alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or $-SO_2$-,

G is absent or is $(CR_{17}\text{~~C~~}R_{18})_r$,

H is absent or is C=O, or $-SO_2$-,

m~~M~~, n, and r are independently 0, 1, 2, 3, or 4,

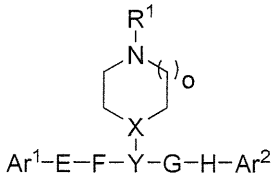
o is 0, 1, or 2,

X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof

with the provisos that (i) when E, F, G, and H are all absent, o is 1, X is N, Y is CH, and R^1 is hydrogen, methyl, ethyl, or isopropyl, the compound is a single enantiomer at the carbon bearing Ar^1 and Ar^2, and (ii) when E, F, G, and H are all absent, o is 1, X is CH and Y is N, R^1 is hydrogen, methyl, or ethyl.

[0006] The disclosure ~~invention~~ also provides a method of treating or preventing hepatitis C comprising administering to a mammal in need thereof an effective amount of a compound of formula (I):



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, C_{6-10} arylsulfonyl, C_{6-10} arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from deuterium, halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or $-SO_2-$,

G is absent or is $(CR_{17}CR_{18})_r$,

H is absent or is C=O, or $-SO_2-$,

m~~M~~, n, and r are independently 0, 1, 2, 3, or 4,

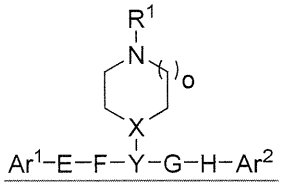
o is 0, 1, or 2,

X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof.

[0006]a The invention also provides pharmaceutical composition comprising a compound, salt, stereoisomers, and mixtures comprising stereoisomers as used herein and a pharmaceutically acceptable carrier.

[0006]b The invention also provides compound of formula (I):



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, C_{6-10} arylsulfonyl, C_{6-10} arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from deuterium, halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or $-SO_2-$,

G is absent or is $(CR^{17}CR^{18})_r$,

H is absent or is C=O, or $-SO_2-$,

m, n, and r are independently 0, 1, 2, 3, or 4,

o is 0, 1, or 2,

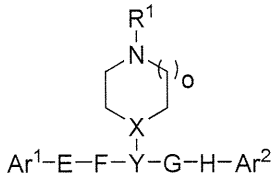
X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof,

for use in the manufacture of a medicament for treating or preventing a viral infection in a mammal in need thereof or for use in synergistically enhancing the antiviral effect of an anti-hepatitis C compound in a mammal undergoing treatment with the anti-hepatitis C compound,

wherein the anti-hepatitis C compound is selected from include ribavirin, interferon-α, telaprevir, cyclosporin A, Asunaprevir (BMS-650032), Boceprevir, GS-9451, GS-9256, ABT-450, Danoprevir (RG7227), Faldaprevir (BI 201335), IDX320, MK-5172, Simeprevir (TMC435), Sovaprevir (ACH-1625), ABT-267, ACH-3102, BMS-791325, Daclatasvir (BMS-790052), GSK2336805, IDX719, JNJ-47910382, Ledipasvir (GS-5885), MK-8742, PPI-461, PPI-668, ABT-333, ALS-002200, BI 207127, IDX184, INX-08189, Mericitabine (RO5024048), PPI-383, PSI-352938, Setrobuvir (ANA-598), Sofosbuvir (PSI-7977 or GS-7977), Tegobuvir (GS-9190), TMC647055, Filibuvir (PF-00868554), GS-9669, GSK2878175, VX-135, VX-222, Algeron (Cepeginterferon Alfa-2b), BIP 48 (Peginterferon alfa 2b 48kDA), Pegylated interferon alfa 2b, Pegylated interferon lambda (BMS-914143), Pegylated-P-Interferon-alpha-2b (P1101), and Alisporivir (DEB025).

[0007] The ~~invention~~ disclosure further provides a method for synergistically enhancing the antiviral effect of an anti-hepatitis C compound in a mammal undergoing treatment with the anti-hepatitis C compound, comprising administering to the mammal a compound of the formula (I):



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, C_{6-10} arylsulfonyl, C_{6-10} arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from deuterium, halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or –SO2-,

G is absent or is $(CR^{17}CR^{18})_r$,

H is absent or is C=O, or –SO2-,

mM, n, and r are independently 0, 1, 2, 3, or 4,

o is 0, 1, or 2,

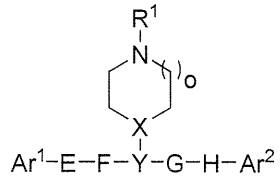
X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof,

in combination with the anti-hepatitis C compound.

