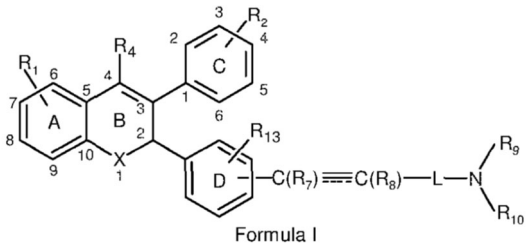
CLAIMS:

1. A compound of Formula I



Formula I

or salts or stereoisomers thereof wherein,

R_1 is mono or di-substitution on ring A and is selected from a group comprising ~~$-R_3$,~~ $-OR_3$, halogen, $-C_{1-6}$ haloalkyl, $-OC_{1-6}$ haloalkyl, -CN, $-N(R_3)_2$, $-NR_3SO_2R_3$, $-NR_3CHO$, $-NR_3COR_3$, $-OC(O)R_3$, $-OC(O)N(R_3)_2$, $-OP(O)(OH)_2$ and $-OC(O)OR_3$ wherein R_3 at each occurrence is selected from hydrogen, C_{1-6} linear, branched or cyclic alkyl and C_{1-6} linear, branched or cyclic haloalkyl;

R_2 is mono or di-substitution and is ~~selected from a group comprising $-R_{11}$, $-OR_{11}$,~~a halogen~~, $-C_{1-6}$ haloalkyl, $-OC_{1-6}$ haloalkyl, -CN, $-N(R_{11})_2$, $-NR_{11}SO_2R_{11}$, $-NR_{11}CHO$, $-NR_{11}COR_{11}$, $-OC(O)R_{11}$, $-OC(O)N(R_{11})_2$, $-OP(O)(OH)_2$ and $-OC(O)OR_{11}$ wherein R_{11} at each occurrence is selected from hydrogen, C_{1-6} linear, branched or cyclic alkyl and C_{1-6} linear, branched or cyclic haloalkyl~~;

R_4 is selected from hydrogen, and $-C_{1-5}$ alkyl~~, $-C_{3-4}$ cycloalkyl, $-OC_{1-5}$ alkyl, $-C_{1-5}$ haloalkyl, halogen~~;

L is selected from C_{1-7} linear or branched alkyl;

R_7 and R_8 are absent or independently selected from hydrogen and C_{1-5} alkyl;

~~R_9 and R_{10} are independently selected from hydrogen or C_{1-20} linear, branched or cyclic alkyl or C_{1-20} haloalkyl optionally interrupted with one or more radicals independently selected from $-O-$, $-NR_5-$, $-S-$, $-SO-$, $-S(O_2)-$, $-CR_5=CR_5-$, $-C\equiv C-$, $-NR_5CO-$, $-NR_5CO-$, $-NR_5CONR_5-$, $NR_5C(O)O-$, and $-OC(O)O-$; wherein R_5 at each occurrence is selected from a group comprising hydrogen or C_{1-6} linear, branched or cyclic alkyl;~~

~~or~~ R_9 and R_{10} together with the nitrogen atom to which they are attached forms a 4 to ~~7~~5 membered ring optionally containing 1 to 2 additional heteroatoms selected from oxygen, nitrogen or sulfur; and the ring is optionally substituted with one or more group selected from halogen, $-OR_6$, $-N(R_6)_2$ and R_6 wherein R_6, at each occurrence is selected from a group comprising hydrogen, C_{1-20} linear, branched or cyclic alkyl optionally interrupted with one or more radicals independently selected from -O-, $-NR_5$-, -S-, -SO-, $-S(O)_2$-, $-CR_5=CR_5$-, -C≡C-, $-NR_5CO$-, $-CONR_5$-, $-NR_5CONR_5$-, $-NR_5C(O)O$- and -OC(O)O-;

optionally, R_6 is further substituted with one or more groups selected from a group comprising halogen, $-OR_{12}$, $-N(R_{12})_2$, and $-COOR_{12}$, $-CON(R_{12})_2$ or $-CON(R_{12})OH$; wherein R_{12} at each occurrence is selected from hydrogen or C_{1-6} linear, branched or cyclic alkyl;

 is a double or a triple bond;

