CHAPTER VII
CONCLUSIONS

1. There were 2 isoforms of *O. viverrini* cathepsin B that isolated from adult *O. viverrini*. These 2 isoforms were designated as *Ov*-CB-1 and *Ov*-CB-2.

2. *Ov*-CB-1 and *Ov*-CB-2 transcripts were detected in developmental stages of *O. viverrini* including eggs, metacercariae, immature worm and adult stages.

3. *Ov*-CB-1 is expressed as an active zymogen and can trans-activated *Ov*-CF-1 zymogen to active *Ov*-CF-1 at pH 5.5.

4. *Ov*-CB-1 and *Ov*-CF-1 can work in concert to hydrolyze human hemoglobin at low pH and they were showed different cleavage sites within hemoglobin.

5. *Ov*-CB-1 and *Ov*-CF-1 showed ability to hydrolyzed 2 major components of extracellular matrix protein, fibronectin and laminin.

6. In this study, *Ov*-CB-1 was proposed as regulator in multi-enzyme networks of *O. viverrini* at acidic condition.

7. RNAi is a key tool to investigate gene function and there have RNAi machinery and pathway in *O. viverrini*.

8. *Ov*-CB-1 susceptible to RNAi knockdown by exhibited the reduction of *Ov*-CB-1 transcript and *Ov*-CB-1 activity in adult *O. viverrini* crude somatic extracts against specific synthetic substrate.

9. Recombinant form of *Ov*-CB-1 showed highly immunogenicity with opisthorchiasis human serum and show potential as a serodiagnostic molecule for human opisthorchiasis with 67% and 81% of sensitivity and specificity, respectively.

10. Vaccination with recombinant *Ov*-CB-1 induces strong humoral immune response throughout the duration of infection in hamsters but only small level of protection against *O. viverrini* was achieved (18% worm reduction).

11. Recombinant *Ov*-CB-1 showed non-significant effects to stimulate cholangiocarcinoma cell line growth.