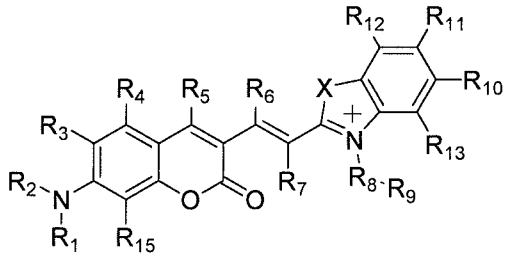
We Claim:

1. A Compound of Formula I:



I

Wherein,

X is selected from group comprising nitrogen, oxygen, sulphur, Se, -NH-;

R1 is selected from group comprising H, alkyl chain (C1-C5) and substituted alkyl, preferably halogen substituted alkyl;

R2 is selected from group comprising H and alkyl chain (C1-C5);

R3, R4 and R5 are selected from group comprising H, OH, halogen, alkyl or substituted alkyl; wherein the substituted alkyl is selected from group comprising alkyl substituted with halogen and alkyl substituted hydroxyl groups; and wherein, halogen is selected from a group comprising bromide, chloride and iodide;

R6 is selected from group comprising H, alkyl, aryl, cyano, acid and halogen; wherein halogen is selected from a group comprising, Chloride, Fluoride, Bromide and Iodide; and wherein acid is carboxylic acid;

R7 is selected from group comprising H, alkyl, aryl, acid and halogen; wherein halogen is selected from a group comprising, Chloride, Fluoride, Bromide and Iodide; and wherein acid is carboxylic acid;

R8 is selected from group comprising H and $(CH_2)_n$, wherein 'n' is 1 -6;

and wherein when R8 is $(CH_2)_n$, R8 is linked to R9;

R9 is selected from group comprising aryl, halogen, amines, terminal alkynes, alkenes, alkyl acids and amine acids;

R10, R11, R12 and R13 are selected from group comprising H, OH, Alkyl, aryl, halogen, Nitro, sulfonates (SO_3^-) and cyano group;

R15 is selected from group comprising H, OH, halogen, alkyl or alkyl substituted with halogen or hydroxyl groups; wherein, halogen is selected from a group comprising bromide, chloride and iodide; Alkyl is selected from a group comprising methyl, ethyl, propyl and butyl; Alkyl substituted with halogen or hydroxyl groups is selected from group comprising CH2X and CH2OH, wherein X is either bromide, chloride or iodide;

Wherein, optionally R2 and R3, R1 and R15 form a cyclic structure;

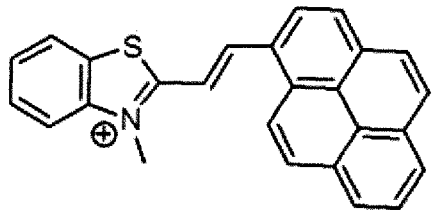
provided when X=S and R1 and R2 = ethyl, R8≠ H.

2. The compound as claimed in claim 1, wherein the compound is selected from group comprising, (E)-3-(2-(N-methyl-benzo [d] oxazol-2-yl)vinyl)-7-(diethylamino)-2 H -chromen-2-one, (E)-3-(2-(N-methyl-benzo[d][1,3]selenazol-2-yl)vinyl)-7-(diethylamino)-2 H -chromen-2-one, (E)-3-(2-(N-(prop-2-ynyl)-benzo[d]thiazol-2-yl)vinyl)-7-(diethylamino)-2 H -chromen-2-one, (E)-3-(2-(N-(N, N, N-trimethyl-2-aminoethyl)-benzo[d]thiazol-2-yl)vinyl)-7-(diethylamino)-2 H -chromen-2-one, (E)-3-(2-(N-(2-aminium ethyl)-benzo[d]thiazol-2-yl)vinyl)-7-(diethylamino)-2 H -chromen-2-one, (E)-3-(2-(N-(N, N, N-trimethyl-3-aminopropyl)-benzo[d]thiazol-2-yl)vinyl)-7-(diethylamino)-2 H -chromen-2-one, (E)-3-(2-(N-(prop-2-ynyl)-benzo[d]oxazol-2-yl)vinyl)-7-(diethylamino)-2 H -chromen-2-one, (E)-3-(2-(N-(N, N, N-trimethyl-2-aminoethyl)- benzo[d]oxazol-2-yl)vinyl)-7-(diethylamino)-2 H -chromen-2-one, (E)-3-(2-(N-(2-aminium ethyl)- benzo[d]oxazol-2-yl)vinyl)-7-(diethylamino)-2 H -chromen-2-one, (E)-3-(2-(N-(N, N, N-trimethyl-3-aminopropyl)- benzo[d]oxazol-2-yl)vinyl)-7-(diethylamino)-2 H -chromen-2-one, (E)-3-(2-(N-methyl-benzo[d]thiazol-2-yl)vinyl)-7-(dimethylamino)-2 H -chromen-2-one, (E)-3-(2-(N-methyl-benzo[d]thiazol-2-yl)vinyl)-7-(dipropylamino)-2 H -chromen-2-one, 2,3,6,7-Tetrahydro-8-hydroxy-1*H*,5*H*-benzo[*ij*]quinolizine-9-carboxaldehyde (Thiazole Julidinal), (E)-3-(2-(N-(prop-2-ynyl)-benzo[d]thiazol-2-yl)vinyl)-7-(diethylamino)-2 H -chromen-2-one, (E)-3-(2-(N-(4-

