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Novel Curcumin Nano Formulations for Breast Cancer

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Abstract

Introduction: Curcumin is a natural yellow compound that is obtained from Curcuma longa. Curcumin is found in two forms of ketone and enol that in PH > 8, enol form is predominant. In enol form, curcumin acts as a potent antioxidant by losing its proton and reduction of free radicals. However, curcumin has had very low dissolution in water and its ketone form has been predominant in acidic conditions (the PH of environment surrounding the tumor is acidic). In addition, degradation rate of curcumin by enzyme and its elimination from the bloodstream is very high. So, the antioxidants effects of curcumin in the body have had greatly reduce. Today, scientists have promising that nanoparticles of curcumin can to overcome at these problems. In this study, has used of a new curcumin-albumin Nano formulation and measured its effect on MCF 7 and PBMC cells.

Materials and Methods: After making of curcumin- albumin Nano drug, anticancer effects of its have been examined by MTT and flow cytometry tests on MCF7 and PBMC cells.

Results: The MTT test showed that in the first 24 hours, the antioxidant effect of free curcumin and Nano drug has been similar and after 48 hours, curcumin antioxidant properties has reduced but Nano drug antioxidant properties have not changed. For normal cells, the results were almost the same. Flow cytometry has shown that at 54 µmol concentration, free curcumin and Nano drug have led to 74% and 83% apoptosis in MCF 7 and survival value of PBMC was 84% and 92%, respectively.

Conclusions: Nano-curcumin drug increase curcumin solubility in water and its stability in physiological and acidic conditions. These, have been able it to overcome the limitation of use of curcumin.