cells was 40.2 μmol/L substantiating its anticancer efficacy. Accelerated stability studies revealed insignificant effects of temperature and humidity on LT-9. In summary, solubility enhancement of curcumin in LTs produced significant improvements in its permeation and bioavailability.

Sierra, A. F. et al. (2013). "In vivo and in vitro evaluation of the use of a newly developed melatonin loaded emulsion combined with UV filters as a protective agent against skin irradiation." *J Dermatol Sci* 69(3):202–214.

BACKGROUND: Melatonin has attracted attention because of their high antioxidant and anticarcinogenic activity. Otherwise, the use of sunscreens is recommended for patients after chemotherapy and radiotherapy treatments or to prevent UV radiation-induced skin damages that may result in precancerous and cancerous skin lesions. OBJECTIVE: To evaluate the beneficial influence of melatonin in topical sunscreen emulsions combined with three common ultraviolet filters. METHODS: After the formulation characterization in terms of rheology, stability studies were performed. Release studies let us to evaluate its mechanism of delivery and ex vivo permeation study through human skin, the amount of melatonin retained. The antioxidant activity assay was also carried out, and finally the in vivo photoprotective effect in rats was tested as transepidermal water loss and erythema formation. RESULTS: The rheological behaviour of formulations was pseudoplastic fluid, all emulsions had good physical stability. Release studies showed a trend of enhancement in melatonin release from emulsions incorporating UV filters and followed a Weibull model. Melatonin permeation was higher from the emulsion containing melatonin combined with a mixture of three ultraviolet filters (MMIX) formulation. Equally this formulation exhibited the highest radical scavenging activity. Finally, the photoprotective assay showed that only skin areas treated with this formulation were statistically equivalent to the unirradiated control area. CONCLUSION: MMIX formulation would be a promising formulation for preventing the undesirable adverse effects of UV skin irradiation because melatonin not only acts as a potent antioxidant itself, but also is capable of activating an endogenous enzymatic protective system against oxidative stress.

Thatai, P. et al. (2016). "Progressive development in experimental models of transungual drug delivery of anti-fungal agents." *Int J Cosmet Sci* 38(1):1–12.

Preclinical development comprises of different procedures that relate drug discovery in the laboratory for commencement of human clinical trials. Preclinical studies can be designed to recognize a lead candidate from a list to develop the procedure for scale-up, to choose the unsurpassed formulation, to determine the frequency, and duration of exposure; and eventually make the foundation of the anticipated clinical trial design. The foremost aim in the pharmaceutical research and industry is the claim of drug product quality throughout a drug's life cycle. The particulars of the preclinical development process for different candidates may vary; however, all have some common features. Typically, in vitro, in vivo, or ex vivo studies are elements of preclinical studies. Human pharmacokinetic in vivo studies are often supposed to serve as the 'gold standard' to assess product performance. On the other hand, when this general assumption is revisited, it appears that in vitro studies are occasionally better than in vivo studies in assessing dosage forms.