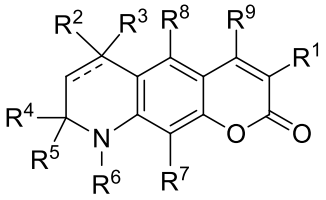
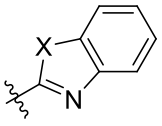
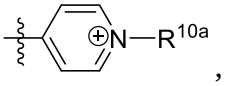
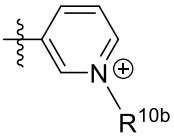
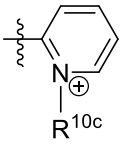
Claims

1. A compound of Formula (I), or salts, mesomeric forms thereof:



(I)

wherein R^1 is , ,  or , and wherein R^1 is optionally substituted with one or more substituents selected from the group consisting of alkyl, substituted alkyl, alkoxy, alkenyl, alkynyl, haloalkyl, haloalkoxy, alkoxyalkyl, amino, aminoalkyl, halo, cyano, hydroxy, hydroxyalkyl, heteroalkyl, C-carboxy, O-carboxy, C-amido, N-amido, nitro, sulfonyl, sulfo, sulfino, sulfonate, S-sulfonamido, N-sulfonamido, optionally substituted aryl, optionally substituted heteroaryl, optionally substituted cycloalkyl, and optionally substituted heterocyclyl;

each R^2, R^3, R^4, and R^5 is independently selected from the group consisting of H, alkyl, substituted alkyl, alkoxy, alkenyl, alkynyl, haloalkyl, haloalkoxy, alkoxyalkyl, amino, aminoalkyl, halo, cyano, hydroxy, hydroxyalkyl, heteroalkyl, C-carboxy, O-carboxy, C-amido, N-amido, nitro, sulfonyl, sulfo, sulfino, sulfonate, S-sulfonamido, N-sulfonamido, optionally substituted carbocyclyl, optionally substituted aryl, optionally substituted heteroaryl and optionally substituted heterocyclyl;

R^6 is alkyl substituted with carboxyl, $–C(O)OR^{12}$, or $–C(O)NR^{13}R^{14}$;

R^9 is H;

each R^{10a}, R^{10b} and R^{10c} is independently selected from the group consisting of alkyl, substituted alkyl, alkenyl, alkynyl, aminoalkyl, haloalkyl, heteroalkyl, alkoxyalkyl, and sulfonyl hydroxide;

each R^7 and R^8 is independently selected from the group consisting of H, alkyl, substituted alkyl, alkoxy, alkenyl, alkynyl, haloalkyl, haloalkoxy, alkoxyalkyl, amino, aminoalkyl, halo, cyano, hydroxy, hydroxyalkyl, heteroalkyl, C-carboxy, O-carboxy, C-amido, N-amido, nitro, sulfonyl, sulfo, sulfino, sulfonate, S-sulfonamido,

N-sulfonamido, optionally substituted carbocyclyl, optionally substituted aryl, optionally substituted heteroaryl and optionally substituted heterocyclyl;

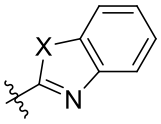
X is selected from the group consisting of O, S, NR^{11}, and Se;

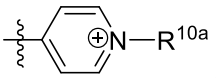
R^{11} is selected from the group consisting of H, alkyl, substituted alkyl, alkenyl, alkynyl, aminoalkyl, carboxyalkyl, sulfonatoalkyl, haloalkyl, heteroalkyl, alkoxyalkyl, sulfo, optionally substituted aryl, optionally substituted heteroaryl, optionally substituted carbocyclyl, and optionally substituted heterocyclyl;

R^{12} is selected from the group consisting of optionally substituted alkyl, optionally substituted aryl, optionally substituted heteroaryl, and optionally substituted 3 to 7 membered cycloalkyl;

each R^{13} and R^{14} is independently selected from H, optionally substituted alkyl, optionally substituted aryl, optionally substituted heteroaryl and optionally substituted 3 to 7 membered cycloalkyl; and

the bond represented by a solid and dashed line ------ is selected from the group consisting of a single bond and a double bond, provided that when ------ is a double bond, then R^3 is absent.

