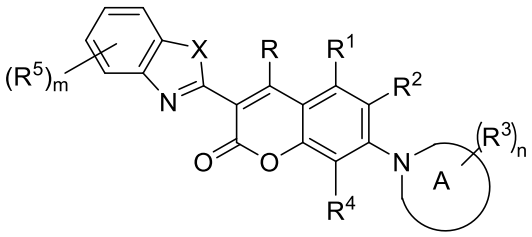
CLAIMS

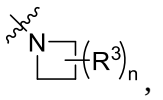
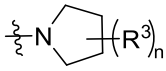
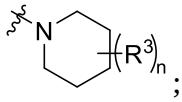
1. A compound of Formula (I), a salt or a mesomeric form thereof:



(I)

wherein:

X is O, S, or NR^n, wherein R^n is H;

ring A is , , or ;

R, R^1, R^2, and R^4 are H;

each R^3 is independently -CO_2H, -$(CH_2)_p$-CO_2R^c;

wherein p and q are each 1, 2, 3 or 4;

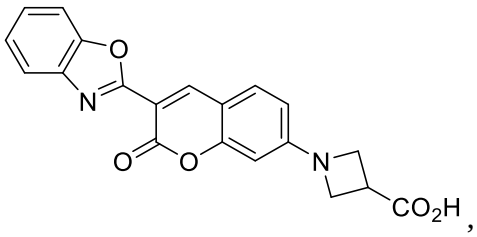
each R^5 is independently halo, -CN, -CO_2H, -SO_3H, --SO_2NH_2, or C_{1-6} alkyl substituted with -SO_3H or -SO_2NH_2;

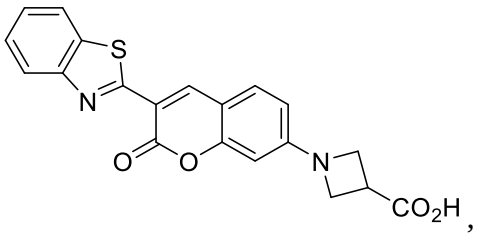
each R^c is independently H, or C_{1-4} alkyl;

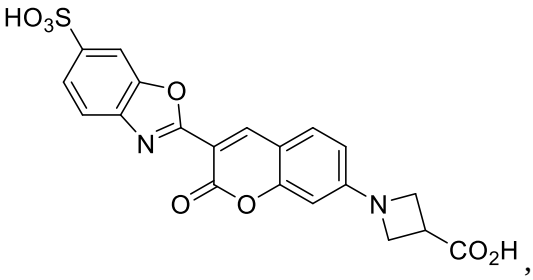
m is 0 or 1; and

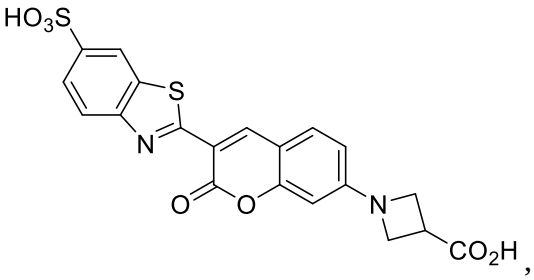
n is 1.

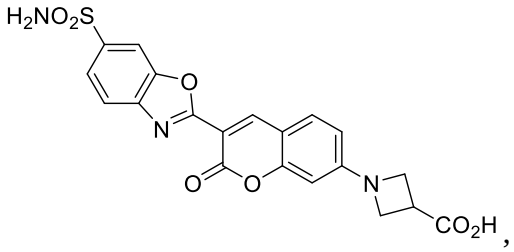
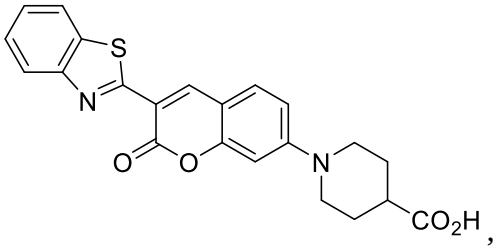
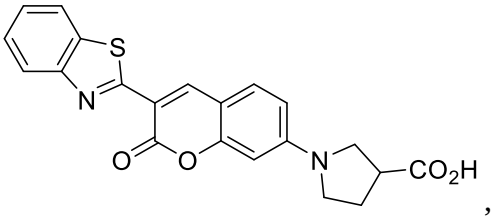
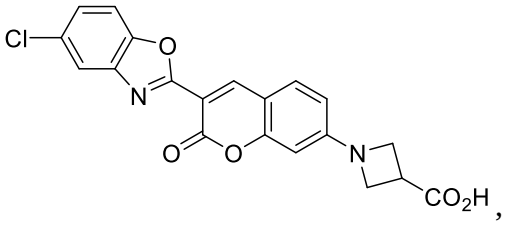
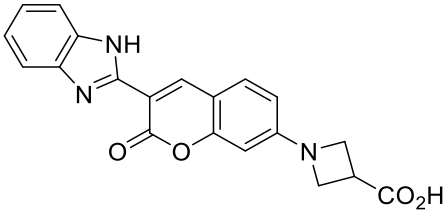
2. The compound of claim 1, selected from the group consisting of:

,

,

,

,






, and salts and mesomeric forms thereof.