~~ring D is optionally further substituted with a~~ R_{13} is selected from a group ~~selected from~~comprising $-R_{13}$~~14~~, $-OR_{13}$~~14~~, halogen, $-C_{1-6}$ haloalkyl, $-OC_{1-6}$ haloalkyl, -CN, $-N(R_{13}$~~14~~$)_2$, $-NR_{13}$~~14~~SO_2R_{13}~~14~~, $-NR_{13}$~~14~~CHO, $-NR_{13}$~~14~~COR_{13}~~14~~, $-OC(O)R_{13}$~~14~~, $-OC(O)N(R_{13}$~~14~~$)_2$, $-OP(O)(OH)_2$ and $-OC(O)OR_{13}$~~14~~ wherein R_{13}~~14~~ at each occurrence is selected from hydrogen, and C_{1-6} linear, branched or cyclic alkyl; and

X is ~~selected from NH, sulfur and~~ oxygen

~~with a proviso that, when R_{13} is hydrogen, R_1 and R_2 are mono-substitution and are hydroxyl group and R_2 is present at 4 position of the ring C, then R_1 is not at position 8 of the ring A~~.

2. The compound of claim 1 wherein, R_1 is selected from OH, OR_3 and $-OC(O)R_3$

~~R_2 is selected from halogen, OR_{11} and $-OC(O)R_{11}$;~~

R_4 is ~~selected from~~ C_{1-5} alkyl ~~or C_{1-5} haloalkyl~~;

L is selected from C_{1-4} alkyl;

~~R_9 and R_{10} are independently selected from hydrogen, C_{1-20} linear alkyl and C_{1-20} haloalkyl optionally interrupted with one or more radicals selected from -O-, $-NR_5$-, -S- and $-CR_5=CR_5$-, or~~

R_9 and R_{10} together with the nitrogen atom to which they are attached forms a ~~5-6~~4-5 membered ring optionally containing 1 or 2 additional nitrogen atoms and the ring is optionally substituted with one or more group selected from halogen, $-OR_6$, $-N(R_6)_2$ and R_6; wherein R_6, at each

occurrence is selected from hydrogen and C_{1-20} linear, branched or cyclic alkyl optionally interrupted with one or more radicals selected from -O-, -NR_5-, -S- and -CR_5=CR_5-;
optionally, R_6 is further substituted with one or more groups selected from halogen, -OR_{12} and -$N(R_{12})_2$;

 is a double or a triple bond; and

R_7 and R_8 are hydrogen or absent;

R_{13} is a group selected from hydrogen, halogen and -C_{1-6} haloalkyl; and

X is oxygen.

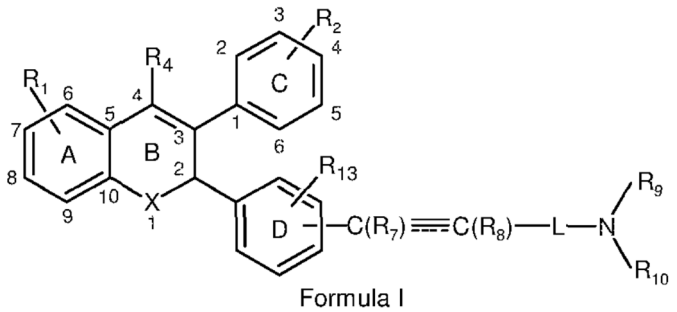
~~3. The compound of claim 1 wherein R_9 and R_{10} together forms a 5 to 6 membered ring optionally containing 1 additional heteroatom selected from oxygen, nitrogen and sulfur; and the ring is further substituted with R_6 wherein R_6 is a C_{1-15} linear or branched alkyl optionally interrupted with one or more radicals selected from -O-, -NR_5-, -S- or -CR_5=CR_5-.~~

~~4. The compound of claim 1 wherein R_9 is hydrogen or C_{1-3} alkyl and R_{10} is selected from C_{1-15} linear or branched alkyl optionally interrupted with one or more radicals selected from -O-, -NR_5-, -S- and -CR_5=CR_5-.~~

~~5. The compound of any preceding claims wherein X is O.~~

~~6~~3. The compound of ~~any preceding~~ claim~~s~~ 1 wherein R_2 is substituted at position 3 of ring C and R_1 is substituted at position 7 of the ring A.

