CHAPTER 1

BACKGROUND AND RATIONALE :

Hemoglobin (Hb) Bart's hydrops fetalis is a lethal condition, invariably complicated by serious maternal complications[1-3]. It is due to homozygous alpha thalassemia 1 (- - SEA/- - SEA)[4], in which all four alpha thalassemia genes are deleted. Hb Bart's hydrops fetalis is the most common cause of late fetal loss in Southern Chinese, Filipinos, and other Southeast Asian countries. Alpha thalassemia 1 carrier (trait) is common in Thailand. Its prevalence is 3.5% in Bangkok[5] and up to 14% in Northern Thailand(Chiengmai)[6], giving an expected homozygote incidence of 0.3 and 4.9 per thousand pregnancy in Bangkok and Chiengmai respectively.

The carrier state of alpha-thalassemia 1 is asymptomatic, with abnormality of red cell indices or microcytic (MCV<80fl), but these changes are not specific. The most commonly test used for screening alpha-thalassemia carrier state is MCV[7] and osmotic fragility test[8] (OFT).The former is fast, reliable, but

expensive and highly technological while the latter is simple, fast, and low cost. The subject who has positive osmotic fragility test may suffer from iron deficiency anemia, alpha and beta-thalassemia trait.

The **Hb H inclusion test**[9] , based on incubation of erythrocytes with brilliant cresyl blue, is used extensively in detection of subject with alpha thalassemia after being screened by MCV. However it is quite laborious to scan Hb H granules and faulty incubation of erythrocytes which may cause to false negative results. Another test, **Polymerase Chain Reaction (PCR)**[10,11] based protocol which specifically detect the alpha thalassemia 1 (- - SEA/ deletion) is a possible alternative method for diagnosis of alpha-thalassemia. The limitation of this test is expensive and highly technological.

Therefore, this study tries to modify the hemoglobin H inclusion test that can be used in the laboratories lacking PCR facilities in order to detect alpha-thalassemia trait among osmotic fragility positive screenee.