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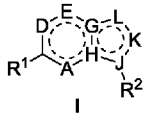
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— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*
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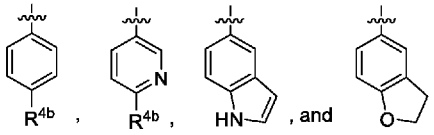
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(54) Title: HETEROCYCLIC COMPOUNDS FOR THE TREATMENT OF ARENAVIRUS INFECTION



I



(57) Abstract: The invention relates to compounds of structural formula I, wherein A, D, and E are independently N or C-R^3, G, H, and J are independently N or C, K is N or C-H, L is N, N-R^3 or C-R^3, and A, D, E, G, H, J, K, and L together cannot have more than 4 N, R^1 is selected from (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and 5-indolyl, wherein each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is substituted with at least one R^{4a} group, and wherein said (C_2 to C_9) heteroaryl is C-attached, and R^2 is selected from the group consisting of (i), (ii), (iii), and (iv).

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HETEROCYCLIC COMPOUNDS FOR THE TREATMENT OF ARENAVIRUS INFECTION

CROSS REFERENCES TO RELATED APPLICATIONS

This patent application is a continuation in part of and claims the benefit of priority to United States Provisional Patent Applications serial numbers 62/361,423, filed July 12, 2016 and 62/378,177, filed August 22, 2016, both applications are herein incorporated by reference for all purposes.

STATEMENT AS TO RIGHTS TO INVENTIONS MADE UNDER FEDERALLY SPONSORED RESEARCH AND DEVELOPMENT

This invention was made with government support under **1R44AI112097** awarded by U.S. National Institutes of Health. The government has certain rights in the invention.

REFERENCE TO A "SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING APPENDIX SUBMITTED ON A COMPACT DISK

NOT APPLICABLE

FIELD OF THE INVENTION

The present invention relates to the use of heterocyclic compounds for inhibiting arenavirus infection in humans, other mammals, or in cell culture, to methods of treating arenavirus infection such as Lassa, Bolivian, Argentine, Venezuelan, Brazilian, Chapare and Lujo hemorrhagic fevers, to methods of inhibiting the replication of arenaviruses, to methods of reducing the amount of arenaviruses, and to compositions that can be employed for such methods.

BACKGROUND OF THE INVENTION

Arenaviridae comprise a diverse family of 29 (and growing) negative stranded enveloped RNA viruses. Arenaviruses are divided into two groups, Old and New World complex, based on serological, genetic and geographical data. Old World viruses are found primarily throughout South and West Africa and include the prototypic lymphocytic choriomeningitis virus (LCMV), along with Lassa (LASV), Lujo (LUJV), Mopeia (MOPV), Ippy and Mobala (MOBV) viruses. Both LASV and LUJV can cause lethal hemorrhagic fever (HF), while LCMV infection is associated with aseptic meningitis Lassa (LASV) alone is estimated to cause over 300,000 disease cases each year in West Africa of which 15-20% of hospitalized patients die and survivors often suffer sequelae, including permanent bilateral hearing damage. The larger New World complex primarily located in the South American continent, is divided into 3 clades, A, B, and C, with clade B being important as many of the viruses in this group can cause lethal HF. Clade B HF viruses include, Junin (JUNV), Machupo (MACV), Guanarito (GTOV), Sabia (SABV) and Chapare, along with non-HF viruses such as Tacaribe (TCRV) and Amapari (AMPV). Human infection occurs through contact with the excretions of an infected rodent or by inhalation of tiny particles soiled with rodent urine or saliva (aerosol transmission). There is also evidence of human-to-human spread primarily in nosocomial settings (e.g. hospitals). Incubation period of virus is 1-2 weeks followed by fever, general malaise, weakness, sore throat, headache, cough, diarrhea, and vomiting. These general symptoms make it difficult to differentially diagnose arenavirus infection. Poor prognosis is indicated as symptoms worsen to include pleural effusions, facial edema, neurological complications and bleeding from mucosal surfaces. Current arenavirus treatment is limited to the use of ribavirin, which is only partially effective if given early and associated with significant side effects. Although a vaccine has been developed for Junin virus its usage is primarily restricted to the most at risk populations of farm workers in Argentina and there are no approved vaccines for any other arenaviruses. Although highly desirable, prophylactic vaccines may not always be effective countermeasures against rapidly emerging, antigenically distinct new virus strains and the existing vaccine development and production strategies cannot adequately respond to the diverse family of current or emergent arenaviruses. Novel broad-spectrum antiviral drugs could therefore, provide a first line therapy and/or prophylactic not only for endemic regions of arenavirus infection but also as a safeguard against potential biological warfare agents.

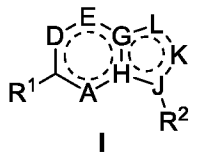
Arenaviruses consist of a nucleocapsid (NP) surrounded by an envelope membrane, and the NP contains two ambisense RNA genome segments L and S that direct the synthesis of two polypeptides. The L segment encodes the RNA-dependent-RNA polymerase (RdRp) and a small Ring Finger protein Z. The S segment encodes for nucleoprotein and a glycoprotein precursor GPC that is cleaved by host proteases and undergoes post-translational modification into a mature complex composed of glycoproteins GP1 (binds host protein at the cell surface), GP2 (directs pH dependent membrane fusion and release of genomic material in the cytoplasm) and a stable signal peptide (SSP1). The mature glycoprotein complex is formed in the viral envelope and is responsible for mediating viral entry. The Old World arenaviruses bind to host α-dystroglycan while New World

arenaviruses bind to transferrin receptor 1 for entry/endocytosis into cells. Upon binding to cell surface receptors, the virus is endocytosed and directed to acidic late endosomes whereby, GP2 mediates pH dependent membrane fusion and release of genomic material into the cytoplasm for viral replication and transcription. Therefore, viral entry inhibitors (e.g. small molecules) that target virus GP complex or host factors are a potential therapeutic/prophylactic approach in treating patients infected with arenavirus infection. Because the HF arenavirus species are classified as BSL-4 alternative approaches are needed to identify viral entry inhibitors. To facilitate the identification of arenavirus entry inhibitors one may express arenavirus GP complex in nonpathogenic BSL-2 envelope viruses, to produce single round infectious pseudoviruses whose viral entry functions are determined by the heterogeneous glycoprotein of interest. One viral expression system that may be utilized is the vesicular stomatitis virus (VSV) system, whereby the envelope protein of VSV is substituted with an envelope glycoprotein from another virus, e.g., LASV, to mediate entry of the pseudotype virion. The cell entry and infectivity properties of GP pseudotype VSV viruses have been shown for multiple viruses including HIV, Hepatitis B and C, Ebola, Lassa, Hanta and others [Ogino, M., et al. *Use of vesicular stomatitis virus pseudotypes bearing hantaan or seoul virus envelope proteins in a rapid and safe neutralization test*. Clin. Diagn. Lab. Immunol.(2003) 10(1):154-60; Saha, M.N., et al. *Formation of vesicular stomatitis virus pseudotypes bearing surface proteins of hepatitis B virus*. J. Virol. (2005) 79(19):12566-74; Takada, A., et al. *A system for functional analysis of Ebola virus glycoprotein*, Proc. Natl. Acad. Sci. (1997) 94:14764-69; Garbutt, M., et al. *Properties of replication-competent vesicular stomatitis virus vectors expressing glycoproteins of filoviruses and arenaviruses*. J. Virol. (2004) 78(10):5458-65]. To monitor pseudovirus infection, a reporter gene such as green fluorescent protein (GFP) or luciferase can be engineered into the pseudovirus genome, and virus infectivity in mammalian cell lines (e.g. Vero or Hek293) can be monitored using optical detection methods (e.g. plate reader) [Cote, M.; Misasi, J.; Ren, T.; Bruchez, A., Lee, K., Filone, C. M.; Hensley, L.; Li, Q.; Ory, D.; Chandran, K.; Cunningham, J., *Small molecule inhibitors reveal Niemann-Pick C1 is essential for Ebola virus infection*, Nature (2011) 477: 344-348, Elshabrawy, H. A., et al. *Identification of a broad-spectrum antiviral amall molecule against severe scute respiratory syndrome Coronavirus and Ebola, Hendra, and Nipah Viruses by using a novel high-throughput screening assay.* J. Virol. (2014) 88: 4353-4365]. The “pseudoviruses” may therefore be used to screen chemical compound libraries to identify inhibitors of arenavirus cell entry while avoiding the complications of working with highly pathogenic BSL4 agents. In the present invention, entry inhibitors described were identified using an arenavirus GP pseudovirus screens and selected compounds were tested against native non-HF virus TCRV to confirm activity against replicative arenavirus. Selected top compounds were then tested agaist native HF viruses including LASV and JUNV to confirm activity against the native highly pathogenic human (HF) arenaviruses.

BRIEF SUMMARY OF THE INVENTION

The present invention relates to the use of heterocyclic compounds for inhibiting arenavirus infection in humans, other mammals, or in cell culture, to methods of treating arenavirus infection such as Lassa, Bolivian, Argentine, Venezuelan, Brazilian, Chapare and Lujo hemorrhagic fevers, to methods of inhibiting the replication of arenaviruses, to methods of reducing the amount of arenaviruses, and to compositions that can be employed for such methods.

In one embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula I



I ,

or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G, H, and J are independently N or C;

K and L are independently N, O, S, N-R^3, or C-R^3;

and A, D, E, G, H, J, K, and L together cannot have more than 4 N;

R^1 is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

each of the R^3 is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, -$C(O)R^5$, -$C(O)NR^{6a}R^{6b}$, -$NR^{6a}R^{6b}$, -$S(O)_mR^5$, -$S(O)_mNR^{6a}R^{6b}$, -$NR^{6a}S(O)_mR^5$, -$(CH_2)_nC(O)OR^5$, -$(CH_2)_nC(O)NR^{6a}R^{6b}$, -$OC(O)R^5$, -$NR^{6a}C(O)R^5$, and -$NR^{6c}C(O)NR^{5a}R^{5b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^4 is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^5$, $-C(O)NR^{6a}R^{6b}$, $-NR^{6a}R^{6b}$, $-S(O)_mR^5$, $-S(O)_mNR^{6a}R^{6b}$, $-NR^{6a}S(O)_mR^5$, $-(CH_2)_nC(O)OR^5$, $-(CH_2)_nC(O)NR^{6a}R^{6b}$, $-OC(O)R^5$, $-NR^{6a}C(O)R^5$, and $-NR^{6c}C(O)NR^{6a}R^{6b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

each of the R^5 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

each of the R^{6a}, R^{6b}, and R^{6c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl,

or R^{6a} and R^{6b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted with at least one R^7 group;

R^7 is independently selected from hydrogen, halogen, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, cyano, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^8$, $-C(O)NR^{9a}R^{9b}$, $-NR^{9a}R^{9b}$, $-S(O)_mR^8$, $-S(O)_mNR^{9a}R^{9b}$, $-NR^{9a}S(O)_mR^8$, $-(CH_2)_nC(O)OR^8$, $-(CH_2)_nC(O)N(R^{9a}R^{9b})$, $-OC(O)R^8$, $-NR^{9a}C(O)R^8$, and $-NR^{9a}C(O)N(R^{9a}R^{9b})$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, is optionally substituted with at least one R^{10} group;

each of the R^8 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^{10} group;

each of the R^{9a}, R^{9b}, and R^{9c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl,

or R^{9a} and R^{9b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted;

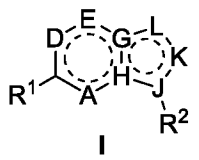
R^{10} is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted.

DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to the use of heterocyclic compounds for inhibiting arenavirus infection in humans, other mammals, or in cell culture, to methods of treating arenavirus infection such as Lassa, Bolivian, Argentine, Venezuelan, Brazilian, Chapare, and Lujo hemorrhagic fevers, to methods of inhibiting the replication of arenaviruses, to methods of reducing the amount of arenaviruses, and to compositions that can be employed for such methods.

In one embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula I



I ,

or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G, H, and J are independently N or C;

K and L are independently N, O, S, N-R^3, or C-R^3;

and A, D, E, G, H, J, K, and L together cannot have more than 4 N;

R^1 is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

each of the R^3 is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^5$, $-C(O)NR^{6a}R^{6b}$, $-NR^{6a}R^{6b}$, $-S(O)_mR^5$, $-S(O)_mNR^{6a}R^{6b}$, $-NR^{6a}S(O)_mR^5$, $-(CH_2)_nC(O)OR^5$, $-(CH_2)_nC(O)NR^{6a}R^{6b}$, $-OC(O)R^5$, $-NR^{6a}C(O)R^5$, and $-NR^{6c}C(O)NR^{5a}R^{5b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^4 is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^5$, $-C(O)NR^{6a}R^{6b}$, $-NR^{6a}R^{6b}$, $-S(O)_mR^5$, $-S(O)_mNR^{6a}R^{6b}$, $-NR^{6a}S(O)_mR^5$, $-(CH_2)_nC(O)OR^5$, $-(CH_2)_nC(O)NR^{6a}R^{6b}$, $-OC(O)R^5$, $-NR^{6a}C(O)R^5$, and $-NR^{6c}C(O)NR^{6a}R^{6b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

each of the R^5 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

each of the R^{6a}, R^{6b}, and R^{6c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl,

or R^{6a} and R^{6b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted with at least one R^7 group;

R^7 is independently selected from hydrogen, halogen, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, cyano, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^8$, $-C(O)NR^{9a}R^{9b}$, $-NR^{9a}R^{9b}$, $-S(O)_mR^8$, $-S(O)_mNR^{9a}R^{9b}$, $-NR^{9a}S(O)_mR^8$, $-(CH_2)_nC(O)OR^8$, $-(CH_2)_nC(O)N(R^{9a}R^{9b})$, $-OC(O)R^8$, $-NR^{9a}C(O)R^8$, and $-NR^{9a}C(O)N(R^{9a}R^{9b})$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, is optionally substituted with at least one R^{10} group;

each of the R^8 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^{10} group;

each of the R^{9a}, R^{9b}, and R^{9c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl,

or R^{9a} and R^{9b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted;

R^{10} is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted;

m is 0, 1, or 2;

n is 0, 1, 2, 3, 4, 5, or 6.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G, H, and J are independently N or C;

K and L are independently N, O, S, N-R^3, or C-R^3;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**,

wherein R^3 and R^4 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E, and K are independently N or C-R^3;

G, H, and J are independently N or C;

L is N, N-R^3, or C-R^3;

and A, D, E, G, H, J, K, and L together cannot have more than 4 N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

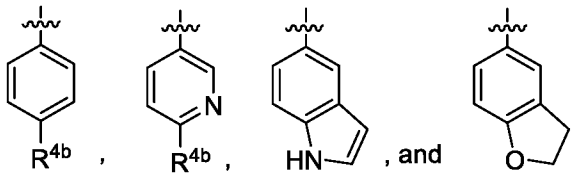
each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group, and wherein said (C_2 to C_9) heteroaryl is C-attached;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^3 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^2 is selected from the group consisting of



, wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, R^2, and R^3 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, surprisingly providing broad spectrum activity against multiple arenavirus strains,

and we believe that similar broad spectrum activity against multiple arenavirus strains can be observed when R^{4b} is selected from the group consisting of

n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-

butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, R^2, and R^3 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy, surprisingly providing improved metabolic stability in multi-species microsomal assays.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein R^3 is defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and H are C;

J and L are N;

K is C-R^3;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

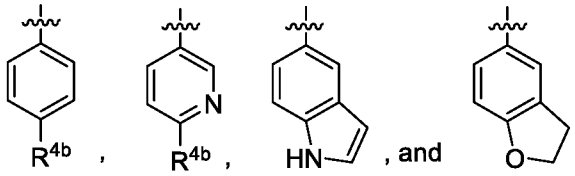
each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group , and wherein said (C_2 to C_9) heteroaryl is C-attached;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^3 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^2 is selected from the group consisting of



, wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**,

wherein A, D, E, G, H, J, K, L, R^1, R^2, and R^3 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, surprisingly providing broad spectrum activity against multiple arenavirus strains,

and we believe that similar broad spectrum activity against multiple arenavirus strains can be observed when R^{4b} is selected from the group consisting of

n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

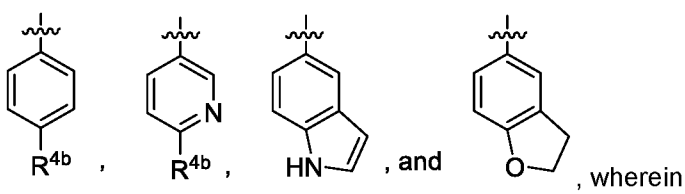
In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen;

R^{4b} is isopropoxy.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein G and H are C, J and L are N, A, D, E, and K are independently C-R^3, and R^1 is defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^2 is selected from the group consisting of



, and , wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, surprisingly providing broad spectrum activity against multiple arenavirus strains,

and we believe that similar broad spectrum activity against multiple arenavirus strains can be observed when R^{4b} is selected from the group consisting of

n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein G and H are C, A, J, and L are N, and D, E, and K are independently C-R^3, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

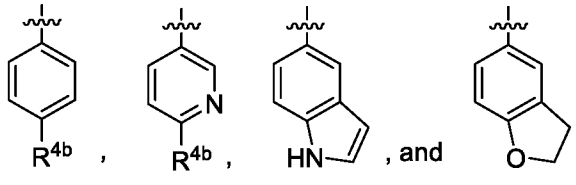
each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group , and wherein said (C_2 to C_9) heteroaryl is C-attached;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, and R^1 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^2 is selected from the group consisting of



, and , wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, surprisingly providing broad spectrum activity against multiple arenavirus strains,

and we believe that similar broad spectrum activity against multiple arenavirus strains can be observed when R^{4b} is selected from the group consisting of

n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**,

wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein G and H are C, D, J and L are N, and A, E, and K are independently C-R^3, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

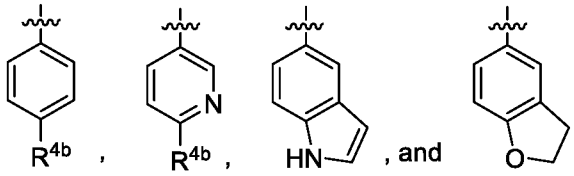
each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group, and wherein said (C_2 to C_9) heteroaryl is C-attached;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, and R^1 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^2 is selected from the group consisting of



, wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, surprisingly providing broad spectrum activity against multiple arenavirus strains,

and we believe that similar broad spectrum activity against multiple arenavirus strains can be observed when R^{4b} is selected from the group consisting of

n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein G and H are C, A, D, J, and L are N, and E and K are independently C-R^3, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

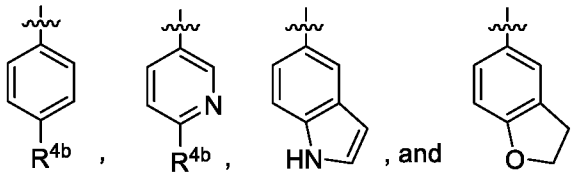
each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group, and wherein said (C_2 to C_9) heteroaryl is C-attached;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, and R^1 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^2 is selected from the group consisting of



, and , wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, surprisingly providing broad spectrum activity against multiple arenavirus strains,

and we believe that similar broad spectrum activity against multiple arenavirus strains can be observed when R^{4b} is selected from the group consisting of

n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

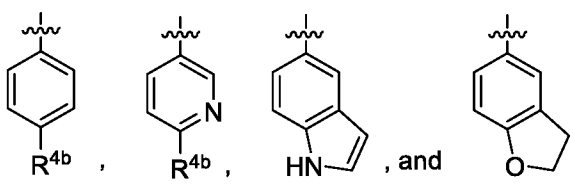
R^{4b} is isopropoxy.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, and E are independently N or C-R^3, G and H are C, J is N, and K and L are independently CR^3, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group, and wherein said (C_2 to C_9) heteroaryl is C-attached;

R^2 is selected from the group consisting of



, and , wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

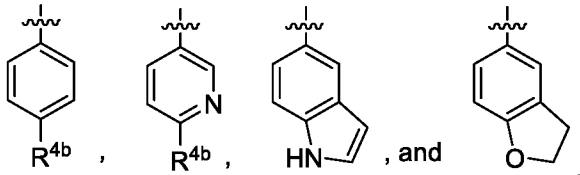
each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, and E are independently N or C-R^3, G and H are C, J and K are N, and L is CR^3, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group, and wherein said (C_2 to C_9) heteroaryl is C-attached;

R^2 is selected from the group consisting of



, and , wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

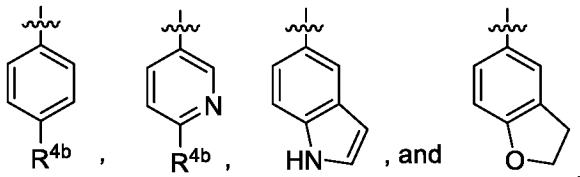
each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, and E are independently N or C-R^3, G, H and J are C, K and L are independently N or NR^3, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is selected from the group consisting of



, and , wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and J are C;

H and L are N;

K is C-R^3;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

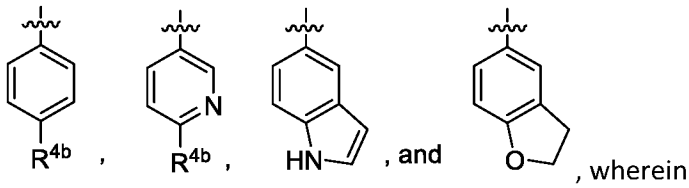
each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group, and wherein said (C_2 to C_9) heteroaryl is C-attached;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, and R^1 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^2 is selected from the group consisting of



, and , wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, surprisingly providing broad spectrum activity against multiple arenavirus strains,

and we believe that similar broad spectrum activity against multiple arenavirus strains can be observed when R^{4b} is selected from the group consisting of

n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

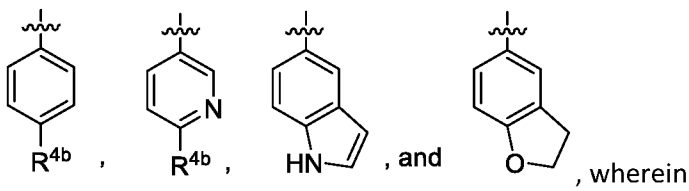
In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen;

R^{4b} is isopropoxy.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, and E are independently C-R^3, G and J are C, H and L are N, K is C-R^3, and R^1 is define as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^2 is selected from the group consisting of



, and , wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, surprisingly providing broad spectrum activity against multiple arenavirus strains,

and we believe that similar broad spectrum activity against multiple arenavirus strains can be observed when R^{4b} is selected from the group consisting of

n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

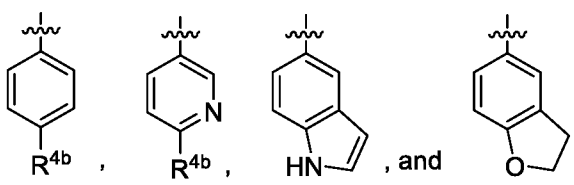
R^3 is hydrogen.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein D and E are independently C-R^3, G and J are C, A, H, and L are N, K is C-R^3, and R^1 is defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^2 is selected from the group consisting of



, and , wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein D and E are independently C-R^3, G and J are C, A, H, and L are N, K is C-R^3, and R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, surprisingly providing broad spectrum activity against multiple arenavirus strains,

and we believe that similar broad spectrum activity against multiple arenavirus strains can be observed when R^{4b} is selected from the group consisting of

n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

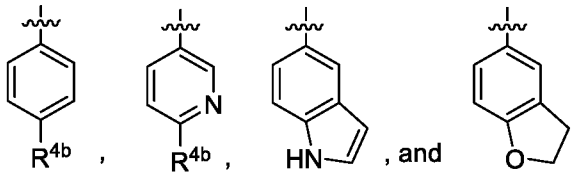
R^3 is hydrogen.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A and D are independently C-R^3, G and J are C, E, H, and L are N; and K is C-R^3, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^2 is selected from the group consisting of



, and , wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, surprisingly providing broad spectrum activity against multiple arenavirus strains,

and we believe that similar broad spectrum activity against multiple arenavirus strains can be observed when R^{4b} is selected from the group consisting of

n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and H are C;

J, K, and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

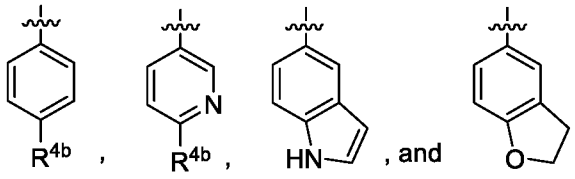
each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group, wherein said (C_2 to C_9) heteroaryl is C-attached;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, and R^1 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^2 is selected from the group consisting of



, wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, surprisingly providing broad spectrum activity against multiple arenavirus strains,

and we believe that similar broad spectrum activity against multiple arenavirus strains can be observed when R^{4b} is selected from the group consisting of

n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**,

wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above,or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above,or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen;

R^{4b} is isopropoxy.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently C-R^3;

G and H are C;

J, K, and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

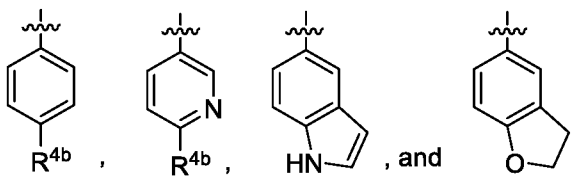
each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group, and wherein said (C_2 to C_9) heteroaryl is C-attached;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, and R^1 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^2 is selected from the group consisting of



, wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, surprisingly providing broad spectrum activity against multiple arenavirus strains,

and we believe that similar broad spectrum activity against multiple arenavirus strains can be observed when R^{4b} is selected from the group consisting of

n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently C-R^3;

G and J are C;

H, K, and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

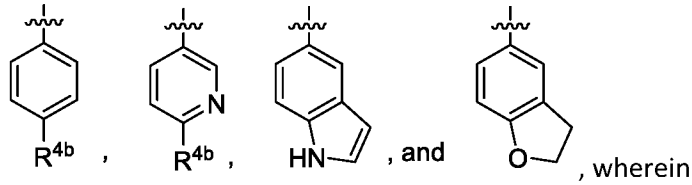
each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group, and wherein (C_2 to C_9) heteroaryl is C-attached;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, and R^1 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^2 is selected from the group consisting of



, and , wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and -C(O)R^5, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, surprisingly providing broad spectrum activity against multiple arenavirus strains,

and we believe that similar broad spectrum activity against multiple arenavirus strains can be observed when R^{4b} is selected from the group consisting of

n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**,

A, D, E, G, H, J, K, L, R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and H are C;

J and L are N;

K is C-R^3.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E, and K are independently C-R^3;

G and H are C;

J and L are N.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E and K are independently C-R^3;

G and H are C;

J and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E, and K are C-H;

G and H are C;

J and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E, and K are independently C-R^3;

G and H are C;

J and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is 4-alkoxyphenyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E, and K are C-H;

G and H are C;

J and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is 4-alkoxyphenyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E and K are independently C-R^3;

G and H are C;

J and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is 4-isopropyloxyphenyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**,

or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E, and K are C-H;

G and H are C;

J and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is 4-isopropyloxyphenyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

D, E, and K are independently C-R^3;

G and H are C;

A, J and L are N.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

D, E, and K are independently C-R^3;

G and H are C;

A, J and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

D, E, and K are C-H;

G and H are C;

A, J and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

D, E, and K are independently C-R^3;

G and H are C;

A, J and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is 4-alkoxyphenyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

D, E, and K are C-H;

G and H are C;

A, J and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is 4-alkoxyphenyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

D, E, and K are independently C-R^3;

G and H are C;

A, J and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is 4-isopropyloxyphenyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

D, E, and K are C-H;

G and H are C;

A, J and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is 4-isopropyloxyphenyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and H are C;

J is N;

K and L are independently C-R^3.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G, H, and J are C;

K is C-R^3;

L is N-R^3.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and H are C;

J and K are N;

L is C-R^3.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G, H, and J are C;

K is N;

L is N-R^3.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**,

or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and J are C;

H and L are N;

K is C-R^3.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E and K are independently C-R^3;

G and J are C;

H and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E and K are C-H;

G and J are C;

H and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E and K are independently C-R^3;

G and J are C;

H and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is 4-alkoxyphenyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E and K are C-H;

G and J are C;

H and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is 4-alkoxyphenyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E and K are independently C-R^3;

G and J are C;

H and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is 4-isopropyloxyphenyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E and K are C-H;

G and J are C;

H and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^2 is 4-isopropyloxyphenyl.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and J are C;

H and K are N;

L is CR^3.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

H and J are C;

G and K are N;

L is C-R^3.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and J are C;

H, K, and L are N.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and H are C;

J, K, and L are N.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G, H, and J are C;

K is C-R^3;

L is O.

In another embodiment, the method comprises administering to humans, other mammals, cell culture, or biological sample an effective amount of a compound represented by Structural Formula **I**, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

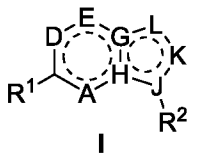
A, D, and E are independently N or C-R^3;

G, H, and J are C;

K is O;

L is N.

