

The Preclinical Drug Development Platform Pheroid® Phytofare® pH2™ Technology

Dr. Nicola Barnard^a; Professor Banie Boneschans,^b Dr. Sterna van Zyl, Sir Roger Baylis-Duffield^c, Dr. Liezl-Marie Scholtz^a, Awie Kotze^d and Professor Anne Grobler^a

^aDST/NWU Preclinical Drug Development Platform, Faculty of Health Sciences, North-West University, Potchefstroom, South Africa, nicola.barnard@nwu.ac.za

^bCEL Cosmetics efficacy laboratory, North-West University, Potchefstroom, South Africa

^cSir Roger Baylis Duffield, Plandai Biotechnology (South Africa) Pty Limited, 9 Palm St, White River 1240, South Africa

^dDean: Health Sciences, North-West University, Potchefstroom Campus, South Africa

Efficient delivery to the target or site of action is critical for the efficacy of any active ingredient (AI). Various applications of the Pheroid® AI delivery system have been patented and registered as this technology shows enhanced absorption of actives in various pharmacological categories.

Pheroid® technology may be fine-tuned to the entrapped active ingredient as well as to the desired route of administration whether; topical, oral dosage forms or injectables. Hydrophilic, hydrophobic and amphiphilic compounds may be entrapped and efficiently delivered through manipulation of loading ability, mechanical resistance, permeability, size and solubility. Thus increasing *in vivo* absorption and bioavailability of a wide variety of active ingredients in novel dosage forms.

Pheroid® has been investigated for use in vaccines, peptides, antimicrobial treatments, radiopharmaceuticals, nutraceuticals, agriculture and animal health. The ability of Pheroid® technology to transverse most biological barriers, including the skin opens up a “prism of possibilities”. Pheroid® technology allows for penetration and delivery of active compounds within the epidermal layer through the superficial layers of the skin, resulting in enriched cosmeceutical and topical products.

Improved absorption/efficacy of Pheroid® entrapped ingredients often results in decrease in side effects, reduced drug resistance and allows administration of less active ingredient less frequently. The technology shown protection toward sensitive active ingredients with regard to stability on the shelf as well as *in vivo*. Successful use of Pheroid® technology has been publicized in a number of studies, preclinical and clinical trials.

A case study will also be discussed. Two formulations coded as Formula A (containing Phytofare® catechin complex entrapped in Pheroid® vesicles) and B (reference formulation)

were evaluated. Phytofare® is a trademarked extraction process of flavonoids/polyphenols from a variety of organic sources, in this case *Camellia sinensis*, and converts these molecules into a highly bioavailable form. The formulas are compared with regard to skin moisture content, -elasticity and -surface parameters. The clinical results showed the Pheroid® Phytofare® formulation is an excellent candidate as the active ingredient with moisturiser and anti-aging skin care products.

