UNIVERSITI TEKNOLOGI MARA

A BIOINFORMATICS APPROACH FOR THE IDENTIFICATION OF VACCINE CANDIDATE IN PATHOGENS, WITH SPECIAL REFERENCE TO *TREPONEMA PALLIDUM*

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CHAPTER 1

INTRODUCTION

1.1 Background

Syphilis is a chronic, complex sexually transmitted infection of major global importance. It becomes a serious transmitted disease since decades ago (Chao, *et. al.*, 2006 and Kerani, *et. al.*, 2007).

It was reported that the progression of the current rate of syphilis in Baltimore, Maryland which is located in northeast of the United State was erupted during the later part of 1994. A large multi-ethnic community in that area experienced an outbreak of syphilis that peaked in 1997 with cases classified as primary, secondary or latent syphilis. In 1998, the city accounted for 1490 total syphilis cases as well as 263 new cases reported for 1999. Baltimore becomes the city with the highest number of syphilis cases in the nation. (Williams and Ekundayo, 2001) Rate of P&S syphilis in United State increased between 2001 and 2006. Overall increases in rates between those years were observed primarily among men (from 3.0 cases per 100,000 populations to 5.7 cases per 100,000 populations). While among women, the rate of P&S syphilis increased from 0.8 cases per 100,000 populations in 2004 to 0.9 cases per 100,000 populations in 2005 to 1.0 case per 100,000 populations in 2006 (Center of Disease Control. Department of Health and

Human Service, 2006). In Malaysia, the rate of syphilis started on year 1999 was higher which are 11.70 cases per 100,000 populations. But, it declined every year to 3.06 in 2006 (Ministry of Health Malaysia, 2008).

The sign of primary syphilis is a painless chancre that develops at the site of inoculation. Chancres appear about 3 weeks after sexual contact and heal within 3 to 6 weeks. Painless, nonsuppurative adenopathy frequently accompanies this presentation. The clinical manifestations of primary syphilis may go unnoticed by the patient and her partner because of the common sites for syphilis develops is the cervix and these lesions are usually painless (Rodney, 2000). Secondary syphilis is well known for its varied clinical signs. Untreated patients will progress to this stage within 4 to 10 weeks after the signs of primary syphilis resolve. Patients at this stage may develop fever, fatigue, sore throat, myalgia and a diffuse rash of the palms and soles. Other signs are alopecia areata, lymphadenopathy, and the genital lesions of condyloma lata. At times, oral lesions called mucous patches may appear (Alona, 2004). Meanwhile, patients with latent syphilis have no clinical evidence of infection. They do, however, demonstrate serologic evidence of infection. Patients who have acquired the infection within the past year have *early latent syphilis.* While patient with *late latent syphilis* have no clinical evidence of disease but are seroreactive for syphilis of unknown duration. Tertiary stage includes gummatous lesions, cardiovascular disease (aortitis), and neurosyphilis. Gummatous and cardiovascular syphilis are rarely lowed by focal neurologic deficits