CHAPTER 1

1.0 INTRODUCTION

One of the human microflora found in nature exist under genus *Acinetobacter* that causes infection. *Acinetobacter* is always related to skin colonization of hospitalized patients, but have not been reported to cause serious infections. Today, *Acinetobacter* has been widely involved in outbreaks of nosocomial infections causing pneumonia, bacteraemia, urinary tract infections, wound infections and meningitis. *Acinetobacter* is known to grow and infect hospital inpatients and spread amongst patients through cross-contaminated hands and hospital equipments. The bacterium can survives well in the hospital environment and on dry surfaces. At the same time *Acinetobacter* can develop resistance to many antimicrobial agents. Normally, Carbapenems are the drugs of choice for the treatment of *Acinetobacter* infection. Under Carbapenems family, Imipenem antibiotic (Tienam®) have been the chosen one used for the treatment of bacteraemia and ventilator-associated pneumonia caused by *Acinetobacter* spp. (Misbah *et al*., 2004).

Previous study has indicated that the best time to treat *Acinetobacter* is when the bacteria start to enter its log phase during its growing time. This involves incubation on culture plate and it occurs more than 2 hours. After 2 hours of incubations, *Acinetobacter* can be easily treated at a maximum concentration of Tienam® (Misbah *et al*., 2004). In addition to this, maximum concentration of Tienam® requires treating *Acinetobacter* at 64µg/ml, but 2 hours is such a long period of time. Therefore, to overcome this problem and to help the researcher, we have come out with this study on the purpose of developing a product that can delay for releasing of Tienam® antibiotics. The products will be use only for research on broth cultures study of *Acinetobacter* in

laboratory. We aim to microencapsulate the Tienam® antibiotics with PEG of different molecular weight.

Taking the above factor into consideration, the objectives of the study were as follows:-

(a) To microencapsulate Tienam® into PEG 2000 and PEG 35000 by using freeze drying method.

(b) To characterize both microencapsulated product by thermal analysis study by using Differential Scanning Calorimeter (DSC).