bromobutyl)-benzo[d]thiazol-2-yl)vinyl)-7-(diethylamino)-2 H -chromen-2-one, and (E)-3-(N-Methyl2-(benzo[d]thiazol-2-yl)vinyl)-7(bis(2-chloroethyl)amino)-2H-chromen-2-one.

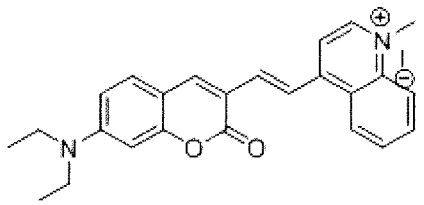
3. The compound as claimed in claim 1, wherein the compound exists in monomeric or dimeric form.

4. A compound of Formula V having the structural formula:



V

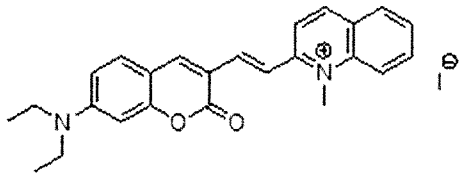
5. A compound of Formula VI having the structural formula:



VI

or its isomer.

6. The compound as claimed in claim 5, wherein the isomer is



7. A process of preparing compound as claimed in claim 1, wherein the process comprises step of reacting a carbaldehyde derivative with heteroaryl derivative in presence of catalyst and solvent to obtain the compound.

8. The process as claimed in claim 7, wherein the carbaldehyde derivative is 7-(dialkylamino)-2-oxo-2H-chromene-3-carbaldehyde or 7-(bis(2-chloroalkyl)amino)-2-oxo-2H-chromene-3-carbaldehyde.

9. The process as claimed in claim 7, wherein the heteroaryl derivative is selected from group comprising N-alkylated 2-methyl benzthiazole, N-alkynylated 2-methyl benzthiazole, N-alkylated 2-methyl benzoxazole and 2-methyl benzoselinazole.

10. A process of preparing dimer of compound as claimed in claim 1, wherein the process comprises step of combining two monomers of formula I as claimed in claim 1 using linker.

11. A process of preparing compound as claimed in claim 4, wherein the process comprises step of reacting N-methylated benzothiazole and pyrene-1-carboxyaldehyde in presence of a catalyst and a solvent to obtain the compound.

12. A process of preparing compound as claimed in claim 5, wherein the process comprises step of reacting carbaldehyde derivative with lepidine in presence of a catalyst and a solvent to obtain the compound.

13. A process of preparing compound as claimed in claim 6, wherein the process comprises step of reacting carbaldehyde derivative with 1-2 dimethylquinoline-1-ium in presence of a catalyst and a solvent to obtain the compound.

14. The process as claimed in claim 12 or 13, wherein the carbaldehyde derivative is 7-(dialkylamino)-2-oxo-2H-chromene-3-carbaldehyde.

15. The process as claimed in claim 7, 11, 12 or 13, wherein the catalyst is selected from group comprising base, acid, salt and combinations thereof.

16. The process as claimed in claim 15, wherein the base is selected from group comprising piperidine, sodium acetate, sodium methoxide, potasium tert-butoxide and combinations thereof.