4. A compound of Formula I



Formula I

or salts or stereoisomers thereof wherein,

R_1 is mono or di-substitution on ring A and is selected from a group consisting of $-OR_3$, halogen, $-C_{1-6}$ haloalkyl, $-OC_{1-6}$ haloalkyl, -CN, $-N(R_3)_2$, $-NR_3SO_2R_3$, $-NR_3CHO$, $-NR_3COR_3$, $-OC(O)R_3$, $-OC(O)N(R_3)_2$, $-OP(O)(OH)_2$ and $-OC(O)OR_3$ wherein R_3 at each occurrence is selected from hydrogen, C_{1-6} linear or branched alkyl;

R_2 is mono or di-substitution and is a halogen;

R_4 is $-C_{1-5}$ alkyl;

L is selected from C_{1-4} linear or branched alkyl;

R_7 and R_8 are independently selected from hydrogen and C_{1-5} alkyl;

R_9 and R_{10} together with the nitrogen atom to which they are attached forms a 4 to 5 membered ring optionally containing 1 to 2 additional heteroatoms selected from oxygen, nitrogen or sulfur; and the ring is optionally substituted with one or more group selected from halogen, $-OR_6$, $-N(R_6)_2$ and R_6 wherein R_6, at each occurrence is selected from a group comprising hydrogen, C_{1-20} linear, branched or cyclic alkyl optionally interrupted with one or more radicals independently selected from -O-, $-NR_5$-, -S-, -SO-, $-S(O)_2$-, $-CR_5=CR_5$-, -C≡C-, $-NR_5CO$-, $-CONR_5$-, $-NR_5CONR_5$-, $-NR_5C(O)O$- and $-OC(O)O$-;

optionally, R_6 is further substituted with one or more groups selected from a group comprising halogen, $-OR_{12}$, $-N(R_{12})_2$, and $-COOR_{12}$, $-CON(R_{12})_2$ or $-CON(R_{12})OH$; wherein R_{12} at each occurrence is selected from hydrogen or C_{1-6} linear, branched or cyclic alkyl;

 is a double bond;

R_{13} is selected from a group consisting of hydrogen, halogen, $-C_{1-6}$ haloalkyl and C_{1-6} alkyl; and

X is oxygen.

5. The compound of claim 4 wherein, R_1 is selected from OH, $-OR_3$ and $-OC_{1-6}$ haloalkyl and $-OC(O)R_3$, wherein R_3 is C_{1-6} linear or branched alkyl;

R_9 and R_{10} together with the nitrogen atom to which they are attached forms a 5 membered ring optionally containing 1 additional heteroatom selected from oxygen, nitrogen and sulfur and the ring is optionally substituted with one or more groups selected from halogen, $-N(R_6)_2$ and R_6; wherein R_6, at each occurrence is independently selected from hydrogen and C_{1-15} linear or branched alkyl;

optionally, R_6 is further substituted with one or more groups selected from halogen and $-OR_{12}$; wherein R_{12} is hydrogen;

R_7 and R_8 are hydrogen; and

R_{13} is a group selected from hydrogen and halogen.

6. The compound of claim 4 wherein R_2 is substituted at position 3 of ring C and R_1 is substituted at position 7 of the ring A.

7. The compound of claim 4, wherein

R_1 is a monosubstitution and is -OH;

R_2 is a di-substitution;

R_4 is methyl;

R_9 and R_{10} together with the nitrogen atom to which they are attached forms a 4 to 5 membered ring optionally containing 1 additional nitrogen atom and the ring is optionally substituted with one or more groups selected from halogen, $-N(R_6)_2$ and R_6;

wherein R_6, at each occurrence is selected from hydrogen and C_{1-10} linear or branched alkyl;

optionally, R_6 is further substituted with one or more groups selected from halogen and $-OR_{12}$; wherein R_{12} is hydrogen.

