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(54) Title: NOVEL ENZYME

(57) Abstract: A recombinant protein having luciferase activity and at least 60 % similarity to a wild-type luciferase wherein in the sequence of the enzyme, the amino acid residue corresponding to residue 357 in *Photinus pyralis* luciferase is mutated as compared to the corresponding wild-type luciferase, such that the luciferase enzyme is able to emit light at a different wavelength as compared to the corresponding wild-type luciferase and/or has enhanced thermostability as compared to the corresponding wild-type luciferase. In general, the residue corresponding to 357 in Photinus pyralis luciferase is changed from an acidic amino acid to a non-acidic amino acid and preferably an uncharged polar amino acid such as tyrosine. Mutant luciferases in accordance with the invention can produce a large (50nm) wavelength shift in emitted light and have good thermostability. The resultant colour shift can be reversed by addition of coenzyme A. These properties make the mutant particularly useful in a variety of assays.