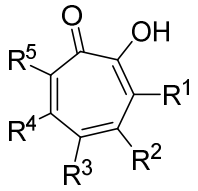
CLAIMS

1. A compound of Formula I:



(**I**);

or a pharmaceutically acceptable salt thereof;

wherein:

R^1 is selected from the group consisting of H, C_1-C_5 alkyl, cycloalkyl, heterocycloalkyl, –O–C_1-C_5 alkyl, –O–cycloalkyl, and –O–heterocycloalkyl;

R^2 is selected from the group consisting of H, C_1-C_5 alkyl, cycloalkyl, heterocycloalkyl, –O–C_1-C_5 alkyl, –O–cycloalkyl, and –O–heterocycloalkyl; and

R^3 is selected from the group consisting of H, C_1-C_5 alkyl, cycloalkyl, heterocycloalkyl, –O–C_1-C_5 alkyl, –O–cycloalkyl, and –O–heterocycloalkyl;

R^4 is selected from the group consisting of H, C_1-C_5 alkyl, cycloalkyl, heterocycloalkyl, –O–C_1-C_5 alkyl, –O–cycloalkyl, and –O–heterocycloalkyl; and

R^5 is selected from the group consisting of H, halo, C_1-C_5 alkyl, cycloalkyl, heterocycloalkyl, –O–C_1-C_5 alkyl, –O–cycloalkyl, and –O–heterocycloalkyl;

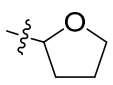
wherein when R^1, R^2, R^3, R^4, or R^5 is C_1-C_5 alkyl, cycloalkyl, heterocycloalkyl, –O–C_1-C_5 alkyl, –O–cycloalkyl, or –O–heterocycloalkyl, at least one hydrogen atom in said C_1-C_5 alkyl, cycloalkyl, heterocycloalkyl, –O–C_1-C_5 alkyl, –O–cycloalkyl, or –O–heterocycloalkyl is replaced with a deuterium atom; and

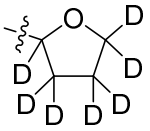
wherein at least one of R^1, R^2, R^3, and R^4 is not H.

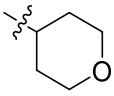
2. The compound of claim 1, wherein R^1 is:

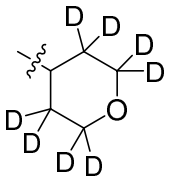
a) selected from the group consisting of methyl, ethyl, propyl, and butyl;

b) selected from the group consisting of CD_3, C_2D_5, C_3D_7, and C_4D_9;

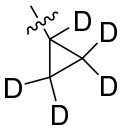
c) ;

d) ;

e) ;

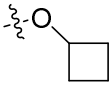
f) ;

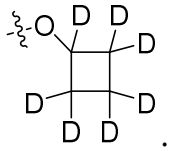
g) ;

h) ;

i) selected from the group consisting of –OMe, –OEt, –OPr, and –OBu;

j) selected from the group consisting of $–OCD_3$, $–OC_2D_5$, $–OC_3D_7$, and $–OC_4D_9$;

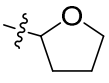
k) ; or

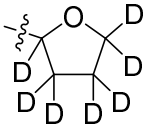
l) .

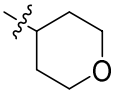
3. The compound of claim 1 or 2, wherein R^2 is:

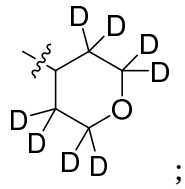
a) selected from the group consisting of methyl, ethyl, propyl, and butyl;

b) selected from the group consisting of CD_3, C_2D_5, C_3D_7, and C_4D_9;

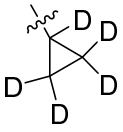
c) ;

d) ;

e) ;

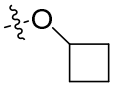
f)  ;

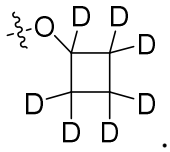
g)  ;

h)  ;

i) selected from the group consisting of –OMe, –OEt, –OPr, and –OBu;

j) selected from the group consisting of $–OCD_3$, $–OC_2D_5$, $–OC_3D_7$, and $–OC_4D_9$;

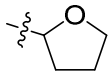
k) ; or

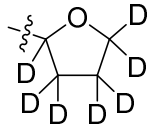
l)  .