2. The compound of claim 1, wherein R^1 is 

.
3. The compound of claim 2, wherein X is O.
4. The compound of claim 2, wherein X is S.
5. The compound of claim 1, wherein R^1 is 

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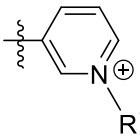
6. The compound of claim 1, wherein R^1 is 

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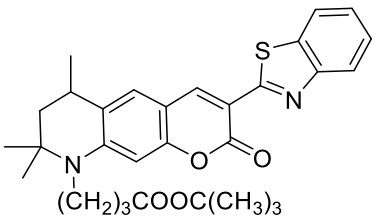
7. The compound of claim 1, selected from the group consisting of: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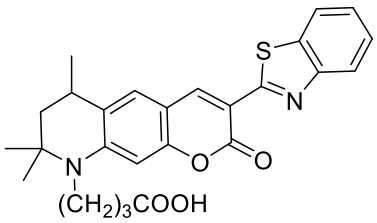
,

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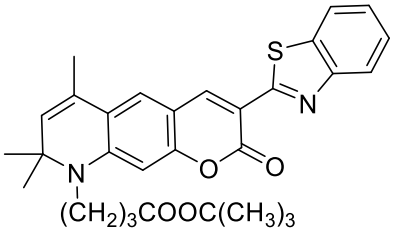
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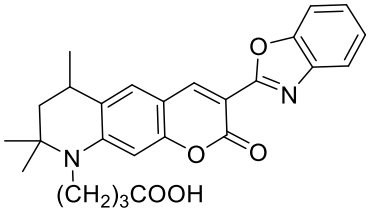
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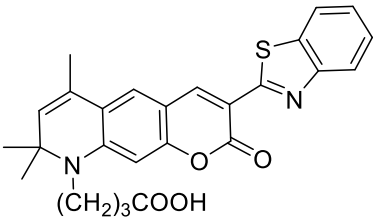
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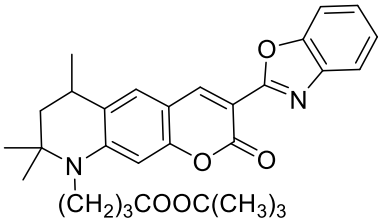
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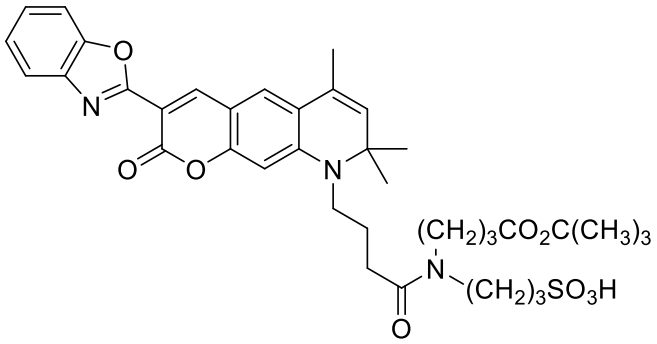
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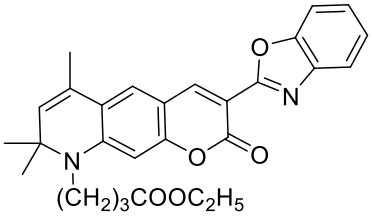
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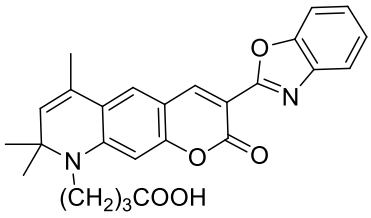
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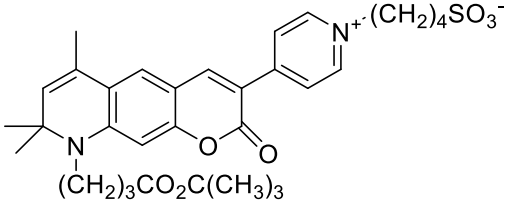
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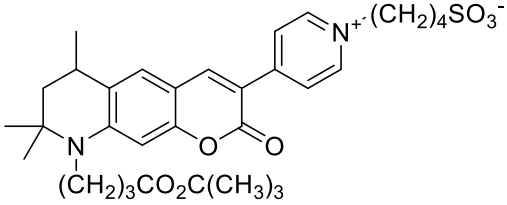
,

