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Molecular cloning and expression of a cDNA encoding the luciferase from the firefly, *Pyrocoelia rufa*

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To clone a cDNA encoding the luciferase of the firefly, *Pyrocoelia rufa*, we have synthesized cDNA library and isolated the luciferase gene using PCR with gene specific primers. Sequence analysis of the cDNA encoding the luciferase of *P. rufa* resulted that the 1,647 bp cDNA has an open reading frame of 548 amino acid residues. The deduced amino acid sequences of the luciferase gene of *P. rufa* showed 98.9% homology to those of *P. miyako*. Phylogenetic analysis further confirmed the deduced amino acid sequences of the *P. rufa* luciferase gene to be belonged to the same subfamily, Lampyrinae. Southern blot analysis suggested possible presence of the *P. rufa* luciferase gene as a single copy number and Northern blot analysis confirmed light organ-specific expression pattern at the transcriptional level. The cDNA encoding the luciferase of *P. rufa* was expressed as a 69 kDa band in baculovirus-infected insect cells and the recombinant baculovirus-infected cell extracts emitted luminescence in luciferase activity assay.