

Scientists at RGCB finds chemosensitization may enhance therapeutic efficacy of chemo drugs used to treat cancer

By Dr Bilqeesa Bhat

Dr. Ruby John Anto, Scientist at Thiruvananthapuram based research laboratory, the Rajiv Gandhi Centre for Biotechnology (RGCB) reported chemosensitizing effect of curcumin on cervical cancer cells treated with paclitaxel chemotherapy *in vitro*. Curcumin is the yellow coloured pigment present in turmeric. Chemosensitization using non-toxic natural compounds such as curcumin is a very promising strategy to counter chemoresistance, thereby attaining maximum therapeutic efficacy with lower doses of a chemodrug.

Dr. Anto's group has also reported chemo preventive efficacy of curcumin against nicotine-induced lung cancer progression. The curcumin down-regulated the nicotine-induced survival signals in lung cancer cells independent of their p53 status. Pre-clinical validation of the synergistic effect of curcumin and paclitaxel using xenograft model of human cervical cancer and 3-MC-induced cervical carcinogenesis model have shown that a sub-optimal concentration of curcumin enhances the antitumor action of paclitaxel drug by down-regulating the activation of major survival signals.

In vitro and *in vivo* studies using a synergistic combination of curcumin and fluorouracil (5FU) have proved that curcumin chemosensitizes breast cancer cells to 5-FU, independent of their receptor status. The major highlight of this study is the receptor independent mode of action of the combination which might be helpful to patients of all breast cancer subtypes if corroborated with clinical trials.

A 25 μ M of curcumin is cytotoxic to cancer cells of various origins *in vitro*. Clinical trials using curcumin as a chemotherapeutic agent have not yet generated any promising results, since maximum bioavailable concentration of the compound is limited to 5 μ M. As curcumin is still not accepted as a chemotherapeutic agent due to its poor bioavailability and retention time in the body, Dr. Anto's group has developed two nanoformulations of curcumin which were shown to enhance the chemosensitizing ability of curcumin. Further, evaluation of the various combinations of curcumin is done with Jubilee Mission Medical College and Research Centre, Thrissur, Kerala.

Dr. Anto's had been working on curcumin since her doctoral degree days. Later, the magnificent chemopreventive and chemosensitizing efficacy of curcumin became the major focus of her research group. The lab has filed patent for this finding.

Contact details:

Dr. Anish N P

E-mail: anishnp@rgcb.res.in

Phone No.: 0471 2529400