

Title - Research and Review of EudragitTM Polymers in the Development of pH-Targeted Pharmaceutical Delivery

Program of Study – Chemistry

Presentation Type – Physical Poster

Subtype –Basic.

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Abstract: The following presentation shall be written regarding research performed with Dr. Korn in his collaboration with Dr. Bauer of Liberty University's College of Osteopathic Medicine (LUCOM). The focus of the research is that of polymeric nanoparticles, specifically a EudragitTM based copolymer in the formation of a capsule for pharmaceutical payloads. Nanoparticles are particles that possess a dimension that is less than 100nm. They are being explored for new methods of controlled release systems for treatment to deliver both soluble and insoluble compounds for medicinal purpose. This research will explore the properties of nanoparticles constructed from EudragitTM, a copolymer derived of methacrylic and acrylic esters. One specific goal of the research will be to incorporate an enzyme, such as alkaline phosphatase, with the nanoparticle. Upon incorporation of the alkaline phosphatase or a similar biomolecule, experiments will be performed to measure the activity of the enzyme or biomolecule. The EudragitTM based compound in particular is being applied as a pharmaceutical delivery system that is pH-selective; it will maintain structure in acidic environments, but releases the contents in more basic environments. Applied to the human body, these polymer payloads are designed to carry medication through the acidic environment of the stomach to the higher pH found within the more basic environment of the intestines and colonic regions of the body. This research is significant both chemically and

medicinally. Methods of construction of polymeric nanoparticles that generate a microscopic powder will be researched to increase understanding of the process of generating and refining polymer capsules. This research may also provide insight in assessing the EudragitTM nanoparticles' chemical properties, providing for potential advancement in the relatively new field of polymeric nanoparticles. Medicinally, the significance is based in advancing the treatment and care of patients. If certain enzymes, proteins, and medicative variants may be encapsulated by EudragitTM, treatment options for a variety of illnesses could increase. Furthermore, treatment may be more effective if implemented into a polymer, making current treatments or medications more efficacious. The ability to enhance and create targeted drug delivery systems will expand care and treatment options provided by physicians to their patients.