

CLAIMS

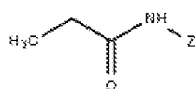
What is claimed is:

1. A mitoketoscin.
2. The mitoketoscin of claim 1, wherein the mitoketoscin comprises the general formula:



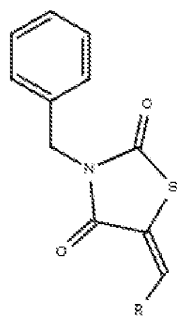
or a pharmaceutically acceptable salt thereof.

3. The mitoketoscin of claim 1, wherein the mitoketoscin comprises the general formula:



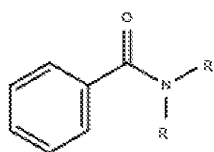
or a pharmaceutically acceptable salt thereof, wherein Z is defined as ethylpiperidine or ethylpyrrolidine.

4. The mitoketoscin of claim 1, wherein the mitoketoscin comprises the general formula:



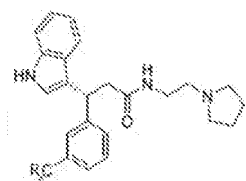
or a pharmaceutically acceptable salt thereof.

5. The mitoketoscin of claim 1, wherein the mitoketoscin comprises the general formula:



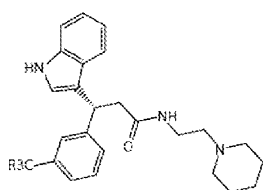
or a pharmaceutically acceptable salt thereof.

6. The mitoketoscin of claim 1, wherein the mitoketoscin comprises the general pharmacophore:



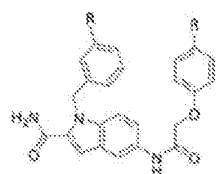
or a pharmaceutically acceptable salt thereof.

7. The mitoketoscin of claim 1, wherein the mitoketoscin comprises the general pharmacophore:



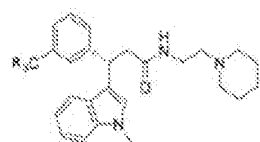
or a pharmaceutically acceptable salt thereof.

8. The mitoketoscin of claim 1, wherein the mitoketoscin comprises the general formula:



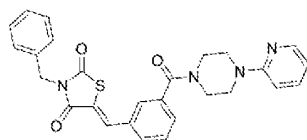
or a pharmaceutically acceptable salt thereof.

9. The mitoketoscin of claim 1, wherein the mitoketoscin comprises the general formula:



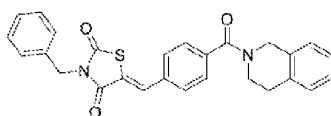
or a pharmaceutically acceptable salt thereof.

10. The mitoketoscin of claim 1, wherein the mitoketoscin comprises the general formula:



or a pharmaceutically acceptable salt thereof.

11. The mitoketoscin of claim 1, wherein the mitoketoscin comprises the general formula:



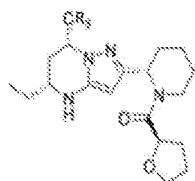
or a pharmaceutically acceptable salt thereof.

12. The mitoketoscin of claim 1, wherein the mitoketoscin comprises the general formula:



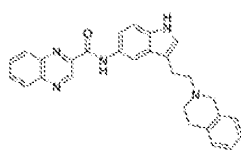
or a pharmaceutically acceptable salt thereof.

13. The mitoketoscin of claim 1, wherein the mitoketoscin comprises the general formula:



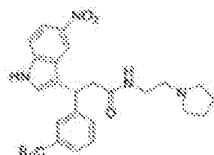
or a pharmaceutically acceptable salt thereof.

14. The mitoketoscin of claim 1, wherein the mitoketoscin comprises the general formula:



or a pharmaceutically acceptable salt thereof.

15. The mitoketoscin of claim 1, wherein the mitoketoscin comprises the general formula:



or a pharmaceutically acceptable salt thereof.

16. The mitoketoscin of any of claims 1-15, wherein the mitoketoscin possesses anti-aging activity.
17. The mitoketoscin of any of claims 1-15, wherein the mitoketoscin possesses radiosensitizing activity.
18. The mitoketoscin of any of claims 1-15, wherein the mitoketoscin possesses photosensitizing activity.
19. The mitoketoscin of any of claims 1-15, wherein the mitoketoscin sensitizes cancer cells to chemotherapeutic agents.
20. The mitoketoscin of any of claims 1-15, wherein the mitoketoscin sensitizes cancer cells to natural substances.
21. The mitoketoscin of any of claims 1-15, wherein the mitoketoscin sensitizes cancer cells to caloric restriction.
22. The mitoketoscin of any of claims 1-15, wherein the mitoketoscin binds to OXCT1.
23. The mitoketoscin of any of claims 1-15, wherein the mitoketoscin binds to ACAT1.
24. The mitoketoscin of any of claims 1-15, wherein the mitoketoscin binds to at least one of OXCT1/2 and ACAT1/2.
25. A method of treating cancer comprising administering to a patient in need thereof of a pharmaceutically effective amount of the mitoketoscin of any of claims 1-15 and a pharmaceutically acceptable carrier.
26. A method of treating a microbial infection comprising administering to a patient in need thereof of a pharmaceutically effective amount of the mitoketoscin of any of claims 1-15 and a pharmaceutically acceptable carrier.

27. A method of treating an age-related condition comprising administering to a patient in need thereof of a pharmaceutically effective amount of the mitoketoscin of any of claims 1-15 and a pharmaceutically acceptable carrier.
28. A pharmaceutical composition for treating cancer containing, as the active ingredient, at least one mitoketoscin.
29. A pharmaceutical composition for treating a bacterial infection containing, as the active ingredient, at least one mitoketoscin.
30. A pharmaceutical composition for treating a pathogenic yeast infection containing, as the active ingredient, at least one mitoketoscin.
31. A pharmaceutical composition for treating aging, as the active ingredient, at least one mitoketoscin.
32. A method of identifying a mitoketoscin using virtual high-throughput screening and phenotypic drug screening, the method comprising;
identifying a mitoketoscin that targets a mitochondrial ketone re-utilization enzyme using virtual high-throughput screening;
synthesizing the mitoketoscin; and
testing the mitoketoscin for mitochondrial inhibition activity.
33. The method of claim 32, wherein the mitoketoscin binds to OXCT1.
34. The method of claim 32, wherein the mitoketoscin binds ACAT1.
35. The method of claim 32, wherein the phenotypic drug screening is in vitro drug screening.
36. The method of claim 32, wherein the phenotypic drug screening comprises an ATP-depletion assay.

37. The method of claim 32, wherein the phenotypic drug screening comprises an extracellular acidification rate assay.
38. The method of claim 32, wherein the phenotypic drug screening comprises an oxygen consumption rate assay.
39. The method of claim 32, further comprising testing the mitoketoscin for anti-cancer activity.
40. The method of claim 39, wherein the anti-cancer activity tested is mammosphere formation.
41. The method of claim 39, wherein the anti-cancer activity tested is cell migration.
42. The method of claim 39, further comprising testing the mitoketoscin for anti-microbial activity.
43. The method of any of claims 25-27, further comprising administering a mitochondrial support substrate.
44. The method of claim 43, wherein the mitochondrial support substrate comprises at least one of glucose, pyruvate, lactate, fatty acids and acetyl-carnitine.