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Satish Agrawal et al., J Pharm Drug Deliv Res 2017, 6:4 (Suppl)
DOI: 10.4172/2325-9604-C1-021

International Conference and Exhibition on

# Nanomedicine and Drug Delivery

May 29-31, 2017 Osaka, Japan

## CD44 targeting hyaluronic acid coated lapatinib nanocrystals for fostered efficacy against triple-negative breast cancer

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Lapatinib (LPT) is an orally administered drug for the treatment of metastatic breast cancer. However, there are many drawbacks associated with LPT that limits its therapeutic activity. In order to address the limitations associated with LPT, we have prepared its nanocrystals (LPT-NCs) those were subsequently coated with hyaluronic acid (HA) to produce LPT-HA-NCs. The detailed investigation of LPT-HA-NCs showed the superior anticancer activity than its counterparts LPT-NCs and free LPT. LPT-HA-NCs were associated with increased cytotoxicity and the enhanced uptake in MDA-MB-231 cells due to active targeting to CD44 and EGFR receptors. It was also evident that the LPT-HA-NCs induced apoptosis is due to the Fas and mitochondrial membrane potential dependent pathway. The results of in-vitro studies were followed very well in the in-vivo studies. In the triple negative 4T1 cells induced breast tumor bearing female Balb/C mice; LPT-HA-NCs not only increased the residence time of LPT, but also targeted the tumor, reduced the tumor burden, and increased overall survival. Our findings clearly suggest that HA coated LPT-NCs formulation enhances the activity of LPT against triple negative breast cancer. It exhibited magnificent therapeutic outcome at low dose thus presenting a strategy to reduce dose administrations and minimize dose related toxicity.

### Biography

Satish Agrawal has his expertise in formulation of novel, specially nano-drug delivery systems and their biomedical testing in animal models. He has completed his BPharm from Pune University, MPharm from BITS Pilani University, and currently pursing PhD from Central Drug Research Institute, Lucknow, India. He has also completed PGDBA (Operations) from Symbiosis Centre for Distance Learning, Pune. He has published 9 papers in reputed journals and has strong passion for research in drug delivery systems.

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