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PACLITAXEL LOADED AND SURFACE COATED N-VINYL CAPROLACTAM NANOPARTICLES FOR BREAST CANCER DRUG DELIVERY

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ABSTRACT

In this work, a nanoformulation of pacliatxel with biodegradable thermo-responsive N-vinyl caprolactam (NVC) is developed for delivery to cancer cells. The thermo-responsive graft co-polymeric nanoparticles (PNVC-MAAc) were prepared by dispersion polymerization method, which showed a lower critical solution temperature (LCST). The paclitaxel drug was incorporated into the carrier using cross-linking reaction. After several characterizations, it was found that the nanoformulation developed met the characteristics fit for cancer drug delivery such as appeared in nanometer in size, better morphology and improve the surface charge of the NPs. These results indicated that PTX-PNVC-MAAc NPs could be a promising candidate for cancer drug delivery.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Breast cancer is a malignant tumor which is a collection of cancer cells and arising from cells of the breast. Breast cancer is the most common cancer among American women. One in four new cancers diagnosed worldwide each year is a cancer of the female breast (Washbrook, 2006). According to new estimate approximately 230,500 new breast cancer cases were diagnosed in 2011 in the U.S (Yip, Taib, & Mohamed, 2006). In Malaysia breast cancer is the most common cancer in woman and in 2007 total 3, 242 cases were diagnosed (*National Cancer Registry Report*, 2007). Despite breast cancer is a major Public Health issue worldwide, the main causes of the incidence of breast cancer are still not fully understood.

Without denying the fact that major development has been done in order to treat and abate the incidence of this fatal cancer. Chemotherapy is one of an effective treatment for cancer and other serious diseases such as cardiovascular restenosis and AIDS. However, problem still exists where patients have to tolerate severe side effects and sacrifice their quality of life after the treatment (Feng, 2004).