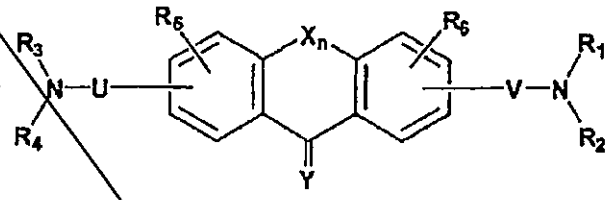
What is claimed is:

1. A compound having the structure of Formula I



Formula I

wherein n = 0 - 2 and wherein when n = 1, X is selected from CH_2, O, NR_A, CO, and $C{=}NOR_A$ and wherein when n = 2, X = CH_2

Y is O, S, NOR_A, or NR_A

wherein R_A is selected from H, alkyl, heteroalkyl, alkenyl, alkynyl, cycloalkyl, -C(=O)RB, $-C(=O)OR_B$, $-C(=O)NR_BR_C$, $-C(=NR_B)RC$, $-NR_BR_C$, heterocycloalkyl, aryl or polyaromatic, heteroaryl, arylalkyl and alkylaryl

wherein each of said R_B and R_C is independently H, alkyl, or heteroalkyl,

U and V are each independently selected from C=O, and O=S=O and wherein when U is C=O, V is not C=O,

R_1, R_2, R_3, and R_4 are each independently selected from H, alkyl, heteroalkyl, cycloalkyl, arylcycloalkyl, alkenyl, alkynyl, aryl, heteroaryl, heterocycloalkyl, and each of said NR_1R_2 and NR_3R_4 can independently combine to form a heterocycloalkyl,

R_5 and R_6 are each independently selected from H, OH, SH, alkoxy, thioalkoxy, alkyl, halogen, CN, CF_3, NO_2, $COOR_D$,

$CONR_DR_E$, NR_DR_E, NR_DCOR_E, $NR_DSO_2R_E$, and $NR_FCONR_DR_E$;

wherein R_D, R_E and R_F are independently H, alkyl, heteroalkyl, aryl, arylalkyl, heteroaryl, heteroarylalkyl, cycloalkyl, or heterocycloalkyl; provided that is X is O, Y is O and U and V are both O=S=O, then

NR_1R_2 and NR_3R_4 are not identical then R_1 and R_3 are each independently selected from H and lower alkyl, and wherein R_2 and R_4 are each independently selected from lower alkoxy(loweralkyl), di(lower)alkylamino(lower)alkyl, halobenzyl, morpholino(lower)alkyl, or NR_1R_2 and NR_3R_4 are independently piperidino, morpholino, piperazino, N-phenylpiperazino, ethylamino, or substituted glycine

and wherein if X is $(CH_2)_2$, Y is O or NOH, and U and V are each O=S=O then none of R_1, R_2, R_3, and R_4 is methyl,

and wherein if n = 0, Y is O or NOH, and U and V are each O=S=O, then NR_1R_2 and NR_3R_4 are not identical and R_1, R_2, R_3, and R_4 are each independently selected from C_1-C_5 alkyl, C_{10} alkyl, C_{16} alkyl, C_{17} alkyl, phenyl, benzyl, naphthalenyl, piperizino, pyridinyl, pyrazolyl, benzimidazolyl, triazolyl; or NR_1R_2 and NR_3R_4 are independently piperidino, morpholino, or piperazino.

and wherein if X is CO, Y is O, and U and V are each O=S=O then NR_1R_2 and NR_3R_4 are not identical, and wherein R_1, R_2, R_3, and R_4 are each independently selected from methyl, ethyl, hydroxy-C_1-C_3-alkyl, SH, RO, COOH, SO, NH_2, and phenyl or wherein one or both of non-identical NR_1R_2 and NR_3R_4 is unsubstituted piperidino, N-methylpiperazino or N-methylhomopiperazino.

and wherein when X is C=O or C=NOH, Y is O or NOH, and U and V are each O=S=O and one of R_1 or R_2 and one of R_3 or R_4 is phenyl then the other of R1 or R_2 and R_3 or R_4 is not H or alkyl,

including all pharmaceutically acceptable salts, esters, amides, stereoisomers, geometric isomers, solvates or prodrugs thereof.

2. The compound of claim 1, wherein U and V are each O=S=O.

3. The compound of claim 1, wherein U and V are each O=S=O, X is CH_2 and n = 1 or 2 and Y is O or S.

4. The compound of claim 1, wherein U and V are each O=S=O, X is CH_2 and n = 1 or 2 and Y is NOR_A, or NR_A.

5. The compound of claim 1, wherein U and V are each O=S=O, X is O, and Y is O or S.

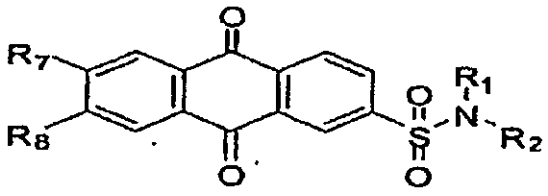
6. The compound of claim 1, wherein U and V are each O=S=O, X is O, and Y is NOR_A, or NR_A.

