



Implen Journal Club | September Issue

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

Nanomedicine Edition

September | Nanomedicine Edition

Novel bone tumor cell targeting nanosystem for chemophotothermal therapy of malignant bone tumors

Yitong Wang, Jinjie Cui, Jiajie Chen, Jianyu Wan, Yakun Liang, Ming Qi, Xudong Wang, Lei Zhang, Kaili Lin

In the first issue of the Implen NanoPhotometer® Journal Club: Nanomedicine Edition, the work of Wang et. al. recently published in the Chemical Engineering Journal providing an effective new approach for the treatment of malignant bone tumors is being highlighted. Malignant bone tumors are frequent and difficult to cure, which is still a major clinical challenge as the bone microenvironment provides a “barrier” for bone tumors to resist clinical chemoradiotherapy, implying that molecules targeting tumor cells alone cannot effectively target bone tumor cells.

The purity, concentration and integrity of RNA were evaluated with the NanoPhotometer® spectrophotometer.

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Polyoxometalate Nanoparticles as a Potential Glioblastoma Therapeutic via Lipid-Mediated Cell Death

Michael S. Petronek, Bryan G. Allen, Gregor Luthe and Jeffrey M. Stolwijk

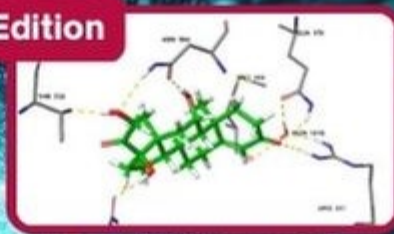
Next, the Nanomedicine Edition is covering a novel, easy-to-use, UV-Vis spectroscopy-based method to accurately observe Polyoxometalate nanoparticles (POMs)- a class of compounds made up of multiple transition metals linked together using oxygen atoms, which have an increased interest in use as organo-metallic compounds for cancer therapy. This method was introduced in a recent study published in the International Journal of Molecular Sciences, wherein Petronek et. al. developed two POM preparations shown to have anti-cancer effects on glioblastoma cells. These preliminary results suggest that Mo-POMs (NH₄)Mo₇O₂₄) and W-POMs (H₃PW₁₂O₄₀) may warrant further investigation into their utility as adjunct cancer therapies.

All spectrophotometric measurements were carried out using the NanoPhotometer® P330 microvolume spectrophotometer instead of a normal cuvette spectrophotometer. The Implen NanoPhotometer® works by decreasing the pathlength, and thus introducing an artificial dilution factor so less sample is needed. More importantly, there is a direct measurement of the POM samples, eliminating any interference of any cuvette material.

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A Poly (Caprolactone)-Cellulose Nanocomposite Hydrogel for Transdermal Delivery of Hydrocortisone in Treating Psoriasis Vulgaris

Pierre P. D. Kondiah, Thankhoe A. Rants'o, Siphio Mdanda, Lawrence M Mohlomi and Yahya E. Choonara



In the last issue, we are discussing the use of a nanocomposite hydrogel for transdermal delivery of hydrocortisone in treating Psoriasis vulgaris (PV), a common chronic, incurable inflammatory skin condition with a severe impact on quality of life affecting much of the population. Kondiah et. al. published their recent work in the polymers journal in which they synthesized a thermo-responsive nano-hydrogel system loaded with an anti-psoriasis drug hydrocortisone (HCT). Results from the formulation of HCT-loaded SMS-PCL nanoparticles encapsulated with CMC showed evidence that this hydrogel can be utilized as a potentially invaluable formulation for transdermal drug delivery of HCT, with less toxicity along with improved efficacy and patient conformity. Further studies with in vivo models should be conducted to assess this as a potential novel therapeutic outlet for the treatment of inflammatory skin disease.

The samples were analyzed from the calibration curve utilizing the NanoPhotometer® NP80 UV/Vis Spectrophotometer at wavelength 245 nm to determine the concentration of HCT as well as the concentration of HCT in the release medium was assayed by UV/Vis spectrophotometry (Implen NanoPhotometer® NP80 UV/Vis Spectrophotometer.)

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