In another embodiment, the invention relates to compounds of Structural Formula I



I ,

or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G, H, and J are independently N or C;

K is N or C-H;

L is N, N-R^3, or C-R^3;

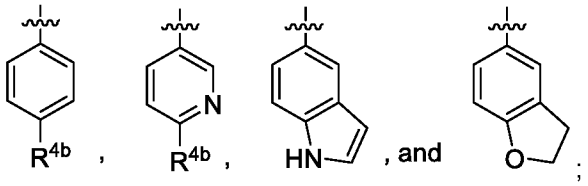
and A, D, E, G, H, J, K, and L together cannot have more than 4 N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, and 5-indolyl, wherein

each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is substituted with at least one R^{4a} group, and wherein said (C_2 to C_9) heteroaryl is C-attached;

with the proviso that R^1 is not selected from the group consisting of substituted 3-carbamoyl-2-phenyl-1-benzofuran-5-yl, substituted 1,3,4-oxadiazolyl, substituted 1,3,4-triazolyl, substituted 1,3,4-thiadiazolyl, substituted oxazoyl, substituted thiazoyl, substituted 1*H*-pyrazol-4-yl, substituted 1*H*-pyrazol-5-yl, optionally substituted 1-phenyl-1*H*-imidazol-5-yl, 4-{[(2-aminoethyl)amino]methyl}phenyl, (2-amino-1,3-benzoxazol)-5-yl; (2-amino-1,3-benzoxazol)-4-yl, 2-chloropyridyl-3-yl, 2-methylpyridinyl-4-yl, 2-fluoropyridyl-4-yl, 6-aminopyridyl-3-yl, 6-methoxypyridyl-3-yl, pyridyl-4-yl-*N*-oxide, 3,4-difluorphenyl, and substituted 1*H*-pyrrol-3-yl;

R^2 is selected from the group consisting of



;

each of the R^3 is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, -C(O)R^5, -C(O)N$R^{6a}R^{6b}$, -N$R^{6a}R^{6b}$, -S(O)$_m$$R^5$, -S(O)$_mNR^{6a}R^{6b}$, -N$R^{6a}$S(O)$_m$$R^5$, -(CH$_2$)$_n$C(O)O$R^5$, -(CH$_2$)$_n$C(O)N$R^{6a}R^{6b}$, -OC(O)$R^5$, -N$R^{6a}$C(O)$R^5$, and -N$R^{6c}$C(O)N$R^{5a}R^{5b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

R^{4a} is independently selected from halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2

to C9) cycloheteroalkyl, (C6 to C10) aryl, (C2 to C9) heteroaryl, -C(O)R^5, -$NR^{6a}R^{6b}$, -$S(O)_mR^5$, -$S(O)_mNR^{6a}R^{6b}$, -$NR^{6a}S(O)_mR^5$, -$OC(O)R^5$, -$NR^{6a}C(O)R^5$, and -$NR^{6c}C(O)NR^{6a}R^{6b}$, wherein

each of the said (C1 to C6) alkyl, (C1 to C6) alkenyl, (C1 to C6) alkynyl, (C1 to C6) alkoxy, aryloxy, (C3 to C10) cycloalkyl, (C5 to C10) cycloalkenyl, (C2 to C9) cycloheteroalkyl, (C6 to C10) aryl, and (C2 to C9) heteroaryl is optionally substituted with at least one R^7 group;

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, surprisingly providing broad spectrum activity against multiple arenavirus strains,

and we believe that similar broad spectrum activity against multiple arenavirus strains can be observed when R^{4b} is selected from the group consisting of

n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl;

each of the R^5 is independently selected from hydrogen, (C1 to C6) alkyl, (C1 to C6) alkenyl, (C1 to C6) alkynyl, (C3 to C10) cycloalkyl, (C5 to C10) cycloalkenyl, (C2 to C9) cycloheteroalkyl, (C6 to C10) aryl, and (C2 to C9) heteroaryl, wherein

each of the said (C1 to C6) alkyl, (C1 to C6) alkenyl, (C1 to C6) alkynyl, (C3 to C10) cycloalkyl, (C5 to C10) cycloalkenyl, (C2 to C9) cycloheteroalkyl, (C6 to C10) aryl, and (C2 to C9) heteroaryl is optionally substituted with at least one R^7 group;

each of the R^{6a}, R^{6b}, and R^{6c} are independently selected from hydrogen, (C1 to C6) alkyl, (C1 to C6) alkenyl, (C1 to C6) alkynyl, (C3 to C10) cycloalkyl, (C5 to C10) cycloalkenyl, (C2 to C9) cycloheteroalkyl, (C6 to C10) aryl, and (C2 to C9) heteroaryl,

or R^{6a} and R^{6b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted with at least one R^7 group;

R^7 is independently selected from hydrogen, halogen, OH, CF_3, (C1 to C6) alkyl, (C1 to C6) alkenyl, (C1 to C6) alkynyl, (C1 to C6) alkoxy, aryloxy, cyano, (C3 to C10) cycloalkyl, (C5 to C10) cycloalkenyl, (C2 to C9) cycloheteroalkyl, (C6 to C10) aryl, (C2 to C9) heteroaryl, -C(O)R^8, -$C(O)NR^{9a}R^{9b}$, -$NR^{9a}R^{9b}$, -$S(O)_mR^8$, -$S(O)_mNR^{9a}R^{9b}$, -$NR^{9a}S(O)_mR^8$, -$(CH_2)_nC(O)OR^8$, -$(CH_2)_nC(O)N(R^{9a}R^{9b})$, -$OC(O)R^8$, -$NR^{9a}C(O)R^8$, and -$NR^{9a}C(O)N(R^{9a}R^{9b})$, wherein

each of the said (C1 to C6) alkyl, (C1 to C6) alkenyl, (C1 to C6) alkynyl, (C1 to C6) alkoxy, aryloxy, (C3 to C10) cycloalkyl, (C5 to C10) cycloalkenyl, (C2 to C9) cycloheteroalkyl, (C6 to C10) aryl, and (C2 to C9) heteroaryl, is optionally substituted with at least one R^{10} group;

each of the R^8 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^{10} group;

each of the R^{9a}, R^{9b}, and R^{9c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl,

or R^{9a} and R^{9b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted;

R^{10} is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted;

m is 0, 1, or 2;

n is 1, 2, 3, 4, 5, or 6.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein

R^3 is hydrogen;

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and H are C;

J and L are N;

K is C-H.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein

R^3 is hydrogen.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen;

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein G and H are C, J and L are N, K is C-H, and R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently C-R^3.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

D and E are independently C-R^3;

G and H are C;

A, J, and L are N;

K is C-H.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A and E are independently C-R^3;

G and H are C;

D, J, and L are N;

K is C-H.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

E is C-R^3;

G and H are C;

K is C-H;

A, D, J, and L are N.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and H are C;

J is N;

K is C-H;

L is C-R^3.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and H are C;

J and K are N;

L is C-R^3.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G, H, and J are C;

K is N;

L is N-R^3.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and J are C;

H and L are N;

K is C-H.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein G and J are C; H and L are N, K is C-H, and R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently C-R^3.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

D and E are independently C-R^3;

A, H, and L are N;

K is C-H;

G and J are C.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A and D are independently C-R^3;

G and J are C;

K is C-H;

E, H, and L are N.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G and J are C;

J, K, and L are N.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein G and H are C, J, K, and L are N, and R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently C-R^3.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently C-$R^{3;}$

G and J are C;

H, K, and L are N.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1, and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^3 is hydrogen.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein A, D, E, G, H, J, K, L, R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

R^{4b} is isopropoxy.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

H and J are C;

G and K are N;

L is C-R^3.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein

A, D, and E are independently N or C-R^3;

G, H, and J are C;

K is C-H;

L is O.

In another embodiment, the invention relates to compounds of Structural Formula I, wherein R^1 and R^2 are defined as above, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein

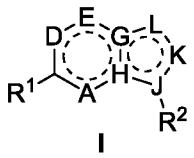
A, D, and E are independently N or C-R^3;

G, H, and J are C;

K is N;

L is O.

In another embodiment, the invention relates to compounds of Structural Formula I



I

or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein

A, D, E, and K are C-H;

G and H are C;

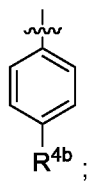
J and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^{4a} group,

with the proviso that R^1 is not selected from the group consisting of optionally substituted 3-carbamoyl-2-phenyl-1-benzofuran-5-yl, optionally substituted 1,3,4-oxadiazolyl, optionally substituted 1*H*-pyrazol-4-yl, optionally substituted 1-phenyl-1*H*-pyrazol-5-yl, optionally substituted 1-phenyl-1*H*-imidazol-5-yl, 4-{[(2-aminoethyl)amino]methyl}phenyl, and (2-amino-1,3-benzoxazol)-5-yl;

R^2 is



;

R^{4a} is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl,

(C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^5$, $-NR^{6a}R^{6b}$, $-S(O)_mR^5$, $-S(O)_mNR^{6a}R^{6b}$, $-NR^{6a}S(O)_mR^5$, $-OC(O)R^5$, $-NR^{6a}C(O)R^5$, and $-NR^{6c}C(O)NR^{6a}R^{6b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

R^{4b} is selected from halogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^5$, $-C(O)NR^{6a}R^{6b}$, $-NR^{6a}R^{6b}$, $-S(O)_mR^5$, $-S(O)_mNR^{6a}R^{6b}$, $-NR^{6a}S(O)_mR^5$, $-(CH_2)_nC(O)OR^5$, $-(CH_2)_nC(O)NR^{6a}R^{6b}$, $-OC(O)R^5$, $-NR^{6a}C(O)R^5$, and $-NR^{6c}C(O)NR^{6a}R^{6b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

each of the R^5 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

each of the R^{6a}, R^{6b}, and R^{6c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl,

or R^{6a} and R^{6b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted with at least one R^7 group;

R^7 is independently selected from hydrogen, halogen, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, cyano, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^8$, $-C(O)NR^{9a}R^{9b}$, $-NR^{9a}R^{9b}$, $-S(O)_mR^8$, $-S(O)_mNR^{9a}R^{9b}$, $-NR^{9a}S(O)_mR^8$, $-(CH_2)_nC(O)OR^8$, $-(CH_2)_nC(O)N(R^{9a}R^{9b})$, $-OC(O)R^8$, $-NR^{9a}C(O)R^8$, and $-NR^{9a}C(O)N(R^{9a}R^{9b})$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, is optionally substituted with at least one R^{10} group;

each of the R^8 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^{10} group;

each of the R^{9a}, R^{9b}, and R^{9c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl,

or R^{9a} and R^{9b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted;

R^{10} is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

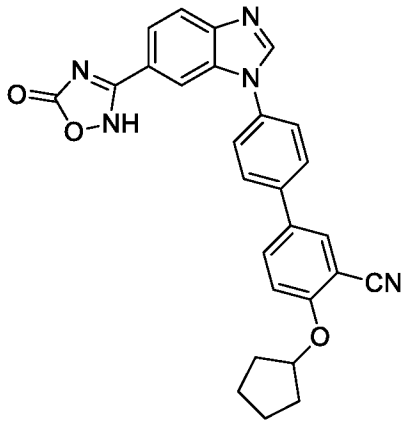
each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted;

m is 0, 1, or 2;

n is 1, 2, 3, 4, 5, or 6;

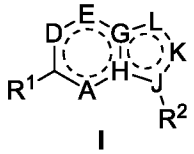
with the proviso that the following compound is excluded:

2-(cyclopentyloxy)-5-{4-[6-(5-oxo-2,5-dihydro-1,2,4-oxadiazol-3-yl)-1*H*-1,3-benzodiazol-1-yl]phenyl}benzonitrile



.

In another embodiment, the invention relates to compounds of Structural Formula I



I ,

or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein

D, E, and K are C-H;

G and H are C;

A, J and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^{4a} group,

with the proviso that R^1 is not selected from the group consisting of optionally substituted 3-carbamoyl-2-phenyl-1-benzofuran-5-yl, optionally substituted 1,3,4-oxadiazolyl, optionally substituted 1*H*-pyrazol-4-yl; optionally substituted 1-phenyl-1*H*-pyrazol-5-yl, optionally substituted 1-phenyl-1*H*-imidazol-5-yl, and (2-amino-1,3-benzoxazol)-5-yl;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^{4b} group,

R^{4a} is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^5$, $-NR^{6a}R^{6b}$, $-S(O)_mR^5$, $-S(O)_mNR^{6a}R^{6b}$, $-NR^{6a}S(O)_mR^5$, $-OC(O)R^5$, $-NR^{6a}C(O)R^5$, and $-NR^{6c}C(O)NR^{6a}R^{6b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

R^{4b} is independently selected from halogen, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^5$, $-C(O)NR^{6a}R^{6b}$, $-NR^{6a}R^{6b}$, $-S(O)_mR^5$, $-S(O)_mNR^{6a}R^{6b}$, $-NR^{6a}S(O)_mR^5$, $-(CH_2)_nC(O)OR^5$, $-(CH_2)_nC(O)NR^{6a}R^{6b}$, $-OC(O)R^5$, $-NR^{6a}C(O)R^5$, and $-NR^{6c}C(O)NR^{6a}R^{6b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

each of the R^5 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

each of the R^{6a}, R^{6b}, and R^{6c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl,

or R^{6a} and R^{6b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted with at least one R^7 group;

R^7 is independently selected from hydrogen, halogen, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, cyano, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^8$, $-C(O)NR^{9a}R^{9b}$, $-NR^{9a}R^{9b}$, $-S(O)_mR^8$, $-S(O)_mNR^{9a}R^{9b}$, $-NR^{9a}S(O)_mR^8$, $-(CH_2)_nC(O)OR^8$, $-(CH_2)_nC(O)N(R^{9a}R^{9b})$, $-OC(O)R^8$, $-NR^{9a}C(O)R^8$, and $-NR^{9a}C(O)N(R^{9a}R^{9b})$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, is optionally substituted with at least one R^{10} group;

each of the R^8 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^{10} group;

each of the R^{9a}, R^{9b}, and R^{9c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl,

or R^{9a} and R^{9b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted;

R^{10} is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

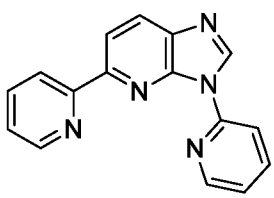
each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted;

m is 0, 1, or 2;

n is 1, 2, 3, 4, 5, or 6;

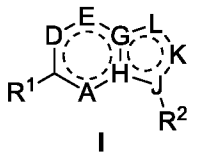
with the proviso that the following compound is excluded:

3,5-dipyridin-2-yl-3*H*-imidazo[4,5-*b*]pyridine



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In another embodiment, the invention relates to compounds of Structural Formula I



I ,

or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein

A, D, E, and K are CH;

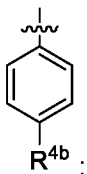
G and J are C;

H and L are N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^{4a} group with the proviso that

R^1 is not selected from the group consisting of optionally substituted 3-carbamoyl-2-phenyl-1-benzofuran-5-yl, optionally substituted optionally 1,3,4-oxadiazolyl, optionally substituted 1*H*-pyrazol-4-yl, optionally substituted 1-phenyl-1*H*-pyrrol-2-yl, optionally substituted 1-phenyl-1*H*-pyrazol-5-yl, optionally substituted 1-phenyl-1*H*-imidazol-5-yl, 2-(4-fluoro-3-methylphenyl)pyridin-3-yl, and (2-amino-1,3-benzoxazol)-5-yl;

R^2 is ;

R^{4a} is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^5$, $-NR^{6a}R^{6b}$, $-S(O)_mR^5$, $-S(O)_mNR^{6a}R^{6b}$, $-NR^{6a}S(O)_mR^5$, $-OC(O)R^5$, $-NR^{6a}C(O)R^5$, and $-NR^{6c}C(O)NR^{6a}R^{6b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

R^{4b} is selected from the group consisting of

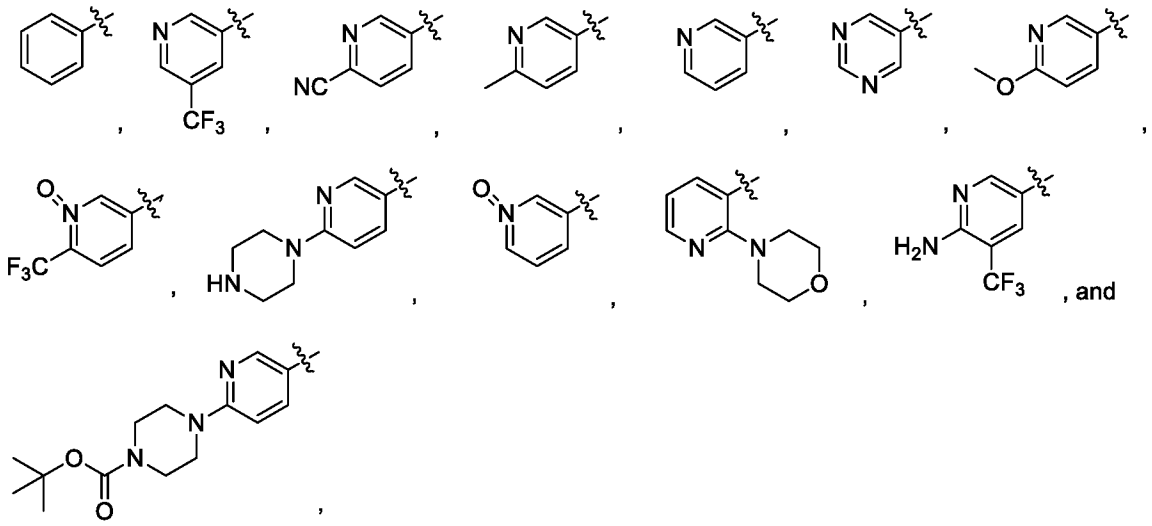
CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, $-C(O)R^5$, $-C(O)NR^{6a}R^{6b}$, $-NR^{6a}R^{6b}$, $-SR^5$, $-S(O)_mNR^{6a}R^{6b}$, $-NR^{6a}S(O)_mR^5$, $-(CH_2)_nC(O)OR^5$, $-(CH_2)_nC(O)NR^{6a}R^{6b}$, $-OC(O)R^5$, $-NR^{6a}C(O)R^5$, and $-NR^{6c}C(O)NR^{6a}R^{6b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group,

with the proviso when

R^{4b} is selected from the group consisting of isopropylthio, morpholin-4-yl, thiomorpholine-1,1-dione-4-yl, and amino,

then R^1 is not selected from the group consisting of



and with the proviso when

R^{4b} is selected from the group consisting of 2-hydroxyethoxy, 2-(oxan-2-yloxy)ethoxy, 2-(oxan-4-yloxy)ethoxy, and 2-(oxan-4-yloxy)ethylamino,

then R^1 is not selected from the group consisting of 1*H*-pyrrol-3-yl, 1*H*-pyrazol-1yl, 1*H*-imidazol-1-yl, 4-pyridin-1-yl, 1-methyl-1*H*-methyl-pyrazol-4-yl, and 1,3-oxazol-2-yl;

each of the R^5 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

each of the R^{6a}, R^{6b}, and R^{6c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl,

or R^{6a} and R^{6b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted with at least one R^7 group;

R^7 is independently selected from hydrogen, halogen, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, cyano, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^8$, $-C(O)NR^{9a}R^{9b}$, $-NR^{9a}R^{9b}$, $-S(O)_mR^8$, $-S(O)_mNR^{9a}R^{9b}$, $-NR^{9a}S(O)_mR^8$, $-(CH_2)_nC(O)OR^8$, $-(CH_2)_nC(O)N(R^{9a}R^{9b})$, $-OC(O)R^8$, $-NR^{9a}C(O)R^8$, and $-NR^{9a}C(O)N(R^{9a}R^{9b})$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, is optionally substituted with at least one R^{10} group;

each of the R^8 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^{10} group;

each of the R^{9a}, R^{9b}, and R^{9c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl,

or R^{9a} and R^{9b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted;

R^{10} is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted.

m is 0, 1, or 2;

n is 1, 2, 3, 4, 5, or 6.

In another embodiment, the invention relates to compounds, or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, selected from the group consisting of the compounds described as examples A1 to A31, B1 to B15, C1 to C51, and D1 to D23 in the method of preparation section.

One can treat Arenavirus infection by administering a pharmaceutically effective amount of a pharmaceutical composition comprising a compound selected of Structural Formula I or a compound as shown above with a pharmaceutically acceptable carrier, dilutant, or vehicle. Additionally a therapeutically effective amount of a therapeutic agent selected from the group consisting of Ribavirin, polymerase inhibitors, T-705 (favipiravir), Triazavirin, small interfering RNAs (siRNAs), vaccines, and immunomodulators can be administered with the compound of the invention.

DEFINITIONS

As used herein, the terms “comprising” and “including” are used in their open, non-limiting sense.

The terms "halo" and/or “halogen” refer to fluorine, chlorine, bromine or iodine.

The term “(C_1 to C_6)” alkyl refers to a saturated aliphatic hydrocarbon radical including straight chain and branched chain groups of 1 to 6 carbon atoms. Examples of (C_1 to C_6) alkyl groups include methyl, ethyl, propyl, 2-propyl, *n*-butyl, *iso*-butyl, *tert*-butyl, pentyl, and the like. The terms “Me” and “methyl,” as used herein, mean a -CH_3 group. The terms “Et” and “ethyl,” as used herein, mean a -C_2H_5 group.

The term "(C_2 to C_8) alkenyl", as used herein, means an alkyl moiety comprising 2 to 8 carbonshaving at least one carbon-carbon double bond. The carbon-carbon double bond in such a group may be anywhere along the 2 to 8 carbon chain that will result in a stable compound. Such groups include both the E and Z isomers of said alkenyl moiety. Examples of such groups include, but are not limited to, ethenyl, propenyl, butenyl, allyl, and pentenyl. The term “allyl,” as used herein, means a –$CH_2CH=CH_2$group. The term, “C(R)=C(R),” as used herein, represents a carbon-carbon double bond in which each carbon is substituted by an R group, and includes E and Z isomers.

As used herein, the term “(C_2 to C_8) alkynyl” means an alkyl moiety comprising from 2 to 8 carbon atoms and having at least one carbon-carbon triple bond. The carbon-carbon triple bond in such a group may be anywhere along the 2 to 8 carbon chain that will result in a stable compound. Examples of such groups include, but are not limited to, ethyne, propyne, 1-butyne, 2-butyne, 1-pentyne, 2-pentyne, 1-hexyne, 2-hexyne, and 3-hexyne.

The term "(C_1 to C_8) alkoxy", as used herein, means an O-alkyl group wherein said alkyl group contains from 1 to 8 carbon atoms and is straight, branched, or cyclic. Examples of such groups include, but are not limited to, methoxy, ethoxy, n-propyloxy, iso-propyloxy, n-butoxy, 5 iso-butoxy, tert-butoxy, cyclopentyloxy, and cyclohexyloxy.

The term “(C_6 to C_{10}) aryl”, as used herein, means a group derived from an aromatic hydrocarboncontaining from 6 to 10 carbon atoms. Examples of such groups include, but are not limited to, phenyl or naphthyl. The terms “Ph” and “phenyl,” as used herein, mean a -C_6H_5 group. The term “benzyl,” as used herein, means a -$CH_2C_6H_5$ group.

“(C_2 to C_9) heteroaryl”, as used herein, means an aromatic heterocyclic group having a total of from 5 to 10 atoms in its ring, and containing from 2 to 9 carbon atoms and from one to four heteroatoms each independently selected from O, S and N, and with the proviso that the ring of said group does not contain two adjacent O atoms or two adjacent S atoms. The heterocyclic groups include benzo-fused ring systems. Examples of aromatic heterocyclic groups are pyridinyl, imidazolyl, pyrimidinyl, pyrazolyl, triazolyl, pyrazinyl, tetrazolyl, furyl, thienyl, isoxazolyl, thiazolyl, oxazolyl, isothiazolyl, pyrrolyl, quinolinyl, isoquinolinyl, indolyl, benzimidazolyl, benzofuranyl, cinnolinyl, indazolyl, indolizinyl, phthalazinyl, pyridazinyl, triazinyl, isoindolyl, pteridinyl, purinyl, oxadiazolyl, thiadiazolyl, furazanyl, benzofurazanyl, benzothiophenyl, benzothiazolyl, benzoxazolyl, quinazolinyl, quinoxalinyl, naphthyridinyl, and furopyridinyl. The (C_2 to C_9) heteroaryl groups may be C-attached or

N-attached where such is possible. For instance, a group derived from pyrrole may be pyrrol-1-yl (N-attached) or pyrrol-3-yl (C-attached). Further, a group derived from imidazole may be imidazol-1-yl (N-attached) or imidazol-3-yl (C-attached).

"(C_2 to C_9) cycloheteroalkyl", as used herein, means a non-aromatic, monocyclic, bicyclic, tricyclic, spirocyclic, or tetracyclic group having a total of from 4 to 13 atoms in its ring system, and containing from 5 to 9 carbon atoms and from 1 to 4 heteroatoms each independently selected from O, S and N, and with the proviso that the ring of said group does not contain two adjacent O atoms or two adjacent S atoms. Furthermore, such C_2 to C_9 cycloheteroalkyl groups may contain an oxo substituent at any available atom that will result in a stable compound. For example, such a group may contain an oxo atom at an available carbon or nitrogen atom. Such a group may contain more than one oxo substituent if chemically feasible. In addition, it is to be understood that when such a C2 to C9 cycloheteroalkyl group contains a sulfur atom, said sulfur atom may be oxidized with one or two oxygen atoms to afford either a sulfoxide or sulfone. An example of a 4 membered cycloheteroalkyl group is azetidinyl (derived from azetidine). An example of a 5 membered cycloheteroalkyl group is pyrrolidinyl. An example of a 6 membered cycloheteroalkyl group is piperidinyl. An example of a 9 membered cycloheteroalkyl group is indolinyl. An example of a 10 membered cycloheteroalkyl group is 4*H*-quinolizinyl. Further examples of such C2 to C9 cycloheteroalkyl groups include, but are not limited to, tetrahydrofuranyl, dihydrofuranyl, tetrahydrothienyl, tetrahydropyranyl, dihydropyranyl, tetrahydrothiopyranyl, piperidino, morpholino, thiomorpholino, thioxanyl, piperazinyl, azetidinyl, oxetanyl, thietanyl, homopiperidinyl, oxepanyl, thiepanyl, oxazepinyl, diazepinyl, thiazepinyl, 1,2,3,6-tetrahydropyridinyl, 2-pyrrolinyl, 3-pyrrolinyl, indolinyl, 2H-pyranyl, 4*H* pyranyl, dioxanyl, 1,3-dioxolanyl, pyrazolinyl, dithianyl, dithiolanyl, dihydropyranyl, dihydrothienyl, dihydrofuranyl, pyrazolidinyl, imidazolinyl, imidazolidinyl, 3-azabicyclo[3.1.0]hexanyl, 3-azabicyclo [4.1.0]heptanyl, 3*H*-indolyl quinolizinyl, 3-oxopiperazinyl, 4-methylpiperazinyl, 4-ethylpiperazinyl, and 1-oxo-2,8,diazaspiro[4.5]dec-8-yl.

The term "(C_3 to C_{10}) cycloalkyl group" means a saturated, monocyclic, fused, spirocyclic, or polycyclic ring structure having a total of from 3 to 10 carbon ring atoms. Examples of such groups include, but are not limited to, cyclopropyl, cyclobutyl, cyclopentyl, cyclopentenyl, cyclohexyl, cycloheptyl, and adamantyl.

The term "spirocyclic" as used herein has its conventional meaning, that is, any compound containing two or more rings wherein two of the rings have one ring carbon in common. The rings of a spirocyclic compound, as herein defined, independently have 3 to 20 ring atoms. Preferably, they have 3 to 10 ring atoms. Non-limiting examples of a spirocyclic compound include spiro[3.3]heptane, spiro[3.4]octane, and spiro[4.5]decane.

The term "(C_5 to C_8) cycloalkenyl" means an unsaturated, monocyclic, fused, spirocyclic ring strucures having a total of from 5 to 8 carbon ring atoms. Examples of such groups include, but are not limited to, cyclopentenyl, cyclohexenyl.

The term cyano" refers to a -C≡N group.

An "aldehyde" group refers to a carbonyl group where R is hydrogen.

An "alkoxy" group refers to both an –O-alkyl and an –O-cycloalkyl group, as defined herein.

An "alkoxycarbonyl" refers to a -C(O)OR.

An "alkylaminoalkyl" group refers to an -alkyl-NR-alkyl group.

An "alkylsulfonyl" group refer to a -SO_2alkyl.

An "amino" group refers to an -NH_2 or an -NRR'group.

An "aminoalkyl" group refers to an –alkyl-NRR' group.

An "aminocarbonyl" refers to a -C(O)NRR'.

An "arylalkyl" group refers to -alkylaryl, where alkyl and aryl are defined herein.

An "aryloxy" group refers to both an –O-aryl and an –O-heteroaryl group, as defined herein.

An "aryloxycarbonyl" refers to -C(O)Oaryl.

An "arylsulfonyl" group refers to a -SO_2aryl.

A "C-amido" group refers to a -C(O)NRR' group.

A "carbonyl" group refers to a -C(O)R.

A "C-carboxyl" group refers to a -C(O)OR groups.

A "carboxylic acid" group refers to a C-carboxyl group in which R is hydrogen.

A "cyano" group refers to a -CN group.

A "dialkylaminoalkyl" group refers to an –(alkyl)N(alkyl)$_2$ group.

A "halo" or "halogen" group refers to fluorine, chlorine, bromine or iodine.

A "haloalkyl" group refers to an alkyl group substituted with one or more halogen atoms.

A "heteroalicycloxy" group refers to a heteroalicyclic-O group with heteroalicyclic as defined herein.

A "heteroaryloxyl" group refers to a heteroaryl-O group with heteroaryl as defined herein.

A "hydroxy" group refers to an -OH group.

An "N-amido" group refers to a -R'C(O)NR group.

An "N-carbamyl" group refers to a -ROC(O)NR-group.

A "nitro" group refers to a -NO_2 group.

An "N-Sulfonamido" group refers to a -NR-S(O)$_2$R group.

An "N-thiocarbamyl" group refers to a ROC(S)NR' group.

An "O-carbamyl" group refers to a -OC(O)NRR' group.

An "O-carboxyl" group refers to a RC(O)O group.

An "O-thiocarbamyl" group refers to a -OC(S)NRR' group.

An “oxo” group refers to a carbonyl moiety such that alkyl substituted by oxo refers to a ketone group.

A "perfluoroalkyl group" refers to an alkyl group where all of the hydrogen atoms have been replaced with fluorine atoms.

A "phosphonyl" group refers to a -P(O)(OR)$_2$ group.

A "silyl" group refers to a -SiR_3 group.

An "S-sulfonamido" group refers to a -S(O)$_2$NR-group.

A "sulfinyl" group refers to a -S(O)R group.

A "sulfonyl" group refers to a -S(O)$_2$R group.

A "thiocarbonyl" group refers to a -C(=S)-R group.

A "trihalomethanecarbonyl" group refers to a $Z_3CC(O)$ group, where Z is halogen.

A "trihalomethanesulfonamido" group refers to a $Z_3CS(O)_2NR$-group.

A "trihalomethanesulfonyl" group refers to a $Z_3CS(O)_2$ group.

A "trihalomethyl" group refers to a $-CZ_3$ group.

A "C-carboxyl" group refers to a -C(O)OR groups.

The term “substituted,” means that the specified group or moiety bears one or more substituents.

The term “unsubstituted,” means that the specified group bears no substituents. The term “optionally substituted” means that the specified group is unsubstituted or substituted by one or more substituents. It is to be understood that in the compounds of the present invention when a group is said to be “unsubstituted,” or is “substituted” with fewer groups than would fill the valencies of all the atoms in the compound, the remaining valencies on such a group are filled by hydrogen. For example, if a C_6 aryl group, also called “phenyl” herein, is substituted with one additional substituent, one of ordinary skill in the art would understand that such a group has 4 open positions left on carbon atoms of the C_6 aryl ring (6 initial positions, minus one to which the remainder of the compound of the present invention is bonded, minus an additional substituent, to leave 4). In such cases, the remaining 4 carbon atoms are each bound to one hydrogen atom to fill their valencies. Similarly, if a C_6 aryl group in the present compounds is said to be “disubstituted,” one of ordinary skill in the art would understand it to mean that the C_6 aryl has 3 35 carbon atoms remaining that are unsubstituted. Those three unsubstituted carbon atoms are each boundto one hydrogen atom to fill their valencies.