[0008] The invention additionally provides a kit comprising:

(a) a compound of formula (I):



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, $C_{6\text{-}10}$ arylsulfonyl, $C_{6\text{-}10}$ arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from deuterium, halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or –SO2-,

G is absent or is $(CR^{17}CR^{18})_r$,

H is absent or is C=O, or –SO2-,

mM, n, and r are independently 0, 1, 2, 3, or 4,

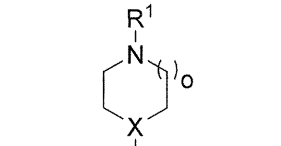
o is 0, 1, or 2,

X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof, and

(b) an anti-hepatitis C compound other than a compound of formula (II).

[0008]a The invention additionally provides a compound of formula (I):



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, C_{6-10} arylsulfonyl, C_{6-10} arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from deuterium, halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or $-SO_2-$,

G is absent or is $(CR^{17}CR^{18})_r$,

H is absent or is C=O, or $-SO_2-$,

m, n, and r are independently 0, 1, 2, 3, or 4,

o is 0, 1, or 2,

X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof,

for use in the manufacture of a medicament for treating or preventing cancer in a mammal in need thereof comprising administering to a mammal in need thereof.

[0009] In accordance with an ~~embodiment~~ example, extracellular and intracellular viral RNA levels were reduced with the treatment of compounds of the invention.

[0010] In accordance with an ~~embodiment~~ example, inhibition of viral entry is not the mechanism of anti-HCV action of compounds of the invention.

[0011] In accordance with an ~~embodiment~~ example, compounds of the invention exhibit synergistic antiviral effect of chlorcyclizine ("CCZ") with current anti-HCV drugs, either approved or under clinical trial.

[0012] In accordance with an ~~embodiment~~ example, compounds of the invention exhibit a lack of long-term in vitro cytotoxicity of chlorcyclizine hydrochloride.

[0013] In accordance with an ~~embodiment~~ example, compounds of formula (I), for example, NCGC00345021, target the late stage of the HCV life cycle.

[0014] In accordance with an ~~embodiment~~ example, inhibition of Dengue virus infection is produced by a compound of formula (I).

[0015] In accordance with an ~~embodiment~~ example, inhibition of HCV genotype 1b and 2a infections *in vivo* is produced by a compound of formula (I) without clear evidence of drug resistance.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S)

[0016] Figures 1A and 1B illustrate the reduction of extracellular and intracellular viral RNA levels, respectively, upon treatment with DMSO (vehicle), racemic chlorcyclizine hydrochloride ("CCZ"), (R)-CCZ, and (S)-CCZ. Cyclosporin A is included as a comparison. A = DMSO; B = racemic CCZ; C = (R)-CCZ; D = (S)-CCZ; E = Cyclosporin A.

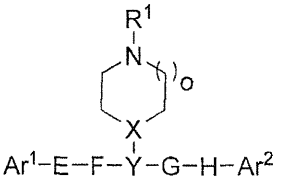
[0017] Figure 2A illustrates luciferase activity of Huh 7.5.1 cells that were inoculated with the infectious HCVsc virus together with DMSO (vehicle), racemic CCZ, (R)-CCZ, and

(S)-CCZ, and Cyclosporin A. A = DMSO; B = racemic CCZ; C = (R)-CCZ; D = (S)-CCZ; E = Cyclosporin A.

[0018] Figure 2B illustrates luciferase activity of HCV replicon GT 1b and 2a cells and transient replicon GT 1a cells that were treated with DMSO (vehicle), racemic CCZ,

CLAIM(S):

1. A compound of formula (I):



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, C_{6-10} arylsulfonyl, C_{6-10} arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from deuterium, halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or $-SO_2-$,

G is absent or is $(CR^{17}CR^{18})_r$,

H is absent or is C=O, or $-SO_2-$,

m, n, and r are independently 0, 1, 2, 3, or 4,

o is 0, 1, or 2,

X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof,

with the provisos that (i) when E, F, G, and H are all absent, o is 1, X is N, Y is CH, and R^1 is hydrogen, methyl, ethyl, or isopropyl, the compound is a single enantiomer at the carbon bearing Ar^1 and Ar^2, and (ii) when E, F, G, and H are all absent, o is 1, X is CH and Y is N, R^1 is hydrogen, methyl, or ethyl.

2. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 1, wherein X is CH and Y is N.

3. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 1 or 2, wherein o is 1.

4. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of any one of claims 1-3, wherein E is $(CR^{13}R^{14})_m$, F is absent, and m is 2.

5. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of any one of claims 1-4, wherein H is absent and r is 1.

6. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of any one of claims 1-5, wherein Ar^1 and Ar^2 are both phenyl.

7. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 6, wherein R^1 is selected from C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_3-C_{10} cycloalkyl C_1-C_{10} alkyl.

8. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 6, wherein R^1 is selected from hydrogen, cyclopentyl, sec-butyl, isopropyl, cyclohexyl, n-propyl, n-butyl, benzoyl, methyl, ethyl, trideuteromethyl, 2,2,2-trideuteroethyl, 2,2,2-trifluoroethyl, phenylsulfonyl, and benzyl.

9. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 6, wherein R^1 is selected from C_6-C_{10} aryl and C_6-C_{10} aryl C_1-C_{10} alkyl, wherein the aryl is optionally substituted with one or more substituents selected from halo, cyano, alkylenedioxy, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl.

10. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 9, wherein R^1 is selected from 4-methylbenzyl, 4-chlorobenzyl, 4-trifluorobenzyl, phenyl, 4-phenylbenzyl, 4-iodobenzyl, 3-methoxybenzyl, 4-cyanobenzyl, 4-bromobenzyl,

2-methoxybenzyl, 4-fluorobenzyl, 4-methoxybenzyl, 2-phenylethyl, 4-methoxycarbonylbenzyl, and (benzo-1,4-dioxane-6-yl)methyl.

11. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 6, wherein R^1 is C_{6-10} arylcarbonyl or C_1-C_{10} alkylcarbonyl.

12. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 11, wherein R^1 is acetyl or benzoyl.

13. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 6, wherein R^1 is C_{6-10} arylsulfonyl.

14. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 13, wherein R^1 is phenylsulfonyl.

15. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 1, wherein X is N and Y is CH.

16. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 15, wherein E, F, G, and H are all absent and o is 1.

17. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 16, wherein Ar^1 and Ar^2 are both phenyl.

18. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 17, wherein R^1 is methyl or ethyl.

19. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 16, wherein Ar^1 and Ar^2 are different.

20. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 19, wherein Ar^1 is 4-chlorophenyl and Ar^2 is phenyl.

21. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 20, wherein R^1 is selected from methyl, ethyl, propyl, butyl, isopropyl, isobutyl, 2,2,2-trideuteroethyl, 2,2,2-trifluoroethyl, cyclopentyl, cyclohexyl, methylcarbonyl, (2,4-dimethoxyphenyl)methyl, 4-methylpiperazin-1-yl, 1-methylpiperidin-4-yl, 4-methylhomopiperazin-1-yl, $-(CH_2)_2O(CH_2)_2COOH$, $-(CH_2)_2O(CH_2)_2OH$, $-(CH_2)_2O(CH_2)_2CONH_2$, $-CH_2CH_2OCH_2CH_2NH_2$, $-(CH_2CH_2O)_4CH_2CH_2NH_2$, $-(CH_2CH_2O)_4CH_2CH_2NHCOCH_3$, and $-(CH_2CH_2O)_4CH_2CH_2NHCOOt$-Bu.

22. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 15, wherein E, F, G, and H are all absent and o is 2.

23. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 22, wherein Ar^1 is 4-chlorophenyl and Ar^2 is phenyl.

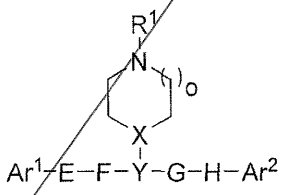
24. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 23, wherein R^1 is methyl or ethyl.

25. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 1, wherein E, F, G, and H are all absent o is 1, X is CH and Y is N, R^1 is hydrogen, methyl, or ethyl.

26. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of any one of claims 16-25, wherein the compound is a single enantiomer at the carbon bearing Ar^1 and Ar^2.

27. A pharmaceutical composition comprising a compound, salt, stereoisomers, and mixtures comprising stereoisomers of any one of claims 1-26 and a pharmaceutically acceptable carrier.