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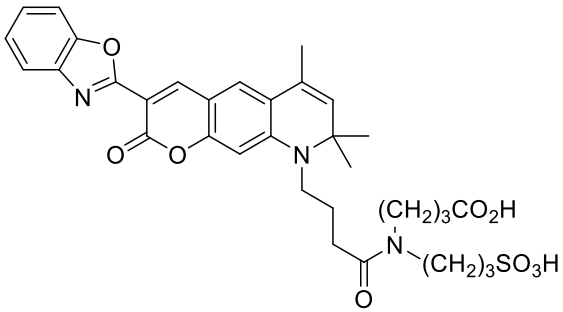
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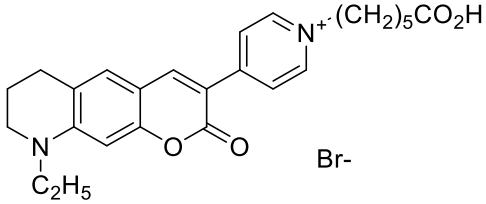
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C2H5
Br-
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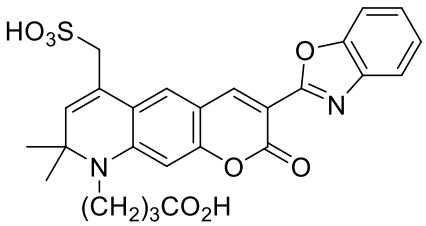
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O
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(CH2)3CO2H
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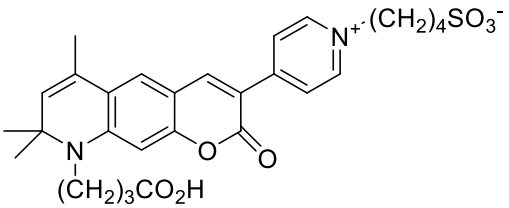
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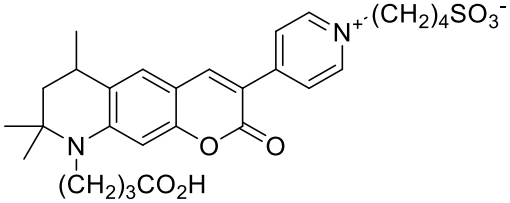
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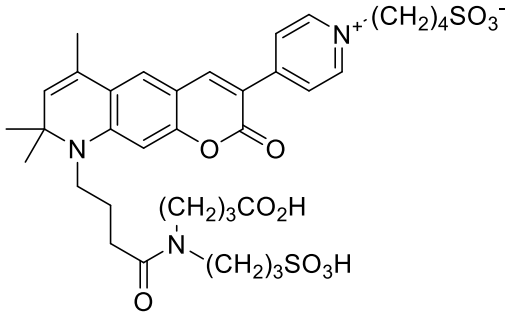
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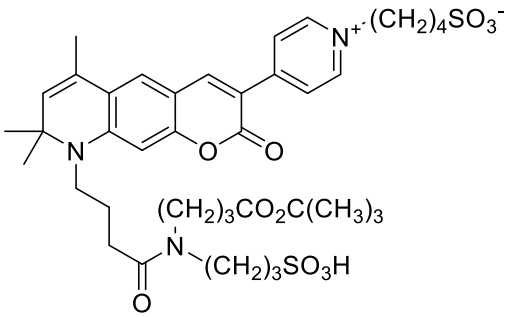
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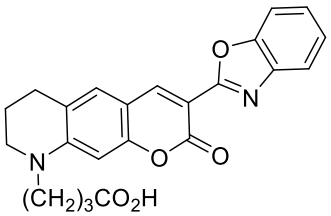
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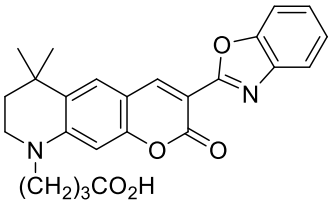
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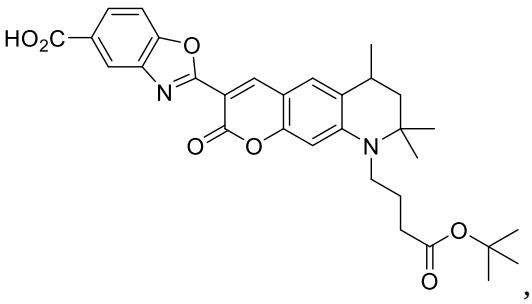
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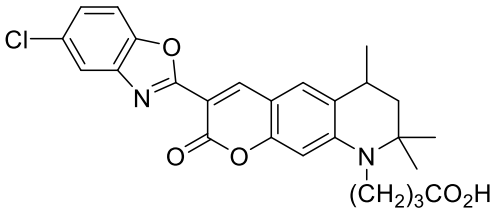
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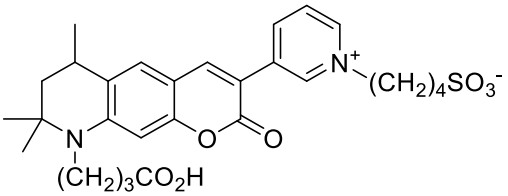
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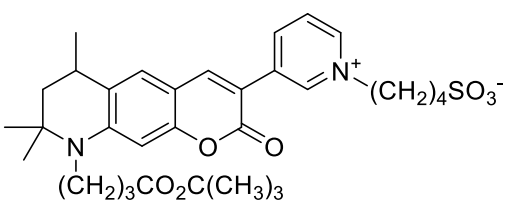
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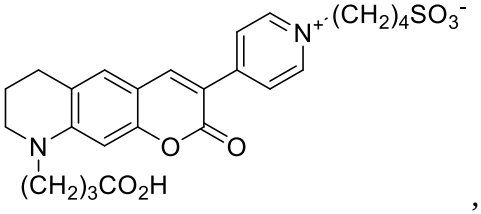
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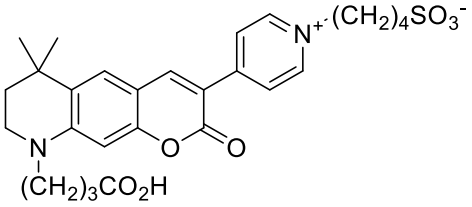