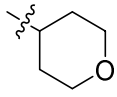
4. The compound of any one of claims 1-3, wherein R^3 is:

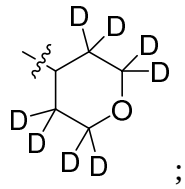
a) selected from the group consisting of methyl, ethyl, propyl, and butyl;

b) selected from the group consisting of CD_3, C_2D_5, C_3D_7, and C_4D_9;

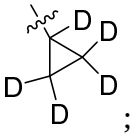
c)  ;

d)  ;

e)  ;

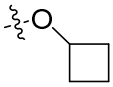
f)  ;

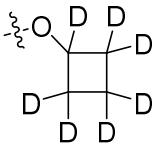
g) ;

h) ;

i) selected from the group consisting of –OMe, –OEt, –OPr, and –OBu;

j) selected from the group consisting of $–OCD_3$, $–OC_2D_5$, $–OC_3D_7$, and $–OC_4D_9$;

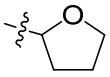
k) ; or

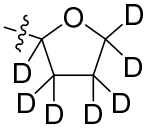
l) .

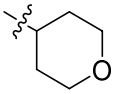
5. The compound of any one of claims 1-4, wherein R^4 is:

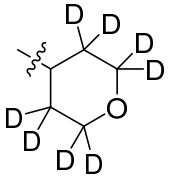
a) selected from the group consisting of methyl, ethyl, propyl, and butyl;

b) selected from the group consisting of CD_3, C_2D_5, C_3D_7, and C_4D_9;

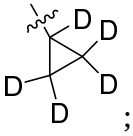
c) ;

d) ;

e) ;

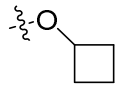
f) ;

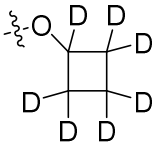
g) ;

h) ;

i) selected from the group consisting of –OMe, –OEt, –OPr, and –OBu;

j) selected from the group consisting of $–OCD_3$, $–OC_2D_5$, $–OC_3D_7$, and $–OC_4D_9$;

k) ; or

l) .

6. The compound of any one of claims 1-5, wherein R^5 is:

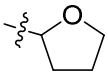
a) H;

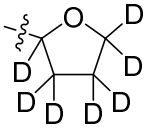
b) halo;

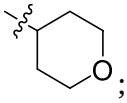
c) F;

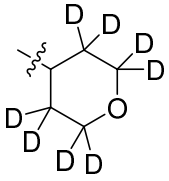
d) selected from the group consisting of methyl, ethyl, propyl, and butyl;

e) selected from the group consisting of CD_3, C_2D_5, C_3D_7, and C_4D_9;

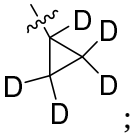
f) ;

g) ;

h) ;

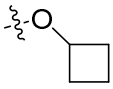
i) ;

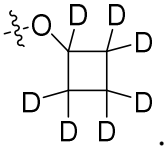
j) ;

k) ;