8. The compound of claim 4, wherein

R_1 is a monosubstitution and is -OH;

R_2 is a di-substitution;

R_7 and R_8 are hydrogen;

R_{13} is hydrogen;

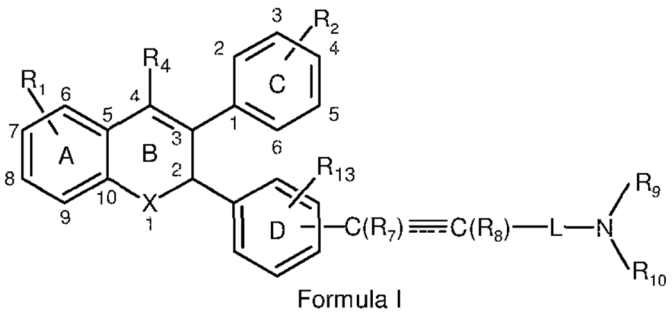
R_4 is methyl;

L is C_{1-3} linear alkyl; and

R_9 and R_{10} together with the nitrogen atom to which they are attached forms a 4-5 membered ring wherein the ring is substituted R_6; wherein R_6 is selected from C_{1-3} linear alkyl and wherein R_6 is further substituted with halogen.

9. The compound of claim 8 wherein R_2 is fluoro.

10. Use of a compound of Formula I



Formula I

or salts or stereoisomers thereof in the manufacture of a medicament for inhibiting the action of endogenous estrogen in estrogen receptor positive breast cancer in a human, wherein,

R_1 is mono or di-substitution on ring A and is selected from a group consisting of, $-OR_3$, halogen, $-C_{1-6}$ haloalkyl, $-OC_{1-6}$ haloalkyl, -CN, $-N(R_3)_2$, $-NR_3SO_2R_3$, $-NR_3CHO$, $-NR_3COR_3$, $-OC(O)R_3$, $-OC(O)N(R_3)_2$, $-OP(O)(OH)_2$ and $-OC(O)OR_3$ wherein R_3 at each occurrence is selected from hydrogen, C_{1-6} linear, branched or cyclic alkyl and C_{1-6} linear, branched or cyclic haloalkyl;

R_2 is mono or di-substitution and is a halogen;

R_4 is selected from hydrogen and $-C_{1-5}$ alkyl;

L is selected from C_{1-7} linear or branched alkyl;

R_7 and R_8 are absent or independently selected from hydrogen and C_{1-5} alkyl;

R_9 and R_{10} together with the nitrogen atom to which they are attached forms a 4 to 5 membered ring optionally containing 1 to 2 additional heteroatoms selected from oxygen, nitrogen or sulfur; and the ring is optionally substituted with one or more group selected from halogen, $-OR_6$, $-N(R_6)_2$ and R_6 wherein R_6, at each occurrence is selected from a group comprising hydrogen, C_{1-20} linear, branched or cyclic alkyl optionally interrupted with one or more radicals independently selected from –O-, $-NR_5$-, -S-, -SO-,$-S(O)_2$-, $-CR_5{=}CR_5$-, -C ≡ C-, $-NR_5CO$-, $-CONR_5$-, $-NR_5CONR_5$-, $NR_5C(O)O$ and $-OC(O)O$-;

optionally, R_6 is further substituted with one or more groups selected from a group comprising halogen, $-OR_{12}$, $-N(R_{12})_2$, and $-COOR_{12}$, $-CON(R_{12})_2$ or $-CON(R_{12})OH$; wherein R_{12} at each occurrence is selected from hydrogen or C_{1-6} linear, branched or cyclic alkyl;

 is a double or a triple bond;

R_{13} is selected from a group comprising $-R_{14}$, $-OR_{14}$, halogen, $-C_{1-6}$ haloalkyl, $-OC_{1-6}$ haloalkyl, -CN, $-N(R_{14})_2$, $-NR_{14}SO_2R_{14}$, $-NR_{14}CHO$, $-NR_{14}COR_{14}$, $-OC(O)R_{14}$, $-OC(O)N(R_{14})_2$, $-OP(O)(OH)_2$

and –OC(O)OR_{14} wherein R_{14} at each occurrence is selected from hydrogen, and C_{1-6} linear, branched or cyclic alkyl; and

X is oxygen.

11. The use of claim 10, wherein the human has breast cancer.

12. The use of claim 10, wherein R_1 is a mono-substitution and is –OH;

R_2 is di-substitution;

R_7 and R_8 are hydrogen;

R_{13} is R_{14}, and R_{14} is hydrogen;

R_4 is methyl;