28. A method of treating or preventing a viral infection in a mammal in need thereof comprising administering to a mammal in need thereof an effective amount of a compound of formula (I):



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, $C_{6\text{-}10}$ arylsulfonyl, $C_{6\text{-}10}$ arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from deuterium, halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or $-SO_2-$,

G is absent or is $(CR^{17}CR^{18})_r$,

H is absent or is C=O, or $-SO_2-$,

m, n, and r are independently 0, 1, 2, 3, or 4,

o is 0, 1, or 2,

X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof.

29. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 28, wherein X is CH and Y is N.

30. The method of claim 28 or 29, wherein o is 1.

31. The method of any one of claims 28-30, wherein E is $(CR^{13}R^{14})_m$, F is absent, and m is 2.

32. The method of any one of claims 28-31, wherein H is absent and r is 1.

33. The method of any one of claims 28-32, wherein Ar^1 and Ar^2 are both phenyl.

34. The method of claim 33, wherein R^1 is selected from C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_3-C_{10} cycloalkyl C_1-C_{10} alkyl.

35. The method of claim 33, wherein R^1 is selected from hydrogen, cyclopentyl, sec-butyl, isopropyl, cyclohexyl, n-propyl, n-butyl, benzoyl, methyl, ethyl, trideuteromethyl, 2,2,2-trideuteroethyl, 2,2,2-trifluoroethyl, phenylsulfonyl, and benzyl.

36. The method of claim 33, wherein R^1 is selected from C_6-C_{10} aryl and C_6-C_{10} aryl C_1-C_{10} alkyl, wherein the aryl is optionally substituted with one or more substituents selected from halo, cyano, alkylenedioxy, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl.

37. The method of claim 36, wherein R^1 is selected from 4-methylbenzyl, 4-chlorobenzyl, 4-trifluorobenzyl, phenyl, 4-phenylbenzyl, 4-iodobenzyl, 3-methoxybenzyl,

4-cyanobenzyl, 4-bromobenzyl, 2-methoxybenzyl, 4-fluorobenzyl, 4-methoxybenzyl, 2-phenylethyl, 4-methoxycarbonylbenzyl, and (benzo-1,4-dioxane-6-yl)methyl.

38. The method of claim 33, wherein R^1 is C_{6-10} arylcarbonyl or C_1-C_{10} alkylcarbonyl.

39. The method of claim 38, wherein R^1 is acetyl or benzoyl.

40. The method of claim 33, wherein R^1 is C_{6-10} arylsulfonyl.

41. The method of claim 40, wherein R^1 is phenylsulfonyl.

42. The method of claim 28, wherein X is N and Y is CH.

43. The method of claim 42, wherein E, F, G, and H are all absent and o is 1.

44. The method of claim 43, wherein Ar^1 and Ar^2 are both phenyl.

45. The method of claim 44, wherein R^1 is methyl or ethyl.

46. The method of claim 43, wherein Ar^1 and Ar^2 are different.

47. The method of claim 46, wherein Ar^1 is 4-chlorophenyl and Ar^2 is phenyl.

48. The method of claim 47, wherein R^1 is selected from methyl, ethyl, propyl, butyl, isopropyl, isobutyl, 2,2,2-trideuteroethyl, 2,2,2-trifluoroethyl, cyclopentyl, cyclohexyl, methylcarbonyl, (2,4-dimethoxyphenyl)methyl, 4-methylpiperazin-1-yl, 1-methylpiperidin-4-yl, 4-methylhomopiperazin-1-yl, $-(CH_2)_2O(CH_2)_2COOH$, $-(CH_2)_2O(CH_2)_2OH$, $-(CH_2)_2O(CH_2)_2CONH_2$, $-CH_2CH_2OCH_2CH_2NH_2$, $-(CH_2CH_2O)_4CH_2CH_2NH_2$, $-(CH_2CH_2O)_4CH_2CH_2NHCOCH_3$, and $-(CH_2CH_2O)_4CH_2CH_2NHCOOt\text{-}Bu$.

49. The method of claim 42, wherein E, F, G, and H are all absent and o is 2.

50. The method of claim 49, wherein Ar^1 is 4-chlorophenyl and Ar^2 is phenyl.

51. The method of claim 50, wherein R^1 is methyl or ethyl.

52. The method of claim 1, wherein m and n are both 0, o is 1, X is CH and Y is N, R^1 is hydrogen, methyl, or ethyl.

53. The method of any one of claims 43-52, wherein the compound is a single enantiomer at the carbon bearing Ar^1 and Ar^2.