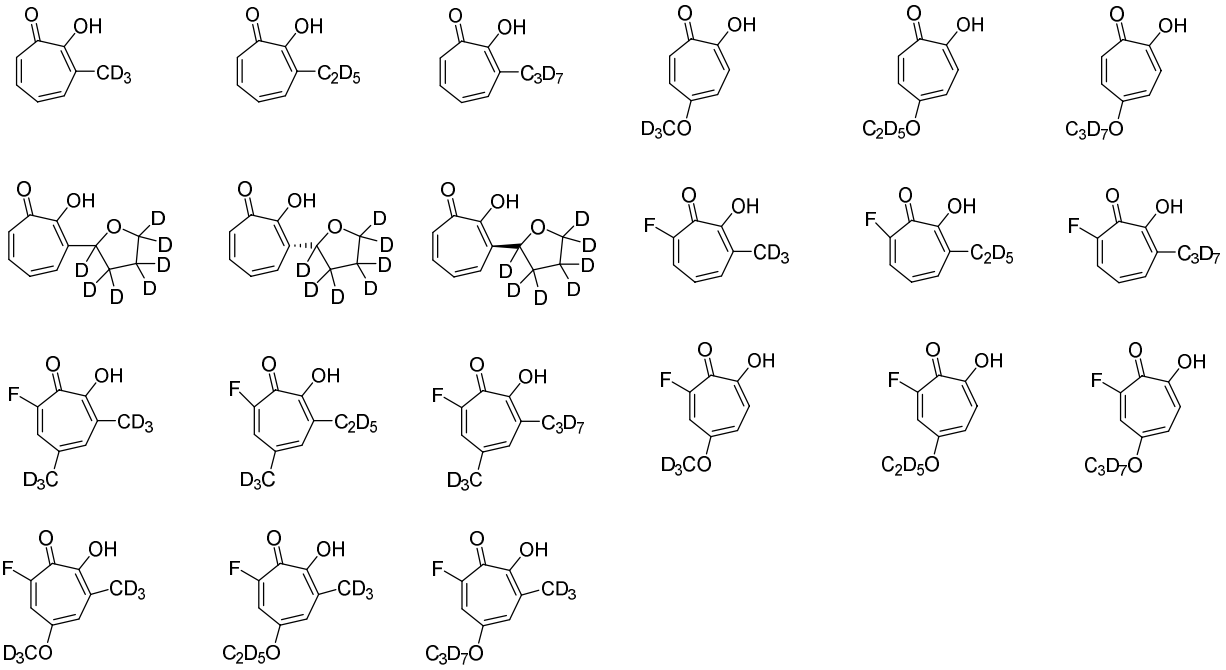
l) selected from the group consisting of –OMe, –OEt, –OPr, and –OBu;

m) selected from the group consisting of $–OCD_3$, $–OC_2D_5$, $–OC_3D_7$, and $–OC_4D_9$;

n) ; or

o) .

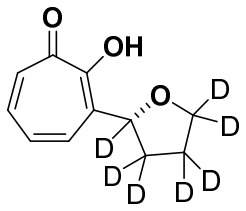
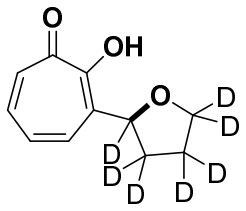
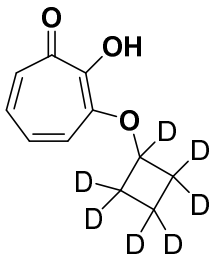
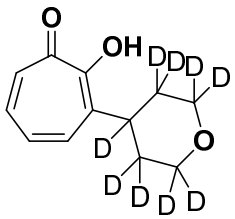
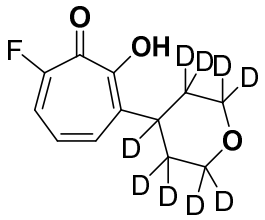
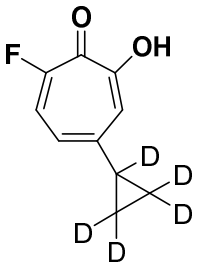
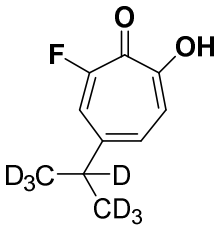
7. The compound of claim 1, wherein the compound is selected from the group consisting of:



;

