

A polynucleotide encoding a modified luciferase polypeptide. The modified luciferase polypeptide has at least 80% amino acid sequence identity to a wild-type *Oplophorus gracilirostris* luciferase (OgLuc) and includes at least one amino acid substitution at a position corresponding to positions 2, 4, 11, 20, 23, 28, 33, 34, 44, 45, 51, 54, 68, 72, 75, 76, 77, 89, 90, 92, 99, 104, 115, 124, 135, 138, 139, 143, 144, 166, 167, or 169 in a wild-type OgLuc of SEQ ID NO: 1. The modified luciferase polypeptide has at least one of enhanced luminescence, enhanced signal stability, and enhanced protein stability relative to the wild-type OgLuc.