The term "solvate," is used to describe a molecular complex between compounds of the present invention and solvent molecules. Examples of solvates include, but are not limited to, compounds of the invention in combination water, isopropanol, ethanol, methanol, dimethylsulfoxide (DMSO), ethyl acetate, acetic acid, ethanolamine, or mixtures thereof. The term “hydrate” can be used when said solvent is water. It is specifically contemplated that in the present invention one solvent molecule can be associated with one molecule of the compounds of the present invention, such as a hydrate. Furthermore, it is specifically contemplated that in the present invention, more than one solvent molecule may be associated with one molecule of the compounds of the present invention, such as a dihydrate. Additionally, it is specifically contemplated that in the present invention less than one solvent molecule may be associated with one molecule of the compounds of the present invention, such as a hemihydrate. Furthermore, solvates of the present invention are contemplated as solvates of compounds of the present invention that retain the biological effectiveness of the non-hydrate form of the compounds.

The term "pharmaceutically acceptable salt," as used herein, means a salt of a compound of the present invention that retains the biological effectiveness of the free acids and bases of the specifiedderivative and that is not biologically or otherwise undesirable.

The term “pharmaceutically acceptable formulation,” as used herein, means a combination of a compound of the invention, or a salt or solvate thereof, and a carrier, diluent, and/or excipient(s) that are compatible with a compound of the present invention, and is not deleterious to the recipient thereof. Pharmaceutical formulations can be prepared by procedures known to those of ordinary skill

in the art. For example, the compounds of the present invention can be formulated with common excipients, diluents, or carriers, and formed into tablets, capsules, and the like. Examples of excipients, diluents, and carriers that are suitable for such formulations include the following: fillers and extenders such as starch, sugars, mannitol, and silicic derivatives; binding agents such as carboxymethyl cellulose and othercellulose derivatives, alginates, gelatin, and polyvinyl pyrrolidone; moisturizing agents such as glycerol; disintegrating agents such as povidone, sodium starch glycolate, sodium carboxymethylcellulose, agar, calcium carbonate, and sodium bicarbonate; agents for retarding dissolution such as paraffin; resorption accelerators such as quaternary ammonium compounds; surface active agents such as cetyl alcohol, glycerol monostearate; adsorptive carriers such as kaolin and bentonite; and lubricants such as talc, calcium and magnesium stearate and solid polyethylene glycols. Final pharmaceutical forms may be pills, tablets, powders, lozenges, saches, cachets, or sterile packaged powders, and the like, depending on the type of excipient used. Additionally, it is specifically contemplated that pharmaceutically acceptable formulations of the present invention can contain more than one active ingredient. For example, such formulations may contain more than one compound according to the present invention. Alternatively, such formulations may contain one or more compounds of the present invention and one or more additional agents that reduce abnormal cell growth.

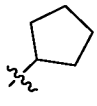
The term “Arenavirus GP-inhibiting amount” as used herein, refers to the amount of a compound of the present invention, or a salt or solvate thereof, required to inhibit the cell entry of Arenaviruses *in vivo*, such as in a mammal, birds or *in vitro*. The amount of such compounds required to cause such inhibition can be determined without undue experimentation using methods described herein and those known to those of ordinary skill in the art.

The term "therapeutically effective amount," as used herein, means an amount of a compound of the present invention, or a salt thereof, that, when administered to a mammal in need of such treatment, is sufficient to effect treatment, as defined herein. Thus, a therapeutically effective amount of a compound of the present invention, or a salt thereof, is a quantity sufficient to modulate or inhibit the activity of the Arenavirus GP protein such that cell entry and replication of arenaviruses that is mediated by activity of the Arenavirus GP protein is reduced or alleviated.

The terms "treat", "treating", and "treatment" with reference to arenavirus infection, in mammals, particularly a human, include: (i) preventing the disease or condition from occurring in a subject which may be predisposed to the condition, such that the treatment constitutes prophylactic treatment for the pathologic condition; (ii) modulating or inhibiting the disease or condition, i.e., arresting its development; (iii) relieving the disease or condition, i.e., causing regression of the disease or condition; or (iv) relieving and/or alleviating the disease or condition or the symptoms resulting from the disease or condition.

Unless indicated otherwise, all references herein to the inventive compounds include references to salts, solvates, and complexes thereof, including polymorphs, stereoisomers, tautomers, and isotopically labeled versions thereof. For example, compounds of the present invention can be pharmaceutically acceptable salts and/or pharmaceutically acceptable solvates.

The term "stereoisomers" refers to compounds that have identical chemical constitution, but differ with regard to the arrangement of their atoms or groups in space. In particular, the term "enantiomers" refers to two stereoisomers of a compound that are non-superimposable mirror images of one another. A pure enantiomer can be contaminated with up to 2% of the opposite enantiomer.

The terms “racemic” or “racemic mixture,” as used herein, refer to a 1:1 mixture of enantiomers of a particular compound. The term "diastereomers", on the other hand, refers to the relationship between a pair of stereoisomers that comprise two or more asymmetric centers and are not mirror images of one another. In accordance with a convention used in the art, the symbol is used in structural formulas herein to depict the bond that is the point of attachment of the moiety or substituent to the core or backbone structure. In accordance with another convention, in some structural formulae herein the carbon atoms and their bound hydrogen atoms are not explicitly depicted, e.g.,  represents a methyl group,  represents an ethyl group,  represents a cyclopentyl group, etc.

The compounds of the present invention may have asymmetric carbon atoms. The carbon carbon bonds of the compounds of the present invention may be depicted herein using a solid line (—), a solid wedge (▬), or a dotted wedge (⋯). The use of a solid line to depict bonds to asymmetric carbon atoms is meant to indicate that all possible stereoisomers (e.g. specificenantiomers, racemic mixtures, etc.) at that carbon atom are included. The use of either a solid or dotted wedge to depict bonds to asymmetric carbon atoms is meant to indicate that only the stereoisomer shown is meant to be included. It is possible that compounds of the invention may contain more than one asymmetric carbon atom. In those compounds, the use of a solid line to depict bonds to asymmetric carbon atoms is meant to indicate that all possible stereoisomers are meant to be included. For example, unless stated otherwise, it is intended that the compounds of the present invention can exist as enantiomers and diastereomers or as racemates and mixtures thereof. The use of a solid line to depict bonds to one or more asymmetric carbon atoms in a compound of the invention and the use of a solid ordotted wedge to depict bonds to other asymmetric carbon atoms in the same compound is meant to indicate that a mixture of diastereomers is present.

Unless otherwise defined, a substituent “R” may reside on any atom of the ring system, assuming replacement of a depicted, implied, or expressly defined hydrogen from one of the ring atoms, so long as a stable structure is formed.

Conventional techniques for the preparation/isolation of individual enantiomers include chiral synthesis from a suitable optically pure precursor or resolution of the reacemate using, for example, chiral high pressure liquid chromatography (HPLC). Alternatively, the racemate (or a racemic precursor) may be reacted with a suitable optically active compound, for example, an alcohol, or, in the case where the compound contains an acidic or basic moiety, an acid or base such as tartaric acid or 1-phenyl ethyl amine. The resulting diastereomeric mixture may be separated by chromatography and/or fractional crystallization and one or both of the diastereoisomers converted to the corresponding pure enantiomer(s) by means well known to one skilled in the art. Chiral

compounds of the invention (and chiral precursors thereof) may be obtained in enantiomerically-enriched form using chromatography, typically HPLC, on an asymmetric resin with a mobile phase consisting of a hydrocarbon, typically heptane or hexane, containing from 0 to 50% isopropanol, typically from 2 to 20%, and from 0 to 5% of an alkylamine, typically 0.1% diethylamine. Concentration of the eluate affords the enriched mixture. Stereoisomeric conglomerates may be separated by conventional techniques known to those skilled in the art. See, e.g. “Stereochemistry of Organic Compounds” by E L Eliel (Wiley, New York, 1994), the disclosure of which is incorporated herein by reference in its entirety.

Where a compound of the invention contains an alkenyl or alkenylene group, geometric *cis/trans* (or Z/E) isomers are possible. Where the compound contains, for example, a keto or oxime group or an aromatic moiety, tautomeric isomerism (‘tautomerism’) can occur. Examples of tautomerism include keto and enol tautomers. A single compound may exhibit more than one type of isomerism. Included within the scope of the invention are all stereoisomers, geometric isomers and tautomeric forms of the inventive compounds, including compounds exhibiting more than one type of isomerism, and mixtures of one or more thereof. Cis/trans isomers may be separated by conventional techniques well known to those skilled in the art, for example, chromatography and fractional crystallization.

The compounds of the present invention may be administered as prodrugs. Thus certain derivatives of compounds of Formula I, which may have little or no pharmacological activity themselves can, when administered to a mammal, be converted into a compound of Formula (I) having the desired activity, for example, by hydrolytic cleavage. Such derivatives are referred to as “prodrugs”. Prodrugs can, for example, be produced by replacing appropriate functionalities present in the compounds of Formula I with certain moieties known to those skilled in the art. See, e.g. “Pro-drugs as Novel Delivery Systems”, Vol. 14, ACS Symposium Series (T Higuchi and W Stella) and “Bioreversible Carriers in Drug Design”, Pergamon Press, 1987 (ed. E B Roche, American Pharmaceutical Association), the disclosures of which are incorporated herein by reference in their entireties. Some examples of such prodrugs include: an ester moiety in the place of a carboxylic acid functional group; an ether moiety or an amide moiety in place of an alcohol functional group; and an amide moiety in place of a primary or secondary amino functional group. Further examples of replacement groups are known to those of skill in the art. See, e.g. “Design of Prodrugs" by H Bundgaard (Elsevier, 1985), the disclosure of which is incorporated herein by reference in its entirety. It is also possible that certain compounds of Formula I may themselves act as prodrugs of other compounds of Formula I.

Salts of the present invention can be prepared according to methods known to those of skill in the art. Examples of salts include, but are not limited to, acetate, acrylate, benzenesulfonate, benzoate (such as chlorobenzoate, methylbenzoate, dinitrobenzoate, hydroxybenzoate, and methoxybenzoate), bicarbonate, bisulfate, bisulfite, bitartrate, borate, bromide, butyne-1,4-dioate, calcium edetate, camsylate, carbonate, chloride, caproate, caprylate, clavulanate, citrate, decanoate, dihydrochloride, dihydrogenphosphate, edetate, edislyate, estolate, esylate, ethylsuccinate, formate, fumarate, gluceptate, gluconate, glutamate, glycollate, glycollylarsanilate, heptanoate, hexyne-1,6-

dioate, hexylresorcinate, hydrabamine, hydrobromide, hydrochloride, γ-hydroxybutyrate, iodide, isobutyrate, isothionate, lactate, lactobionate, laurate, malate, maleate, malonate, mandelate, mesylate, metaphosphate, methanesulfonate, methylsulfate, monohydrogenphosphate, mucate, napsylate, naphthalene-1-sulfonate, naphthalene-2-sulfonate, nitrate, oleate, oxalate, pamoate (embonate), palmitate, pantothenate, phenylacetates, phenylbutyrate, phenylpropionate, phthalate, phospate/diphosphate, polygalacturonate, propanesulfonate, propionate, propiolate, pyrophosphate, pyrosulfate, salicylate, stearate, subacetate, suberate, succinate, sulfate, sulfonate, sulfite, tannate, tartrate, teoclate, tosylate, triethiodode, and valerate salts.

The compounds of the present invention that are basic in nature are capable of forming a wide variety of different salts with various inorganic and organic acids. Although such salts must be pharmaceutically acceptable for administration to animals, it is often desirable in practice to initially isolate the compound of the present invention from the reaction mixture as a pharmaceutically unacceptable salt and then simply convert the latter back to the free base compound by treatment with an alkaline reagent and subsequently convert the latter free base to a pharmaceutically acceptable acid addition salt. The acid addition salts of the base compounds of this invention can be prepared by treating the base compound with a substantially equivalent amount of the selected mineral or organic acid in an aqueous solvent medium or in a suitable organic solvent, such as methanol or ethanol. Upon evaporation of the solvent, the desired solid salt is obtained. The desired acid salt can also be precipitated from a solution of the free base in an organic solvent by adding an appropriate mineral or organic acid to the solution.

Those compounds of the present invention that are acidic in nature are capable of forming base salts with various pharmacologically acceptable cations. Examples of such salts include the alkali metal or alkaline-earth metal salts and particularly, the sodium and potassium salts. These salts are all prepared by conventional techniques. The chemical bases which are used as reagents to prepare the pharmaceutically acceptable base salts of this invention are those which form non-toxic base salts with the acidic compounds of the present invention. Such non-toxic base salts include those derived from such pharmacologically acceptable cations as sodium, potassium calcium and magnesium, etc. These salts can be prepared by treating the corresponding acidic compounds with an aqueous solution containing the desired pharmacologically acceptable cations, and then evaporating the resulting solution to dryness, preferably under reduced pressure. Alternatively, they may also be prepared by mixing lower alkanolic solutions of the acidic compounds and the desired alkali metal alkoxide together, and then evaporating the resulting solution to dryness in the same manner as before. In either case, stoichiometric quantities of reagents are preferably employed in order to ensure completeness of reaction and maximum yields of the desired final product.

If the inventive compound is a base, the desired salt may be prepared by any suitable method available in the art, for example, treatment of the free base with an inorganic acid, such as hydrochloric acid, hydrobromic acid, sulfuric acid, nitric acid, phosphoric acid and the like, or with an organic acid, suchas acetic acid, maleic acid, succinic acid, mandelic acid, fumaric acid, malonic acid, pyruvic acid, oxalicacid, glycolic acid, salicylic acid, a pyranosidyl acid, such as glucuronic acid or galacturonic acid, an alpha-hydroxy acid, such as citric acid or tartaric acid, an amino acid, such as

aspartic acid or glutamic acid, an aromatic acid, such as benzoic acid or cinnamic acid, a sulfonic acid, such as p-toluenesulfonic acid or ethanesulfonic acid, or the like.

If the inventive compound is an acid, the desired salt may be prepared by any suitable method, for example, treatment of the free acid with an inorganic or organic base, such as an amine (primary, secondary or tertiary), an alkali metal hydroxide or alkaline earth metal hydroxide, or the like. Illustrative examples of suitable salts include organic salts derived from amino acids, such as glycine and arginine, ammonia, primary, secondary, and tertiary amines, and cyclic amines, such as piperidine, morpholine and piperazine, and inorganic salts derived from sodium, calcium, potassium, magnesium, manganese, iron, copper, zinc, aluminum and lithium.

In the case of agents that are solids, it is understood by those skilled in the art that the inventive compounds, agents and salts may exist in different crystal or polymorphic forms, all of which are intended to be within the scope of the present invention and specified formulas.

The invention also includes isotopically-labeled compounds of the invention, wherein one or moreatoms is replaced by an atom having the same atomic number, but an atomic mass or mass number different from the atomic mass or mass number usually found in nature. Examples of isotopes suitable forinclusion in the compounds of the invention include isotopes of hydrogen, such as ^{2}H and ^{3}H, carbon, such as ^{11}C, ^{13}C and ^{14}C, chlorine, such as ^{36}Cl, fluorine, such as ^{18}F, iodine, such as ^{123}I and ^{125}I, nitrogen, such as ^{13}N and ^{15}N, oxygen, such as ^{15}O, ^{17}O and ^{18}O, phosphorus, such as ^{32}P, and sulfur, such as ^{35}S.

Certain isotopically-labeled compounds of the invention, for example, those incorporating a radioactive isotope, are useful in drug and/or substrate tissue distribution studies. The radioactive isotopes tritium, ^{3}H, and carbon-14, ^{14}C, are particularly useful for this purpose in view of their ease of incorporation and ready means of detection. Substitution with heavier isotopes such as deuterium, ^{2}H, may afford certain therapeutic advantages resulting from greater metabolic stability, for example, ^{35}S increased *in vivo* half-life or reduced dosage requirements, and hence may be preferred in some circumstances. Substitution with positron emitting isotopes, such as ^{11}C, ^{18}F, ^{15}O and ^{13}N, can be useful in Positron Emission Topography (PET) studies for examining substrate receptor occupancy. Isotopically-labeled compounds of the invention can generally be prepared by conventional techniques known to those skilled in the art or by processes analogous to those described herein, using an appropriate isotopically-labeled reagent in place of the non-labeled reagent otherwise employed.

The compounds of the present invention may be formulated into pharmaceutical compositions as described below in any pharmaceutical form recognizable to the skilled artisan as being suitable. Pharmaceutical compositions of the invention comprise a therapeutically effective amount of at least onecompound of the present invention and an inert, pharmaceutically acceptable carrier or diluent.

To treat or prevent diseases or conditions mediated in part or whole by arenavirus infection, a pharmaceutical composition of the invention is administered in a suitable formulation prepared by combining a therapeutically effective amount (i.e., an arenavirus GP modulating, regulating, or inhibiting amount effective to achieve therapeutic efficacy) of at least one compound of the present invention (as an active ingredient) with one or more pharmaceutically suitable carriers, which may be

selected, for example, from diluents, excipients and auxiliaries that facilitate processing of the active compounds into the final pharmaceutical preparations.

The pharmaceutical carriers employed may be either solid or liquid. Exemplary solid carriers are lactose, sucrose, talc, gelatin, agar, pectin, acacia, magnesium stearate, stearic acid and the like. Exemplary liquid carriers are syrup, peanut oil, olive oil, water and the like. Similarly, the inventive compositions may include time-delay or time-release material known in the art, such as glyceryl monostearate or glyceryl distearate alone or with a wax, ethylcellulose, hydroxypropylmethylcellulose, methylmethacrylate or the like. Further additives or excipients may be added to achieve the desired formulation properties. For example, a bioavailability enhancer, such as Labrasol, Gelucire or the like, or formulator, such as CMC (carboxy-methylcellulose), PG (propyleneglycol), or PEG (polyethyleneglycol), may be added. Gelucire®, a semi-solid vehicle that protects active ingredients from light, moisture and oxidation, may be added, e.g., when preparing a capsule formulation.

If a solid carrier is used, the preparation can be tableted, placed in a hard gelatin capsule in powder or pellet form, or formed into a troche or lozenge. The amount of solid carrier may vary, but generally will be from about 25 mg to about 1 g. If a liquid carrier is used, the preparation may be in the form of syrup, emulsion, soft gelatin capsule, sterile injectable solution or suspension in an ampoule or vial or non-aqueous liquid suspension. If a semi-solid carrier is used, the preparation may be in the form of hard and soft gelatin capsule formulations. The inventive compositions are prepared in unit-dosage form appropriate for the mode of administration, e.g. parenteral or oral administration.

To obtain a stable water-soluble dose form, a salt of a compound of the present invention may be dissolved in an aqueous solution of an organic or inorganic acid, such as a 0.3 M solution of succinic acid or citric acid. If a soluble salt form is not available, the agent may be dissolved in a suitable co-solvent or combinations of co-solvents. Examples of suitable co-solvents include alcohol, propylene glycol, polyethylene glycol 300, polysorbate 80, glycerin and the like in concentrations ranging from 0 to 60% of the total volume. In an exemplary embodiment, a compound of the present invention is dissolved in DMSO and diluted with water. The composition may also be in the form of a solution of a salt form of the active ingredient in an appropriate aqueous vehicle such as water or isotonic saline or dextrose solution.

Proper formulation is dependent upon the route of administration selected. For injection, the agents of the compounds of the present invention may be formulated into aqueous solutions, preferably in physiologically compatible buffers such as Hanks solution, Ringer's solution, or physiological saline buffer.

For transmucosal administration, penetrants appropriate to the barrier to be permeated are used in the formulation. Such penetrants are generally known in the art.

For oral administration, the compounds can be formulated by combining the active compounds with pharmaceutically acceptable carriers known in the art. Such carriers enable the compounds of the invention to be formulated as tablets, pills, dragees, capsules, liquids, gels, syrups, slurries, suspensions and the like, for oral ingestion by a subject to be treated. Pharmaceutical preparations for oral use can be obtained using a solid excipient in admixture with the active ingredient (agent), optionally grinding the resulting mixture, and processing the mixture of granules

after adding suitable auxiliaries, if desired, to obtain tablets or dragee cores. Suitable excipients include: fillers such as sugars, including lactose, sucrose, mannitol, or sorbitol; and cellulose preparations, for example, maize starch, wheat starch, rice starch, potato starch, gelatin, gum, methyl cellulose, hydroxypropylmethyl-cellulose, sodium carboxymethylcellulose, or polyvinylpyrrolidone (PVP). If desired, disintegrating agents may be added, such as crosslinked polyvinyl pyrrolidone, agar, or alginic acid or a salt thereof such as sodium alginate. Dragee cores are provided with suitable coatings. For this purpose, concentrated sugar solutions may be used, which may optionally contain gum arabic, polyvinyl pyrrolidone, Carbopol gel, polyethylene glycol, and/or titanium dioxide, lacquer solutions, and suitable organic solvents or solvent mixtures. Dyestuffs or pigments may be added to the tablets or dragee coatings for identification or to characterizedifferent combinations of active agents.

Pharmaceutical preparations that can be used orally include push-fit capsules made of gelatin, as well as soft, sealed capsules made of gelatin and a plasticizer, such as glycerol or sorbitol. The push-fit capsules can contain the active ingredients in admixture with fillers such as lactose, binders such as starches, and/or lubricants such as talc or magnesium stearate, and, optionally, stabilizers. In soft capsules, the active agents may be dissolved or suspended in suitable liquids, such as fatty oils, liquidparaffin, or liquid polyethylene glycols. In addition, stabilizers may be added. All formulations for oral administration should be in dosages suitable for such administration. For buccal administration, the compositions may take the form of tablets or lozenges formulated in conventional manner.

For administration intranasally or by inhalation, the compounds for use according to the present invention may be conveniently delivered in the form of an aerosol spray presentation from pressurized packs or a nebuliser, with the use of a suitable propellant, e.g., dichlorodifluoromethane, trichlorofluoromethane, dichlorotetrafluoroethane, carbon dioxide or other suitable gas. In the case of a pressurized aerosol the dosage unit may be determined by providing a valve to deliver a metered amount.

Capsules and cartridges of gelatin for use in an inhaler or insufflator and the like may be formulated containing a powder mix of the compound and a suitable powder base such as lactose or starch.

The compounds may be formulated for parenteral administration by injection, e.g., by bolus injection or continuous infusion. Formulations for injection may be presented in unit-dosage form, e.g., in ampoules or in multi-dose containers, with an added preservative. The compositions may take such 35 forms as suspensions, solutions or emulsions in oily or aqueous vehicles, and may contain formulatory agents such as suspending, stabilizing and/or dispersing agents.

Pharmaceutical formulations for parenteral administration include aqueous solutions of the active compounds in water-soluble form. Additionally, suspensions of the active agents may be prepared as appropriate oily injection suspensions. Suitable lipophilic solvents or vehicles include fatty oils such as sesame oil, or synthetic fatty acid esters, such as ethyl oleate or triglycerides, or liposomes. Aqueous injection suspensions may contain substances that increase the viscosity of the suspension, such as sodium carboxymethyl cellulose, sorbitol, or dextran. Optionally, the suspension

may also contain suitable stabilizers or agents that increase the solubility of the compounds to allow for the preparation of highly concentrated solutions.

Alternatively, the active ingredient may be in powder form for constitution with a suitable vehicle, e.g. sterile pyrogen-free water, before use.

In addition to the formulations described above, the compounds of the present invention may also be formulated as a depot preparation. Such long-acting formulations may be administered by implantation (for example, subcutaneously or intramuscularly) or by intramuscular injection. Thus, for example, the compounds may be formulated with suitable polymeric or hydrophobic materials (for example, as an emulsion in an acceptable oil) or ion-exchange resins, or as sparingly soluble derivatives, for example, as a sparingly soluble salt. A pharmaceutical carrier for hydrophobic compounds is a cosolvent system comprising benzyl alcohol, a non-polar surfactant, a water-miscible organic polymer, and an aqueous phase. The co-solvent system may be a VPD co-solvent system. VPD is a solution of 3% w/v benzyl alcohol, 8% w/v of the non-polar surfactant polysorbate 80, and 65% w/v polyethylene glycol300, made up to volume in absolute ethanol. The VPD co-solvent system (VPD: 5W) contains VPD diluted 1:1 with a 5% dextrose in water solution. This co-solvent system dissolves hydrophobic compounds well, and itself produces low toxicity upon systemic administration. The proportions of a cosolvent system may be suitably varied without destroying its solubility and toxicity characteristics. Furthermore, the identity of the co-solvent components may be varied: for example, other low-toxicity nonpolar surfactants may be used instead of polysorbate 80; the fraction size of polyethylene glycol may be varied; other biocompatible polymers may replace polyethylene glycol, e.g. polyvinyl pyrrolidone; and other sugars or polysaccharides may be substituted for dextrose.

Alternatively, other delivery systems for hydrophobic pharmaceutical compounds may be employed. Liposomes and emulsions are known examples of delivery vehicles or carriers for hydrophobic drugs. Certain organic solvents such as dimethylsulfoxide also may be employed, although usually at the cost of greater toxicity due to the toxic nature of DMSO. Additionally, the compounds may be delivered using a sustained-release system, such as semipermeable matrices of solid hydrophobic polymers containing the therapeutic agent. Various sustained-release materials have been established and are known by those skilled in the art. Sustained-release capsules may, depending on their chemical nature, release the compounds for a few weeks up to over 100 days. Depending on the chemical nature and the biological stability of the therapeutic reagent, additional strategies for protein stabilization may be employed.

The pharmaceutical compositions also may comprise suitable solid- or gel-phase carriers or excipients. These carriers and excipients may provide marked improvement in the bioavailability of poorly soluble drugs. Examples of such carriers or excipients include calcium carbonate, calcium phosphate, sugars, starches, cellulose derivatives, gelatin, and polymers such as polyethylene glycols. Furthermore, additives or excipients such as Gelucire®, Capryol®, Labrafil®, Labrasol®, Lauroglycol®, Plurol®, Peceol® Transcutol® and the like may be used.

Further, the pharmaceutical composition may be incorporated into a skin patch for delivery of the drug directly onto the skin.

It will be appreciated that the actual dosages of the agents of this invention will vary according to the particular agent being used, the particular composition formulated, the mode of administration, and the particular site, host, and disease being treated. Those skilled in the art using conventional dosage determination tests in view of the experimental data for a given compound may ascertain optimal dosages for a given set of conditions. For oral administration, an exemplary daily dose generally employed will befrom about 0.001 to about 1000 mg/kg of body weight, with courses of treatment repeated at appropriateintervals.

Furthermore, the pharmaceutically acceptable formulations of the present invention may contain a compound of the present invention, or a salt or solvate thereof, in an amount of about 10 mg to about 2000 mg, or from about 10 mg to about 1500 mg, or from about 10 mg to about 1000 mg, or from about 10 mg to about 750 mg, or from about 10 mg to about 500 mg, or from about 25 mg to about 500 mg, or from about 50 to about 500 mg, or from about 100 mg to about 500mg.

Additionally, the pharmaceutically acceptable formulations of the present invention may contain a compound of the present invention, or a salt or solvate thereof, in an amount from about 0.5 w/w% to about 95 w/w%, or from about 1 w/w% to about 95 w/w%, or from about 1 w/w% to about 75 w/w%, orfrom about 5 w/w% to about 75 w/w%, or from about 10 w/w% to about 75 w/w%, or from about 10 w/w% to about 50 w/w%.

The compounds of the present invention, or salts or solvates thereof, may be administered to a mammal, such as a human, suffering from a condition or disease mediated by arenavirus, either alone or as part of a pharmaceutically acceptable formulation, once a day, twice a day, three times a day, four times a day, or even more frequently.

The compounds of the present invention, or salts or solvates thereof, may be administered to a mammal, such as a human, suffering from a condition or disease mediated by arenavirus in combination with at least one other agent used for treatment of arenavirus selected from the group consisting of Ribavirin, viral RNA-dependent-RNA-polymerase inhibitors as shown by Ng KK, Arnold JJ and Cameron CE, *Structure-Function Relationships Among RNA-Dependent RNA Polymerases*, Curr Top Microbiol Immunol, 2008; **320**: 137-156, incorporated herein by reference in its entirety, Favipiravir , a broad-spectrum inhibitor of viral RNA-Dependent RNA Polymerases, Triazavirin, a broad-spectrum inhibitor of viral RNA-Dependent RNA Polymerases, small interfering RNAs (siRNAs) and microRNAs as shown by Carthew RW and Sontheimer EJ, *Origins and Mechanisms of miRNAs and siRNAs*, Nature, 2009; **136**: 642-655, incorporated herein by reference in its entirety, vaccines as shown by Nablel GJ, *Designing Tomorrow's Vaccines*, NEJM, 2013; **368**: 551-560, incorporated herein by reference in its entirety, and immunomodulators as shown by Patil US, Jaydeokar AV and Bandawane DD, *Immunomodulators: A Pharmacological Review*, Internatl J Pharmacy and Pharmaceutical Sci, 2012; **4**: 30-36, incorporated herein by reference in its entirety], alone or as part of a pharmaceutically acceptable formulation, once a day, twice a day, three times a day, four times a day, or even more frequently.

Those of ordinary skill in the art will understand that with respect to the compounds of the present invention, the particular pharmaceutical formulation, the dosage, and the number of doses

given per day to a mammal requiring such treatment, are all choices within the knowledge of one of ordinary skill in the art and can be determined without undue experimentation.

The compounds of the present invention are useful for modulating or inhibiting arenavirus GP.

Accordingly, these compounds are useful for the prevention and/or treatment of disease states associated with arenavirus infection.

This invention also relates to a method for the treatment of arenavirus infection including a human comprising administering to said mammal an amount of a compound of the Formula I, as defined above, or a salt or solvate thereof, that is effective in treating disease states associated with Arenavirus infection.

In the following Preparations and Examples, “Ac” means acetyl, “Me” means methyl, “Et” means ethyl, “Ph” means phenyl, “Py” means pyridine, “BOC”, “Boc” or “boc” means N-*tert*-butoxycarbonyl, “Ns“ means 2-Nitrophenylsulfonyl, “DCM” (CH_2Cl_2) means dichloromethane or methylene chloride, “dba” means dibenzylideneacetone, “DCE” means dichloroethane or ethylene chloride, “DIAD” means diisopropylazadicarboxylate, “DIPEA” or “DIEA” means diisopropyl ethyl amine, “DMA” means N,N-dimethylacetamide, "DMF" means N-N-dimethyl formamide, “DMSO" means dimethylsulfoxide, “DPPP” means 1,3-bis(diphenylphosphino)propane, “HOAc” means acetic acid, “IPA” means isopropyl alcohol,“NMP” means 1-methyl 2-pyrrolidinone, “TEA” means triethyl amine, “TFA” means trifluoroacetic acid,“DCM” means dichloromethane, “EtOAc” means ethyl acetate, “$MgSO_4$” means magnesium sulphate,“Na_2SO_4” means sodium sulphate, “MeOH” means methanol, “Et_2O” means diethyl ether, “EtOH” meansethanol, “H_2O” means water, “HCl” means hydrochloric acid, “$POCl_3$” means phosphorus oxychloride,“$SOCl_2$“ means thionylchloride, “K_2CO_3” means potassium carbonate, “THF” means tetrahydrofuran, “DBU” means 1,8-diazabicyclo[5.4.0]undec-7-ene, “LiHMDS” or “LHMDS” means lithium hexamethyldisilazide, “TBME” or "MTBE" means *tert*-butyl methyl ether, “LDA” means lithium diisopropylamide, “NBS” means *N*-bromosuccinimide, “NIS” means *N*-iodosuccinimide, “Xanthphos” means 4,5-bis(diphenylphosphino)-9,9-dimethylxanthene; “$P(Ph_3)$” means triphenylphosphine, “N” means Normal, “M” means molar, “mL” means millilitre, “mmol” means millimoles, “µmol” means micromoles, “eq.” means equivalent, “°C” means degrees Celsius, “Pa” means pascals, “Xanthphos” means 4,5-bis(diphenylphosphino)-9,9-dimethylxanthene, “rt” means room temperature.