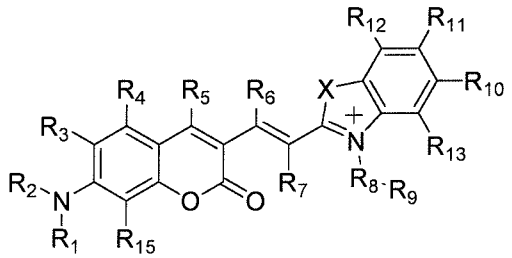
17. The process as claimed in claim 7, 11, 12 or 13, wherein the solvent is selected from a group comprising ethanol, methanol, dichloromethane and combinations thereof.

18. The process as claimed in claim 7, 11, 12 or 13, wherein the process is carried out at a temperature ranging from about 25 °C to about 90 °C, and for a time period ranging from about 3 hours to about 10 hours.

19. The process as claimed in claim 7, 11, 12 or 13, wherein the compound obtained is optionally purified.

20. A method for detecting ~~AT-rich sequence of~~ DNA comprising AT bases in a sample, the method comprising steps of:~~;~~

a) incubating the sample with compound of formula I



I

Wherein,

X is selected from group comprising nitrogen, oxygen, sulphur, Se, -NH- and dimethylmethylene;

R1 and R2 are selected from group comprising H, alkyl chain (C1-C5) and substituted alkyl, preferably halogen substituted alkyl;

R3, R4 and R5 are selected from group comprising H, OH, halogen, alkyl or substituted alkyl; wherein, halogen is selected from a group comprising bromide, chloride and iodide;

R6 and R7 are selected from group comprising H, alkyl, aryl, cyano, acid and halogen; wherein halogen is selected from a group comprising Chloride, Fluoride, Bromide and Iodide; and wherein acid is carboxylic acid;

R8 is selected from group comprising H and $(CH_2)_n$, wherein 'n' is 1 -6;

R9 is selected from group comprising hydrogen, aryl, halogen, methyl, amines, terminal alkynes, alkenes, alkyl acids, amine acids, –OH and sulfonates(SO_3^-);

R10, R11, R12 and R13 are selected from group comprising H, OH, Alkyl, aryl, halogen, Nitro, sulfonates (SO_3^-) and cyano group;

R15 is selected from group comprising H, OH, halogen, alkyl or alkyl substituted with halogen or hydroxyl groups; wherein, halogen is selected from a group comprising bromide, chloride and iodide; Alkyl is selected from a group comprising methyl, ethyl, propyl and butyl; Alkyl substituted with halogen or hydroxyl groups is selected from group comprising CH_2X and CH_2OH, wherein X is either bromide, chloride or iodide;

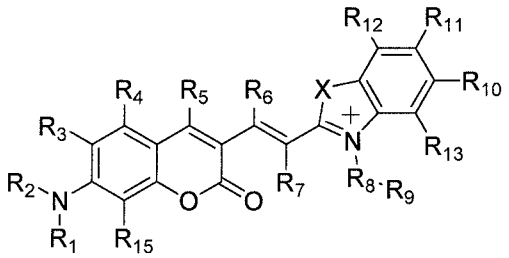
wherein, optionally R2 and R3, R1 and R15 form a cyclic structure;

or with compound as claimed in claims, 4 or 5 so as to allow binding of the compound with DNA; and

b) detecting the binding by flurescence enhancement resulting from the binding of the compound with the DNA comprising ~~subjecting the incubated sample to fluorescence imaging for detecting the~~ AT basesrich ~~sequence of DNA~~.

21. A method for detecting presence of a parasite in a sample, the method comprising steps of:

a) incubating the sample with compound of formula I,



I

Wherein,

X is selected from group comprising nitrogen, oxygen, sulphur, Se, -NH- and dimethylmethylene;

R1 and R2 are selected from group comprising H, alkyl chain (C1-C5) and substituted alkyl, preferably halogen substituted alkyl;

R3, R4 and R5 are selected from group comprising H, OH, halogen, alkyl or substituted alkyl; wherein,halogen is selected from a group comprising bromide, chloride and iodide;

R6 and R7 are selected from group comprising H, alkyl, aryl, cyano, acid and halogen; wherein halogen is selected from a group comprising Chloride, Fluoride, Bromide and Iodide; and wherein acid is carboxylic acid;

