A Serine Protease Gene from the Firefly, *Pyrocoelia rufa*: Gene Structure, Expression, and Enzyme Activity

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We have previously cloned a serine protease cDNA from the firefly, *Pyrocoelia rufa*. We report here the gene structure, expression and functional characterization of a serine protease from *P. rufa* (PrSP). The PrSP gene spans 1474 bp and consisted of two introns and three exons coding for 257 amino acid residues. Southern blot analysis of genomic DNA suggested the presence of PrSP gene as a single copy. Western blot analysis and enzyme activity assay exhibited midgut-specific expression, suggesting that the midgut is the prime site where large quantities of PrSP are synthesized for degrading the absorbed protein from the diet. The cDNA encoding PrSP was expressed as a 31-kDa polypeptide in the baculovirus-infected insect Sf9 cells and the recombinant PrSP showed activity in the protease enzyme assay using gelatin as a substrate.