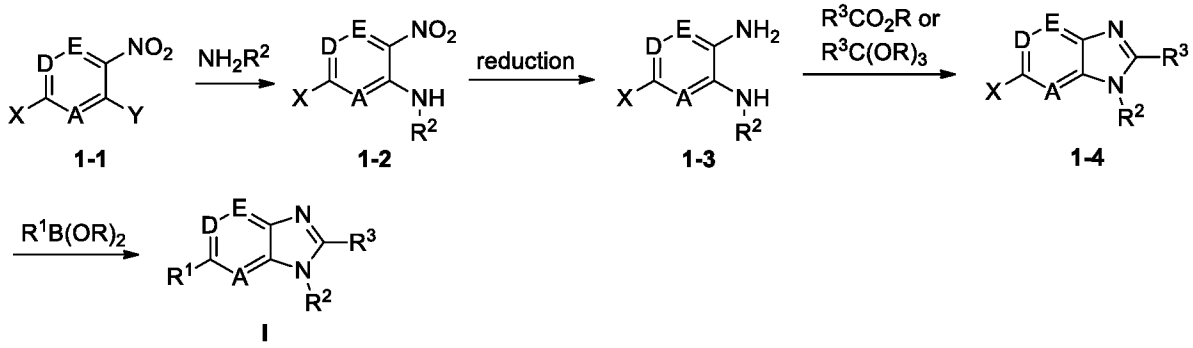
Methods of Preparation.

Compounds of the present invention may be prepared using the reaction routes and synthetic schemes described below, employing the techniques available in the art using starting materials that are readily available. The preparation of certain embodiments of the present invention is described in detail in the following examples, but those of ordinary skill in the art will recognize that the preparations described may be readily adapted to prepare other embodiments of the present invention. For example, the synthesis of non-exemplified compounds according to the invention may be performed by modifications apparent to those skilled in the art, e.g. by appropriately protecting interfering groups, by changing to other suitable reagents known in the art, or by making routine

modifications of reaction conditions. Alternatively, other reactions referred to herein or known in the art will be recognized as having adaptability for preparing other compounds of the invention.

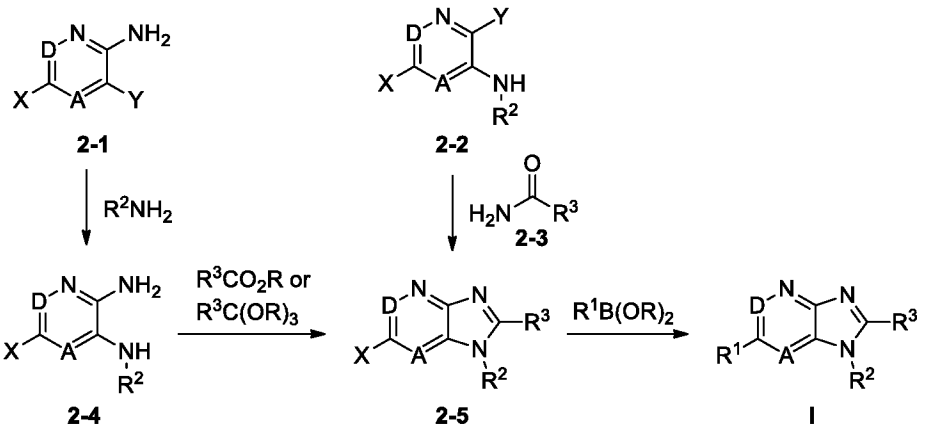
Scheme 1 shows a method useful for the synthesis of compounds of structural Formula **I** wherein G and H are C, J and L are N, and K is C-R^3. Compound **1-1** (X = Cl, Br, or I, and Y is F, Cl, Br, or I) can be reacted with amine R_2NH_2 in the presence of a base such as NaH or Cs_2CO_3 in a solvent such as THF or DMF to form compound **1-2**. Reduction of the nitro group using a reducing agent such as Fe or $SnCl_2$ in a solvent such as THF or methanol can provide aniline **1-3** which can be reacted with ester R_3CO_2R or orthoester $R_3C(OR)_3$ to form **1-4**. Coupling of **1-4** with a boronic acid or boronic ester $R^1B(OR)_2$ using a catalyst such as [1,1'-bis(diphenylphosphino)ferrocene]palladium(II) dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane can provide compound of structural Formula **I**.

Scheme 1



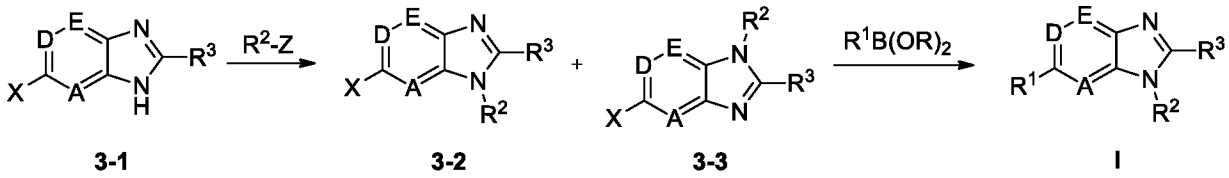
Scheme 2 shows a method useful for the synthesis of compounds of structural Formula **I** wherein G and H are C, E, J and L are N, and K is C-R^3. Compound **2-1** (X = Cl, Br, or I, and Y is F, Cl, Br, or I) can be reacted with amine R_2NH_2 in the presence of a base such as NaH or Cs_2CO_3 in a solvent such as THF or DMF to form compound **2-4** which can be reacted with ester R_3CO_2R or orthoester $R_3C(OR)_3$ to form **2-5**. Alternatively, **2-5** can be formed by reaction of compound **2-2** (X = Cl, Br, or I, and Y is F, Cl, Br, or I) on treatment with primary amide **2-3** in a presence of a palladium catalyst such as $Pd(dba)_3$ [A. Rosenberg, J. Zhao, D. A. Clark, Org. Lett. 14, 2012, 1764 – 1767]. Coupling of **2-5** with a boronic acid or boronic ester $R^1B(OR)_2$ using a catalyst such as [1,1'-bis(diphenylphosphino)ferrocene]palladium(II) dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane can provide compound of structural Formula **I**.

Scheme 2



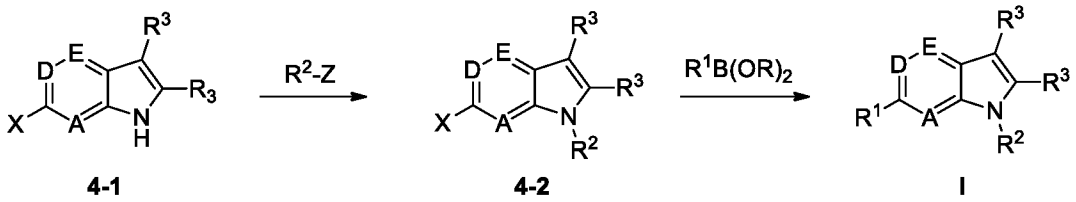
Scheme 3 depicts an alternative method useful for the synthesis of compounds of structural Formula **I** wherein G, and H are C, J and L are N, and K is C-R^3. Compound **3-1** (X = Cl, Br, or I) can be reacted with an alkyl halide R^2Z (Z = Cl, Br, or I) in the presence of a base such as NaH or Cs_2CO_3 in a solvent such as THF or DMF, or with an aryl halide R^2Z (Z = I) in the presence of CuI, a ligand such as 1,10-phenanthroline, and a base such as K_2CO_3 in a solvent such as DMF [C. Baumgartner et al. Helv. Chim. Acta 90, 2007, 1043 -1068] to form a mixture of isomers **3-2** and **3-3** which can be separated by column chromatography or other methods know to whose skilled in the arts. Coupling of **3-3** with a boronic acid or boronic ester $R^1B(OR)_2$ using a catalyst such as [1,1'-bis(diphenylphosphino)ferrocene] palladium(II)dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane can provide compound of structural Formula **I**.

Scheme 3



Scheme 4 displays a method useful for the synthesis of compounds of structural Formula **I** wherein G and H are C, J is N, and K and L are independently C-R^3. Compound **4-1** (X = Cl, Br, or I) can be reacted with an alkyl halide R^2Z (Z = Cl, Br, or I) in the presence of a base such as NaH or Cs_2CO_3 in a solvent such as THF or DMF, or with an aryl halide R^2Z (Z = I) in the presence of CuI, a ligand such as 1,10-phenanthroline, and a base such as K_2CO_3 in a solvent such as DMF to form compound **4-2.** Coupling of **4-2** with a boronic acid or boronic ester $R^1B(OR)_2$ using a catalyst such as [1,1'-bis(diphenylphosphino)ferrocene]palladium(II) dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane can provide compound of structural Formula **I**.

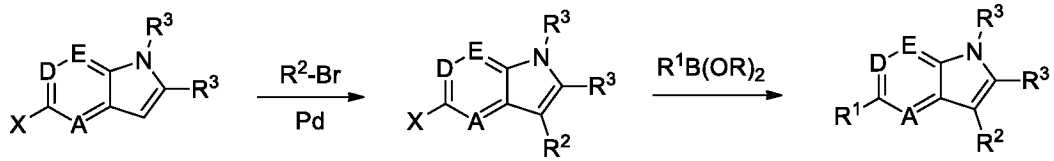
Scheme 4



4-1 **4-2** **I**

Scheme 5 shows a method useful for the synthesis of compounds of structural Formula **I** wherein G, H, and J are C, K is C-R^3, and L is N-R^3. Compound **5-1** (X = Br) can be reacted with an aryl bromide R^2Br in the presence a catalyst such as $Pd(OAc)_2$ and a base such as K_2CO_3 in a solvent such as toluene [F. Bellina, F. Benelli, R. Rossi J. Org. Chem. 2008, 73, 5529 - 5535] to form compound **5-2.** Coupling of **5-2** with a boronic acid or boronic ester $R^1B(OR)_2$ using a catalyst such as [1,1'-bis(diphenylphosphino) ferrocene]palladium(II) dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane can provide compound of structural Formula **I**.

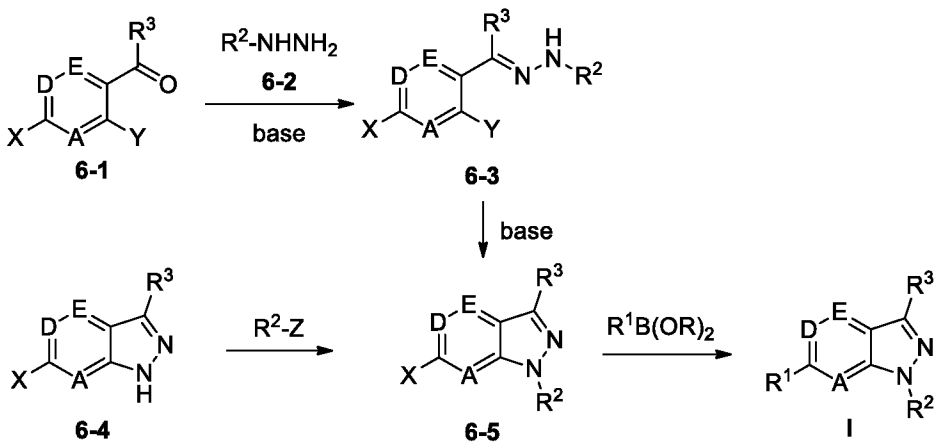
Scheme 5



5-1 **5-2** **5-3**

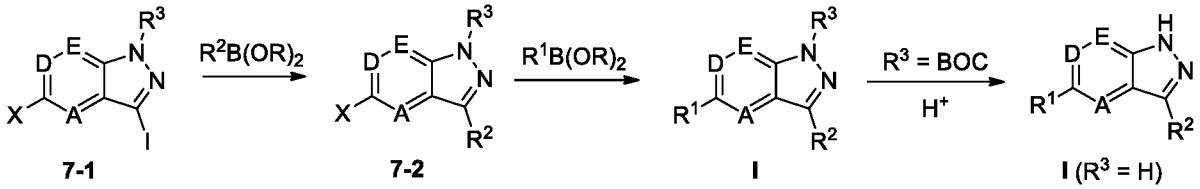
Scheme 6 shows a method useful for the synthesis of compounds of structural Formula **I** wherein G and H are C, J and K are N, and L is C-R^3. Compound **6-1** (X = Cl, Br, or I, and Y is F, Cl, Br, or I) can be reacted with hydrazine **6-2** in the presence of a base such as DIEA in a solvent such as THF or DMF to form hydrazone **6-3** which can cyclize to **6-5** on treatment with a base such as sodium *t*-butoxide with or without a catalyst such as $Pd(dba)_3$. Alternatively, compound **6-4** can be reacted with an alkyl halide R^2Z (Z = Cl, Br, or I) in the presence of a base such as NaH or Cs_2CO_3 in a solvent such as THF or DMF, or with an aryl halide R^2Z (Z = I) in the presence of CuI, a ligand such as 1,10-phenanthroline, and a base such as K_2CO_3 in a solvent such as DMF to form compound **6-5.** Coupling of **6-5** with a boronic acid or boronic ester $R^1B(OR)_2$ using a palladium catalyst such as [1,1'-bis(diphenylphosphino)ferrocene] palladium(II)dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane can provide compound of structural Formula **I**.

Scheme 6



Scheme 7 depicts a method useful for the synthesis of compounds of structural Formula **I** wherein G, H, and J are C, K is N, and L is NR^3. Compound **7-1** (X = Cl, Br) can be coupled with a boronic acid or boronic ester $R^2B(OR)_2$ using a catalyst such as tetrakis(triphenylphosphine)palladium in the presence of a base such as K_2CO_3 in a solvent such as dioxane to form **7-2** which can react with a second boronic acid or boronic ester $R^1B(OR)_2$ using a catalyst such as [1,1'-bis(diphenylphosphino) ferrocene]palladium(II)dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane to provide a compound of structural Formula **I.**

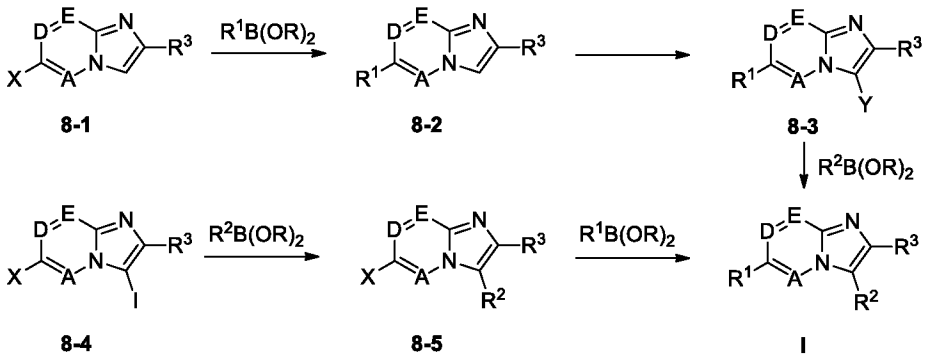
Scheme 7



Scheme 8 depicts a method useful for the synthesis of compounds of structural Formula **I** wherein G, and J are C, H and L are N, and K is C-R^3. Compound **8-1** (X = Cl, Br) can be coupled with a boronic acid or boronic ester $R^1B(OR)_2$ using a catalyst such as [1,1'-bis(diphenylphosphino)ferrocene] palladium(II) dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane to form **8-2** which can be treated with a halogenation reagent such as bromine or *N*-bromosuccinimide (NBS), or iodine or *N*-iodosuccinimide (NIS) to form compound **8-3** (Y = Br, I). Treatment of **8-3** with a boronic acid or boronic ester $R^2B(OR)_2$ using a catalyst such as tetrakis(triphenylphosphine)palladium in the presence of a base such as K_2CO_3 in a solvent such as dioxane can provide a compound of Structural Formula **I**. Alternatively, compound **8-4** (X = Cl, Br) can react with boronic acid or boronic ester $R^2B(OR)_2$ using a catalyst such as tetrakis(triphenylphosphine) palladium in the presence of a base such as K_2CO_3 in a solvent such as dioxane to provide compound **8-5** which can react with a second boronic acid or boronic ester $R^1B(OR)_2$ using a catalyst such as [1,1'-bis(diphenylphosphino)ferrocene] palladium(II) dichloride in

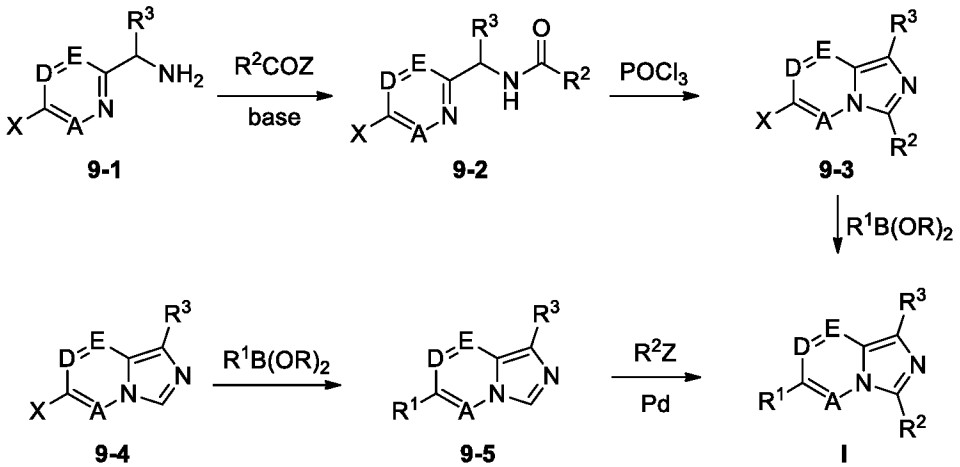
the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane to provide a compound of structural Formula **I**.

Scheme 8



Scheme 9 shows a method useful for the synthesis of compounds of structural Formula **I** wherein G and J are C, H and K are N, and L is C-R^3. Amine **9-1** (X = Cl, Br) can be reacted with an acyl halide R^2COZ (Z = Cl, Br) in the presence of a base such as DIEA to form amide **9-2** which on treatment with $POCl_3$ can cyclize to **9-3**. Treatment of **9-3** with a boronic acid or boronic ester $R^1B(OR)_2$ using a catalyst such as [1,1'-bis(diphenylphosphino)ferrocene]palladium(II) dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane can provide a compound of structural Formula **I**. Alternatively, compound **9-4** can react with a boronic acid or boronic ester $R^1B(OR)_2$ using a palladium catalyst such as [1,1'-bis(diphenylphosphino)ferrocene] palladium(II) dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane to form **9-5** which then can undergo a cross-coupling reaction with an aryl halide R^2Z (Z = Br, I) in a presence of a catalyst such as $Pd(OAc)_2$ in a presence of a base such as tetrabutylammmonium acetate in a solvent such as toluene [C. Huang, A. Giokaris, V. Gevorgyan, Chem. Lett. 40, 2011, 1053 -1054] to provide a compound of structural Formula **I**.

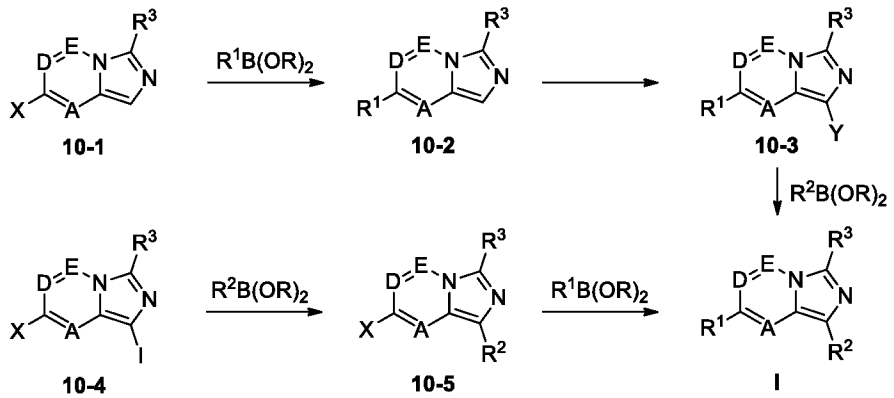
Scheme 9



Scheme 10 depicts a method useful for the synthesis of compounds of structural Formula **I** wherein H and J are C, G and K are N, and L is C-R^3. Compound **10-1** (X = Cl, Br) can be coupled

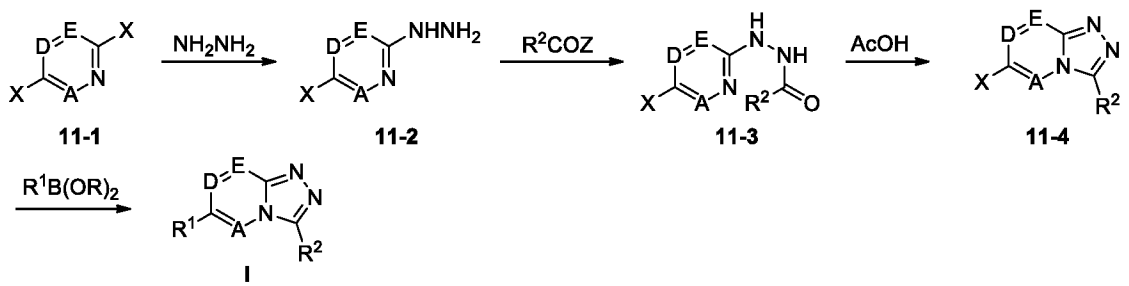
with a boronic acid or boronic ester $R^1B(OR)_2$ using a catalyst such as [1,1'-bis(diphenylphosphino)ferrocene] palladium(II) dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane to form **10-2** which can be treated with a halogenation reagent such as bromine or *N*-bromosuccinimide (NBS), or iodine or *N*-iodosuccinimide (NIS) to form compound **10-3** (Y = Br, I). Treatment of **10-3** with a boronic acid or boronic ester $R^2B(OR)_2$ using a catalyst such as tetrakis(triphenylphosphine)palladium in the presence of a base such as K_2CO_3 in a solvent such as dioxane can provide a compound of structural Formula **I**. Alternatively, compound **10-4** (X = Cl, Br) can react with boronic acid or boronic ester $R^2B(OR)_2$ using a catalyst such as tetrakis (triphenylphosphine)palladium in the presence of a base such as K_2CO_3 in a solvent such as dioxane to provide compound **10-5** which can react with a second boronic acid or boronic ester $R^1B(OR)_2$ using a palladium catalyst such as [1,1'-bis(diphenylphosphino)ferrocene] palladium(II) dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane to provide a compound of structural Formula **I**.

Scheme 10



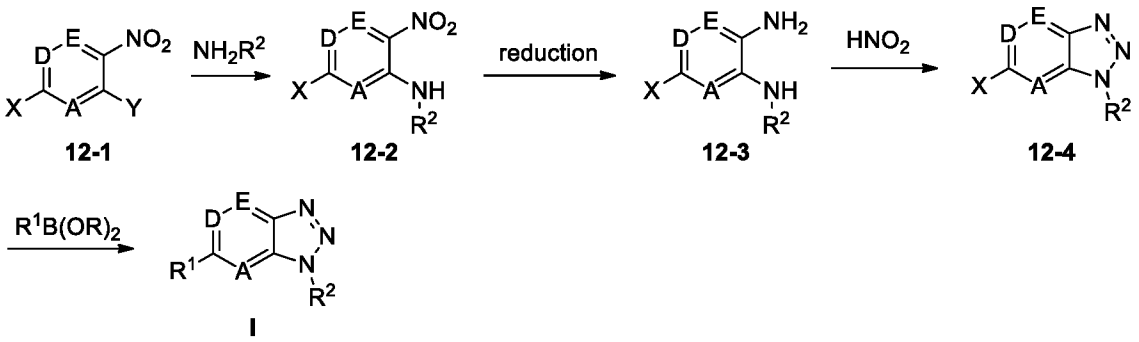
Scheme 11 depicts a method useful for the synthesis of compounds of structural Formula **I** wherein G and J are C, and H, K, and L are N. Compound **10-1** (X = Cl, Br) can react with hydrazine to form **11-2** which upon treatment with an acyl halide or ester R^2COZ (Z = Cl, Br, OR) can form acyl hydrazide **11-3**. Under acid condition (e g. acetic acid) **11-3** can cyclize to form **11-4** which then can be coupled with a boronic acid or boronic ester $R^1B(OR)_2$ using a catalyst such as [1,1'-bis(diphenylphosphino)ferrocene]palladium(II) dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane to provide a compound of structural Formula **I**.

Scheme 11



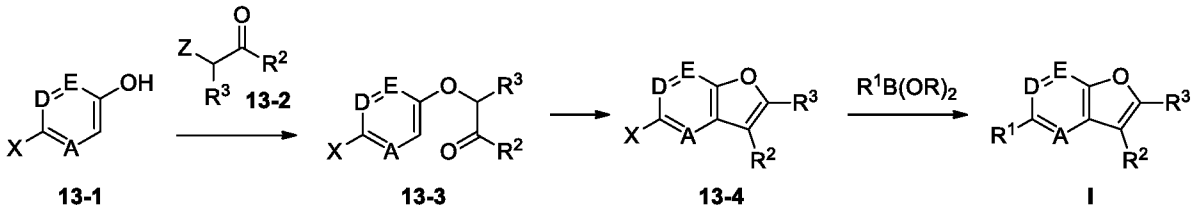
Scheme 12 depicts a method useful for the synthesis of compounds of structural Formula **I** wherein G and H are C, and J, K, and L are N. Compound **12-1** (X = Cl, Br, or I, and Y is F, Cl, Br, or I) can be reacted with amine R_2NH_2 in the presence of a base such as NaH or K_2CO_3 in a solvent such as THF or DMF to form compound **12-2**. Reduction of the nitro groups using a reducing agent such as Fe or $SnCl_2$ in a solvent such as THF or methanol can provide aniline **12-3** which can be reacted with nitric acid to form **12-4**. Coupling of **12-4** with a boronic acid or boronic ester $R^1B(OR)_2$ using a catalyst such as [1,1'-bis(diphenylphosphino)ferrocene]palladium(II) dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane can provide compound of structural Formula **I**.

Scheme 12



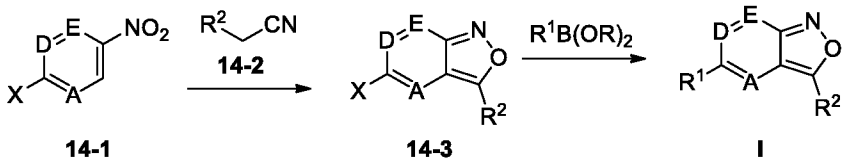
Scheme 13 depicts a method useful for the synthesis of compounds of structural Formula **I** wherein G, H, and J are C, K is C-R^3, and L is O. Compound **13-1** (X = Cl, Br) can react with haloketone **13-2** (Z = Cl, Br) in a presence of a base such as Cs_2CO_3 in a solvent such as DMF to form **13-3** which under acidic conditions using an acid such as para toluene sulfonic acid can undergo cyclodehydration to form **13-4.** Coupling of **13-4** with a boronic acid or boronic ester $R^1B(OR)_2$ using a catalyst such as [1,1'-bis(diphenylphosphino)ferrocene]palladium(II) dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane can provide a compound of structural Formula **I**.

Scheme 13



Scheme 14 shows a method useful for the synthesis of compounds of structural Formula **I** wherein G, H, and J are C, K is O, and L is N. Compound **14-1** (X = Cl, Br) can react with nitrile **14-2** using as base such as KOH in solvent such as methanol to form **14-3** which can react with a boronic acid or boronic ester $R^1B(OR)_2$ using a catalyst such as [1,1'-bis(diphenylphosphino)ferrocene] palladium(II) dichloride in the presence of a base such as K_2CO_3 in a solvent such as dimethoxyethane to provide a compound of structural Formula **I**.

Scheme 14

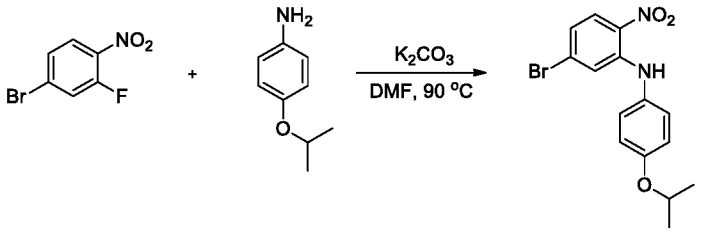


Examples

Preparation of intermediates for Examples A1 to A31.

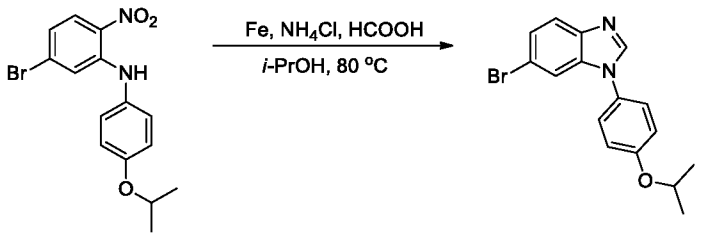
6-Bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole

Step 1: 5-Bromo-2-nitro-*N*-[4-(propan-2-yloxy)phenyl]aniline



A mixture of 4-bromo-2-fluoro-1-nitrobenzene (0.3 g, 1.36 mmol), 4-(propan-2-yloxy)aniline (0.22 g, 1.43 mmol) and K_2CO_3 (0.38 g, 2.73 mmol) in DMF (3 mL) was stirred at 90 ^{0}C for 5h. Then the reaction mixture was diluted with EtOAc and washed with 5% aq. LiCl solution. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column chromatography (hexanes / EtOAc from 30:1 to 20:1) to give 0.43g (90%) of the product as orange solid.^{1}H NMR (500 MHz, $CDCl_3$) δ 9.37 (s, 1H), 8.04 (d, 1H), 7.12-7.17 (m, 3H), 6.93-6.97 (m, 2H), 6.81 (dd, 1H), 4.56 (sep, 1H), 1.36 (d, 6H).