7. The compound of claim 1, wherein U and V are each O=S=O, X is NR_A, and Y is O or S.

8. The compound of claim 1, wherein U and V are each O=S=O, X is NRA, and Y is NOR_A, or NR_A.

9. The compound of claim 1, wherein U and V are each O=S=O, X is CO and Y=O.

10. The compound of claim 1 having formula II



Formula II

wherein R_7 and R_8 are independently selected from H and $SO_2NR_3R_4$ and one of R_7 or R_8 is hydrogen and the other substituents have the meanings as defined in claim 1.

11. The compound of claim 10, wherein R_1, R_2, R_3, and R_4 are each independently selected from H, alkyl, cycloalkyl, alkenyl, and alkynyl.

12. The compound of claim 10, wherein R_A is hydrogen and R_1, R_2, R_3, and R_4 are each independently selected from H, alkyl, cycloalkyl, alkenyl, and alkynyl.

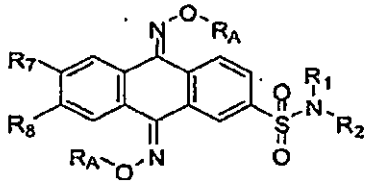
13. The compound of claim 10, wherein NR_1R_2 and NR_3R_4 are each independently a 6- to 15-membered heterocycloalkyl.

14. The compound of claim 1, wherein U and V are each O=S=O, X is CO and Y is NOR_A or NR_A.

15. The compound of claim 1, wherein U and V are each O=S=O, X is $C=NOR_A$ and Y is O.

16. The compound of claim 1, wherein U and V are each O=S=O, X is C=NORA and Y is NORA.

17. The compound of claim 1 having formula III



Formula III

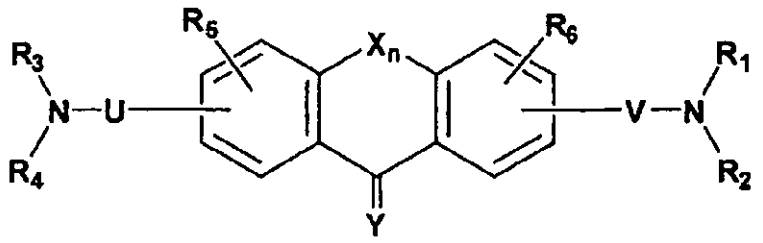
wherein R_7 and R_8 are independently selected from H and $SO_2NR_3R_4$, wherein one of R_7 and R_8 is hydrogen and the other substituents have the meanings as defined in claim 1.

18. The compound of claim 17, wherein R_1, R_2, R_3, and R_4 are each independently selected from H, alkyl, cycloalkyl, alkenyl, or alkynyl.

19. A composition comprising a therapeutically effective amount of the compound of claim 1 in a pharmaceutically acceptable carrier.

20. A method of preventing, treating or ameliorating cancer or tumor metastasis in a mammal comprising administering to said mammal an effective amount of a compound of claim 1.

1. A compound having the structure of Formula I



Formula I

wherein n = 1-2 and wherein when n = 1, X is selected from CH_2, O, CO, and $C{=}NOR_A$ and wherein when n = 2, X = CH_2

Y is O, S, NOR_A, or NR_A,

wherein U and V are each O=S=O,

wherein R_A is selected from H, alkyl, heteroalkyl, alkenyl, alkynyl, cycloalkyl, -C(=O)RB, $-C(=O)OR_B$, $-C(=O)NR_BR_C$, $-C(=NR_B)RC$, $-NR_BR_C$, heterocycloalkyl, aryl or polyaromatic, heteroaryl, arylalkyl and alkylaryl,

wherein each of said R_B and R_C is independently H, alkyl, or heteroalkyl,

R_1, R_2, R_3, and R_4 are each independently selected from H, alkyl, heteroalkyl, cycloalkyl, arylcycloalkyl, alkenyl, alkynyl, aryl, heteroaryl, heterocycloalkyl, and each of said NR_1R_2 and NR_3R_4 can independently combine to form a heterocycloalkyl,

R_5 and R_6 are each independently selected from H, OH, SH, alkoxy, thioalkoxy, alkyl, halogen, CN, CF_3, NO_2, $COOR_D$,

$CONR_DR_E$, NR_DR_E, NR_DCOR_E, $NR_DSO_2R_E$, and $NR_FCONR_DR_E$;

wherein R_D, R_E and R_F are independently H, alkyl, heteroalkyl, aryl, arylalkyl, heteroaryl, heteroarylalkyl, cycloalkyl, or heterocycloalkyl; provided that is X is O, Y is O and U and V are both O=S=O, then