54. The method of any one of claims 28-53, wherein the viral infection is caused by hepatitis C.

55. The method of claim 54, further comprising administering to the mammal an effective amount of an anti-hepatitis C compound.

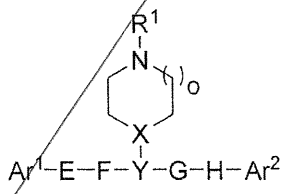
56. The method of claim 55, wherein the anti-hepatitis C compound is selected from ribavirin, interferon-α, telaprevir, cyclosporin A, Asunaprevir (BMS-650032),

Boceprevir, GS-9451, GS-9256, ABT-450, Danoprevir (RG7227), Faldaprevir (BI 201335), IDX320, MK-5172, Simeprevir (TMC435), Sovaprevir (ACH-1625), ABT-267, ACH-3102, BMS-791325, Daclatasvir (BMS-790052), GSK2336805, IDX719, JNJ-47910382, Ledipasvir (GS-5885), MK-8742, PPI-461, PPI-668, ABT-333, ALS-002200, BI 207127, IDX184, INX-08189, Mericitabine (RO5024048), PPI-383, PSI-352938, Setrobuvir (ANA-598), Sofosbuvir (PSI-7977 or GS-7977), Tegobuvir (GS-9190), TMC647055, Filibuvir (PF-00868554), GS-9669, GSK2878175, VX-135, VX-222, Algeron (Cepeginterferon Alfa-2b), BIP 48 (Peginterferon alfa 2b 48kDA), Pegylated interferon alfa 2b, Pegylated interferon lambda (BMS-914143), Pegylated-P-Interferon-alpha-2b (P1101), and Alisporivir (DEB025).

57. The method of any one of claims 28-53, wherein the viral infection is caused by a *Flaviviridae* virus.

58. The method of claims 57, wherein the *Flaviviridae* virus is a Dengue virus.

59. A method for synergistically enhancing the antiviral effect of an anti-hepatitis C compound in a mammal undergoing treatment with the anti-hepatitis C compound, comprising co-administering to the mammal a compound of the formula (I):



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, C_{6-10} arylsulfonyl, C_{6-10} arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from deuterium, halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or $-SO_2-$,

G is absent or is $(CR^{17}CR^{18})_r$,

H is absent or is C=O, or $-SO_2-$,

m, n, and r are independently 0, 1, 2, 3, or 4,

o is 0, 1, or 2,

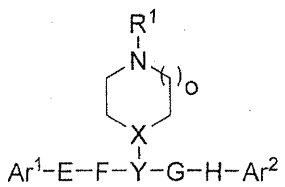
X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof.

60. The method of claim 59, wherein the anti-hepatitis C compound is selected from include ribavirin, interferon-α, telaprevir, cyclosporin A, Asunaprevir (BMS-650032), Boceprevir, GS-9451, GS-9256, ABT-450, Danoprevir (RG7227), Faldaprevir (BI 201335), IDX320, MK-5172, Simeprevir (TMC435), Sovaprevir (ACH-1625), ABT-267, ACH-3102, BMS-791325, Daclatasvir (BMS-790052), GSK2336805, IDX719, JNJ-47910382, Ledipasvir (GS-5885), MK-8742, PPI-461, PPI-668, ABT-333, ALS-002200, BI 207127, IDX184, INX-08189, Mericitabine (RO5024048), PPI-383, PSI-352938, Setrobuvir (ANA-598), Sofosbuvir (PSI-7977 or GS-7977), Tegobuvir (GS-9190), TMC647055, Filibuvir (PF-00868554), GS-9669, GSK2878175, VX-135, VX-222, Algeron (Cepeginterferon Alfa-2b), BIP 48 (Peginterferon alfa 2b 48kDA), Pegylated interferon alfa 2b, Pegylated interferon lambda (BMS-914143), Pegylated-P-Interferon-alpha-2b (P1101), and Alisporivir (DEB025).