R8 is selected from group comprising H and $(CH_2)_n$, wherein 'n' is 1 -6;

R9 is selected from group comprising hydrogen, aryl, halogen, methyl, amines, terminal alkynes, alkenes, alkyl acids, amine acids, –OH and sulfonates(SO_3^-);

R10, R11, R12 and R13 are selected from group comprising H, OH, Alkyl, aryl, halogen, Nitro, sulfonates (SO_3^-) and cyano group;

R15 is selected from group comprising H, OH, halogen, alkyl or alkyl substituted with halogen or hydroxyl groups; wherein, halogen is selected from a group comprising bromide, chloride and iodide; Alkyl is selected from a group comprising methyl, ethyl, propyl and butyl; Alkyl substituted with halogen or hydroxyl groups is selected from group comprising CH2X and CH2OH, wherein X is either bromide, chloride or iodide;

wherein, optionally R2 and R3, R1 and R15 form a cyclic structure;

or with compound as claimed in claims 4 or 5 so as to allow binding of the compound with the parasite; and

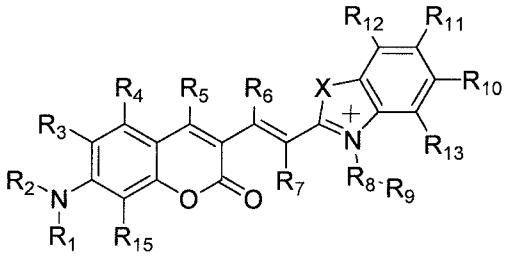
b) detecting the binding by fluorescence enhancement resulting from the binding of the compound with~~subjecting the incubated sample to fluorescence imaging for detecting~~ the ~~malarial~~ parasite.

22. The method as claimed in claim 21, wherein the parasite is selected from group comprising P.falcipuram, P. vivax, P. ovale and P. malariae.

23. The method as claimed in claim 21, wherein the sample is selected from group comprising blood, urine, serum, plasma and saliva.

24. A method for detecting Amyloid β and its~~peptide~~ aggregates in a sample, the method comprising steps of:

a) incubating the sample with compound of formula I



I

wherein,

X is selected from group comprising nitrogen, oxygen, sulphur, Se, -NH- and dimethylmethylene;

R1 and R2 are selected from group comprising H, alkyl chain (C1-C5) and substituted alkyl, preferably halogen substituted alkyl;

R3, R4 and R5 are selected from group comprising H, OH, halogen, alkyl or substituted alkyl; wherein, halogen is selected from a group comprising bromide, chloride and iodide;

R6 and R7 are selected from group comprising H, alkyl, aryl, cyano, acid and halogen; wherein halogen is selected from a group comprising, Chloride, Fluoride, Bromide and Iodide; and wherein acid is carboxylic acid;

R8 is selected from group comprising H and $(CH_2)_n$, wherein 'n' is 1 -6;

R9 is selected from group comprising, hydrogen, aryl, halogen, methyl, amines, terminal alkynes, alkenes, alkyl acids, amine acids, –OH and sulfonates(SO_3^-);

R10, R11, R12 and R13 are selected from group comprising H, OH, Alkyl, aryl, halogen, Nitro, sulfonates (SO_3^-) and cyano group;

R15 is selected from group comprising H, OH, halogen, alkyl or alkyl substituted with halogen or hydroxyl groups; wherein, halogen is selected from a group comprising bromide, chloride and iodide; Alkyl is selected from a group comprising methyl, ethyl, propyl and butyl; Alkyl substituted with halogen or hydroxyl groups is selected from group comprising CH2X and CH2OH, wherein X is either bromide, chloride or iodide;

Wherein, optionally R2 and R3, R1 and R15 form a cyclic structure;

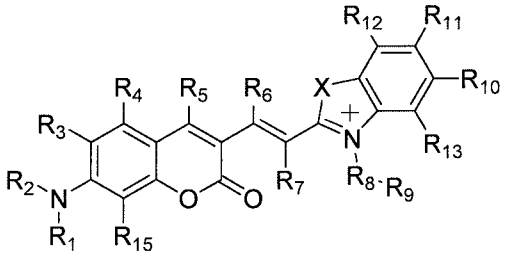
or with compound as claimed in claim 5 so as to allow binding of the compound with the Amyloid β and its aggregates; and

b) detecting the binding by fluorescence enhancement resulting from the binding of the compound with ~~subjecting the incubated sample to fluorescence imaging for detecting~~ the Amyloid β and its~~peptide~~ aggregates.