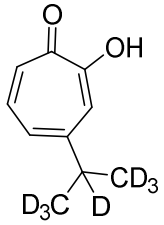
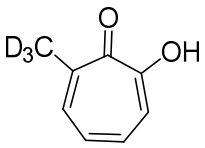
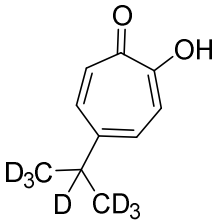
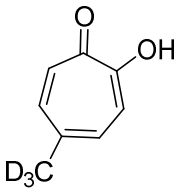
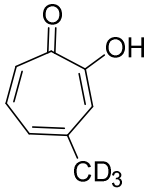
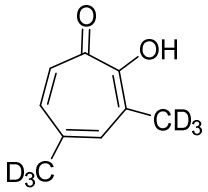
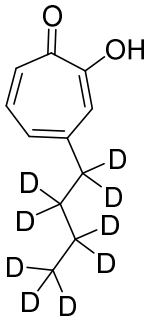
or a pharmaceutically acceptable salt thereof.

8. The compound of claim 1, wherein the compound is selected from the group consisting of:








;

or a pharmaceutically acceptable salt thereof.

9. The compound of claim 1, wherein the compound is selected from the group consisting of:


,

,

,

,

,

, and

; or a pharmaceutically acceptable salt thereof.

10. A pharmaceutical composition, comprising a compound of any one of claims 1-9, or a pharmaceutically acceptable salt thereof; and a pharmaceutically acceptable carrier or excipient.

11. The pharmaceutical composition of claim 10, further comprising an additional therapeutic agent selected from the group consisting of an iron mobilizer and deferiprone.

12. Use of a compound of any one of claims 1-9 in the manufacture of a medicament for the treatment of a disease or condition characterized by decreased ferroportin.

13. The use of claim 12, wherein the disease or condition characterized by decreased ferroportin is induced ferroportin disease associated with aging.

14. Use of a compound of any one of claims 1-9 in the manufacture of a medicament for the treatment of a disease or condition characterized by decreased iron transport.

15. Use of a compound of any one of claims 1-9 in the manufacture of a medicament for the treatment of a disease or condition characterized by a defect or deficiency in an iron transporter.

16. Use of a compound of any one of claims 1-9 in the manufacture of a medicament for the treatment of a disease or condition characterized by iron accumulation.

17. The use of claim 16, wherein the iron accumulation is iron accumulation in the brain.

18. Use of a compound of any one of claims 1-9 in the manufacture of a medicament for the treatment of a disease or condition characterized by iron misdistribution.

19. The use of claim 18, wherein the iron misdistribution is iron misdistribution in the brain.

20. The use of any one of claims 14-19, wherein the disease or condition is selected from the group consisting of anemia of inflammation, iron overload, thalassemia, hemochromatosis, atransferrinemia, myelodysplasia, hypochromic microcytic anemia, ferroportin disease, transfusional iron overload, and aceruloplasminemia.

21. Use of a compound of any one of claims 1-9 in the manufacture of a medicament for the treatment of a neurodegenerative disorder.

22. The use of claim 21, wherein the neurodegenerative disorder is selected from the group consisting of Parkinson's Disease, Alzheimer's Disease, Amyotrophic lateral sclerosis, Friedrich's ataxia, Huntington's Disease, Lewy Body Disease, and Spinal Muscular Atrophy.

23. The use of claim 21, wherein the neurodegenerative disorder is neurodegeneration with brain iron accumulation (NBIA).

24. The use of claim 23, wherein the NBIA is selected from the group consisting of Beta-propeller Protein-associated Neurodegeneration (BPAN), Pantothenate Kinase-associated Neurodegeneration (PKAN), PLA2G6-associated Neurodegeneration (PLAN), Mitochondrial-membrane Protein-associated Neurodegeneration (MPAN), Fatty Acid Hydroxylase-Associated Neurodegeneration (FAHN), COASY Protein-Associated Neurodegeneration (CoPAN), Aceruloplasminemia, Kufor-Rakeb Syndrome (also known as Parkinson's Disease 9 (PARK9)), Neuroferritinopathy, Woodhouse-Sakati Syndrome, and Idiopathic NBIA.

25. The use of any one of claims 12-24, wherein the medicament further comprises an effective amount of an additional therapeutic agent selected from the group consisting of an iron mobilizer and deferiprone.