61. A kit comprising:

(a) a compound of formula (I):



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, C_{6-10} arylsulfonyl, C_{6-10} arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from deuterium, halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or $-SO_2-$,

G is absent or is $(CR^{17}CR^{18})_r$,

H is absent or is C=O, or $-SO_2-$,

m, n, and r are independently 0, 1, 2, 3, or 4,

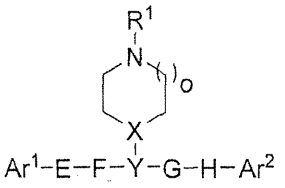
o is 0, 1, or 2,

X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof, and

(b) an anti-hepatitis C compound other than a compound of formula (I).

62. Use of a compound of formula (I);



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, C_{6-10} arylsulfonyl, C_{6-10} arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from deuterium, halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or $-SO_2-$,

G is absent or is $(CR^{17}CR^{18})_r$,

H is absent or is C=O, or $-SO_2-$,

m, n, and r are independently 0, 1, 2, 3, or 4,

o is 0, 1, or 2,

X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof,

for treating or preventing a viral infection in a mammal in need thereof.

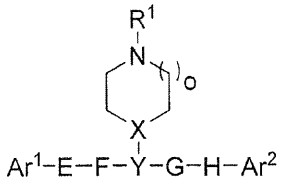
63. The use of claim 62, further comprising administering to the mammal an effective amount of an anti-hepatitis C compound.

64. The method of claim 63, wherein the anti-hepatitis C compound is selected from include ribavirin, interferon-α, telaprevir, cyclosporin A, Asunaprevir (BMS-650032), Boceprevir, GS-9451, GS-9256, ABT-450, Danoprevir (RG7227), Faldaprevir (BI 201335), IDX320, MK-5172, Simeprevir (TMC435), Sovaprevir (ACH-1625), ABT-267, ACH-3102, BMS-791325, Daclatasvir (BMS-790052), GSK2336805, IDX719, JNJ-47910382, Ledipasvir (GS-5885), MK-8742, PPI-461, PPI-668, ABT-333, ALS-002200, BI 207127, IDX184, INX-08189, Mericitabine (RO5024048), PPI-383, PSI-352938, Setrobuvir (ANA-598), Sofosbuvir (PSI-7977 or GS-7977), Tegobuvir (GS-9190), TMC647055, Filibuvir (PF-00868554), GS-9669, GSK2878175, VX-135, VX-222, Algeron (Cepeginterferon Alfa-2b), BIP 48 (Peginterferon alfa 2b 48kDA), Pegylated interferon alfa 2b, Pegylated interferon lambda (BMS-914143), Pegylated-P-Interferon-alpha-2b (P1101), and Alisporivir (DEB025).

65. The method of claim 62, wherein the viral infection is caused by a *Flaviviridae* virus.

66. The method of claim 65, wherein the *Flaviviridae* virus is a Dengue virus.

67. A method of treating or preventing cancer in a mammal in need thereof comprising administering to a mammal in need thereof an effective amount of a compound of formula (I):



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, $C_{6\text{-}10}$ arylsulfonyl, $C_{6\text{-}10}$ arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from deuterium, halo,

C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or $-SO_2-$,

G is absent or is $(CR^{17}CR^{18})_r$,

H is absent or is C=O, or $-SO_2-$,

m, n, and r are independently 0, 1, 2, 3, or 4,

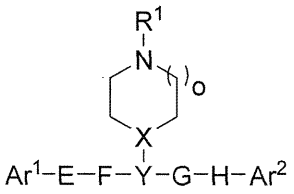
o is 0, 1, or 2,

X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof.

[0100] CLAIM(S):

1. A compound of formula (I):



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, $C_{6\text{-}10}$ arylsulfonyl, $C_{6\text{-}10}$ arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from deuterium, halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or $-SO_2-$,

G is absent or is $(CR^{17}R^{18})_r$,

H is absent or is C=O, or $-SO_2-$,

m, n, and r are independently 0, 1, 2, 3, or 4,

o is 0, 1, or 2,

X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof,

with the provisos that (i) when E, F, G, and H are all absent, o is 1, X is N, Y is CH, and R^1 is hydrogen, methyl, ethyl, or isopropyl, the compound is a single enantiomer at the carbon bearing Ar^1 and Ar^2, and (ii) when E, F, G, and H are all absent, o is 1, X is CH and Y is N, R^1 is hydrogen, methyl, or ethyl.

2. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 1, wherein X is CH and Y is N and o is 1.

3. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 1 or 2, wherein E is $(CR^{13}R^{14})_m$, F is absent, m is 2, G is $(CR^{17}R^{18})_r$, H is absent, and r is 1.

4. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 1, wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, preferably wherein R^1 is selected from hydrogen, cyclopentyl, sec-butyl, isopropyl, cyclohexyl, n-propyl, n-butyl, methyl, ethyl, trideuteromethyl, 2,2,2-trideuteroethyl, 2,2,2-trifluoroethyl, and benzyl.

5. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 1, wherein R^1 is selected from C_6-C_{10} aryl and C_6-C_{10} aryl C_1-C_{10} alkyl, wherein the aryl is optionally substituted with one or more substituents selected from halo, cyano, alkylenedioxy, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl, preferably wherein R^1 is selected from 4-methylbenzyl, 4-chlorobenzyl, 4-trifluorobenzyl, phenyl, 4-phenylbenzyl, 4-iodobenzyl, 3-methoxybenzyl, 4-cyanobenzyl, 4-bromobenzyl, 2-methoxybenzyl, 4-fluorobenzyl, 4-methoxybenzyl, 2-phenylethyl, 4-methoxycarbonylbenzyl, and (benzo-1,4-dioxane-6-yl)methyl.

6. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 1, wherein R^1 is $C_{6\text{-}10}$ arylcarbonyl C_1-C_{10} alkylcarbonyl, or $C_{6\text{-}10}$ arylsulfonyl.

7. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 1, wherein X is N and Y is CH, preferably wherein E, F, G, and H are all absent and o is 1.

8. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 7, wherein Ar^1 and Ar^2 are both phenyl.

9. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 8, wherein R^1 is methyl or ethyl.

10. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 7, wherein Ar^1 and Ar^2 are different.

11. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 1, wherein Ar^1 is 4-chlorophenyl and Ar^2 is phenyl.

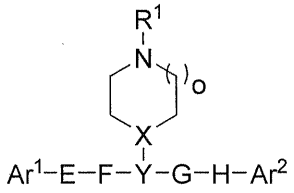
12. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 11, wherein R^1 is selected from methyl, ethyl, propyl, butyl, isopropyl, isobutyl, 2,2,2-trideuteroethyl, 2,2,2-trifluoroethyl, cyclopentyl, cyclohexyl, methylcarbonyl, (2,4-dimethoxyphenyl)methyl, 4-methylpiperazin-1-yl, 1-methylpiperidin-4-yl, 4-methylhomopiperazin-1-yl, $-(CH_2)_2O(CH_2)_2COOH$, $-(CH_2)_2O(CH_2)_2OH$, $-(CH_2)_2O(CH_2)_2CONH_2$, $-CH_2CH_2OCH_2CH_2NH_2$, $-(CH_2CH_2O)_4CH_2CH_2NH_2$, $-(CH_2CH_2O)_4CH_2CH_2NHCOCH_3$, and $-(CH_2CH_2O)_4CH_2CH_2NHCOOt\text{-}Bu$.

13. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of claim 1, wherein E, F, G, and H are all absent o is 1, X is CH and Y is N, R^1 is hydrogen, methyl, or ethyl.

14. The compound, salt, stereoisomers, and mixtures comprising stereoisomers of any one of claims 1-13, wherein the compound is a single enantiomer at the carbon bearing Ar^1 and Ar^2.

15. A pharmaceutical composition comprising a compound, salt, stereoisomers, and mixtures comprising stereoisomers of any one of claims 1-14 and a pharmaceutically acceptable carrier.

16. A compound of formula (I):



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, $C_{6\text{-}10}$ arylsulfonyl, $C_{6\text{-}10}$ arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from

deuterium, halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or $-SO_2-$,

G is absent or is $(CR^{17}CR^{18})_r$,

H is absent or is C=O, or $-SO_2-$,

m, n, and r are independently 0, 1, 2, 3, or 4,

o is 0, 1, or 2,

X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof,

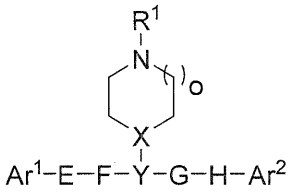
for use in the manufacture of a medicament for treating or preventing a viral infection in a mammal in need thereof or for use in synergistically enhancing the antiviral effect of an anti-hepatitis C compound in a mammal undergoing treatment with the anti-hepatitis C compound,

wherein the anti-hepatitis C compound is selected from include ribavirin, interferon-α, telaprevir, cyclosporin A, Asunaprevir (BMS-650032), Boceprevir, GS-9451, GS-9256, ABT-450, Danoprevir (RG7227), Faldaprevir (BI 201335), IDX320, MK-5172, Simeprevir (TMC435), Sovaprevir (ACH-1625), ABT-267, ACH-3102, BMS-791325, Daclatasvir (BMS-790052), GSK2336805, IDX719, JNJ-47910382,