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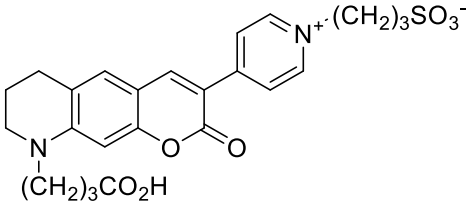

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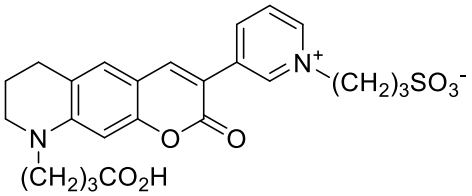

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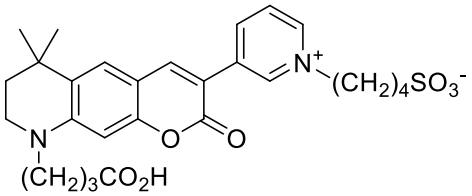


, and salts, mesomeric forms thereof.

8. A nucleotide or oligonucleotide labeled with a compound according to claim 1.

9. The labeled nucleotide or oligonucleotide of claim 8, wherein the compound is covalently attached to the nucleotide or oligonucleotide via R^6.

10. The labeled nucleotide or oligonucleotide of claim 8, wherein the compound is covalently attached to the nucleotide or oligonucleotide via R^{10a}, R^{10b} or R^{10c}, and wherein R^{10a}, R^{10b} or R^{10c} is a substituted alkyl.

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

12. The labeled nucleotide or oligonucleotide of claim 8, further comprising a 3'-OH blocking group covalently attached to the ribose or deoxyribose sugar of the nucleotide or oligonucleotide.

13. A kit comprising one or more nucleotides wherein at least one nucleotide is a labeled nucleotide according to claim 8.

14. The kit of claim 13, comprising two or more labeled nucleotides.

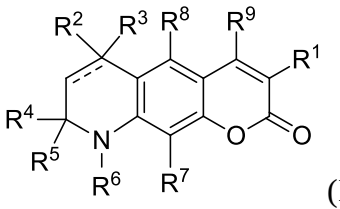
15. The kit of claim 14, wherein two of the labeled nucleotides are excited using a single laser.

16. A method of sequencing comprising incorporating a nucleotide according to claim 8 in a sequencing assay.

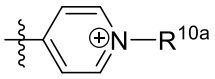
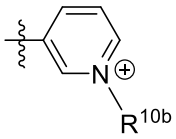
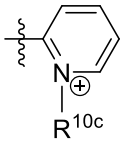
17. The method of claim 16, further comprising detecting the nucleotide.