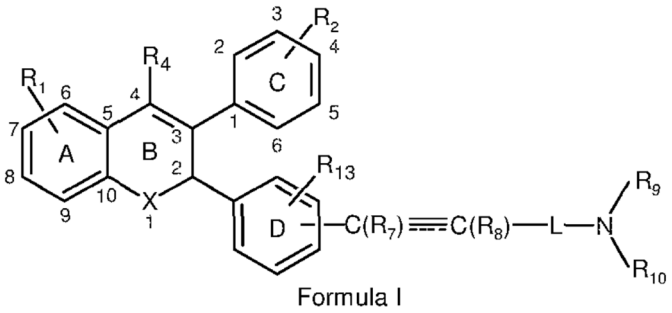
L is C_{1-3} linear alkyl; and R_9 and R_{10} together with the nitrogen atom to which they are attached forms a 4-5 membered ring wherein the ring is substituted with R_6; wherein R_6 is selected from C_{1-3} linear alkyl and wherein R_6 is further substituted with halogen;

and

 is a double bond.

13. The use of claim 12, wherein R_2 is fluoro.

14. Use of a compound of Formula I



Formula I

or salts or stereoisomers thereof, in the manufacture of a medicament for treating breast cancer in a human having the disease wherein,

R_1 is mono or di-substitution on ring A and is selected from a group consisting of, -OR_3, halogen, -C_{1-6} haloalkyl, -OC_{1-6} haloalkyl, -CN, -$N(R_3)_2$, -$NR_3SO_2R_3$, -NR_3CHO, -NR_3COR_3, -$OC(O)R_3$, -$OC(O)N(R_3)_2$, -$OP(O)(OH)_2$ and –$OC(O)OR_3$ wherein R_3 at each occurrence is selected from hydrogen, C_{1-6} linear, branched or cyclic alkyl and C_{1-6} linear, branched or cyclic haloalkyl;

R_2 is mono or di-substitution and is a halogen;

R_4 is selected from hydrogen and -C_{1-5} alkyl;

L is selected from C_{1-7} linear or branched alkyl;

R_7 and R_8 are absent or independently selected from hydrogen and C_{1-5} alkyl;

R_9 and R_{10} together with the nitrogen atom to which they are attached forms a 4 to 5 membered ring optionally containing 1 to 2 additional heteroatoms selected from oxygen, nitrogen or sulfur; and the ring is optionally substituted with one or more group selected from halogen, $-OR_6$, $-N(R_6)_2$ and R_6 wherein R_6, at each occurrence is selected from a group comprising hydrogen, C_{1-20} linear, branched or cyclic alkyl optionally interrupted with one or more radicals independently selected from –O-, $-NR_5$-, -S-, -SO-,$-S(O)_2$-, $-CR_5=CR_5$-, -C ≡ C-, $-NR_5CO$-, $-CONR_5$-, $-NR_5CONR_5$-, $NR_5C(O)O$ and $-OC(O)O$-;

optionally, R_6 is further substituted with one or more groups selected from a group comprising halogen, $-OR_{12}$, $-N(R_{12})_2$, and $–COOR_{12}$, $-CON(R_{12})_2$ or $–CON(R_{12})OH$; wherein R_{12} at each occurrence is selected from hydrogen or C_{1-6} linear, branched or cyclic alkyl;

 is a double or a triple bond;

R_{13} is selected from a group comprising $–R_{14}$, $-OR_{14}$, halogen, $-C_{1-6}$ haloalkyl, $-OC_{1-6}$ haloalkyl, -CN, $-N(R_{14})_2$, $-NR_{14}SO_2R_{14}$, $-NR_{14}CHO$, $-NR_{14}COR_{14}$, $-OC(O)R_{14}$, $-OC(O)N(R_{14})_2$, $-OP(O)(OH)_2$ and $–OC(O)OR_{14}$ wherein R_{14} at each occurrence is selected from hydrogen, and C_{1-6} linear, branched or cyclic alkyl; and

X is oxygen.

15. The use of claim 14,

wherein R_1 is a mono-substitution and is –OH;

R_2 is di-substitution;

R_7 and R_8 are hydrogen;

R_{13} is R_{14}, and R_{14} is hydrogen;

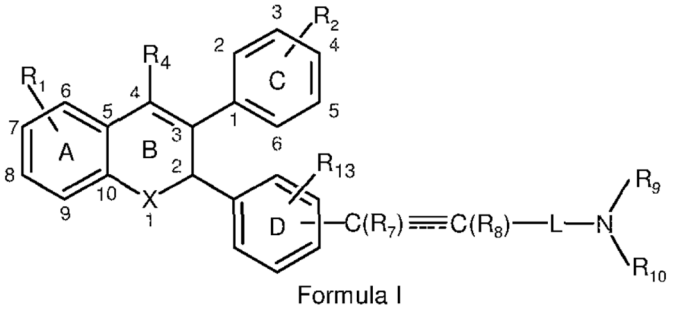
R_4 is methyl;

L is C_{1-3} linear alkyl; and R_9 and R_{10} together with the nitrogen atom to which they are attached forms a 4-5 membered ring wherein the ring is substituted with R_6; wherein R_6 is selected from C_{1-3} linear alkyl and wherein R_6 is further substituted with halogen; and

 is a double bond.