~~25. The method as claimed in claim 24, wherein upon said incubation, the compound of formula I or compound as claimed in claim 5 exhibits interaction selected from group comprising hydrophobic interaction with Leu17, Val39 of the Aβ peptide aggregate, π-π stacking interaction with the phenyl ring of Phe19 of the Aβ peptide aggregate and a combination thereof.~~The method as claimed in claims 20, 21 or 24, wherein the method of detection involves spectroscopy, Fluorescence Resonance Energy Transfer (FRET), polymerase chain reaction, flow cytometry, gel electrophoresis, nuclear staining and imaging or any combinations thereof.

26. A method for diagnosing disease selected from group comprising Malaria, Alzheimer's disease, Frontotemporal Dementia and a combination thereof in a subject; wherein the method comprises steps of:

a) incubating sample obtained from the subject with compound of formula I



I

wherein,

X is selected from group comprising nitrogen, oxygen, sulphur, Se, -NH- and dimethylmethylene;

R1 and R2 are selected from group comprising H, alkyl chain (C1-C5) and substituted alkyl, preferably halogen substituted alkyl;

R3, R4 and R5 are selected from group comprising H, OH, halogen, alkyl or substituted alkyl; wherein, halogen is selected from a group comprising bromide, chloride and iodide;

R6 and R7 are selected from group comprising H, alkyl, aryl, cyano, acid and halogen; wherein halogen is selected from a group comprising, Chloride, Fluoride, Bromide and Iodide; and wherein acid is carboxylic acid;

R8 is selected from group comprising H and ~~(~~CH_2~~)~~$_n$, wherein 'n' is 1 -6;

R9 is selected from group comprising, hydrogen, aryl, halogen, methyl, amines, terminal alkynes, alkenes, alkyl acids, amine acids –OH and sulfonates(SO_3^-);

R10, R11, R12 and R13 are selected from group comprising H, OH, Alkyl, aryl, halogen, Nitro, sulfonates (SO_3^-) and cyano group;

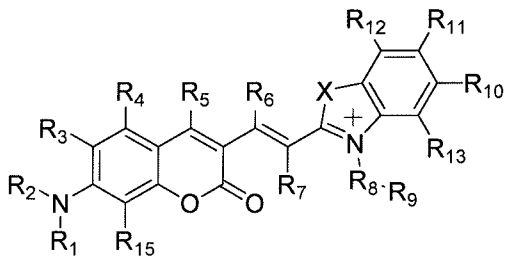
R15 is selected from group comprising H, OH, halogen, alkyl or alkyl substituted with halogen or hydroxyl groups; wherein, halogen is selected from a group comprising bromide, chloride and iodide; Alkyl is selected from a group comprising methyl, ethyl, propyl and butyl; Alkyl substituted with halogen or hydroxyl groups is selected from group comprising CH2X and CH2OH, wherein X is either bromide, chloride or iodide;

Wherein, optionally R2 and R3, R1 and R15 form a cyclic structure;
or with compound as claimed in claim 4 or 5; and

b) detecting the fluorescence intensity in the sample ~~subjecting the~~ incubated with said compound ~~sample to fluorescence imaging~~ for diagnosing said disease.

27. The method as claimed in claim 26, wherein the subject is a mammal; and wherein the sample is selected from group comprising blood, urine, serum, plasma, cerebrospinal fluid and brain tissue.

28. A compound of formula I



I

Wherein,

X is selected from group comprising nitrogen, oxygen, sulphur, Se, -NH- and dimethylmethylene;

R1 and R2 are selected from group comprising H, alkyl chain (C1-C5) and substituted alkyl, preferably halogen substituted alkyl;

R3, R4 and R5 are selected from group comprising H, OH, halogen, alkyl or substituted alkyl; wherein, halogen is selected from a group comprising bromide, chloride and iodide;

R6 and R7 are selected from group comprising H, alkyl, aryl, cyano, acid and halogen; wherein halogen is selected from a group comprising Chloride, Fluoride, Bromide and Iodide; and wherein acid is carboxylic acid;

R8 is selected from group comprising H and ~~(~~CH_2~~)~~$_n$, wherein 'n' is 1 -6;