18. The compound of claim 1, wherein each R^{10a}, R^{10b} and R^{10c} is alkyl substituted with carboxyl, carboxylate, sulfo or sulfonate.

19. A compound of Formula (I), or salts, mesomeric forms thereof:



(I)

wherein R^1 is ,  or , and wherein R^1 is optionally substituted with one or more substituents selected from the group consisting of alkyl, substituted alkyl, alkoxy, alkenyl, alkynyl, haloalkyl, haloalkoxy, alkoxyalkyl, amino, aminoalkyl, halo, cyano, hydroxy, hydroxyalkyl, heteroalkyl, C-carboxy, O-carboxy, C-amido, N-amido, nitro, sulfonyl, sulfo, sulfino, sulfonate, S-sulfonamido, N-sulfonamido, optionally substituted aryl, optionally substituted heteroaryl, optionally substituted cycloalkyl, and optionally substituted heterocyclyl;

each R^2, R^3, R^4, R^5, and R^9 is independently selected from the group consisting of H, alkyl, substituted alkyl, alkoxy, alkenyl, alkynyl, haloalkyl, haloalkoxy, alkoxyalkyl, amino, aminoalkyl, halo, cyano, hydroxy, hydroxyalkyl, heteroalkyl, C-carboxy, O-carboxy, C-amido, N-amido, nitro, sulfonyl, sulfo, sulfino, sulfonate, S-sulfonamido, N-sulfonamido, optionally substituted carbocyclyl, optionally substituted aryl, optionally substituted heteroaryl and optionally substituted heterocyclyl;

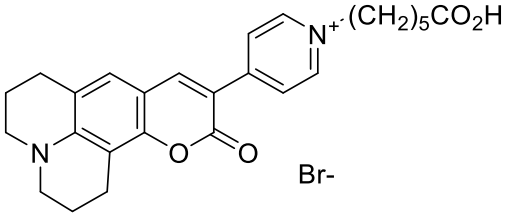
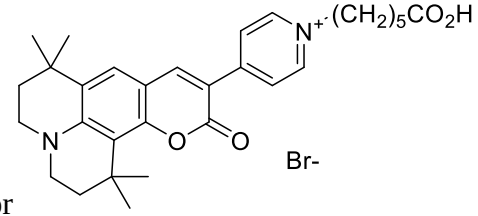
each R^{10a}, R^{10b} and R^{10c} is independently alkyl substituted with carboxyl, carboxylate, sulfo or sulfonate;

R^6 and R^7 together with the atoms to which they are attached form an optionally substituted 5-10 membered heterocyclyl;

R^8 is selected from the group consisting of H, alkyl, substituted alkyl, alkoxy, alkenyl, alkynyl, haloalkyl, haloalkoxy, alkoxyalkyl, amino, aminoalkyl, halo, cyano, hydroxy, hydroxyalkyl, heteroalkyl, C-carboxy, O-carboxy, C-amido, N-amido, nitro, sulfonyl, sulfo, sulfino, sulfonate, S-sulfonamido, N-sulfonamido, optionally substituted carbocyclyl, optionally substituted aryl, optionally substituted heteroaryl and optionally substituted heterocyclyl;

the bond represented by a solid and dashed line is selected from the group consisting of a single bond and a double bond, provided that when is a double bond, then R^3 is absent.

20. The compound of claim 19, wherein R^6 and R^7 together with the atoms to which they are attached form an optionally substituted 6 membered heterocyclyl.

21. The compound of claim 19, having the structure  or , or salts, mesomeric forms thereof.

22. The compound of claim 2, wherein the bond represented by a solid and dashed line ------ is a single bond, and wherein at least one of R^2 and R^3 is alkyl.

23. The compound of claim 22, wherein at least one of R^4 and R^5 is alkyl.

24. The compound of claim 5, wherein R^{10a} is alkyl substituted with carboxyl, carboxylate, sulfo or sulfonate.

25. The compound of claim 24, wherein the bond represented by a solid and dashed line ------ is a single bond, and wherein at least one of R^2 and R^3 is alkyl.

26. The compound of claim 25, wherein at least one of R^4 and R^5 is alkyl.