

Ionic liquid green synthesis of CeO₂ nano rods and nano-cubes: investigation of the shape dependent on catalytic performance

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Abstract:

Incorporation of nano drug delivery systems with herbal extracts is a promising research area which provides possibility of obtaining high efficacy with low dose of natural therapeutics. In this aspect we prepared the nano-micellar formulation of the polyphenolic fraction of *Thymus vulgaris* L. (ThV) using poly(lactic-co-glycolic) acid (PLGA). ThV is very well known for its anticancer activity. Phenolic compounds are able to scavenge free radicals and show antioxidant activity. However, in cancer cell where the accumulation of Fe²⁺ ions are higher than healthy tissue, this anti-oxidant activity transforms to pro-oxidant activity via the Fenton Reaction. Pro-oxidation induces cancer cell death and this point is where the anti-cancer activity of natural products could be discussed. Thus it is possible to obtain pro-oxidant activity with low doses of plant extracts using their nano-formulations.

For this purpose petroleum ether (P.E.) extract of ThV was obtained in order to remove the non-polar and non-phenolic secondary metabolites along with the chlorophyll derivatives. Following P.E. extraction the plant material was further extracted using Acetonitrile (AcN) in room temperature to obtain an extract rich in phenolic components. ThVAcN extract was vacuum dried. Different amounts of the obtained extract (5-20 mg) was dissolved in acetone along with 50 mg PLGA and drop wise added on 20 ml of aqueous media containing 0.05% Tween 80. Acetone was evaporated in R.T. and the obtained PLGA-ThVAcN nano formulations with the size of 175nm showed increased anti-cancer efficacy against MCF-7 breast cancer cell lines compared to free ThVAcN dissolved in DMSO.

Biography:

Beyza Sumeyye Aydin has completed her master's degree at BezmialemVakif University, Faculty of Pharmacy and is a Ph.D student at the same university, Institute of Health Sciences, Biotechnology Ph.D. Programme.

Speaker Publications:

1. Apolipoprotein E4 mediated targeting of blood brain barrier using nano-micellar metal chelators for treatment of Alzheimer disease, *Biol Syst Open Access* 2015, 4:2
2. Synthesis and characterization of TPGS-gemcitabine prodrug micelles for pancreatic cancer therapy, *Journal of RSC Advance*, Issue 65, 2016

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