

Process for preparation of nano-curcumin based formulation

Defence Institute of Physiology and Allied Sciences (DIPAS) has developed a formulation based on Nanocurcumin (NCF) which has the potential to maintain the general health at high altitudes especially the cardiac health including several others. A patent has been granted to DIPAS on this formulation, preclinical and toxicity studies under GLP condition have been completed and found to be safe.

Nano-curcumin formulation is a unique formulation containing nanocurcumin and pyrrolo-quinolinequinine (PQQ), which supplements the brain and body to function and adapt in severe stressful conditions along with increasing work endurance. Curcumin, a dietary pigment obtained from *Curcuma longa*, possesses tremendous therapeutic potential but has not been used as a drug of choice because of its poor bio-availability and rapid elimination. We have overcome these problems by nanotizing curcumin to nanocurcumin while maintaining its biological functions. While, PQQ is a naturally occurring redox co-factor found in various fruits and vegetables.

Studies were performed on *in-vivo* animal model (Sprague Dawley rats) as well as on *in-vitro* model like Human Ventricular Cardiomyocytes (HVCM) and rodent cardiomyocytes (H9c2) showed anti-inflammatory and anti-apoptotic properties, maintains redox status thus improving overall health by modulating mitochondrial functioning, biogenesis and integrity. It also increases work endurance and cardiac function.

The toxicity analysis at GLP certified lab established NCF to be safe as per the pre-clinical requirements of CDSCO. The calculated (extrapolated) LD50 was more than 5000mg/kg bw.

Thus, the proposed use of nanocurcumin formulation as a potential therapeutic agent to maintain the general health at high altitudes especially the cardiac health including several others.