NR_1R_2 and NR_3R_4 are not identical then R_1 and R_3 are each independently selected from H and lower alkyl, and wherein R_2 and R_4 are each independently selected from lower alkoxy(loweralkyl), di(lower)alkylamino(lower)alkyl, halobenzyl, morpholino(lower)alkyl, or NR_1R_2 and NR_3R_4 are independently piperidino, morpholino, piperazino, N-phenylpiperazino, ethylamino, or substituted glycine,

and wherein if X is $(CH_2)_2$, and Y is O or NOH, then none of R_1, R_2, R_3, and R_4 is methyl,

and wherein if X is CO and Y is O, then NR_1R_2 and NR_3R_4 are not identical, and wherein R_1, R_2, R_3, and R_4 are each independently selected from methyl, ethyl, hydroxy-C_1-C_3-alkyl, SH, RO, COOH, SO, NH_2, and phenyl or wherein one or both of non-identical NR_1R_2 and NR_3R_4 is unsubstituted piperidino, N-methylpiperazino or N-methylhomopiperazino, wherein said unsubstituted piperidino, N-methylpiperazino or N-methylhomopiperazino NR_1R_2 and NR_3R_4 moieties are not identical,

and wherein when X is C=O or C=NOH, Y is O or NOH, and one of R_1 or R_2 and one of R_3 or R_4 is phenyl then the other of R1 or R_2 and R_3 or R_4 is not H or alkyl,

or a pharmaceutically acceptable salt, ester, amide, stereoisomer or geometric isomer thereof.

2. The compound of claim 1, wherein X is CH_2 and n = 1 or 2 and Y is O or S.

3. The compound of claim 1, wherein X is CH_2 and n = 1 or 2 and Y is NOR_A, or NR_A.

4. The compound of claim 1, wherein X is O, and Y is O or S.

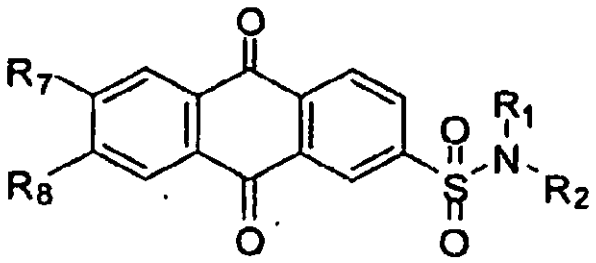
5. The compound of claim 1, wherein X is O, and Y is NOR_A, or NR_A.

6. The compound of claim 1, wherein X is NR_A, and Y is O or S.

7. The compound of claim 1, wherein X is NRA, and Y is NOR_A, or NR_A.

8. The compound of claim 1, wherein X is CO and Y=O.

9. The compound of claim 1 having formula II



Formula II

wherein R_7 and R_8 are independently selected from H and $SO_2NR_3R_4$ and one of R_7 or R_8 is hydrogen and the other substituents have the meanings as defined in claim 1.

10. The compound of claim 9, wherein R_1, R_2, R_3, and R_4 are each independently selected from H, alkyl, cycloalkyl, alkenyl, and alkynyl.

11. The compound of claim 9, wherein R_A is hydrogen and R_1, R_2, R_3, and R_4 are each independently selected from H, alkyl, cycloalkyl, alkenyl, and alkynyl.

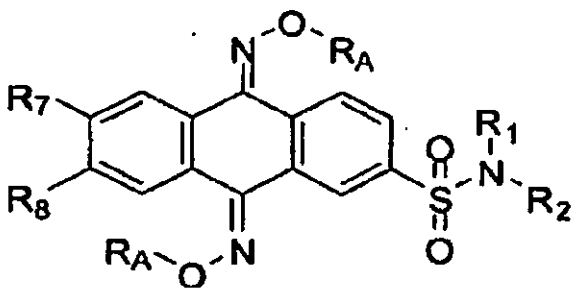
12. The compound of claim 11, wherein NR_1R_2 and NR_3R_4 are each independently a 6- to 15-membered heterocycloalkyl.

13. The compound of claim 1, wherein X is CO and Y is NOR_A or NR_A.

14. The compound of claim 1, wherein X is $C{=}NOR_A$ and Y is O.

15. The compound of claim 1, wherein X is C=NORA and Y is NORA.

16. The compound of claim 1 having formula III



Formula III

wherein R_7 and R_8 are independently selected from H and $SO_2NR_3R_4$, wherein one of R_7 and R_8 is hydrogen and the other substituents have the meanings as defined in claim 1.

17. The compound of claim 16, wherein R_1, R_2, R_3, and R_4 are each independently selected from H, alkyl, cycloalkyl, alkenyl, or alkynyl.

18. A composition comprising a therapeutically effective amount of the compound of claim 1 in a pharmaceutically acceptable carrier.

19. The compound of claim 1 having the following formula:

