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Fluorescein Dye for Exploring Anti-Cancer Drug Dissolution Kinetics

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ABSTRACT

Nanocrystalline formulations of anti-tumor drugs have been shown to improve desirable characteristics as well as increase the efficacy of delivery. However, the improvements seen are not strong enough to eradicate tumors and there exists a need to better understand how the drug particles move about and release in the body. The use of fluorophores incorporated into substrates allows for highly sensitive and resolute imaging in the body without the need for radioisotopes. This research aims to utilize quenching characteristics of fluorescein in order to provide pharmacokinetic information to aid in the improvement of nanoparticulate delivery formulations. Nanocrystal formulations of paclitaxel were created which included various concentrations of fluorescein and were then analyzed using fluorescent spectroscopy. Experimental results explored the excitation and/or emission wavelength maxima value's dependence on upon the concentration of fluorescein incorporated into paclitaxel nanocrystals. Additional work is needed to validate these conclusions under in vivo conditions but indicate it is possible to gain an understanding of the pharmacokinetics of drug formulations by using a fluorescent agent.

KEYWORDS

Fluorescent dye, fluorescein, nanocrystal, paclitaxel