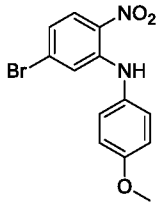
Step 2: 6-Bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole



To a solution of 5-bromo-2-nitro-*N*-[4-(propan-2-yloxy)phenyl]aniline (0.156 g, 0.44 mmol) in 2-propanol (2.2 mL) were added iron powder (0.248 g, 4.4 mmol), NH_4Cl (0.237 g, 4.4 mmol) and formic acid (2.2 mL) (E. J. Hanan, B. K. Chan, A. A. Estrada, D. G. Shore and J. P. Lyssikatos, *Synlett* **2010**, 2759-2764). The resulting reaction mixture was stirred at 80 ^{0}C for 5 h. Then the reaction mixture was diluted with 2-propanol, filtered through Celite, and the filtrate was concentrated. The resulting residue

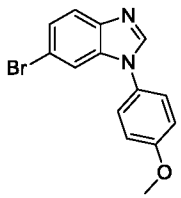
was diluted with dichloromethane and washed with saturated aq. $NaHCO_3$ solution. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column chromatography (hexanes / EtOAc from 7:3 to 1:2) to give 0.1 g (68%) of the product as pale pink solid.LC/MS *m/z*: 331.06 (^{79}Br, M+H)$^+$, 332.9 (^{81}Br, M+H)$^+$.

5-Bromo-*N*-(4-methoxyphenyl)-2-nitroaniline



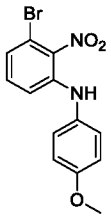
The title compound was prepared from 4-bromo-2-fluoro-1-nitrobenzene and 4-methoxyaniline in the same manner as described for 5-bromo-2-nitro-*N*-[4-(propan-2-yloxy)phenyl]aniline.

6-Bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole



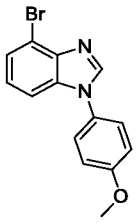
The title compound was prepared from 5-bromo-*N*-(4-methoxyphenyl)-2-nitroaniline in the same manner as described for 6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole. LC/MS *m/z*: 303.15 (^{79}Br, M+H)$^+$, 305.12 (^{81}Br, M+H)$^+$.

3- Bromo-*N*-(4-methoxyphenyl)-2-nitroaniline



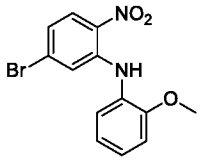
The title compound was prepared from 1-bromo-3-fluoro-2-nitrobenzene and 4-methoxyaniline in the same manner as described for 5-bromo-2-nitro-*N*-[4-(propan-2-yloxy)phenyl]aniline.

4-Bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole



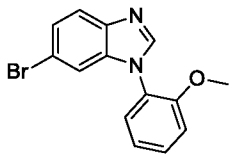
The title compound was prepared from 3-bromo-*N*-(4-methoxyphenyl)-2-nitroaniline in the same manner as described for 6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole. LC/MS *m/z*: 303.09 (^{79}Br, M+H)$^+$, 305.15 (^{81}Br, M+H)$^+$.

5-Bromo-*N*-(2-methoxyphenyl)-2-nitroaniline



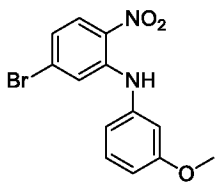
The title compound was prepared from 4-bromo-2-fluoro-1-nitrobenzene and 2-methoxyaniline in the same manner as described for 5-bromo-2-nitro-*N*-[4-(propan-2-yloxy)phenyl]aniline.

6-Bromo-1-(2-methoxyphenyl)-1*H*-1,3-benzodiazole



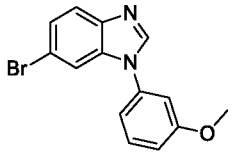
The title compound was prepared from 5-bromo-*N*-(2-methoxyphenyl)-2-nitroaniline in the same manner as described for 6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole. LC/MS *m/z*: 302.99 (^{79}Br, M+H)$^+$, 304.98 (^{81}Br, M+H)$^+$.

5-Bromo-*N*-(3-methoxyphenyl)-2-nitroaniline



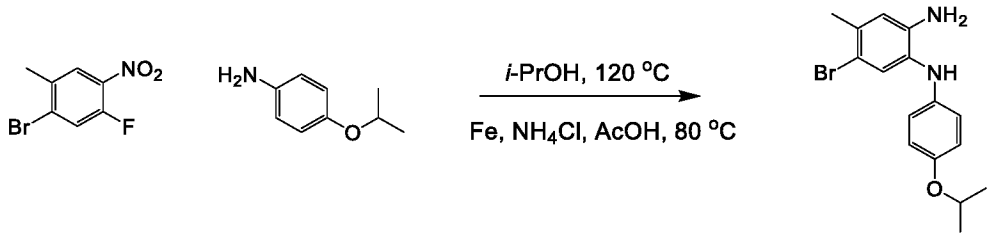
The title compound was prepared from 4-bromo-2-fluoro-1-nitrobenzene and 3-methoxyaniline in the same manner as described for 5-Bromo-2-nitro-*N*-[4-(propan-2-yloxy)phenyl]aniline.

6-Bromo-1-(3-methoxyphenyl)-1*H*-1,3-benzodiazole



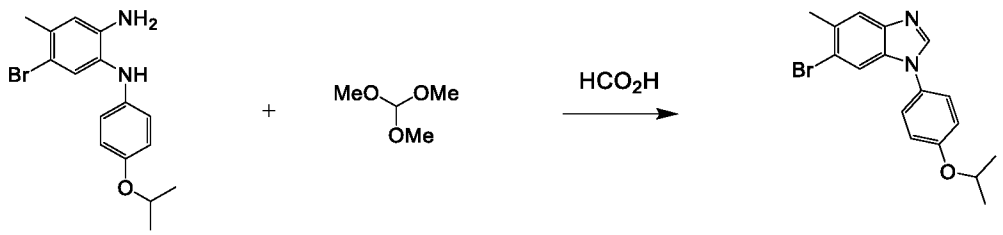
The title compound was prepared from 5-bromo-*N*-(3-methoxyphenyl)-2-nitroaniline in the same manner as described for 6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole. LC/MS *m/z*: 303.08 (^{79}Br, M+H)$^+$, 304.93 (^{81}Br, M+H)$^+$.

5-Bromo-N^1-(4-isopropoxyphenyl)-4-methylbenzene-1,2-diamine



To a solution of 1-bromo-5-fluoro-2-methyl-4-nitrobenzene (200 mg, 0.85 mmol) in *i*-propanol (2 mL), was added 4-isopropoxyaniline (129 mg, 0.85 mmol). The resulting mixture was stirred at 120 °C for 30 min under microwave. After cooling to room temperature, the reaction was concentrated under reduced pressure and the residue was dissolved in ethanol (0.6 mL), dioxane (0.6 mL), and water (0.3 mL). The solution was added with iron (476 mg, 8.5 mmol), NH_4Cl (457 mg, 8.5 mmol). The reaction was stirred at 80 °C for 2 hr. After cooling to room temperature, the reaction was filtered with a celitepad. The filtrate was concentrated under reduced pressure and the residue was poured into water and extracted with ethyl acetate. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column chromatography (hexane/EtOAc = 3:1) to give 198 mg (69.2 %) of the product as a white solid. LC/MS*m/z*: 335.13 (^{79}Br, M+H)$^+$, 337.19 (^{81}Br, M+H)$^+$, 376.28 (^{79}Br, M+H+CH_3CN)$^+$, 378.25 (^{81}Br, M+H+CH_3CN)$^+$.

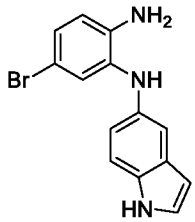
6-Bromo-5-methyl-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole



To a solution of 5-bromo-N^1-(4-isopropoxyphenyl)-4-methylbenzene-1,2-diamine (50.1 mg, 0.15 mmol) in THF (1 mL), was added trimethoxymethane (18.9 mg, 0.18 mmol) followed by formic acid (100 uL). The resulting mixture was stirred at 80 °C for 2 hr. After cooling to room temperature, the reaction was poured into water and extracted with ethyl acetate. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column

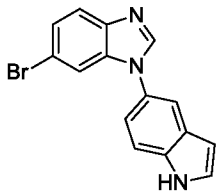
chromatography (hexane/EtOAc = 1:1) to give 42.1 mg (81.7 %) of the product as a white solid. LC/MS*m/z*: 345.15 (^{79}Br, M+H)$^+$, 347.21 (^{81}Br, M+H)$^+$, 386.28 (^{79}Br, M+H+CH_3CN)$^+$, 388.20 (^{81}Br, M+H+CH_3CN)$^+$.

5-Bromo-*N*^{1}-(1*H*-indol-5-yl)benzene-1,2-diamine



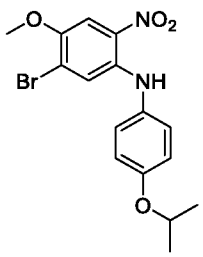
The title compound was prepared from 4-bromo-2-fluoro-1-nitrobenzene and 1*H*-indol-5-amine in the same manner as described for 5-bromo-*N*^{1}-(4-isopropoxyphenyl)-4-methylbenzene-1,2-diamine.LCMS*m/z*: 302.12 (^{79}Br, M+H)$^+$, 344.13 (^{81}Br, M+H)$^+$, 343.18 (^{79}Br, M+H+CH_3CN)$^+$, 345.22 (^{81}Br, M+H+CH_3CN)$^+$.

6-Bromo-1-(1*H*-indol-5-yl)-1*H*-1,3-benzodiazole



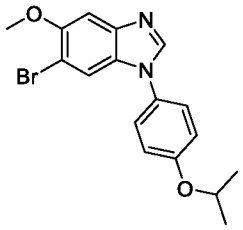
The title compound was prepared from 5-bromo-*N*^{1}-(1*H*-indol-5-yl)benzene-1,2-diamine in the same manner as described for 6-bromo-5-methyl-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole. LC/MS*m/z*: 312.04 (^{79}Br, M+H)$^+$, 314.03 (^{81}Br, M+H)$^+$, 353.09 (^{79}Br, M+H+CH_3CN)$^+$, 355.12 (^{81}Br, M+H+CH_3CN)$^+$.

5-Bromo-4-methoxy-2-nitro-N-[4-(propan-2-yloxy)phenyl]aniline



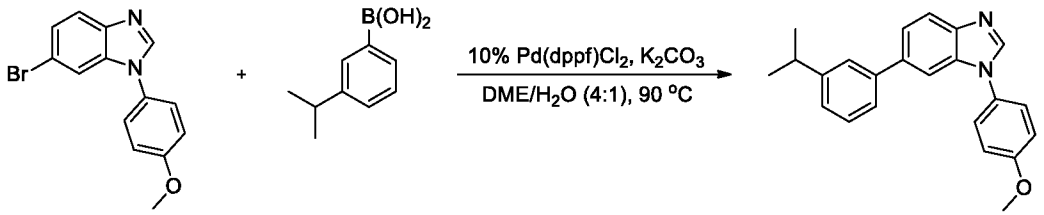
The title compound was prepared from 1-bromo-5-fluoro-2-methoxy-4-nitrobenzeneand 4-(propan-2-yloxy)anilinein the same manner as described for 5-Bromo-2-nitro-*N*-[4-(propan-2-yloxy)phenyl]aniline.

6-Bromo-5-methoxy-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole



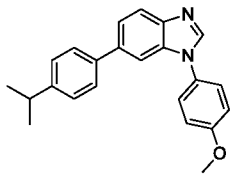
The title compound was prepared from 5-bromo-4-methoxy-2-nitro-*N*-[4-(propan-2-yloxy)phenyl]anilinein the same manner as described for 6-Bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole.LC/MS *m/z*: 402.12 $(M+H)^+$.

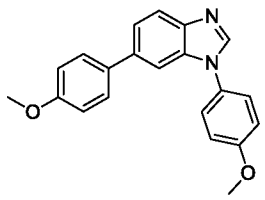
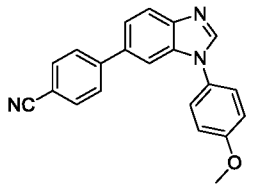
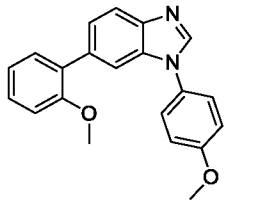
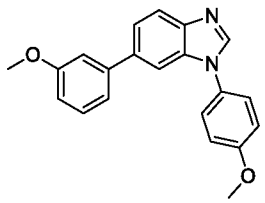
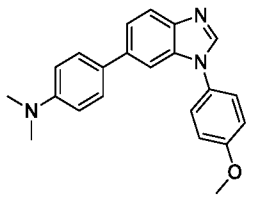
Example A1: 1-(4-Methoxyphenyl)-6-[3-(propan-2-yl)phenyl]-1*H*-1,3-benzodiazole

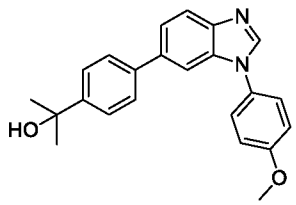
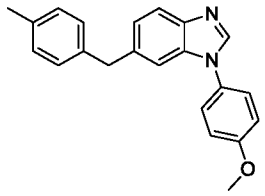
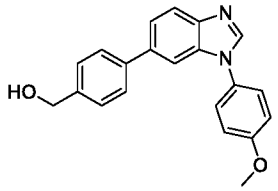
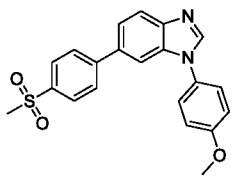
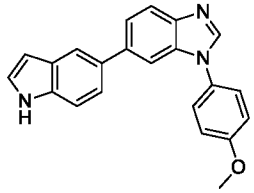


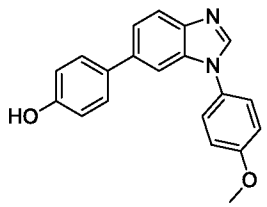
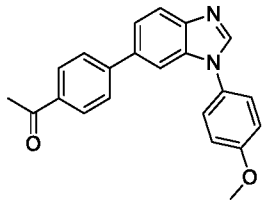
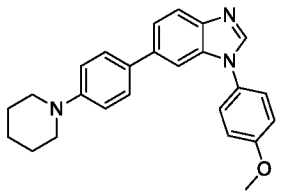
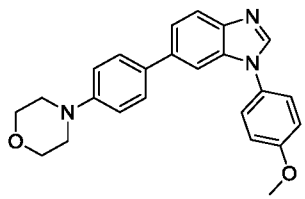
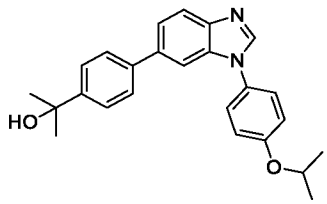
To a solution of 6-bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole (30 mg, 0.1 mmol) in1,2-dimethoxyethane (1 mL) were added [3-(propan-2-yl)phenyl]boronic acid (32 mg, 0.2 mmol), [1,1'-bis(diphenylphosphino)ferrocene]palladium(II) dichloride (7 mg, 0.01 mmol), potassium carbonate (40 mg, 0.3 mmol) and water (0.25 mL). The resulting reaction mixture was degassed with nitrogen for 10 min, then heated to 90^0C for 5h. Then the reaction mixture was diluted with ethyl acetate and washed with water. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column chromatography (hexanes / EtOAc from 7:3 to 1:4) to give 21 mg (62%) of the product as a colorless oil.LC/MS *m/z*: 343.34 $(M+H)^+$, 384.30 $(M+H+CH_3CN)^+$.

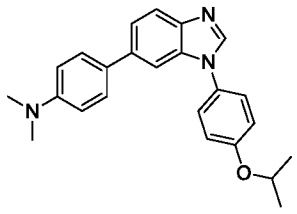
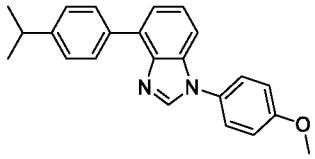
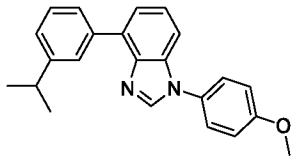
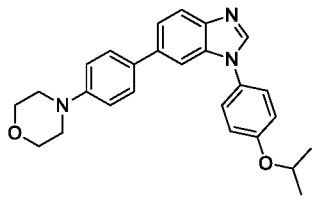
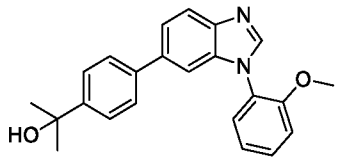
Examples A2 to A31 were prepared in the same manner as described above for 1-(4-methoxyphenyl)-6-[3-(propan-2-yl)phenyl]-1*H*-1,3-benzodiazole using the appropriate bromide and commercial boronic acid or boronic acid pinacol ester performing the reaction either under conventional heating or in a microwave reactor.

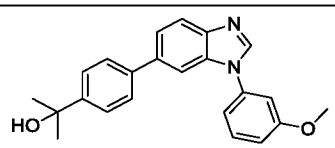
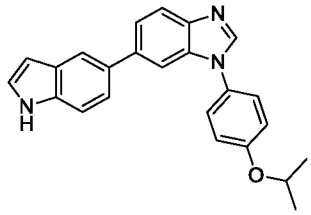
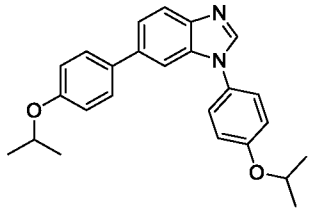
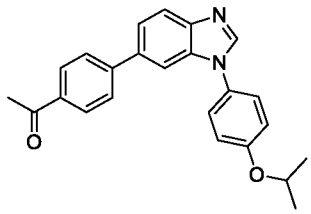
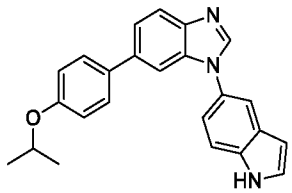
Ex.	Starting materials	Product/Name	Analytical Data
A2	6-bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole [4-(propan-2-yl)phenyl] boronic acid	 1-(4-methoxyphenyl)-6-[4-(propan-2-yl)phenyl]-1*H*-1,3-benzodiazole	LC/MS *m/z*: 343.26 $(M+H)^+$

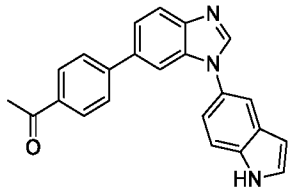
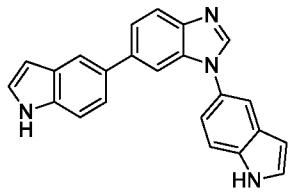
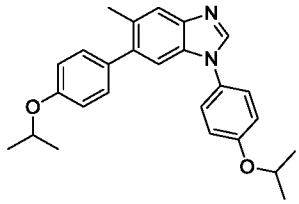
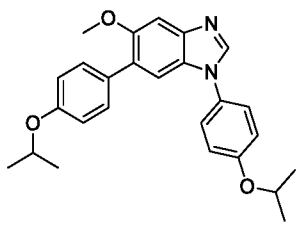
A3	6-bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole (4-methoxyphenyl) boronic acid	 1,6-bis(4-methoxyphenyl)-1*H*-1,3-benzodiazole	LC/MS *m/z*: 331.25 $(M+H)^+$, 661.42 $(2M+H)^+$
A4	6-bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole (4-cyanophenyl) boronic acid	 4-[1-(4-methoxyphenyl)-1*H*-1,3-benzodiazol-6-yl] benzonitrile	LC/MS *m/z*: 326.22 $(M+H)^+$, 367.25 $(M+H+CH_3CN)^+$
A5	6-bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole (2-methoxyphenyl) boronic acid	 6-(2-methoxyphenyl)-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole	LC/MS *m/z*: 331.22 $(M+H)^+$
A6	6-bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole (3-methoxyphenyl) boronic acid	 6-(3-methoxyphenyl)-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole	LC/MS *m/z*: 331.22 $(M+H)^+$
A7	6-bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole [4-(dimethylamino) phenyl] boronic acid	 4-[1-(4-methoxyphenyl)-1*H*-1,3-benzodiazol-6-yl]-*N*,*N*-dimethylaniline	LC/MS *m/z*: 344.32 $(M+H)^+$

A8	6-bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole [4-(2-hydroxypropan-2-yl)phenyl]boronic acid	 2-{4-[1-(4-methoxyphenyl)-1*H*-1,3-benzodiazol-6-yl]phenyl}propan-2-ol	LC/MS *m/z*: 359.27 $(M+H)^+$, 400.30$(M+H+CH_3CN)^+$
A9	6-bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole 4,4,5,5-tetramethyl-2-[(4-methylphenyl) methyl]-1,3,2-dioxaborolane	 1-(4-methoxyphenyl)-6-[(4-methylphenyl)methyl]-1*H*-1,3-benzodiazole	LC/MS *m/z*: 329.23 $(M+H)^+$, 370.27 $(M+H+CH_3CN)^+$
A10	6-bromo-1-(4-methoxyphenyl)--1,3-benzodiazole [4-(hydroxymethyl) phenyl] boronic acid	 {4-[1-(4-methoxyphenyl)-1*H*-1,3-benzodiazol-6-yl] phenyl} methanol	LC/MS *m/z*: 331.27 $(M+H)^+$
A11	6-bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole (4-methanesulfonyl phenyl)boronic acid	 6-(4-methanesulfonyl phenyl)-1-(4-methoxy phenyl)-1*H*-1,3-benzodiazole	LC/MS *m/z*: 379.19 $(M+H)^+$, 420.16 $(M+H+CH_3CN)^+$
A12	6-bromo-1-(4-methoxy phenyl)-1*H*-1,3-benzodiazole 1*H*-indol-5-ylboronic acid	 6-(1*H*-indol-5-yl)-1-(4-methoxyphenyl) -1*H*-1,3-benzodiazole	LC/MS *m/z*: 340.27 $(M+H)^+$, 679.38 $(2M+H)^+$

A13	6-bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole (4-hydroxyphenyl) boronic acid	 4-[1-(4-methoxyphenyl)-1*H*-1,3-benzodiazol-6-yl]phenol	LC/MS *m/z*: 317.23 $(M+H)^+$
A14	6-bromo-1-(4-methoxy phenyl)-1*H*-1,3-benzodiazole (4-acetylphenyl)boronic acid	 1-{4-[1-(4-methoxyphenyl)-1*H*-1,3-benzodiazol-6-yl] phenyl}ethan-1-one	LC/MS *m/z*: 343.13 $(M+H)^+$
A15	6-bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole [4-(piperidin-1-yl)phenyl]boronic acid	 1-(4-methoxyphenyl)-6-[4-(piperidin-1-yl)phenyl]-1*H*-1,3-benzodiazole	LC/MS *m/z*: 384.34 $(M+H)^+$
A16	6-bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole [4-(morpholin-4-yl)phenyl]boronic acid	 1-(4-methoxyphenyl)-6-[4-(morpholin-4-yl)phenyl]-1*H*-1,3-benzodiazole	LC/MS *m/z*: 386.29 $(M+H)^+$
A17	6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole [4-(2-hydroxypropan-2-yl)phenyl]boronic acid	 2-(4-{1-[4-(propan-2-yloxy) phenyl]-1*H*-1,3-benzodiazol-6-yl}phenyl) propan-2-ol	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.67 (br. s, 1H), 8.07 (d, 1H), 7.71 (d, 1H), 7.64 (s, 1H), 7.58 – 7.40 (m, 6H), 7.12 – 7.04 (m, 2H), 4.69 – 4.59 (m, 1H), 3.35 (br. s, 1H), 1.61 (s, 6H), 1.40 (d, 6H). LC/MS *m/z*: 387.32 $(M+H)^+$

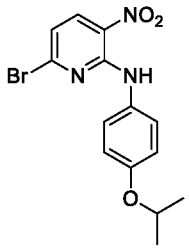
A18	6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole [4-(dimethylamino) phenyl]boronic acid	 *N*,*N*-dimethyl-4-{1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazol-6-yl}aniline	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.10 (s, 1H), 7.88 (d, 1H), 7.59 – 7.48 (m, 4H), 7.42 (d, 2H), 7.05 (d, 2H), 6.84 (d, 2H), 4.62 (sep, 1H), 2.99 (s, 6H), 1.40 (d, 6H). LC/MS *m/z*: 372.24 $(M+H)^+$
A19	4-bromo-1-(4-methoxyphenyl)-1*H*-1,3-benzodiazole [4-(propan-2-yl)phenyl] boronic acid	 1-(4-methoxyphenyl)-4-[4-(propan-2-yl)phenyl]-1*H*-1,3-benzodiazole	LC/MS *m/z*: 343.21 $(M+H)^+$
A20	4-bromo-1-(4-methoxy phenyl)-1*H*-1,3-benzodiazole [3-(propan-2-yl)phenyl] boronic acid	 1-(4-methoxyphenyl)-4-[3-(propan-2-yl)phenyl]-1*H*-1,3-benzodiazole	LC/MS *m/z*: 343.3 $(M+H)^+$, 685.45 $(2M+H)^+$
A21	6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole [4-(morpholin-4-yl)phenyl]boronic acid	 6-[4-(morpholin-4-yl)phenyl]-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole	LC/MS *m/z*: 414.28 $(M+H)^+$
A22	6-bromo-1-(2-methoxyphenyl)-1*H*-1,3-benzodiazole [4-(2-hydroxypropan-2-yl)phenyl]boronic acid	 2-{4-[1-(2-methoxyphenyl)-1*H*-1,3-benzodiazol-6-yl]phenyl}propan-2-ol	LC/MS *m/z*: 359.22 $(M+H)^+$

A23	6-bromo-1-(3-methoxyphenyl)-1*H*-1,3-benzodiazole [4-(2-hydroxypropan-2-yl)phenyl]boronic acid	 2-{4-[1-(3-methoxyphenyl)-1*H*-1,3-benzodiazol-6-yl]phenyl}propan-2-ol	LC/MS *m/z*: 359.23 $(M+H)^+$
A24	6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole 1*H*-indol-5-ylboronic acid	 6-(1*H*-indol-5-yl)-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.44 (br. s, 1H), 8.33 (s, 1H), 7.96 (d, 1H), 7.83 (s, 1H), 7.73 – 7.64 (m, 2H), 7.47 – 7.39 (m, 4H), 7.06 (d, 2H), 6.60 – 6.56 (m, 1H), 4.62 (sep, 1H), 3.66 (br. s, 1H), 1.39 (d, 6H). LC/MS *m/z*: 368.22 $(M+H)^+$
A25	6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole (4-isopropoxyphenyl) boronic acid	 1,6-bis[4-(propan-2-yloxy) phenyl]-1*H*-1,3-benzodiazole	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.27 (br, 1H), 7.97 (br, 1H), 7.61 (br, 2H), 7.53 (d, 2H), 7.45 (d, 2H), 7.11 (d, 2H), 6.97 (d, 2H), 4.70-4.5 (m, 2H), 1.43 (d, 6H), 1.38 (d, 6H).LC/MS *m/z*: 387.35 $(M+H)^+$
A26	6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole (4-acetylphenyl)boronic acid	 1-(4-{1-[4-(propan-2-yloxy) phenyl]-1*H*-1,3-benzodiazol-6-yl}phenyl) ethan-1-one	LC/MS *m/z*: 371.32 $(M+H)^+$, 412.21 $(M+H+CH_3CN)^+$
A27	6-bromo-1-(1*H*-indol-5-yl)-1*H*-1,3-benzodiazole (4-isopropoxyphenyl) boronic acid	 1-(1*H*-indol-5-yl)-6-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole	LC/MS*m/z*: 368.28 $(M+H)^+$

A28	6-bromo-1-(1*H*-indol-5-yl)-1*H*-1,3-benzodiazole (4-acetylphenyl)boronic acid	 1-{4-[1-(1*H*-indol-5-yl)-1*H*-1,3-benzodiazol-6-yl]phenyl} ethan-1-one	LC/MS*m/z*: 352.25 $(M+H)^+$
A29	6-bromo-1-(1*H*-indol-5-yl)-1*H*-1,3-benzodiazole 1*H*-indol-5-ylboronic acid	 1,6-bis(1*H*-indol-5-yl)-1H-1,3-benzodiazole	LC/MS*m/z*: 349.22 $(M+H)^+$
A30	6-bromo-5-methyl-1-[4-(propan-2-yloxy) phenyl]-1*H*-1,3-benzodiazole (4-isopropoxyphenyl) boronic acid	 5-methyl-1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.44 (br, 1H), 8.04 (d, 1H), 7.92 (s, 1H), 7.43 (d, 2H), 7.23 (d, 2H), 7.03 (d, 2H), 6.94 (d, 2H), 4.53-4.78 (m, 2H), 2.41 (s, 3H), 1.40 (d, 6H), 1.38 (d, 6H). LC/MS *m/z*: 401.29 $(M+H)^+$
A31	6-bromo-5-methoxy-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole (4-isopropoxyphenyl) boronic acid	 5-methoxy-1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole	LC/MS *m/z*: 417.28 $(M+H)^+$

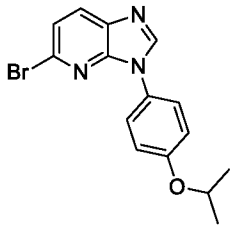
Preparation of intermediates for Examples B1 to B15.

6-Bromo-3-nitro-*N*-[4-(propan-2-yloxy)phenyl]pyridin-2-amine



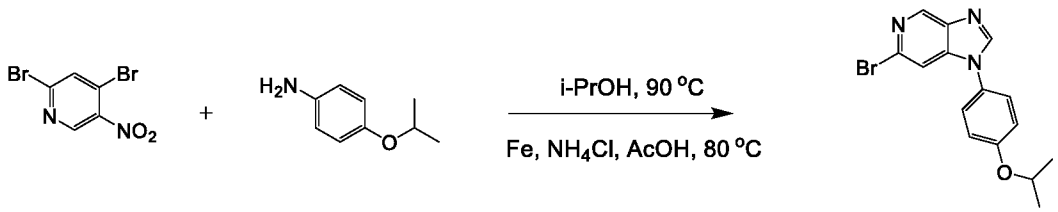
The title compound was prepared from 2,6-dibromo-3-nitropyridine and 4-(propan-2-yloxy)aniline in the same manner as described for 5-bromo-2-nitro-*N*-[4-(propan-2-yloxy)phenyl]aniline.

5-Bromo-3-[4-(propan-2-yloxy)phenyl]-3*H*-imidazo[4,5-*b*]pyridine



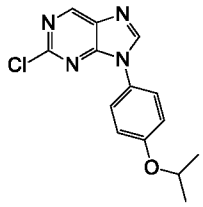
The title compound was prepared from 6-Bromo-3-nitro-*N*-[4-(propan-2-yloxy)phenyl]pyridin-2-amine in the same manner as described for 6-Bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,3-benzodiazole. LC/MS *m/z*: 332.19 (^{79}Br, M+H)$^+$, 334.11 (^{81}Br, M+H)$^+$.

