Nuanjun Wichukchinda 2007: Transformation of Human Immunodeficiency Virus Type 1 Envelope Glycoproteins in Tobacco and Silkworm. Doctor of Philosophy (Bioscience), Major Field: Bioscience, Interdisciplinary Graduate Program. Thesis Advisor: Associate Professor Sunanta Ratanapo, Ph.D. 111 pages

HIV-1 infection which causes AIDS is still be health, social and economical problems in Thailand. Early diagnosis of HIV-1 infected individuals is one of the strategies to confine the spreading of this incurable virus. Every year, commercial kits for HIV-1 infection diagnosis were imported to Thailand at several hundred millions Baht. The development of production system for proteins used as antigens in diagnostic kit is very important for self-depending and decreasing imports of recombinant proteins and commercial kits to Thailand. In this study, two systems, tobacco plant with *Agrobacterium*-mediated and silkworm with piggyBac based transformation were tried for expression of HIV-1 gp120 and gp41.

The successful of transgenesis of gp120 into tobacco plant was demonstrated by the presence of integrated gp120 coding sequence in the genomic DNA of transformed tobacco plants by nested-PCR, and confirmed by sequencing. However, neither gp120 mRNA nor protein was detected. This study did not success for transgenesis of gp41 into tobacco plant, and for neither gp120 nor gp41 into silkworm. Naturally, HIV-1 infects only human and uses advance machinery of human cell to produce all viral proteins. Furthermore, envelope glycoprotein of HIV-1 was expressed as gp160 polyprotein precursor, which later be glycosylated and cleaved into gp120 and gp41 during viral maturation. The research and development of protein production system to produce such special proteins like HIV- 1 gp120 and gp41would be desired.

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