R9 is selected from group comprising hydrogen, aryl, halogen, methyl, amines, terminal alkynes, alkenes, alkyl acids, amine acids –OH and sulfonates(SO_3^-);

R10, R11, R12 and R13 are selected from group comprising H, OH, Alkyl, aryl, halogen, Nitro, sulfonates (SO_3^-) and cyano group;

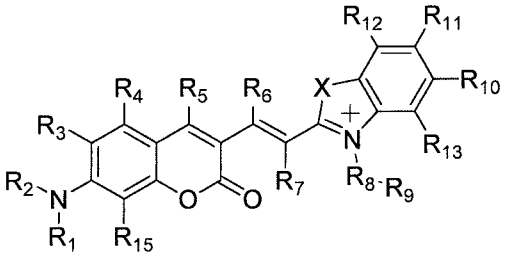
R15 is selected from group comprising H, OH, halogen, alkyl or alkyl substituted with halogen or hydroxyl groups; wherein, halogen is selected from a group comprising bromide, chloride and iodide; Alkyl is selected from a group comprising methyl, ethyl, propyl and butyl; Alkyl substituted with halogen or hydroxyl groups is selected from group comprising CH2X and CH2OH, wherein X is either bromide, chloride or iodide;

wherein, optionally R2 and R3, R1 and R15 form a cyclic structure;

or compound as claimed in claims 4 or 5 for use in detecting DNA comprising AT ~~rich~~ bases ~~sequence of DNA~~ or Amyloid β and its~~peptide~~ aggregates.

29. The compound for use as claimed in claim 28, wherein the compound is used for application selected from group comprising spectroscopy, Fluorescence Resonance Energy Transfer (FRET), polymerase chain reaction, flow cytometry, gel electrophoresis, nuclear staining and imaging or any combinations thereof.

~~29.~~30. A compound of formula I



I

wherein,

X is selected from group comprising nitrogen, oxygen, sulphur, Se, -NH- and dimethylmethylene;

R1 and R2 are selected from group comprising H, alkyl chain (C1-C5) and substituted alkyl, preferably halogen substituted alkyl;

R3, R4 and R5 are selected from group comprising H, OH, halogen, alkyl or substituted alkyl; wherein, halogen is selected from a group comprising bromide, chloride and iodide;

R6 and R7 are selected from group comprising H, alkyl, aryl, cyano, acid and halogen; wherein halogen is selected from a group comprising, Chloride, Fluoride, Bromide and Iodide; and wherein acid is carboxylic acid;

R8 is selected from group comprising H and $(CH_2)_n$, wherein 'n' is 1 -6;

R9 is selected from group comprising hydrogen, aryl, halogen, methyl, amines, terminal alkynes, alkenes, alkyl acids, amine acids –OH and sulfonates(SO_3^-);

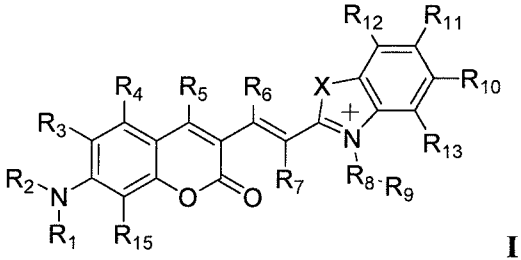
R10, R11, R12 and R13 are selected from group comprising H, OH, Alkyl, aryl, halogen, Nitro, sulfonates (SO_3^-) and cyano group;

R15 is selected from group comprising H, OH, halogen, alkyl or alkyl substituted with halogen or hydroxyl groups; wherein, halogen is selected from a group comprising bromide, chloride and iodide; Alkyl is selected from a group comprising methyl, ethyl, propyl and butyl; Alkyl substituted with halogen or hydroxyl groups is selected from group comprising CH2X and CH2OH, wherein X is either bromide, chloride or iodide;

wherein, optionally R2 and R3, R1 and R15 form a cyclic structure;

or a compound as claimed in claim 4 or 5 for use in diagnosing disease selected from group comprising malaria, Frontotemporal dementia and Alzheimer's disease or a combination thereof.