3. The compound according to claims 1 to 2, wherein the compound is attached to a nucleotide or oligonucleotide.

4. A nucleotide or oligonucleotide labeled with a compound according to any one of claims 1 to 2.

5. The labeled nucleotide or oligonucleotide according to claim 4, wherein the compound is attached the nucleotide or oligonucleotide via R^3 of Formula (I).

6. The labeled nucleotide or oligonucleotide of claim 5, wherein R^3 of Formula (I) is $-CO_2H$ or $-(CH_2)_p-CO_2H$ and the attachment forms an amide using the $–CO_2H$ group.

7. The labeled nucleotide or oligonucleotide according to claim 4, wherein the compound is attached the nucleotide or oligonucleotide via R^5 of Formula (I).

8. The labeled nucleotide or oligonucleotide of claim 7, wherein R^5 of Formula (I) is $-CO_2H$ and the attachment forms an amide using the $–CO_2H$ group.

9. The labeled nucleotide or oligonucleotide of any one of claims 4 to 8, wherein the compound is attached to the C5 position of a pyrimidine base or the C7 position of a 7-deaza purine base through a linker moiety.

10. The labeled nucleotide or oligonucleotide according to any one of claims 4 to 8, further comprising a 3’ OH blocking group covalently attached to the ribose or deoxyribose sugar of the nucleotide.

11. A kit comprising a first labeled nucleotide according to any one of claims 4 to 10 and a second labeled nucleotide.

12. The kit of claim 11, wherein the second labeled nucleotide is labeled with a different compound than the first labeled nucleotide.

13. The kit of claim 12, wherein the first and second labeled nucleotides are excitable using a single laser wavelength.

14. The kit of claim 12 or 13, further comprising a third nucleotide and a fourth nucleotide, wherein each of the second, third, and fourth nucleotides is labeled with a different compound, wherein each label has a distinct absorbance maximum that is distinguishable from the other labels.

15. The kit of claim 11, wherein the kit comprises four nucleotides, wherein a first of the four nucleotides is a labeled nucleotide according to any one of claims 4 to 10, a second of the four nucleotides carries a second label, a third nucleotide carries a third label, and a fourth nucleotide is unlabeled (dark).

16. The kit of claim 11, wherein the kit comprises four nucleotides, wherein a first of the four nucleotides is a labeled nucleotide according to any one of claims 4 to 10, a second of the four nucleotides carries a second label, a third nucleotide carries a mixture of two labels, and a fourth nucleotide is unlabeled (dark).

17. Use of a compound according to any one of claims 1 to 2, a labeled nucleotide or oligonucleotide according to claims 4 to 10, or a kit according to any one of claims 11 to 16 in sequencing, expression analysis, hybridization analysis, genetic analysis, RNA analysis, or a protein binding assay.

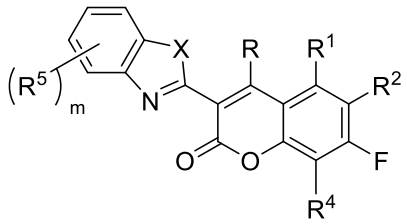
18. The use according to claim 17 on an automated sequencing instrument, wherein said automated sequencing instrument comprises two lasers operating at different wavelengths.

19. A method of sequencing comprising incorporating a labeled nucleotide according to any one of claims 4 to 10 in a sequencing assay.

20. The method of claim 19, further comprising detecting the labeled nucleotide.

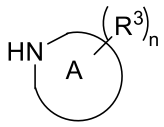
21. The method of claim 19 or 20, wherein the sequencing assay is performed on an automated sequencing instrument, and wherein the automated sequencing instrument comprises two light sources operating at different wavelengths.

22. A method of synthesizing a compound of Formula (I) comprising reacting a compound of Formula (II) with an optionally substituted cyclic amine of Formula (III):



(II)

,



(III)

where each of the variables, X, R, R^1, R^2, R^3, R^4, R^5, ring A, m and n are defined as in claim 1.