# CHAPTER 5

# CONCLUSION

## 5.1 Organophosphate and carbamate pesticides

The present study shows that SBChE did not have any variability due to the disease status' effect on the activity of enzymes, i. e. hypertension, hyperlipidemia, diabetes and taking the contraceptive pill. Moreover, in consumers who were less exposed to pesticides didn't have any variability in low level detection of SBChE because the present study showed a correlation ($r = 0.232$, $P = 0.020$) between the activity of SBChE and PBChE only in consumers. Results from the present study suggest that SBChE may be an alternative biomarker for pesticide exposure beside PBChE among non-farmers or consumers. The modified methods in the present study showed sufficient sensitivity with a low LOQ and high accuracy when applied to measure ChE activity in saliva with low variability (%CV) i. e. by the intra-assay for within-day for %CV, and between-day for all enzymes.

However, a more sensitive method than the present developed method one should be developed to measure the relatively low activities of SAChE and SBChE among ChE inhibited farmers.

**5.2 Synthetic pyrethroid pesticides**

A sensitive and specific ELISA for plasma and urinary 3-PBA had been developed. The modified methods were successfully applied to the detection of 3-PBA, a urinary metabolite of some pyrethroid insecticides among a rather large population in an agricultural area. These assays could analyze 20 and 37 samples per day for plasma and urine samples, respectively. The ELISA generated data rapidly (within 3 hr) and was suitable for routine analysis. We estimate that each sample cost about $12.00 to analyze, compared to the relatively high cost ($50-150 per sample) of instrumental analysis such as a liquid chromatography-tandem mass spectrometry (LC/MS/MS).

To our knowledge, this is the first report that compares plasma 3-PBA, including the adducted form and urinary 3-PBA in a large group of volunteers. Although there was no correlation between plasma 3-PBA and urinary 3-PBA concentrations in the study population, it may be due to differences in metabolism and urinary elimination of pyrethroids among individual as well as the higher likelihood of farmers have recent acute exposures. Further studies will be needed validate the 3-PBA in plasma as a biomarker of cumulative exposures to pyrethroids. However, the applications of the methods for plasma and urinary 3-PBA analyses in this study showed confirmation that these volunteers are exposed.