~~30.~~31. A method of fluorescing ~~AT-rich~~ DNA comprising AT bases comprising step of incubating the DNA with compound of formula I



I

wherein,

X is selected from group comprising nitrogen, oxygen, sulphur, Se, -NH- and dimethylmethylene;

R1 and R2 are selected from group comprising H, alkyl chain (C1-C5) and substituted alkyl, preferably halogen substituted alkyl;

R3, R4 and R5 are selected from group comprising H, OH, halogen, alkyl or substituted alkyl; wherein, halogen is selected from a group comprising bromide, chloride and iodide;

R6 and R7 are selected from group comprising H, alkyl, aryl, cyano, acid and halogen; wherein halogen is selected from a group comprising, Chloride, Fluoride, Bromide and Iodide; and wherein acid is carboxylic acid;

R8 is selected from group comprising H and ~~(~~CH_2~~)~~$_n$, wherein 'n' is 1 -6;

R9 is selected from group comprising hydrogen, aryl, halogen, methyl, amines, terminal alkynes, alkenes, alkyl acids, amine acids –OH and sulfonates(SO_3^-);

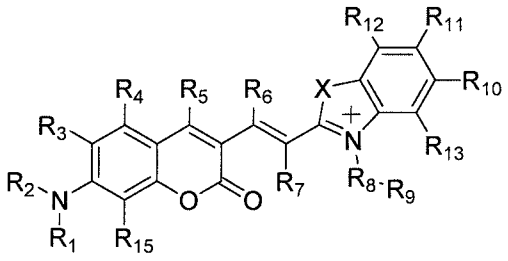
R10, R11, R12 and R13 are selected from group comprising H, OH, Alkyl, aryl, halogen, Nitro, sulfonates (SO_3^-) and cyano group;

R15 is selected from group comprising H, OH, halogen, alkyl or alkyl substituted with halogen or hydroxyl groups; wherein, halogen is selected from a group comprising bromide, chloride and iodide; Alkyl is selected from a group comprising methyl, ethyl, propyl and butyl; Alkyl substituted with halogen or hydroxyl groups is selected from group comprising CH2X and CH2OH, wherein X is either bromide, chloride or iodide;

wherein, optionally R2 and R3, R1 and R15 form a cyclic structure;

or with the compound as claimed in claim 4 or 5.

~~31.~~32. A method of fluorescing Amyloid β and its ~~peptide~~ aggregates comprising step of incubating the Amyloid β and its ~~peptide~~ aggregates with compound of formula I



I

wherein,

X is selected from group comprising nitrogen, oxygen, sulphur, Se, -NH- and dimethylmethylene;

R1 and R2 are selected from group comprising H, alkyl chain (C1-C5) and substituted alkyl, preferably halogen substituted alkyl;

R3, R4 and R5 are selected from group comprising H, OH, halogen, alkyl or substituted alkyl; wherein, halogen is selected from a group comprising bromide, chloride and iodide;

R6 and R7 are selected from group comprising H, alkyl, aryl, cyano, acid and halogen; wherein halogen is selected from a group comprising, Chloride, Fluoride, Bromide and Iodide; and wherein acid is carboxylic acid;

R8 is selected from group comprising H and $(CH_2)_n$, wherein 'n' is 1 -6;

R9 is selected from group comprising hydrogen, aryl, halogen, methyl, amines, terminal alkynes, alkenes, alkyl acids, amine acids –OH and sulfonates(SO_3^-);

R10, R11, R12 and R13 are selected from group comprising H, OH, Alkyl, aryl, halogen, Nitro, sulfonates (SO_3^-) and cyano group;

R15 is selected from group comprising H, OH, halogen, alkyl or alkyl substituted with halogen or hydroxyl groups; wherein, halogen is selected from a group comprising bromide, chloride and iodide; Alkyl is selected from a group comprising methyl, ethyl, propyl and butyl; Alkyl substituted with halogen or hydroxyl groups is selected from group comprising CH2X and CH2OH, wherein X is either bromide, chloride or iodide;

wherein, optionally R2 and R3, R1 and R15 form a cyclic structure;

or with compound as claimed in claim 5.

~~32. The method as claimed in claim 31, wherein upon said incubation, the compound of formula I or the compound as claimed in claim 5 exhibits interaction selected from group comprising hydrophobic interaction with Leu17, Val39 of the Aβ peptide aggregate, π-π~~

~~stacking interaction with the phenyl ring of Phe19 of the Aβ peptide aggregate and a combination thereof.~~

33. A kit comprising compound as claimed in claim 1, 4 or 5 and combinations thereof, optionally along with an instruction manual.