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Till date, melanoma is one of the prominent skin cancers exhibits the maximum mortality rate worldwide [1]. Modern studies claimed cold atmospheric plasma (CAP) utilization with different cancer cell lines and in animal models, showing promising results and recent technological advancement in plasma devices developed at PBRC showed a new way of approach in the treatment of many cancers. Apart from the therapeutic activity of CAP, nanotechnology has dramatically influenced drug delivery research for improving therapeutic performance of drugs for the cure of cancer [2,3] and hence nanoemulsion of flavonolignan (silymarin) and called as self-nano emulsifying drug delivery system (SNEDDS) were used in this study. Our main objectives are(i) to estimate growth inhibition, apoptosis in melanoma cells were calculated using PI alone and annexin-V PI apoptosis kit. Reactive oxygen species and reactive nitrogen species were assessed by flow cytometry using DCFDA and DAFFM dyes DNA damage and cell death were assessed along with apoptosis estimation,(ii) measurement of melanoma specific enzymes and inhibition of epithelial mesenchymal transition (EMT), (iii) animal weight, tumor volume and melanoma level in *in vivo* levels. Together with these studies, plasma assisted drug delivery system (PADD) by SNEDDS may play a plausible potential role in improving drug delivery to inhibit the progress of melanoma.

[1] Glazer AM, Rigel DS, Winkelmann RR, Farberg AS. *Dermatol Clin.*35(4):409-416 (2017). [2] Kaushik N et al. *Biomaterials.* 87: 118-130 (2016). [3] Zhu W, Lee SJ, Castro NJ, Yan D, Keidar M, ZhangLG. *Sci Rep.* 26;6:21974 (2016).