6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-imidazo[4,5-*c*]pyridine



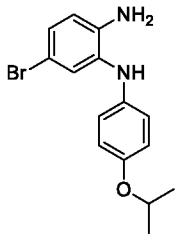
To a solution of 2,4-dibromo-5-nitropyridine (200 mg, 0.71 mmol) in *i*-propanol (3 mL) was added 4-isopropoxyaniline (128 mg, 0.85 mmol) at room temperature. The resulting mixture was heated to 90 °C for 1 hr. After cooling to room temperature, the reaction was added with iron (391 mg, 7.1 mmol), NH_4Cl (377 mg, 7.1 mmol), and acetic acid (3 mL). The reaction was stirred at 80 °C for 8 hr. After cooling to room temperature, the reaction was filtered with a celite pad. The filtrate was concentrated under reduced pressure and the residue was poured into water and extracted with ethyl acetate. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column chromatography (hexane/EtOAc = 1:1) to give 215 mg (87 %) of the product as a white solid. LC/MS*m/z*: 332.29 (^{79}Br, M+H)$^+$, 334.19 (^{81}Br, M+H)$^+$, 373.22 (^{79}Br, M+H+CH_3CN)$^+$, 375.19 (^{81}Br, M+H+CH_3CN)$^+$.

2-chloro-9-[4-(propan-2-yloxy)phenyl]-9*H*-purine



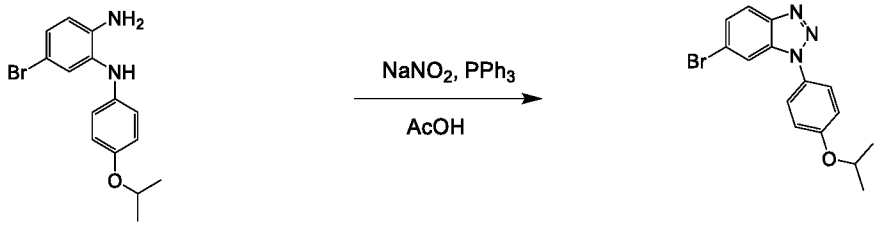
The title compound was prepared from 2,4-dichloro-5-nitropyrimidine and 4-sopropoxyaniline in the same manner as described for 6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-imidazo[4,5-*c*]pyridine. LC/MS*m/z*: 289.24 $(M+H)^+$, 330.24$(M+H+CH_3CN)^+$.

5-bromo-N^1-(4-isopropoxyphenyl)benzene-1,2-diamine



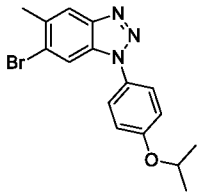
The title compound was prepared from 4-bromo-2-fluoro-1-nitrobenzene and 4-isopropoxyaniline in the same manner as described for 5-bromo-N^1-(4-isopropoxyphenyl)-4-methylbenzene-1,2-diamine. LCMSm/z 321.20 (^{79}Br, $M+H)^+$, 323.19 (^{81}Br, $M+H)^+$, 362.20 (^{79}Br, $M+H+CH_3CN)^+$, 364.24(^{81}Br, $M+H+CH_3CN)^+$.

6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,2,3-benzotriazole



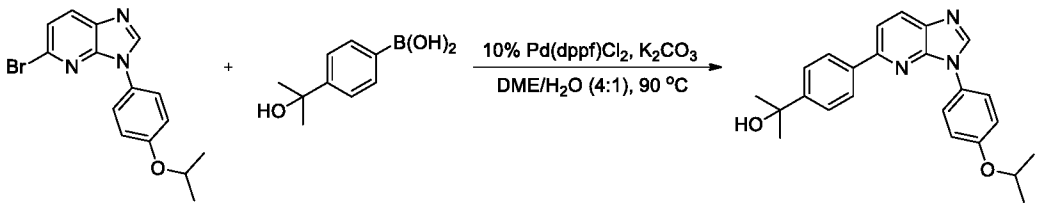
To a solution of 5-bromo-N^1-(4-isopropoxyphenyl)benzene-1,2-diamine (100 mg, 0.3 mmol) in acetic acid (3 mL), was added PPh_3 (81.6 mg, 0.3 mmol) followed by addition of sodium nitrite (25.8 mg, 0.36 mmol) at 0 °C. The reaction was warmed to room temperature and stirred for 1 h. The reaction was poured into water and extracted with ethyl acetate. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column chromatography (hexane/EtOAc = 2:1) to give 98.0 g (95%) of the product as a white solid. LC/MS*m/z*: 332.07 (^{79}Br, $M+H)^+$, 334.08 (^{81}Br, $M+H)^+$, 373.15 (^{79}Br, $M+H+CH_3CN)^+$, 375.14 (^{81}Br, $M+H+CH_3CN)^+$.

6-bromo-1-(4-isopropoxyphenyl)-5-methyl-1*H*-benzo[d][1,2,3]triazole



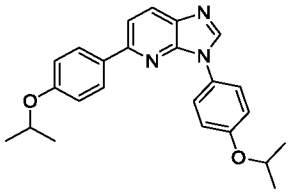
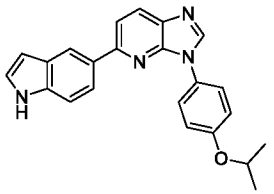
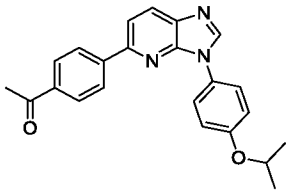
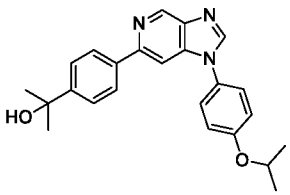
The title compound was prepared from 5-bromo-N^1-(4-isopropoxyphenyl)-4-methylbenzene-1,2-diamine in the same manner as described for 6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,2,3-benzotriazole. LC/MS *m/z*: 345.89 (^{79}Br, M+H)$^+$, 347.94 (^{81}Br, M+H)$^+$, 387.15 (^{79}Br, M+H+CH_3CN)$^+$, 389.10 (^{81}Br, M+H+CH_3CN)$^+$.

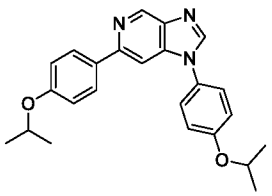
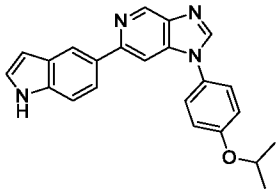
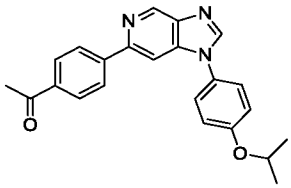
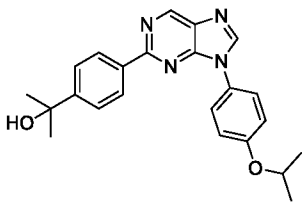
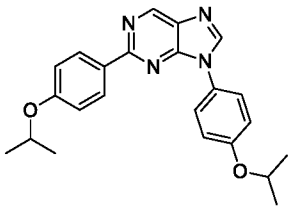
Example B1: 2-(4-{3-[4-(propan-2-yloxy)phenyl]-3*H*-imidazo[4,5-*b*]pyridin-5-yl}phenyl)propan-2-ol

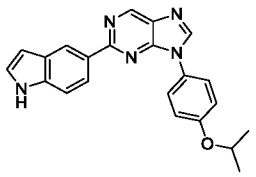
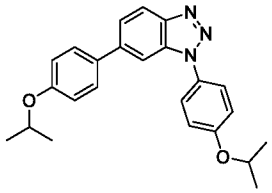
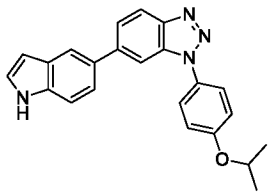
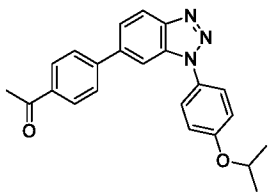
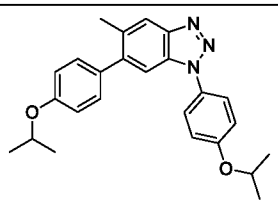


To a solution of 5-bromo-3-[4-(propan-2-yloxy)phenyl]-3*H*-imidazo[4,5-*b*]pyridine (11 mg, 0.033 mmol) in 1,2-dimethoxyethane (0.4 mL) were added [4-(2-hydroxypropan-2-yl)phenyl]boronic acid (12 mg, 0.066 mmol), [1,1'-bis(diphenylphosphino)ferrocene]palladium(II) dichloride (2.4 mg, 0.0033 mmol), potassium carbonate (14 mg, 0.1 mmol) and water (0.1 mL). The resulting reaction mixture was degassed with nitrogen for 10 min, then heated to 90^{0}C for 5h. Then the reaction mixture was diluted with ethyl acetate and washed with water. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column chromatography (hexanes / EtOAc from 1:1 to 1:8) to give 6 mg (47%) of the product as a colorless oil.^{1}H NMR (500 MHz, $CDCl_3$) δ 8.49 (br. s, 1H), 8.24 (d, 1H), 8.03 (d, 2H), 7.84 (d, 1H), 7.72 (d, 2H), 7.59 (d, 2H), 7.08 (d, 2H), 4.63 (sep, 1H), 2.24 (br. s, 1H), 1.62 (s, 6H), 1.40 (d, 6H).LC/MS *m/z*: 388.25 (M+H)$^+$, 429.28 (M+H+CH_3CN)$^+$.

Examples B2 to B15 were prepared in the same manner as described above for example B1, 2-(4-{3-[4-(propan-2-yloxy)phenyl]-3*H*-imidazo[4,5-*b*]pyridin-5-yl}phenyl)propan-2-olusing the appropriate starting materialsperforming the reaction either under conventional heating or in a microwave reactor.

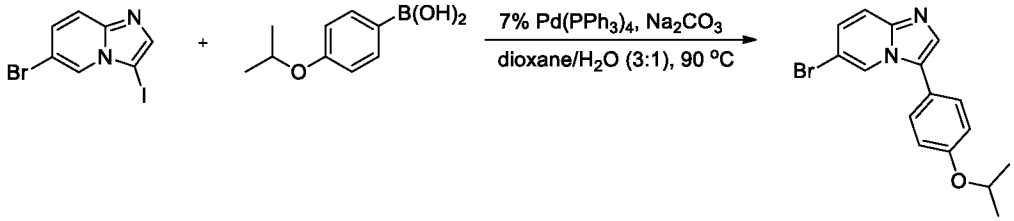
Ex.	Starting materials	Product/Name	Analytical Data
B2	5-bromo-3-[4-(propan-2-yloxy)phenyl]-3*H*-imidazo[4,5-*b*]pyridine (4-isopropoxyphenyl) boronic acid	 3,5-bis[4-(propan-2-yloxy) phenyl]-3*H*-imidazo[4,5-*b*] pyridine	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.61 (s, 1H), 8.30 (d, 1H), 8.08 (d, 1H), 8.02 (d, 2H), 7.73 (d, 2H), 7.13 (d, 2H), 7.01 (d, 2H), 4.70-4.61 (m, 2H), 1.44 (d, 6H), 1.39 (d, 6H). LC/MS *m/z*: 388.33 $(M+H)^+$, 429.25 $(M+H+CH_3CN)^+$.
B3	5-bromo-3-[4-(propan-2-yloxy)phenyl]-3*H*-imidazo[4,5-*b*]pyridine 1*H*-indol-5-ylboronic acid	 5-{3-[4-(propan-2-yloxy) phenyl]-3*H*-imidazo[4,5-*b*]pyridin-5-yl}-1*H*-indole	LC/MS *m/z*: 369.26 $(M+H)^+$.
B4	5-bromo-3-[4-(propan-2-yloxy)phenyl]-3*H*-imidazo[4,5-b]pyridine (4-acetylphenyl) boronic acid	 1-(4-{3-[4-(propan-2-yloxy) phenyl]-3*H*-imidazo[4,5-*b*] pyridin-5-yl}phenyl)ethan-1-one	LC/MS *m/z*: 372.24 $(M+H)^+$, 413.24 $(M+H+CH_3CN)^+$
B5	6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-imidazo[4,5-*c*]pyridine [4-(2-hydroxypropan-2-yl)phenyl]boronic acid	 2-(4-{1-[4-(propan-2-yloxy) phenyl]-1*H*-imidazo[4,5-*c*] pyridin-6-yl}phenyl)propan-2-ol	LC/MS *m/z*: 388.32 $(M+H)^+$

B6	6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-imidazo[4,5-*c*]pyridine (4-isopropoxyphenyl) boronic acid	 1,6-bis[4-(propan-2-yloxy) phenyl]-1*H*-imidazo[4,5-*c*]pyridine	LC/MS *m/z*: 388.27 $(M+H)^+$
B7	6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-imidazo[4,5-*c*]pyridine 1*H*-indol-5-ylboronic acid	 5-{1-[4-(propan-2-yloxy) phenyl]-1*H*-imidazo[4,5-*c*]pyridin-6-yl}-1*H*-indole	LC/MS *m/z*: 369.39 $(M+H)^+$
B8	6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-imidazo[4,5-*c*]pyridine (4-acetylphenyl) boronic acid	 1-(4-{1-[4-(propan-2-yloxy) phenyl]-1*H*-imidazo[4,5-*c*] pyridin-6-yl}phenyl)ethan-1-one	LC/MS *m/z*: 372.29 $(M+H)^+$
B9	2-chloro-9-[4-(propan-2-yloxy)phenyl]-9*H*-purine [4-(2-hydroxypropan-2-yl)phenyl]boronic acid	 2-(4-{9-[4-(propan-2-yloxy) phenyl]-9*H*-purin-2-yl} phenyl)propan-2-ol	LC/MS *m/z*: 389.14 $(M+H)^+$
B10	2-chloro-9-[4-(propan-2-yloxy)phenyl]-9*H*-purine (4-isopropoxyphenyl) boronic acid	 2,9-bis[4-(propan-2-yloxy)phenyl]-9*H*-purine	LC/MS*m/z*: 389.31 $(M+H)^+$

B11	2-chloro-9-[4-(propan-2-yloxy)phenyl]-9*H*-purine 1*H*-indol-5-ylboronic acid	 2-(1*H*-indol-5-yl)-9-[4-(propan-2-yloxy)phenyl]-9H-purine	LC/MS*m/z*: 370.32 $(M+H)^+$
B12	6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,2,3-benzotriazole (4-isopropoxyphenyl) boronic acid	 1,6-bis[4-(propan-2-yloxy) phenyl]-1*H*-1,2,3-benzotriazole	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.17 (s, 1H), 7.77 (s, 1H), 7.66 (s, 1H), 7.68 (d, 2H), 7.58 (d, 2H), 7.13 (d, 2H), 7.01 (d, 2H), 4.65-4.62 (m, 2H), 1.43 (d, 6H), 1.40 (d, 6H). LC/MS *m/z*: 388.22 $(M+H)^+$, 429.27 $(M+H+CH_3CN)^+$
B13	6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,2,3-benzotriazole 1*H*-indol-5-ylboronic acid	 6-(1*H*-indol-5-yl)-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,2,3-benzotriazole	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.35 (br, 1H), 8.20 (d, 1H), 7.93 (s, 1H), 7.87 (s, 1H), 7.79 (d, 1H), 7.72 (d, 2H), 7.52 (s, 1H), 7.29 (s, 1H), 7.13 (d, 2H), 6.66 (s, 1H), 4.63-4.80 (m, 2H), 1.45 (d, 6H). LC/MS *m/z*: 369.17 $(M+H)^+$.
B14	6-bromo-1-[4-(propan-2-yloxy)phenyl]-1*H*-1,2,3-benzotriazole (4-acetylphenyl) boronic acid	 1-(4-{1-[4-(propan-2-yloxy) phenyl]-1*H*-1,2,3-benzotriazol-6-yl}phenyl)ethan-1-one	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.18 (s, 1H), 7.77 (s, 1H), 7.70 (d, 2H), 7.68 (s, 1H), 7.59 (d, 2H), 7.14 (d, 2H), 7.02 (d, 2H), 4.65-4.82 (m, 2H), 1.44 (d, 6H), 1.41 (d, 6H). LC/MS*m/z*: 372.26 $(M+H)^+$, 413.31 $(M+H+CH_3CN)^+$.
B15	6-bromo-5-methyl-1-[4-(propan-2-yloxy) phenyl]-1*H*-1,2,3-benzotriazole (4-isopropoxyphenyl) boronic acid	 5-methyl-1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-1,2,3-benzotriazole	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.03 (br, 1H), 7.67 (d, 2H), 7.54 (s, 1H), 7.28 (d, 2H), 7.06 (d, 2H), 6.97 (d, 2H), 4.57-4.68 (m, 2H), 2.43 (s, 3H), 1.41 (d, 6H), 1.39 (d, 6H).LC/MS*m/z*: 401.29 $(M+H)^+$.

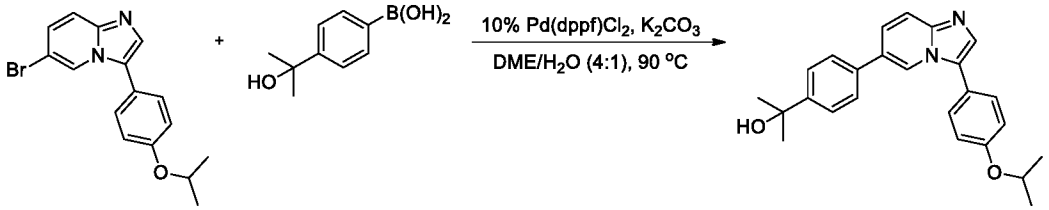
Example C1:2-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)propan-2-ol

Step 1: 6-bromo-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine



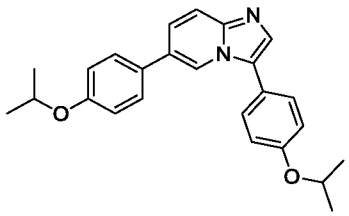
To a solution of 6-bromo-3-iodoimidazo[1,2-*a*]pyridine (0.3 g, 0.93 mmol) in dioxane (9 mL) were added (4-isopropoxyphenyl)boronic acid (0.167 g, 0.93mmol), tetrakis(triphenylphosphine) palladium(0) (0.075g, 0.065 mmol), sodium carbonate (0.3 g, 2.8 mmol) and water (3 mL). The resulting reaction mixture was degassed with nitrogen for 10 min, then heated to 90^{0}C for 5 h. Then the reaction mixture was diluted with ethyl acetate and washed with water. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column chromatography (hexanes / EtOAc from 4:1 to 1:2) to give 0.26g (84%) of the product as a white solid.^{1}H NMR (500 MHz, $CDCl_3$) δ 8.36 (s, 1H), 7.62 (s, 1H), 7.57 (d, 1H), 7.42 (d, 2H), 7.23 (d, 1H), 7.03 (d, 2H), 4.62 (sep, 1H), 1.39 (d, 6H). LC/MS *m/z*: 331.07 (^{79}Br, M+H)$^+$, 333.14 (^{81}Br, M+H)$^+$.

Step 2: 2-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)propan-2-ol



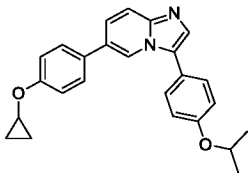
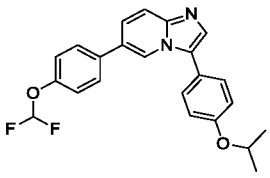
To a solution of 6-bromo-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine (20 mg, 0.06mmol) in 1,2-dimethoxyethane (0.8 mL) were added [4-(2-hydroxypropan-2-yl)phenyl]boronic acid (22 mg, 0.12mmol), [1,1'-bis(diphenylphosphino)ferrocene]palladium(II) dichloride (4.4 mg, 0.006mmol), potassium carbonate (25 mg, 0.18 mmol) and water (0.2 mL). The resulting reaction mixture was degassed with nitrogen for 10 min, then heated to 90^{0}C for 5 h. Then the reaction mixture was diluted with ethyl acetate and washed with water. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column chromatography (hexanes / EtOAc from 1:1 to 1:10, then pure EtOAc) to give 12 mg (52%) of the product as a colorless oil.^{1}H NMR (300 MHz, $CDCl_3$) δ8.42 (s, 1H), 7.82 (d, 1H), 7.66 (s, 1H), 7.59 (d, 2H), 7.48-7.51 (m, 3H), 7.46 (d, 2H), 7.05 (d, 2H), 4.62-4.64 (m, 1H), 2.20-2.45 (br s, 1H), 1.62 (s, 6H), 1.40 (d, 6H). LC/MS *m/z*: 387.27 $(M+H)^+$.

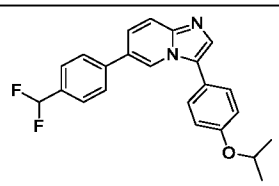
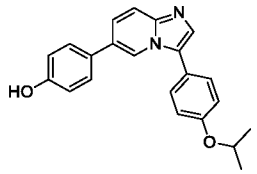
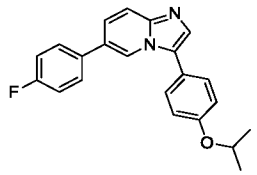
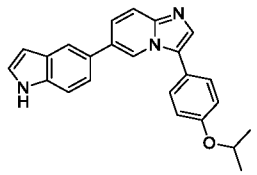
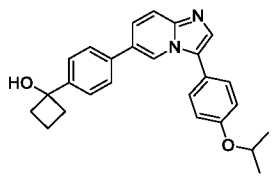
Example C2:3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine

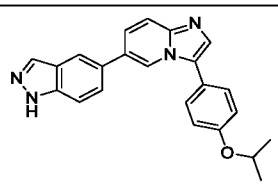
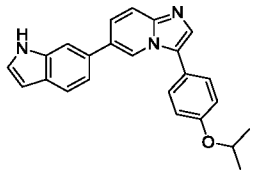
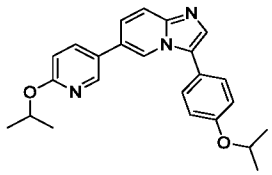
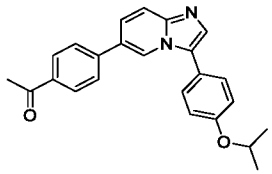
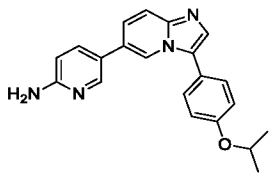


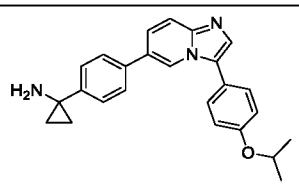
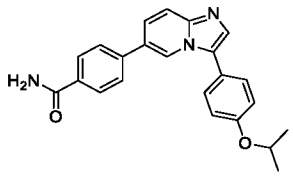
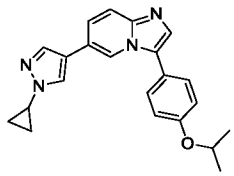
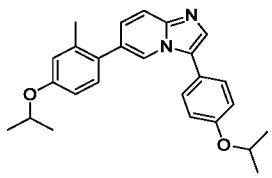
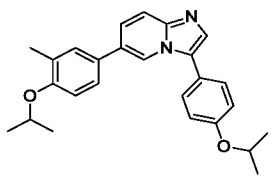
To a solution of 6-bromo-3-iodoimidazo[1,2-*a*]pyridine (0.3 g, 0.93 mmol) in dioxane (9 mL) and water (3 mL) was added (4-isopropoxyphenyl)boronic acid (0.334 g, 1.86 mmol) and sodium carbonate (0.6 g, 5.6 mmol). The reaction mixture was purged with nitrogen, then $Pd(dppf)Cl_2$ (0.05 g, 0.06 mmol) was added. The resulting reaction mixture was heated to 90^0C for 12h, brought to room temperature and was extracted with ethyl acetate. Dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column chromatography (hexanes / EtOAc from 4:1 to 1:2) to give 0.24g (62%) of the title compound as a beige solid.^{1}H NMR (300 MHz, $CDCl_3$) δ 8.37 (s, 1H), 7.70 (d, 1H), 7.64 (s, 1H), 7.49 (d, 2H), 7.44 (d, 2H), 7.41 (d, 1H), 7.05 (d, 2H), 6.97 (d, 2H), 4.56 - 4.67 (m, 2H), 1.40 (d, 6H), 1.37 (d, 6H).,LC/MS *m/z*: 387.28 $(M+H)^+$.

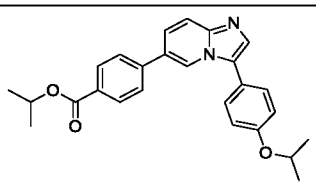
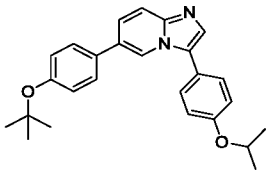
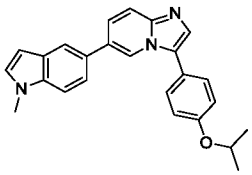
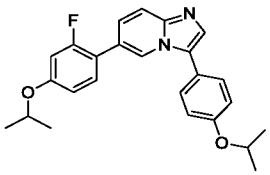
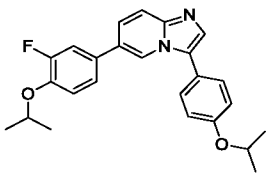
Examples C3 to C26 were prepared in the same manner as described above for example C1, 2-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)propan-2-olusing 6-bromo-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine and appropriate commercialboronic acid or boronic acid pinacol ester performing the reaction either under conventional heating or in a microwave reactor

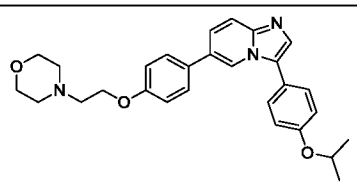
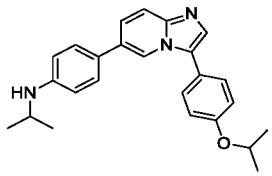
Ex.	Starting materials	Product/Name	Analytical Data
C3	4-(cyclopropoxy) phenylboronic acid	 6-(4-cyclopropoxyphenyl)-3-[4-(propan-2-yloxy)phenyl] imidazo[1,2-*a*]pyridine	LC/MS *m/z*: 385.31 $(M+H)^+$
C4	4-(difluoromethoxy) phenyl boronic acid	 6-[4-(difluoromethoxy) phenyl]-3-[4-(propan-2-yloxy) phenyl] imidazo[1,2-*a*]pyridine	LC/MS *m/z*: 395.22 $(M+H)^+$

C5	4-(difluoromethyl) phenyl boronic acid	 6-[4-(difluoromethyl)phenyl]-3-[4-(propan-2-yloxy)phenyl] imidazo[1,2-*a*]pyridine	LC/MS *m/z*: 379.23 $(M+H)^+$
C6	4-hydroxyphenyl boronic acid	 4-{3-[4-(propan-2-yloxy) phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenol	LC/MS *m/z*: 345.27 $(M+H)^+$
C7	4-fluorophenyl boronic acid	 6-(4-fluorophenyl)-3-[4-(propan-2-yloxy)phenyl] imidazo[1,2-*a*]pyridine	LC/MS *m/z*: 347.30 $(M+H)^+$
C8	1*H*-indol-5-ylboronic acid	 5-{3-[4-(propan-2-yloxy) phenyl]imidazo[1,2-*a*]pyridin-6-yl}-1*H*-indole	LC/MS *m/z*: 368.28 $(M+H)^+$
C9	4-(1-hydroxycyclo butyl)phenyl boronic acid	 1-(4-{3-[4-(propan-2-yloxy) phenyl]imidazo[1,2-*a*] pyridin-6-yl}phenyl) cyclobutan-1-ol	LC/MS *m/z*: 399.28 $(M+H)^+$

C10	1*H*-indazol-5-ylboronic acid	 5-{3-[4-(propan-2-yloxy) phenyl]imidazo[1,2-*a*]pyridin-6-yl}-1*H*-indazole	LC/MS *m/z*: 369.33 $(M+H)^+$
C11	1*H*-indol-6-boronic acid	 6-{3-[4-(propan-2-yloxy) phenyl]imidazo[1,2-*a*]pyridin-6-yl}-1*H*-indole	LC/MS *m/z*: 368.36 $(M+H)^+$
C12	2-isopropoxypyridine-5- boronic acid	 2-(propan-2-yloxy)-5-{3-[4-(propan-2-yloxy)phenyl] imidazo[1,2-*a*]pyridin-6-yl} pyridine	LC/MS *m/z*: 388.28 $(M+H)^+$
C13	(4-acetylphenyl) boronic acid	 1-(4-{3-[4-(propan-2-yloxy) phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)ethan-1-one	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.48 (s, 1H), 8.06 (d, 2H), 7.93 (d, 1H), 7.70 (s, 1H), 7.66 – 7.58 (m, 3H), 7.49 (d, 2H), 7.08 (d, 2H), 4.69 – 4.61 (m, 1H), 2.65 (s, 3H), 1.41 (d, 6H)., LC/MS *m/z*: 371.33 $(M+H)^+$
C14	5-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)pyridin-2-amine	 5-{3-[4-(propan-2-yloxy) phenyl]imidazo[1,2-*a*]pyridin-6-yl}pyridin-2-amine	LC/MS *m/z*: 345.32 $(M+H)^+$

C15	4-(1-aminocyclo propyl)phenyl boronic acid	 1-(4-{3-[4-(propan-2-yloxy) phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl) cyclopropan-1-amine	LC/MS *m/z*: 384.35 $(M+H)^+$
C16	(4-carbamoylphenyl) boronic acid	 4-{3-[4-(propan-2-yloxy) phenyl]imidazo[1,2-*a*]pyridin-6-yl}benzamide	LC/MS *m/z*: 372.23 $(M+H)^+$
C17	1-cyclopropyl-4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)pyrazole	 1-cyclopropyl-4-{3-[4-(propan-2-yloxy)phenyl] imidazo[1,2-*a*]pyridin-6-yl}-1*H*-pyrazole	LC/MS *m/z*: 359.26 $(M+H)^+$
C18	4-isopropoxy-2-methylphenyl boronic acid	 6-[2-methyl-4-(propan-2-yloxy)phenyl]-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine	LC/MS *m/z*: 401.39 $(M+H)^+$
C19	4-isopropoxy-3-methylphenyl boronic acid	 6-[3-methyl-4-(propan-2 yloxy)phenyl]-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*] pyridine	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.36 (s, 1H), 8.13 (d, 1H), 7.76 (d, 1H), 7.69 (s, 1H), 7.48 (d, 2H), 7.29 (s, 1H), 7.26 (d, 1H), 7.09 (d, 2H), 6.92 (d, 1H), 4.51 - 4.73 (m, 2H), 2.27 (s, 3H), 1.41 (d, 6H), 1.38 (d, 6H)., LC/MS *m/z*: 401.34 $(M+H)^+$

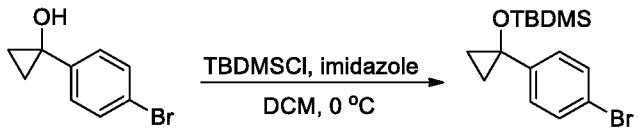
C20	{4-[(propan-2-yloxy) carbonyl]phenyl}boronic acid	 propan-2-yl 4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}benzoate	LC/MS *m/z*: 415.30 $(M+H)^+$
C21	[4-(*tert*-butoxy) phenyl]boronic acid	 6-[4-(*tert*-butoxy)phenyl]-3-[4-(propan-2-yloxy)phenyl] imidazo[1,2-*a*]pyridine	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.39 (s, 1H), 7.94 (d, 1H), 7.68 (s, 1H), 7.62 (d, 1H), 7.49 (d, 2H), 7.43 (d, 2H), 7.09 (d, 2H), 7.06 (d, 2H), 4.60 - 4.71 (m, 1H), 1.42 (d, 6H), 1.39 (s, 9H)., LC/MS *m/z*: 401.30 $(M+H)^+$
C22	1-methylindole-5-boronic acid	 1-methyl-5-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*] pyridin-6-yl}-1*H*-indole	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.45 (s, 1H), 7.85 (d, 1H), 7.77 (s, 1H), 7.66 (s, 1H), 7.64 (d, 1H), 7.51 (d, 2H), 7.40 (br s, 2H), 7.12 (d, 1H), 7.06 (d, 2H), 6.55 (d, 1H), 4.61-4.69 (m, 1H), 3.84 (s, 3H), 1.41 (d, 6H)., LC/MS *m/z*: 382.35 $(M+H)^+$
C23	[2-fluoro-4-(propan-2-yloxy)phenyl]boronic acid	 6-[2-fluoro-4-(propan-2-yloxy)phenyl]-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*] pyridine	LC/MS *m/z*: 405.30 $(M+H)^+$
C24	[3-fluoro-4-(propan-2-yloxy)phenyl]boronic acid	 6-[3-fluoro-4-(propan-2-yloxy) phenyl]-3-[4-(propan-2-yloxy) phenyl]imidazo[1,2-*a*]pyridine	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.36 (s, 1H), 7.99 (d, 1H), 7.69 (s, 1H), 7.59 (d, 1H), 7.48 (d, 2H), 7.28 (s, 1H), 7.23 (d, 1H), 7.08 (d, 2H), 7.05 (d, 1H), 4.53 - 4.72 (m, 2H), 1.41 (d, 6H), 1.39 (d, 6H)., LC/MS *m/z*: 405.26 $(M+H)^+$

C25	4-(2-morpholino ethoxy) phenyl boronic acid	 4-[2-(4-{3-[4-(propan-2-yloxy) phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenoxy)ethyl] morpholine	LC/MS *m/z*: 458.32 $(M+H)^+$
C26	*N*-(propan-2-yl)-4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl) aniline	 *N*-(propan-2-yl)-4-{3-[4-(propan-2-yloxy)phenyl] imidazo[1,2-*a*]pyridin-6-yl} aniline	^{1}H NMR (300 MHz, $CDCl_3$) δ 8.32 (s, 1H), 8.19 (d, 1H), 7.82 (dd, 1H), 7.66 (s, 1H), 7.45 (d, 2H), 7.31 (d, 2H), 7.07 (d, 2H), 6.65 (d, 2H), 4.69 – 4.59 (m, 1H), 3.73 – 3.60 (m, 1H), 1.40 (d, 6H), 1.23 (d, 6H).LC/MS *m/z*: 386.32 $(M+H)^+$

Preparation of boronic acid pinacol esters for Examples C27 – C29.

