

Nano-delivery of secondary-lipophilic drug system: In vitro and ex vivo studies

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Abstract

Probuticol is a highly lipophilic drug that has potent anti-inflammatory and anti-oxidant properties. It has been shown to have a protective effect on pancreatic β cells and made a potential therapeutic agent in the treatment of T2D. Despite its high efficacy and strong antioxidant effects, PB showed significant variation after oral absorption, poor oral bioavailability, and potentially severe side effects, which restricted its use. This study aimed to examine PB and LCA microcapsules in terms of the microcapsules' morphology, microcapsules membrane strength, release kinetics and biological effects *ex vivo*. Microcapsules (PB-SA and PB-LCA-SA) were prepared with a Buchi-based microencapsulating system, based on the jet-flow microencapsulation technique using polymer sodium alginate (SA) and examined *in vitro* (formulation studies) and *ex vivo*.

Both control and test microcapsules showed good and uniform morphology characteristics. Incorporation of LCA did not alter the drug content, production yield microencapsulation efficiency, zeta potential, and particle size. However, LCA reduced conductivity, microcapsules swelling, improved membrane resistance and controlled and targeted release of PB. The microcapsules swelling and drug release pattern were higher at high pH values (pH 7.8, $p < 0.05$). LCA microcapsules enhanced cell viability but not statistically significant, reduced the inflammatory profile ($p < 0.01$), increased anti-inflammatory cytokine and improved bioenergetics parameter ($p < 0.01$). LCA improved the characteristics and release pattern of PB microcapsules and also enhanced their pharmacological activity *in vitro* and *ex vivo*, suggesting potential oral targeted delivery and applications in diabetes treatment.

Biography:

My name is Susbin Raj Wagle. I am from Nepal and came to study in Australia in year 2014. I successfully completed Master of Biomedical Science from Curtin University in December, 2015.

During my study and worked time, I was exposed to the field of clinical research through my courses; that is where my interest developed in this research field. I thoroughly enjoyed the challenge these courses provided and I found myself immersed in the world of research.

This research and lab field is, to me, one of the fundamental areas of science in modern day society. But, I knew this study is not sufficient to be a genuine researcher. Hence, I decided to continue further study, and I enrolled in a Master of Philosophy at Curtin University on 1 May, 2018. The normal length of this course is 2 years. Throughout the course period, my study and research will be focused on drug delivery and encapsulation. This course and topic I choose is a solid step towards my future career as a researcher who understands and appreciates science and technology.

My ultimate goal is to pursue a PhD (under present research topic and supervisor) and return back to my home country Nepal as in recent years, the Nepalese government has paid more and more attention to higher education and scientific research, which is becoming better and better. Speaker Publications:

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