa* bulb could have promising chemotherapeutic potential to treat retinoblastoma cancer cells as the optimised *E. bulbosa* ethanolic bulb extract induced a significant cell death and cell cycle arrestment on retinoblastoma cancer cells. This provides evidence that the bulb of *E. bulbosa* is also a potential cytotoxic natural resource that has promise to be developed into new drugs to combat cancers.

The NanoPhotometer® was used in this study to evaluate the quality and quantity of RNA.

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