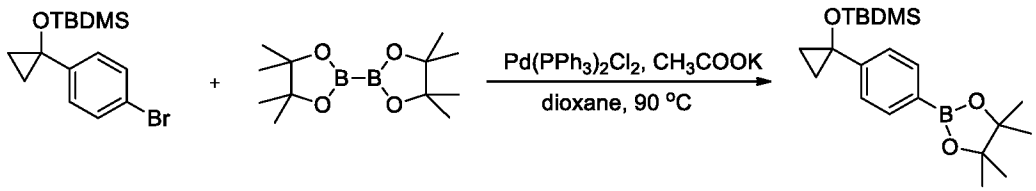
tert-butyldimethyl{1-[4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl]cyclopropoxy}silane

Step 1: [1-(4-bromophenyl)cyclopropoxy](*tert*-butyl)dimethylsilane



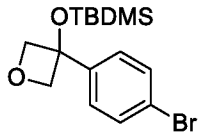
To a solution of 1-(4-bromophenyl)cyclopropan-1-ol (90 mg, 0.42mmol) in DCM (1.5 mL) cooled to 0 ^{0}C was added imidazole (57 mg, 0.84mmol), followed by TBDMSCl (76 mg, 0.5 mmol). The reaction mixture was brought to r.t. gradually and stirred for 2h. Then DCM (10 mL) was added, reaction mixture was washed with water. The organic layer was dried over Na_2SO_4, filtered, and concentrated *in vacuo.* The residue was dissolved in DCM and passed through a short pad of silica gel eluting with DCM. Then volatiles were removed *in vacuo* to give 0.14 g (quantitative yield) of the product as a colorless oil, which was used in the next step.

Step 2:*tert*-butyldimethyl{1-[4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl]cyclopropoxy}silane



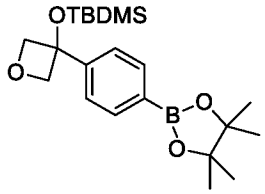
To a degassed mixture of [1-(4-bromophenyl)cyclopropoxy](*tert*-butyl)dimethylsilane (0.14 g, 0.42 mmol), bis(pinacolato)diboron (0.16 g, 0.63 mmol) and potassium acetate (0.13 g, 1.3 mmol) in anhydrousdioxane (1.6 mL) was added bis(triphenylphosphine)palladium(II) dichloride (0.03 g, 0.042mmol). The resulting reaction mixture was stirred under N_2atmosphereat 90^{0}C for 3h. Then the reaction mixture was diluted with ethyl acetate and washed with water. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by flash chromatography on SiO_2(hexanes / EtOAc8:1) to give 0.11 g (69%) of the product as a colorless oil which solidified upon standing.^{1}H NMR (300 MHz, $CDCl_3$) δ 7.75 (d, 2H), 7.31 (d, 2H), 1.35 (s, 12H), 1.23 – 1.17 (m, 2H), 1.04 – 0.99 (m, 2H), 0.89 (s, 9H), 0.00 (s, 6H).

{[3-(4-Bromophenyl)oxetan-3-yl]oxy}(*tert*-butyl)dimethylsilane



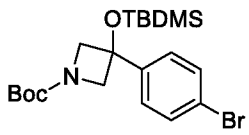
The title compound was prepared from 3-(4-bromophenyl)oxetan-3-olin the same manner as described above for [1-(4-bromophenyl)cyclopropoxy](*tert*-butyl)dimethylsilane.

tert-Butyldimethyl({3-[4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl]oxetan-3-yl}oxy)silane



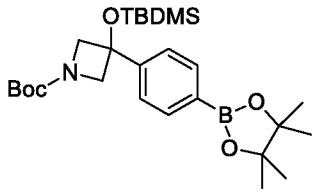
The title compound was prepared from {[3-(4-bromophenyl)oxetan-3-yl]oxy}(*tert*-butyl)dimethylsilanein the same manner as described above for *tert*-butyldimethyl{1-[4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl]cyclopropoxy}silane. ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.87 (d, 2H), 7.62 (d, 2H), 5.00 (d, 2H), 4.84 (d, 2H), 1.37 (s, 12H), 0.96 (s, 9H), 0.00 (s, 6H).

tert-Butyl 3-(4-bromophenyl)-3-[(*tert*-butyldimethylsilyl)oxy]azetidine-1-carboxylate



The title compound was prepared from *tert*-butyl 3-(4-bromophenyl)-3-hydroxyazetidine-1-carboxylatein the same manner as described above for [1-(4-bromophenyl)cyclopropoxy](*tert*-butyl)dimethylsilane.

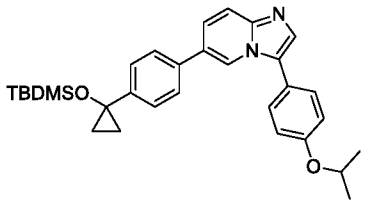
tert-Butyl 3-[(*tert*-butyldimethylsilyl)oxy]-3-[4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl]azetidine-1-carboxylate



The title compound was prepared from *tert*-butyl 3-(4-bromophenyl)-3-[(*tert*-butyldimethylsilyl)oxy]azetidine-1-carboxylatein the same manner as described above for *tert*-butyldimethyl{1-[4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl]cyclopropoxy}silane.

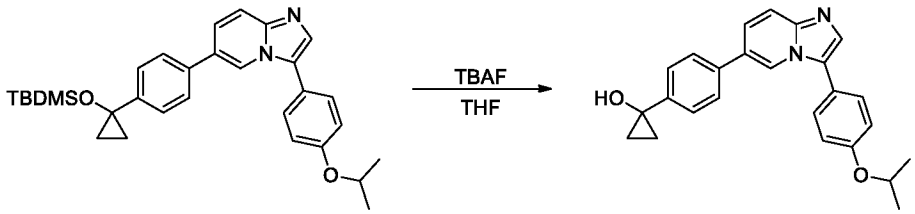
Example C27: 1-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)cyclopropan-1-ol

Step 1: 6-(4-{1-[(*tert*-butyldimethylsilyl)oxy]cyclopropyl}phenyl)-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine



The title compound was prepared from 6-bromo-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine and *tert*-butyldimethyl{1-[4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl]cyclopropoxy}silanein the same manner as described above for 2-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)propan-2-ol (Example C1).LC/MS *m/z*: 499.36 $(M+H)^+$.

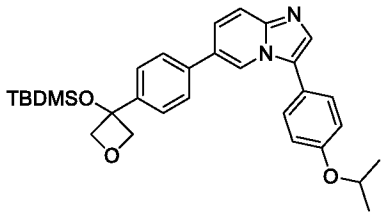
Step 2: 1-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)cyclopropan-1-ol



To a solution of 6-(4-{1-[(*tert*-butyldimethylsilyl)oxy]cyclopropyl}phenyl)-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine (12 mg, 0.024 mmol) in THF (0.5 mL) was added TBAF·$3H_2O$ (20 mg, 0.063 mmol). The reaction mixture was stirred at r.t. for 2h, thenconcentrated*invacuo*. The residue was dissolved in EtOAc and washed with water. The organic layer was dried over Na_2SO_4, filtered, and concentrated *in vacuo*.The residue was purified by SiO_2 column chromatography (hexanes / EtOAc from 1:1 to 1:10, then pure EtOAc) to give 5.6 mg (60%) of the title compound as a white solid. ^1H NMR (300 MHz, $CDCl_3$) δ 8.39 (s, 1H), 8.02 (d, 1H), 7.69 – 7.63 (m, 2H), 7.46 – 7.36 (m, 6H), 7.06 (d, 2H), 4.63 (sep, 1H), 3.31 (br. s, 1H), 1.39 (d, 6H), 1.37 – 1.33 (m, 2H), 1.09 – 1.05 (m, 2H).LC/MS *m/z*: 385.29 $(M+H)^+$.

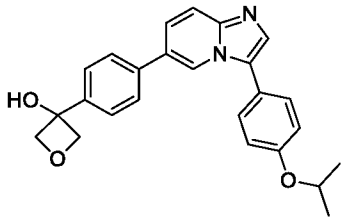
Example C28: 3-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)oxetan-3-ol

Step 1: 6-(4-{3-[(*tert*-butyldimethylsilyl)oxy]oxetan-3-yl}phenyl)-3-[4-(propan-2-yloxy)phenyl] imidazo [1,2-*a*]pyridine



The title compound was prepared from 6-bromo-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine and *tert*-butyldimethyl({3-[4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl]oxetan-3-yl}oxy)silane in the same manner as described above for 2-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)propan-2-ol (Example C1). LC/MS *m/z*: 515.38 $(M+H)^+$.

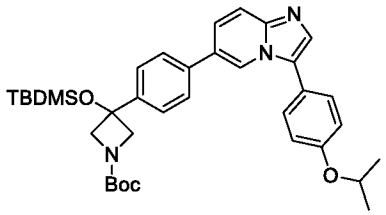
Step 2: 3-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)oxetan-3-ol



The title compound was prepared from 6-(4-{3-[(*tert*-butyldimethylsilyl)oxy]oxetan-3-yl}phenyl)-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridinein the same manner as described above for 1-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)cyclopropan-1-ol.LC/MS *m/z*: 401.31 $(M+H)^+$.

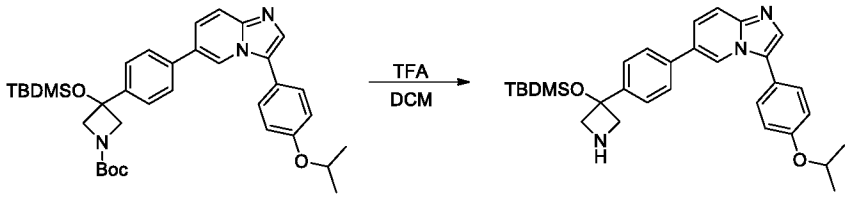
Example C29: 3-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)azetidin-3-ol

Step 1:*tert*-butyl 3-[(*tert*-butyldimethylsilyl)oxy]-3-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)azetidine-1-carboxylate



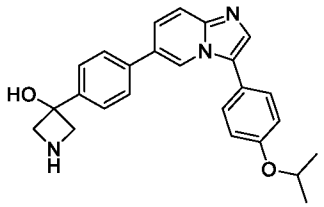
The title compound was prepared from 6-bromo-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine and *tert*-butyl 3-[(*tert*-butyldimethylsilyl)oxy]-3-[4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl]azetidine-1-carboxylatein the same manner as described above for 2-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)propan-2-ol (Example C1).LC/MS *m/z*: 614.42 $(M+H)^+$.

Step 2: 3-[(*tert*-butyldimethylsilyl)oxy]-3-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)azetidine



To a solution of *tert*-butyl 3-[(*tert*-butyldimethylsilyl)oxy]-3-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)azetidine-1-carboxylate(29 mg, 0.047 mmol) in DCM (1 mL) was added trifluoroacetic acid (0.25 mL). The reaction mixture was stirred at r.t. overnight.Then, solvent was evaporated, and the residue was dissolved in DCM and washed withsaturated aq. $NaHCO_3$ solution. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo* to give 20 mg (83%) of the product as a colorless oil, which was used in the next stepwithout further purification.LC/MS *m/z*: 514.44 $(M+H)^+$.

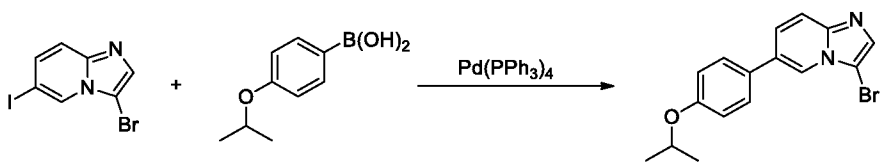
Step 3: 3-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)azetidin-3-ol



The title compound was prepared from3-[(*tert*-butyldimethylsilyl)oxy]-3-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)azetidine in the same manner as described above for 1-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)cyclopropan-1-ol. LC/MS *m/z*: 400.41 $(M+H)^+$.

Example C30: 3-(4-cyclopropylphenyl)-6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine

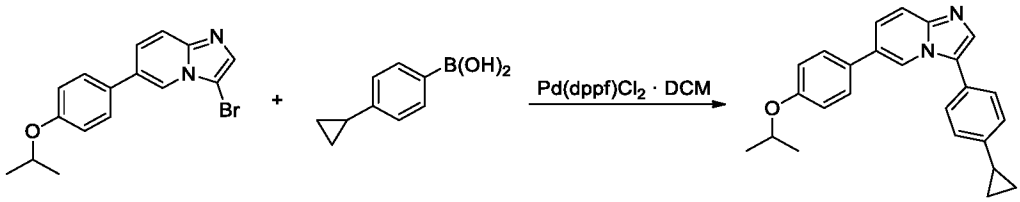
Step 1: 3-bromo-6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine



3-bromo-6-iodoimidazo[1,2-*a*]pyridine (100 mg, 0.3 mmol) was added to a microwave reactor vial followed by 4-isopropoxyphenyl boronic acid (62 mg, 0.34 mmol), tetrakis(triphenylphosphine) palladium(0) (34 mg,0.03 mmol), sodium carbonate (94 mg, 0.9 mmol), 3 mL of 1,4-dioxane, and 1 mL of water. The mixture was capped tightly and degassed by bubbling nitrogen through the septum for 5 minutes. The resulting solution was heated to 90 °C for 15 minutes in a microwave reactor and allowed to cool. The mixture was then diluted with ethyl acetate, washed with water (2x) and brine

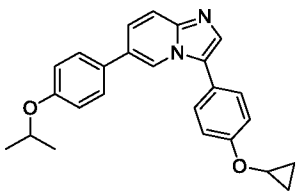
(1x), dried over sodium sulfate, and evaporated. The crude oil was purified by flash chromatography on silica (1:1 hexanes:ethyl acetate, isocratic) to provide the title compound (82 mg) as a light yellow oil that slowly solidified. LC/MS *m/z*: 331.24 (^{79}Br, M+H)$^+$, 333.28(^{81}Br, M+H)$^+$.

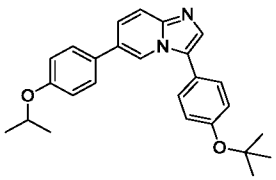
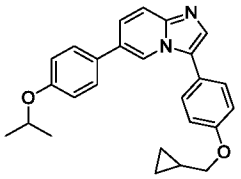
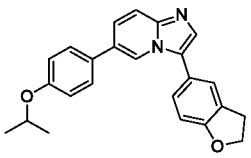
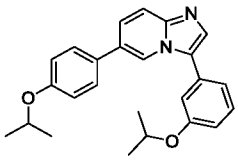
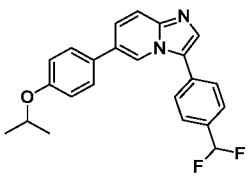
Step 2:3-(4-cyclopropylphenyl)-6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine

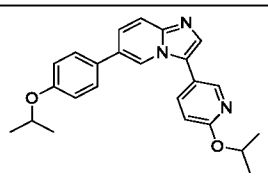
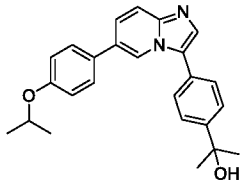
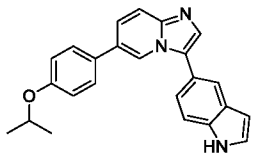
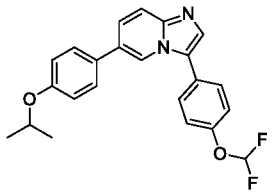
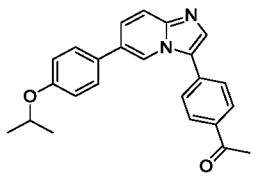


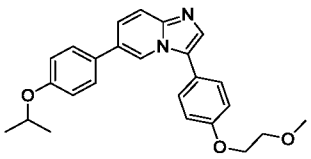
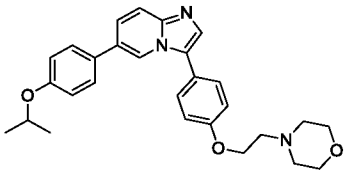
To a solution of 3-bromo-6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine (20 mg, 0.06 mmol) in 2 mL THF:Water 3:1 was added 4-cyclopropylboronic acid (12 mg, 0.072 mmol), potassium carbonate (5 mg, 0.18 mmol), and Pd(dppf)Cl2 dichloromethane complex (5mg, .006 mmol). The mixture was capped tightly and degassed by bubbling nitrogen through the septum for 5 minutes. The resulting solution was heated to 100°C for 15 minutes in a microwave reactor and allowed to cool. The mixture was then diluted with ethyl acetate, washed with water (2x) and brine (1x), dried over sodium sulfate, and evaporated. The crude oil was purified by flash chromatography on silica (3:7hexanes:ethyl acetate, isocratic) to provide 13 mg of the title compound as a light yellow oil. LC/MS *m/z*: 369.26 $(M+H)^+$

Examples C31 to C43 were prepared in the same manner as described above for example C30, 3-(4-cyclopropylphenyl)-6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine, using 3-bromo-6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine, the appropriate commercial boronic acid or boronic acid pinacol ester, and the appropriate catalyst (Method A: $Pd(PPh_3)_4$; Method B: $Pd(dppf)Cl_2$·DCM; Method C: $Pd(dba)_2$ (0.1 eq.) / PCy_3 (0.15 eq.))

Ex.	Method	Starting materials	Product/Name	Analytical Data
C31	A	(4-cyclopropoxy phenyl)boronic acid	 3-(4-cyclopropoxy phenyl)-6-[4-(propan-2-yloxy)phenyl] imidazo[1,2-*a*]pyridine	^{1}H NMR (300 MHz, $CDCl_3$) δ ppm 8.39 (s, 1H), 8.08 (d, 1H), 7.72 (d, 2H), 7.56-7.39 (m, 5H), 7.25 (s, 1H), 7.00 (d, 2H), 4.62 (sep, 1H), 3.88-3.80 (m, 1H), 1.38 (d, 6H), 0.87 (br:s, 4H)., LC/MS *m/z*: 385.31 $(M+H)^+$

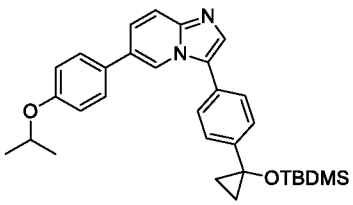
C32	A	(4-(tert-butoxy) phenyl) boronic acid	 3-[4-(tert-butoxy)phenyl]-6-[4-(propan-2-yloxy)phenyl] imidazo[1,2-*a*]pyridine	^{1}H NMR (300 MHz, $CDCl_3$) δ ppm 8.41 (s, 1H), 8.02 (d, 1H), 7.72 (s, 1H), 7.66 (d, 1H), 7.47 (dd, 4H), 7.19 (d, 2H), 7.00 (d, 2H), 4.62 (sept, 1H), 1.46 (s, 9H), 1.39 (d, 6H)., LC/MS *m/z*: 401.35 $(M+H)^+$
C33	A	(4-(cyclopropyl methoxy)phenyl) boronic acid	 3-[4-(cyclopropylmethoxy) phenyl]-6-[4-(propan-2-yloxy) phenyl]imidazo[1,2*a*]pyridine	^{1}H NMR (300 MHz, $CDCl_3$) δ ppm 8.37 (s, 1H), 8.05 (d, 1H), 7.73-7.66 (m, 2H), 7.47 (dd, 4H), 7.11 (d, 2H), 6.99 (d, 2H), 4.62 (sept, 1H), 3.91 (d, 2H), 1.39 (d, 6H), 0.77-0.66 (m, 2H), 0.46-0.37 (m, 2H)., LC/MS *m/z*: 399.31 $(M+H)^+$
C34	A	(2,3-dihydro benzofuran-5-yl) boronic acid	 3-(2,3-dihydro-1-benzofuran-5-yl)-6-[4-(propan-2-yloxy) phenyl]imidazo[1,2-*a*]pyridine	LC/MS *m/z*: 371.35 $(M+H)^+$
C35	A	(3-isopropoxy phenyl)boronic acid	 3-[3-(propan-2-yloxy)phenyl]-6-[4-(propan-2-yloxy)phenyl] imidazo[1,2-*a*]pyridine	LC/MS *m/z*: 387.34 $(M+H)^+$, 428.47 $(M+H+CH_3CN)^+$
C36	B	(4-(difluoromethyl) phenyl)boronic acid	 3-[4-(difluoromethyl)phenyl]-6-[4-(propan-2-yloxy)phenyl] imidazo[1,2-*a*]pyridine	LC/MS *m/z*: 379.31 $(M+H)^+$, 420.51 $(M+H+CH_3CN)^+$

C37	A	(6-isopropoxy pyridin-3-yl)boronic acid	 2-(propan-2-yloxy)-5-{6-[4-(propan-2-yloxy)phenyl] imidazo[1,2-*a*]pyridin-3-yl}pyridine	LC/MS *m/z*: 388.32 $(M+H)^+$, 429.34 $(M+H+CH_3CN)^+$
C38	B	(4-(2-hydroxy propan-2-yl phenyl) boronic acid	 2-(4-{6-[4-(propan-2-yloxy) phenyl]imidazo[1,2-*a*]pyridin-3-yl}phenyl)propan-2-ol	LC/MS *m/z*: 387.28 $(M+H)^+$, 428.55 $(M+H+CH_3CN)^+$
C39	B	1*H*-indol-5-ylboronic acid	 5-{6-[4-(propan-2yloxy)phenyl] imidazo[1,2-*a*]pyridin-3-yl}-1*H*-indole	LC/MS *m/z*: 368.24 $(M+H)^+$
C40	C	(4-(difluoro methoxy)phenyl) boronic acid	 3-[4-(difluoromethoxy) phenyl]-6-[4-(propan-2-yloxy)phenyl] imidazo[1,2*a*]pyridine	LC/MS *m/z*: 395.26 $(M+H)^+$, 436.22 $(M+H+CH_3CN)^+$
C41	A	(4-acetylphenyl) boronic acid	 1-(4-{6-[4-(propan-2-yloxy) phenyl]imidazo[1,2-*a*]pyridin-3-yl}phenyl)ethan-1-one	LC/MS *m/z*: 371.28 $(M+H)^+$

C42	B	[4-(2-methoxy ethoxy) phenyl] boronic acid	 3-[4-(2-methoxyethoxy) phenyl]-6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine	LC/MS *m/z*: 403.31 $(M+H)^+$
C43	B	4-(2-morpholino ethoxy)phenyl boronic acid	 4-[2-(4-{6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-3-yl}phenoxy) ethyl]morpholine	LC/MS *m/z*: 458.10 $(M+H)^+$

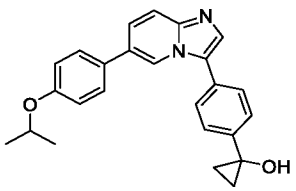
Example C44: 1-(4-{6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-3-yl}phenyl)cyclopropan-1-ol

Step 1: 3-(4-{1-[(*tert*-butyldimethylsilyl)oxy]cyclopropyl}phenyl)-6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine



The title compound was prepared from 3-bromo-6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine and *tert*-butyldimethyl{1-[4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl]cyclopropoxy}silane in the same manner as described above for 3-(4-cyclopropylphenyl)-6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine (Example C30). LC/MS *m/z*: 499.33 $(M+H)^+$.

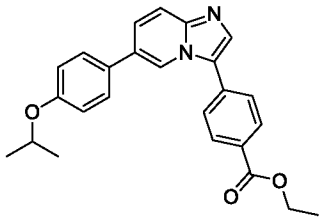
Step 2: 1-(4-{6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-3-yl}phenyl)cyclopropan-1-ol



The title compound was prepared from 3-(4-{1-[(*tert*-butyldimethylsilyl)oxy]cyclopropyl}phenyl)-6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine in the same manner as described above for 1-(4-{3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)cyclopropan-1-ol. ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.43 – 8.37 (m, 2H), 7.97 (d, 1H), 7.63 (s, 1H), 7.55 – 7.48 (m, 4H), 7.41 (d, 2H), 6.99 (d, 2H), 4.60 (sep, 1H), 1.96 (br. s, 1H), 1.47 – 1.42 (m, 2H), 1.36 (d, 6H), 1.17 – 1.13 (m, 2H).LC/MS *m/z*: 385.35 $(M+H)^+$.

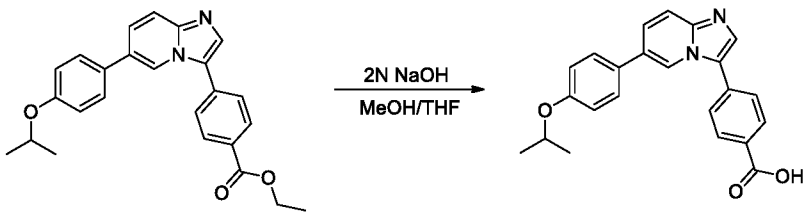
Example C45: 4-{6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-3-yl}benzoic acid

Step 1: ethyl 4-{6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-3-yl}benzoate



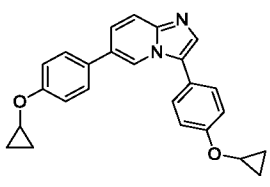
The title compound was prepared from 3-bromo-6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine and [4-(ethoxycarbonyl)phenyl]boronic acid in the same manner as described above for 3-(4-cyclopropylphenyl)-6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine (Example C30).LC/MS *m/z*: 401.31 $(M+H)^+$.

Step 2: 4-{6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-3-yl}benzoic acid



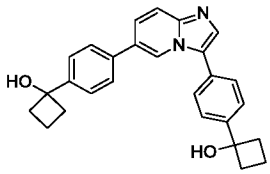
To a solution of ethyl 4-{6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridin-3-yl}benzoate(9.7 mg, 0.024 mmol) in a mixture of MeOH/THF (1:1) (0.5 mL) was added 2N NaOH (0.25 mL). The reaction mixture was stirred at r.t. for 4h, then concentrated *in vacuo*. The residue was acidified with 1N HCl, and then purified by preparative HPLCto afford 2mg (22%) of the product as a white solid.LC/MS *m/z*: 373.20 $(M+H)^+$.

Example C46: 3,6-bis(4-cyclopropoxyphenyl)imidazo[1,2-*a*]pyridine



The title compound was prepared from 6-bromo-3-iodoimidazo[1,2-a]pyridine and 4-(cyclopropoxy)phenylboronicacidin the same manner as described above for 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine (Example C2). LC/MS *m/z*: 383.33 $(M+H)^+$.

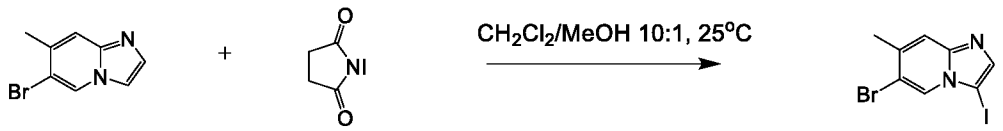
Example C47: 1-(4-{3-[4-(1-hydroxycyclobutyl)phenyl]imidazo[1,2-*a*]pyridin-6-yl}phenyl)cyclobutan-1-ol



The title compound was prepared from 6-bromo-3-iodoimidazo[1,2-a]pyridine and 4-(1-hydroxycyclobutyl)phenylboronicacidin the same manner as described above for 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine (Example C2). LC/MS *m/z*: 411.34 $(M+H)^+$.