Ledipasvir (GS-5885), MK-8742, PPI-461, PPI-668, ABT-333, ALS-002200, BI 207127, IDX184, INX-08189, Mericitabine (RO5024048), PPI-383, PSI-352938, Setrobuvir (ANA-598), Sofosbuvir (PSI-7977 or GS-7977), Tegobuvir (GS-9190), TMC647055, Filibuvir (PF-00868554), GS-9669, GSK2878175, VX-135, VX-222, Algeron (Cepeginterferon Alfa-2b), BIP 48 (Peginterferon alfa 2b 48kDA), Pegylated interferon alfa 2b, Pegylated interferon lambda (BMS-914143), Pegylated-P-Interferon-alpha-2b (P1101), and Alisporivir (DEB025).

17. A kit comprising:

(a) a compound of formula (I):



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, $C_{6\text{-}10}$ arylsulfonyl, $C_{6\text{-}10}$ arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from deuterium, halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or $-SO_2-$,

G is absent or is $(CR^{17}CR^{18})_r$,

H is absent or is C=O, or $-SO_2-$,

m, n, and r are independently 0, 1, 2, 3, or 4,

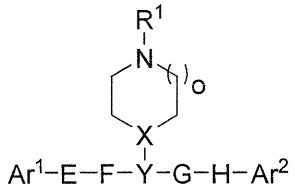
o is 0, 1, or 2,

X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof, and

(b) an anti-hepatitis C compound other than a compound of formula (I).

18. A compound of formula (I):



(I)

wherein R^1 is selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, C_3-C_{10} cycloalkyl C_1-C_{10} alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl C_1-C_{10} alkyl, C_6-C_{10} aryl C_3-C_{10} cycloalkyl, heteroaryl, heterocyclyl, C_{6-10} arylsulfonyl, C_{6-10} arylcarbonyl, C_1-C_{10} alkylcarbonyl, $-(CH_2)_xA(CH_2)_yB$, and $-(CH_2CH_2O)_p(CH_2CH_2)_qD$, wherein the alkyl, aryl, or heteroaryl part of R^1 is optionally substituted with one or more substituents selected from deuterium, halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, cyano, alkylenedioxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

Ar^1 and Ar^2 are the same or different and are independently selected from C_6-C_{10} aryl, heteroaryl, and heterocyclyl, wherein the aryl, heteroaryl, and heterocyclyl are optionally substituted with one or more substituents selected from halo, C_1-C_{10} alkyl, C_6-C_{10} aryl, trifluoromethyl, C_1-C_{10} alkoxy, C_1-C_{10} alkylcarbonyl, and C_1-C_{10} alkoxycarbonyl,

A is O, S, or N,

x and y are independently 1-4, inclusive,

B is selected from OR^4, $COOR^5$, and $CONR^6R^7$,

wherein R^4, R^5, R^6, and R^7 are independently selected from hydrogen, C_1-C_{10} alkyl, C_3-C_{10} cycloalkyl, and C_6-C_{10} aryl,

D is NR^8R^9, OH, or OR^{12},

R^8 and R^9 are independently selected from hydrogen, COR^{10}, and $COOR^{11}$,

R^{10} and R^{11} are hydrogen or C_1-C_{10} alkyl,

p and q are independently 1-4, inclusive,

E is absent or is $(CR^{13}R^{14})_m$, NH, or S,

F is absent or is $(CR^{15}R^{16})_n$, C=O, or $-SO_2-$,

G is absent or is $(CR^{17}CR^{18})_r$,

H is absent or is C=O, or $-SO_2-$,

m, n, and r are independently 0, 1, 2, 3, or 4,

o is 0, 1, or 2,

X and Y are independently CH or N,

or pharmaceutically acceptable salts, stereoisomers, and mixtures comprising stereoisomers thereof for use in the manufacture of a medicament for treating or preventing cancer in a mammal in need thereof comprising administering to a mammal in need thereof.