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## Effect of nanocurcumin for management of subclinical mastitis

**P Sankar**[1], **S Suresh**[2] and **A G Telang**[2]
[1]Tamil Nadu Veterinary and Animal Sciences University, India
[2]Indian Veterinary Research Institute, India

The therapeutic potential of polymeric nanoparticle-encapsulated curcumin was evaluated in mouse model of mastitis. Mastitis caused by *Staphylococcus aureus* is usually subclinical and chronic in nature. Poly-(D, L-lactide)-co-glycolide (PLGA)-encapsulated curcumin nanoparticles (CUR-NP) prepared through solid-in-oil-in-water emulsion technique were administered by oral gavage as pre-treatment from day 2 to day 7 of parturition. Both curcumin and CUR-NP were administered at 100 mg/kg bw. Mastitis was induced by infecting the mice with *Staphylococcus aureus* through intramammary inoculation on the 9th day of parturition. Accordingly, the curcumin or CUR-NP-pretreated mice were given intramammary inoculation. Body temperature was recorded at different time intervals after inoculation. Mammary tissues from animals were collected at 24, 48 and 72 hours post-infection. There was swelling in the mammary gland of the mastitis control mice. In these animals, there were significant rise in body temperature and increase in neutrophil and decrease in lymphocyte counts. The swelling subsided in both the curcumin and CUR-NP-treated mice after 12 to 24 hours, while body temperature and the leukocyte counts were restored after 48-72 hours in these animals. The number of colony forming unit (CFU) counted in the L4 abdominal mammary gland homogenate of the mastitis control group was significantly reduced with both curcumin and CUR-NP. Differential bacterial count was done in the same homogenate. Curcumin significantly decreased the total and extracellular counts, whereas CUR-NP also decreased intracellular count. Comparison of the effects showed that CUR-NP was significantly more effective in reducing the body temperature, CFU and intracellular bacterial count than curcumin. These results suggest that CUR-NP may possess better potential in alleviating murine mastitis than curcumin.

### Biography

P Sankar is currently working as an Assistant Professor in the Department of Veterinary Pharmacology and Toxicology, Veterinary College and Research Institute, under Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), Chennai. He has obtained his BVSc in Veterinary Science at TANUVAS in the year 2005, MVSc and Doctoral degree in Veterinary Pharmacology and Toxicology in the year 2008 and 2012 respectively at Indian Veterinary Research Institute, Deemed University, India, where he worked as a Scientist for four years in the area of Toxicology and Nanoparticle Drug Delivery. He was awarded with ICAR Junior Research Fellowship for pursing his Master's degree and Senior Research Fellowship for Doctoral Program. Currently his research focuses on the nanoparticle drug delivery system to improve the drug efficiency of existing drugs in markets. In addition, he has completed three research projects in the area of nanoparticle drug delivery and toxicology and has published research papers in the peer reviewed international journals with good impact factor.

drpsankarster@gmail.com

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