16. The use of claim 15, wherein R_2 is fluoro.

17. Use of a compound of Formula I



Formula I

or salts or stereoisomers thereof, in the manufacture of a medicament for inhibiting breast cancer cell growth in a human wherein,

R_1 is mono or di-substitution on ring A and is selected from a group consisting of, $-OR_3$, halogen, $-C_{1-6}$ haloalkyl, $-OC_{1-6}$ haloalkyl, -CN, $-N(R_3)_2$, $-NR_3SO_2R_3$, $-NR_3CHO$, $-NR_3COR_3$, $-OC(O)R_3$, $-OC(O)N(R_3)_2$, $-OP(O)(OH)_2$ and $-OC(O)OR_3$ wherein R_3 at each occurrence is selected from hydrogen, C_{1-6} linear, branched or cyclic alkyl and C_{1-6} linear, branched or cyclic haloalkyl;

R_2 is mono or di-substitution and is a halogen;

R_4 is selected from hydrogen and $-C_{1-5}$ alkyl;

L is selected from C_{1-7} linear or branched alkyl;

R_7 and R_8 are absent or independently selected from hydrogen and C_{1-5} alkyl;

R_9 and R_{10} together with the nitrogen atom to which they are attached forms a 4 to 5 membered ring optionally containing 1 to 2 additional heteroatoms selected from oxygen, nitrogen or sulfur; and the ring is optionally substituted with one or more group selected from halogen, $-OR_6$, $-N(R_6)_2$ and R_6 wherein R_6, at each occurrence is selected from a group comprising hydrogen, C_{1-20} linear, branched or cyclic alkyl optionally interrupted with one or more radicals independently selected from –O-, $-NR_5$-, -S-, -SO-, $-S(O)_2$-, $-CR_5{=}CR_5$-, $-C{\equiv}C$-, $-NR_5CO$-, $-CONR_5$-, $-NR_5CONR_5$-, $NR_5C(O)O$ and -OC(O)O-;

optionally, R_6 is further substituted with one or more groups selected from a group comprising halogen, $-OR_{12}$, $-N(R_{12})_2$, and $-COOR_{12}$, $-CON(R_{12})_2$ or $-CON(R_{12})OH$; wherein R_{12} at each occurrence is selected from hydrogen or C_{1-6} linear, branched or cyclic alkyl;

 is a double or a triple bond;

R_{13} is selected from a group comprising $-R_{14}$, $-OR_{14}$, halogen, $-C_{1-6}$ haloalkyl, $-OC_{1-6}$ haloalkyl, -CN, $-N(R_{14})_2$, $-NR_{14}SO_2R_{14}$, $-NR_{14}CHO$, $-NR_{14}COR_{14}$, $-OC(O)R_{14}$, $-OC(O)N(R_{14})_2$, $-OP(O)(OH)_2$ and $-OC(O)OR_{14}$ wherein R_{14} at each occurrence is

selected from hydrogen, and C_{1-6} linear, branched or cyclic alkyl; and
X is oxygen.

18. The use of claim 17 wherein the human has breast cancer.

19. The use of claim 17, wherein
R_1 is a mono-substitution and is –OH;
R_2 is di-substitution;
R_7 and R_8 are hydrogen;
R_{13} is R_{14}, and R_{14} is hydrogen;
R_4 is methyl;
L is C_{1-3} linear alkyl; and R_9 and R_{10} together with the nitrogen atom to which they are attached forms a 4-5 membered ring wherein the ring is substituted with R_6; wherein R_6 is selected from C_{1-3} linear alkyl and wherein R_6 is further substituted with halogen; and

 is a double bond.

20. The use of claim 19, wherein R_2 is fluoro.