Example C48: 7-methyl-3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine

Step 1: 6-bromo-3-iodo-7-methylimidazo[1,2-*a*]pyridine



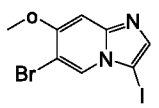
To a solution of 6-bromo-7-methylimidazo[1,2-a]pyridine (100 mg, 0.47 mmol) in CH_2Cl_2 (1 mL), was added 1-Iodopyrrolidine-2,5-dione (84 mg, 0.47 mmol) and MeOH (0.1 mL). The resulting mixture was stirred at room temperature for 2 h. The reaction was poured into water and extracted with ethyl acetate. The organic phase was dried over Na_2SO_4, filtered, and concentrated in vacuo. The residue was purified by SiO_2 column chromatography (hexane/EtOAc = 1:1) to give 122 mg (77 %) of the product as a white solid. LC/MS *m/z*: 337.00 $(M+H)^+$.

Step 2: 7-methyl-3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine

The title compound was prepared from 6-bromo-3-iodo-7-methylimidazo[1,2-a]pyridineand[4-(propan-2-yloxy)phenyl]boronicacidin the same manner as described above for 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine (Example C2). LC/MS *m/z*: 401.33 $(M+H)^+$.

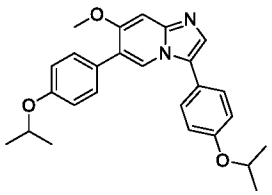
Example C49:7-methoxy-3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine

Step 1: 6-bromo-3-iodo-7-methoxyimidazo[1,2-a]pyridine



The title compound was prepared from 6-bromo-7-methoxyimidazo[1,2-a]pyridinein the same manner as described above for 6-bromo-3-iodo-7-methylimidazo[1,2-a]pyridine(Example C48, step 1). LC/MS *m/z*: 394.01$(M+H+CH_3CN)^+$.

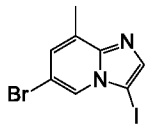
Step 2: 7-methoxy-3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine



The title compound was prepared from 6-bromo-3-iodo-7-methoxyimidazo[1,2-a]pyridineand[4-(propan-2-yloxy)phenyl]boronicacidin the same manner as described above for 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine (Example C2). ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.06 (s, 1H), 7.68 (s, 1H), 7.53 (s, 1H), 7.41 (d, 2H), 7.34 (d, 2H), 7.06 (d, 2H), 6.96 (d, 2H), 4.54-4.68 (m, 2H), 4.05 (s, 3H), 1.39 (d, 6H), 1.37 (d, 6H)., LC/MS *m/z*: 417.27 $(M+H)^+$.

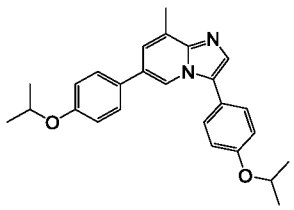
Example C50: 8-methyl-3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-a]pyridine

Step 1: 6-bromo-3-iodo-8-methylimidazo[1,2-a]pyridine



The title compound was prepared from 6-bromo-8-methylimidazo[1,2-a]pyridinein the same manner as described above for 6-bromo-3-iodo-7-methylimidazo[1,2-a]pyridine (Example C48, step 1). LC/MS*m/z*: 337.05 (^{79}Br, $M+H)^+$, 339.04 (^{81}Br, $M+H)^+$, 378.22 (^{79}Br, $M+H+CH_3CN)^+$, 380.00 (^{81}Br, $M+H+CH_3CN)^+$.

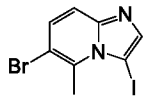
Step2: 8-methyl-3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-a]pyridine



The title compound was prepared from 6-bromo-3-iodo-8-methylimidazo[1,2-a]pyridineand[4-(propan-2-yloxy)phenyl]boronic acidin the same manner as described above for 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine (Example C2). LC/MS*m/z*: 401.33 $(M+H)^+$.

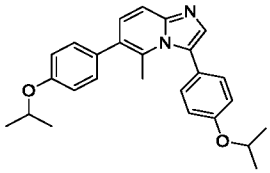
Example C51: 5-methyl-3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine

Step 1: 6-bromo-3-iodo-5-methylimidazo[1,2-*a*]pyridine



The title compound was prepared from 6-bromo-7-methylimidazo[1,2-a]pyridine in the same manner as described above for 6-bromo-3-iodo-8-methylimidazo[1,2-a]pyridine (Example C50, step 1). LC/MS *m/z*: 337.00$(M+H)^+$.

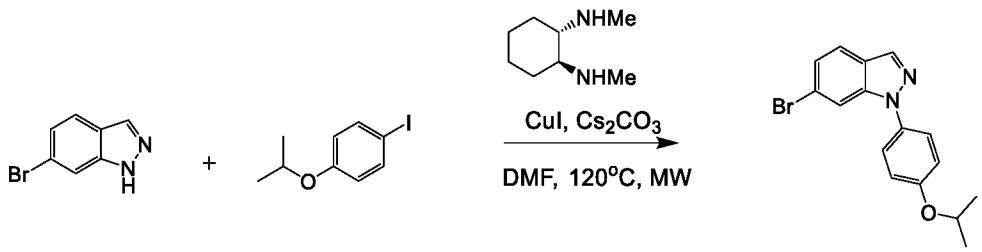
Step 2: 5-methyl-3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine



The title compound was prepared from 6-bromo-3-iodo-7-methoxyimidazo[1,2-a]pyridine and [4-(propan-2-yloxy)phenyl]boronicacidin the same manner as described above for 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine (Example C2).^{1}H NMR (300 MHz, $CDCl_3$) δ8.14 (d, 1H), 7.63 (s, 1H), 7.56 (d, 1H), 7.37 (d, 2H), 7.18 (d, 2H), 6.97 (d, 2H), 6.94 (d, 2H), 4.53 - 4.69 (m, 2H), 2.19 (s, 3H), 1.39 (d, 6H), 1.37 (d, 6H)., LC/MS *m/z*: 401.29 $(M+H)^+$.

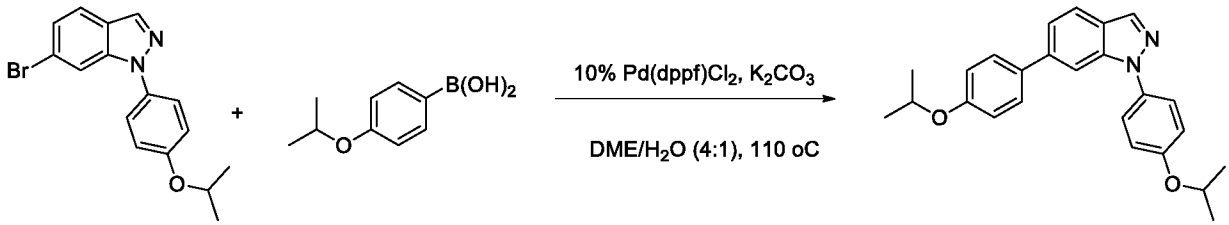
Example D1: 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole

Step1: 6-bromo-1-(4-isopropoxyphenyl)-1*H*-indazole



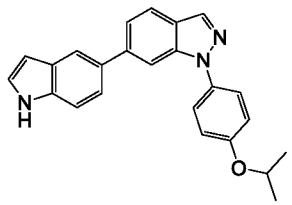
To a solution of 6-bromo-1*H*-indazole (10 mg, 0.04 mmol) in DMF (1 mL), were added 1-iodo-4-isopropoxybenzene (10 mg, 0.06 mmol), (1S,2S)-N^1,N^2-dimethylcyclohexane-1,2-diamine (0.8 mg, 0.084 mmol), copper(I) iodide (0.25 mg, 0.042 mmol), and Cs_2CO_3 (32.5 mg, 0.10 mmol) . The resulting mixture was stirred at 120 °C for 2 hr in microwave. After cooling to room temperature, the reaction was filtered with a celite pad. The filtrate was concentrated under reduced pressure and the residue was poured into water and extracted with ethyl acetate. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column chromatography (hexane/EtOAc = 1:1) to give 7.5 mg (45.2 %) of the product as a colorless oil. LC/MS *m/z*: 331.13 (^{79}Br, $M+H)^+$, 333.14 (^{81}Br, $M+H)^+$, 374.23 (^{79}Br, $M+H+CH_3CN)^+$, 376.22 (^{81}Br, $M+H+CH_3CN)^+$.

Step2: 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole



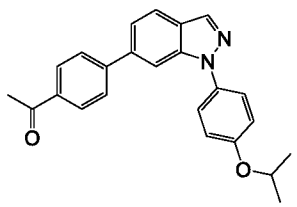
To a solution of 6-bromo-1-(4-isopropoxyphenyl)-1H-indazole (10 mg, 0.03 mmol) in dioxane (1.0 mL) and water (0.3 mL) was added (4-isopropoxyphenyl)boronic acid (6.5 mg, 1.2eq.) and sodium carbonate (10.4 mg g, 2.5 eq.). The reaction mixture was purged with nitrogen, then $Pd(dppf)Cl_2$ (2.2 mg, 0.1 eq.) was added. The resulting reaction mixture was heated to 110 ^{0}C for 0.5h under microwave. After cooling the reaction was poured into water and extracted with ethyl acetate. Dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column chromatography (hexanes / EtOAc = 1:2) to give 7.2 mg (65%) of the title compound as an oil. LC/MS *m/z*: 387.34 $(M+H)^+$.

Example D2: 6-(1*H*-indol-5-yl)-1-[4-(propan-2-yloxy)phenyl]-1*H*-indazole



The title compound was prepared from 6-bromo-1-(4-isopropoxyphenyl)-1H-indazole and (1H-indol-5-yl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole. LC/MS *m/z*: 368.27 $(M+H)^+$.

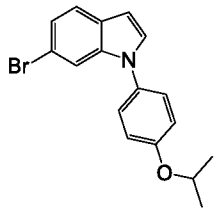
Example D3: 1-(4-{1-[4-(propan-2-yloxy)phenyl]-1*H*-indazol-6-yl}phenyl)ethan-1-one



The title compound was prepared from 6-bromo-1-(4-isopropoxyphenyl)-1H-indazole and (4-acetylphenyl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole. LC/MS *m/z*: 371.30 $(M+H)^+$, 413.24 $(M+H+CH_3CN)^+$.

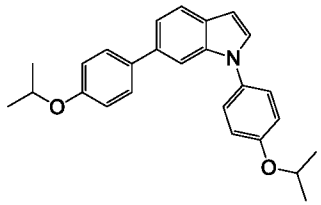
Example D4: 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indole

Step1: 6-bromo-1-(4-isopropoxyphenyl)-1*H*-indole



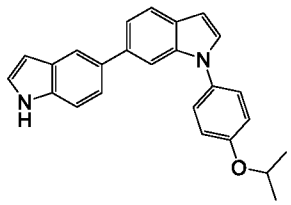
The title compound was prepared from 6-bromo-1*H*-indole and 1-iodo-4-isopropoxybenzene in the same manner as described above for 6-bromo-1-(4-isopropoxyphenyl)-1*H*-indazole (Example D1, Step 1). LC/MS *m/z*: 330.12 (^{79}Br, M+H)$^+$, 332.14 (^{81}Br, M+H)$^+$

Step2: 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indole



The title compound was prepared from 6-bromo-1-(4-isopropoxyphenyl)-1*H*-indole and (4-isopropoxyphenyl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole. LC/MS *m/z*: 386.33 (M+H)$^+$.

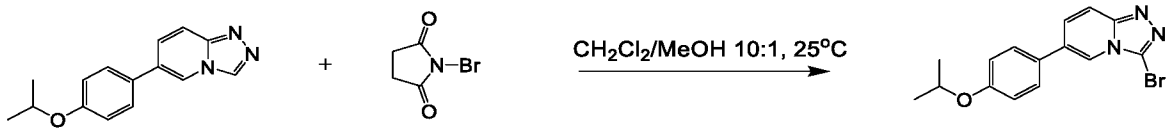
Example D5: 6-(1*H*-indol-5-yl)-1-[4-(propan-2-yloxy)phenyl]-1*H*-indole



The title compound was prepared from 6-bromo-1-(4-isopropoxyphenyl)-1H-indole and (1H-indol-5-yl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole. LC/MS *m/z*: 386.33 (M+H)$^+$.

Example D6: 3,6-bis[4-(propan-2-yloxy)phenyl]-[1,2,4]triazolo[4,3-*a*]pyridine

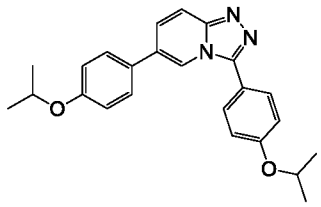
Step1: 3-bromo-6-(4-isopropoxyphenyl)-[1,2,4]triazolo[4,3-*a*]pyridine



To a solution of 6-(4-isopropoxyphenyl)-[1,2,4]triazolo[4,3-a]pyridine (10 mg, 0.039 mmol) in CH_2Cl_2 (0.5mL), was added 1-bromopyrrolidine-2,5-dione (14.1 mg, 0.80 mmol) and MeOH (0.05 mL). The resulting mixture was stirred at room temperature for 2 hr. The reaction was poured into water and

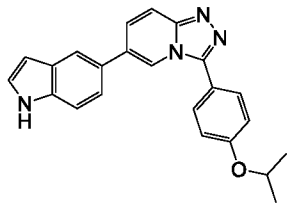
extracted with ethyl acetate. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column chromatography (EtOAc) to give 7.2 mg (56 %) of the product as a white solid. LC/MS *m/z*: 342.08 (^{79}Br, M+H)$^+$, 344.14 (^{81}Br, M+H)$^+$, 373.13 (^{79}Br, M+H+CH_3CN)$^+$, 375.22 (^{81}Br, M+H+CH_3CN)$^+$.

Step2: 3,6-bis[4-(propan-2-yloxy)phenyl]-[1,2,4]triazolo[4,3-*a*]pyridine



The title compound was prepared from 6-bromo-3-(4-isopropoxyphenyl)-[1,2,4]triazolo[4,3-*a*]pyridine and (4-isopropoxyphenyl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole. LC/MS *m/z*: 388.83 (M+H)$^+$.

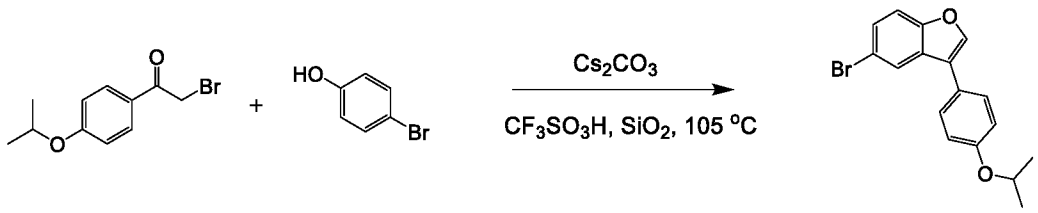
Example D7: 5-{3-[4-(propan-2-yloxy)phenyl]-[1,2,4]triazolo[4,3-a]pyridin-6-yl}-1*H*-indole



The title compound was prepared from 3-bromo-6-(4-isopropoxyphenyl)-[1,2,4]triazolo[4,3-*a*]pyridine and (1*H*-indol-5-yl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole. LC/MS *m/z*: 369.27 (M+H)$^+$.

Example D8: 3,5-bis[4-(propan-2-yloxy)phenyl]-1-benzofuran

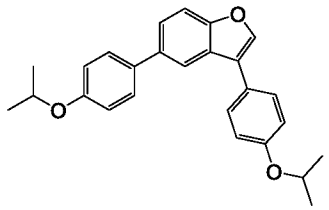
Step1: 5-bromo-3-(4-isopropoxyphenyl)benzofuran



To a solution of 2-bromo-1-(4-isopropoxyphenyl)ethan-1-one (100 mg, 0.39 mmol) in DMF (5 mL), were added 4-bromophenol (67.2, 0.39 mmol) and Cs_2CO_3(252 mg, 0.78 mmol) at room temperature. The resulting mixture was stirred at 40 °C for 1 hr. After cooling to room temperature, the reaction was filtered with a celite pad. The filtrate was poured into water and extracted with ethyl acetate. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was dissolved in toluene (5 mL) and then treated with trifluoro sulfonic acid (23.3 mg, 0.16 mmol) with 1g of SiO_2.

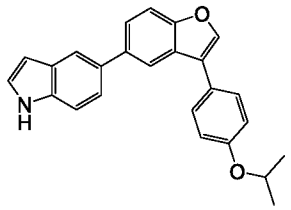
The resulting mixture was heated to 105 °C for 5hr. After cooling, the reaction was filtered with a celitepad. The filtrate was washed with water. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 (hexane/EtOAc = 5:1) to afford 102 mg of the title compound (82 mg, 63.4%) as a colorless oil.

Step2: 3,5-bis[4-(propan-2-yloxy)phenyl]-1-benzofuran



The title compound was prepared from 5-bromo-3-(4-isopropoxyphenyl)benzofuran and (4-isopropoxyphenyl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole.

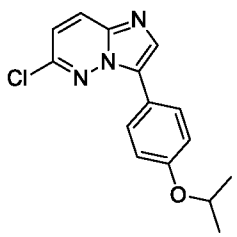
Example D9: 5-{3-[4-(propan-2-yloxy)phenyl]-1-benzofuran-5-yl}-1*H*-indole



The title compound was prepared from 5-bromo-3-(4-isopropoxyphenyl)benzofuran and (1*H*-indol-5-yl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole.

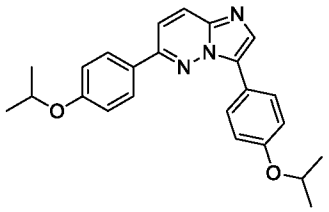
Example D10: 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*b*]pyridazine

Step 1: 6-chloro-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*b*]pyridazine



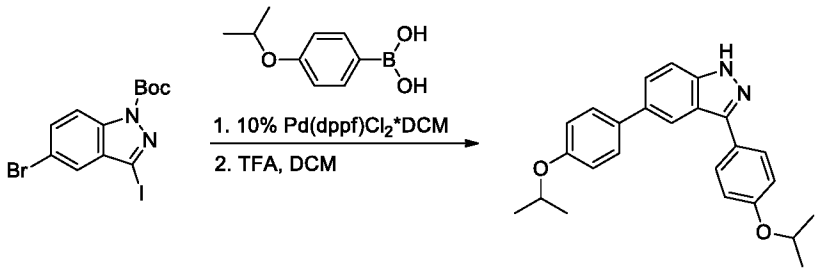
The title compound was prepared from 6-chloro-3-iodoimidazo[1,2-*b*]pyridazine and (4-isopropoxyphenyl)boronic acid in the same manner as described above for 6-bromo-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine. LC/MS *m/z*: 288.13 (^{35}Cl, M+H)$^+$, 290.15 (^{37}Cl, M+H)$^+$.

Step 2: 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*b*]pyridazine



The title compound was prepared from 6-chloro-3-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*b*]pyridazine and (4-isopropoxyphenyl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole. LC/MS *m/z*: 388.25 $(M+H)^+$.

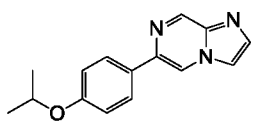
Example D11: 3,5-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole



To a solution of *tert*-butyl 5-bromo-3-iodo-1*H*-indazole-1-carboxylate (30 mg, 0.071mmol) in dioxane (0.5 mL) were added (4-isopropoxyphenyl)boronic acid (25 mg, 0.14mmol), [1,1'-bis(diphenylphosphino) ferrocene]dichloropalladium(II) complex with dichloromethane (5.8 mg, 0.0071 mmol), potassium carbonate (30 mg, 0.22mmol) and water (0.125 mL). The resulting reaction mixture was degassed with nitrogen for 10 min, heated to 100 °C for 10 min in a microwave reactor, then heated to 120 °C for additional15 min.Then, the reaction mixture was diluted with ethyl acetate and washed with water. The organic phase was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was dissolved in DCM (1 mL) and TFA (0.25 mL) was added dropwise. The reaction mixture was stirred at r.t. for 3 h, thenconcentrated*invacuo*. The residue was purified by preparative HPLC to afford 7 mg (26%) of the product as a yellow solid.LC/MS *m/z*: 387.28 $(M+H)^+$, 773.52 $(2M+H)^+$.

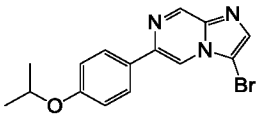
Example D12: 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyrazine

Step1: 6-(4-isopropoxyphenyl)imidazo[1,2-a]pyrimidine



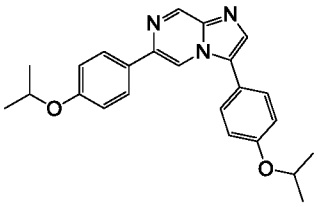
The title compound was prepared from 6-bromoimidazo[1,2-a]pyrazine and (4-isopropoxyphenyl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole. LC/MS m/z: 254.54 $(M+H)^+$.

Step2: 3-bromo-6-(4-isopropoxyphenyl)imidazo[1,2-*a*]pyrazine



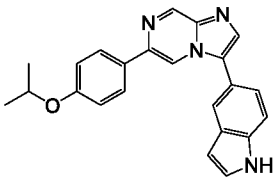
The title compound was prepared from 6-(4-isopropoxyphenyl)imidazo[1,2-*a*]pyrazine in the same manner as described above for 3-bromo-6-(4-isopropoxyphenyl)-[1,2,4]triazolo[4,3-*a*]pyridine (Example D6, Step 1). LC/MS m/z: 342.19 (^{79}Br, M+H)$^+$, 344.17 (^{81}Br, M+H)$^+$, 373.16 (^{79}Br, M+H+CH_3CN)$^+$, 375.14 (^{81}Br, M+H+CH_3CN)$^+$.

Step3: 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyrazine



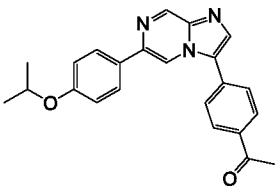
The title compound was prepared from 3-bromo-6-(4-isopropoxyphenyl)imidazo[1,2-*a*]pyrazine and (4-isopropoxyphenyl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole. LC/MS *m/z*: 388.26 (M+H)$^+$, 429.31 (M+H+CH_3CN)$^+$.

Example D13: 5-{6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyrazin-3-yl}-1*H*-indole



The title compound was prepared from 3-bromo-6-(4-isopropoxyphenyl)imidazo[1,2-*a*]pyrazine and (1*H*-indol-5-yl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole. LC/MS *m/z*: 369.27 (M+H)$^+$.

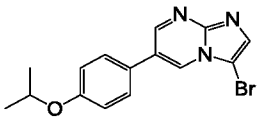
Example D14: 1-(4-{6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyrazin-3-yl}phenyl)ethan-1-one



The title compound was prepared from 3-bromo-6-(4-isopropoxyphenyl)imidazo[1,2-*a*]pyrazine and (4-acetylphenyl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole. LC/MS *m/z*: 369.27 (M+H)$^+$, 413.35 (M+H+CH_3CN)$^+$.

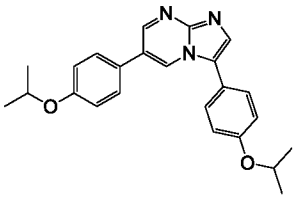
Example D15: 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyrimidine

Step1: 3-bromo-6-(4-isopropoxyphenyl)imidazo[1,2-a]pyrimidine



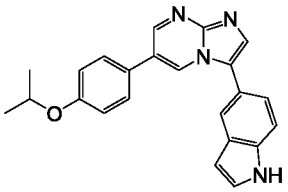
The title compound was prepared from6-(4-isopropoxyphenyl)imidazo[1,2-a]pyrimidine in the same manner as described above for 3-bromo-6-(4-isopropoxyphenyl)-[1,2,4]triazolo[4,3-a]pyridine (Example D6, Step 1).LC/MS *m/z*: 332.16 (^{79}Br, M+H)$^+$, 334.15 (^{81}Br, M+H)$^+$.

Step2: 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyrimidine



The title compound was prepared from 6-bromo-3-(4-isopropoxyphenyl)imidazo[1,2-*a*]pyrimidine and (4-isopropoxyphenyl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole. LC/MS *m/z*: 388.28 (M+H)$^+$.

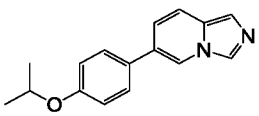
Example D16: 5-{6-[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyrimidin-3-yl}-1*H*-indole



The title compound was prepared from 3-bromo-6-(4-isopropoxyphenyl)imidazo[1,2-*a*]pyrimidine and (1*H*-indol-5-yl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole as a colorless oil. LC/MS*m/z*: 369.31 (M+H)$^+$.

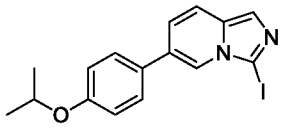
Example D17: 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,5-*a*]pyridine

Step1: 6-(4-isopropoxyphenyl)imidazo[1,5-a]pyridine



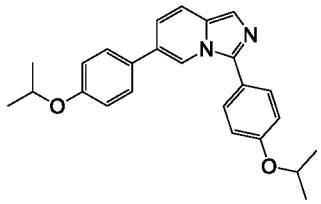
The title compound was prepared from 6-bromoimidazo[1,5-*a*]pyridine and (4-isopropoxyphenyl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole. LC/MSm/z: 253.22 (M+H)$^+$.

Step2: 3-iodo-6-(4-isopropoxyphenyl)imidazo[1,5-*a*]pyridine



The title compound was prepared from 6-(4-isopropoxyphenyl)imidazo[1,5-a]pyridine in the same manner as described above for 6-bromo-3-iodo-7-methylimidazo[1,2-a]pyridine (Example C48, step 1). LC/MSm/z: 379.16 $(M+H)^+$, 420.13 $(M+H+CH3CN)^+$.

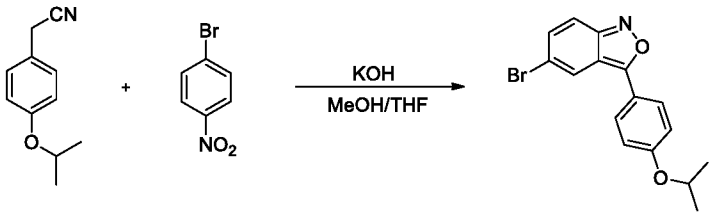
Step3: 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,5-*a*]pyridine



The title compound was prepared from 3-iodo-6-(4-isopropoxyphenyl)imidazo[1,5-*a*]pyridine and (4-isopropoxyphenyl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole as a colorless oil. LC/MS m/z: 387.39 $(M+H)^+$.

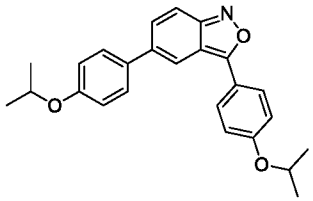
Example D18: 3,5-bis[4-(propan-2-yloxy)phenyl]-2,1-benzoxazole

Step 1: 5-bromo-3-[4-(propan-2-yloxy)phenyl]-2,1-benzoxazole



To a vigorously stirred solution of KOH (0.64 g, 11.4 mmol) in MeOH (1.3 mL) cooled to 0 ^{0}C was added 2-[4-(propan-2-yloxy)phenyl]acetonitrile (0.1 g, 0.57 mmol). After the solution was complete, a solution of 1-bromo-4-nitrobenzene (0.115 g, 0.57 mmol) in a mixture of THF (0.5 mL) and MeOH (1 mL) was added dropwise. The reaction mixture was brought to r.t. gradually and stirred overnight, then concentrated *in vacuo.* The residue was dissolved in EtOAc and washed with water. The organic layer was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by SiO_2 column chromatography (hexanes / EtOAc from 9:1 to 4:1) to give 36 mg (19%) of the product as yellow solid. LC/MS *m/z*: 331.92 (^{79}Br, $M+H)^+$, 333.97 (^{81}Br, $M+H)^+$.

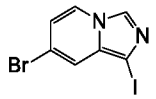
Step 2: 3,5-bis[4-(propan-2-yloxy)phenyl]-2,1-benzoxazole



The title compound was prepared from 5-bromo-3-[4-(propan-2-yloxy)phenyl]-2,1-benzoxazole and (4-isopropoxyphenyl)boronic acid in the same manner as described above for 1,6-bis[4-(propan-2-yloxy)phenyl]-1*H*-indazole. LC/MS *m/z*: 388.21 $(M+H)^+$, 775.52 $(2M+H)^+$.

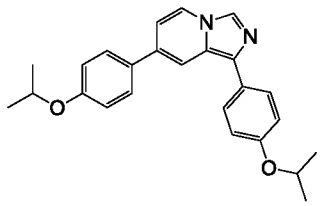
Example D19: 1,7-bis[4-(propan-2-yloxy)phenyl]imidazo[1,5-*a*]pyridine

Step 1: 7-bromo-1-iodoimidazo[1,5-*a*]pyridine



The title compound was prepared from 7-bromoimidazo[1,5-*a*]pyridine in the same manner as described above for 6-bromo-3-iodo-7-methylimidazo[1,2-*a*]pyridine (Example C48, step 1). LC/MS *m/z*: 322.56 (^{79}Br, $M+H)^+$, 324.93 (^{81}Br, $M+H)^+$, 364.01 (^{79}Br, $M+H+CH_3CN)^+$, 366.05 (^{81}Br, $M+H+CH_3CN)^+$.

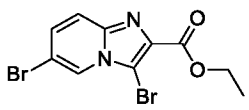
Step 2: 1,7-bis[4-(propan-2-yloxy)phenyl]imidazo[1,5-*a*]pyridine



The title compound was prepared from 7-bromo-1-iodoimidazo[1,5-*a*]pyridine and (4-isopropoxyphenyl)boronic acid in the same manner as described above for 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine (Example C2). LC/MS *m/z*: 387.30 $(M+H)^+$.

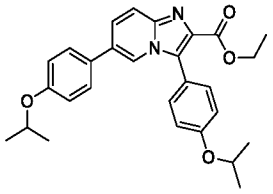
Example D20: ethyl 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-a]pyridine-2-carboxylate

Step 1: ethyl 3,6-dibromoimidazo[1,2-*a*]pyridine-2-carboxylate



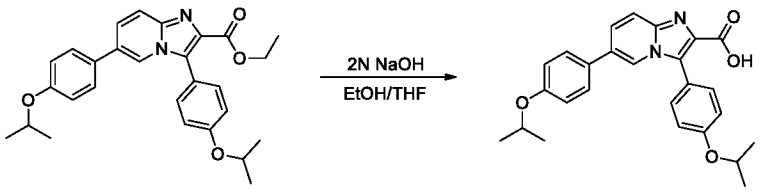
The title compound was prepared from ethyl 6-bromoimidazo[1,2-*a*]pyridine-2-carboxylate in the same manner as described above for 3-bromo-6-(4-isopropoxyphenyl)-[1,2,4]triazolo[4,3-a]pyridine (Example D6, Step 1). LC/MS *m/z*: 346.95 (^{79}Br, $M+H)^+$, 348.97 (^{81}Br, $M+H)^+$.

Step 2: ethyl 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine-2-carboxylate



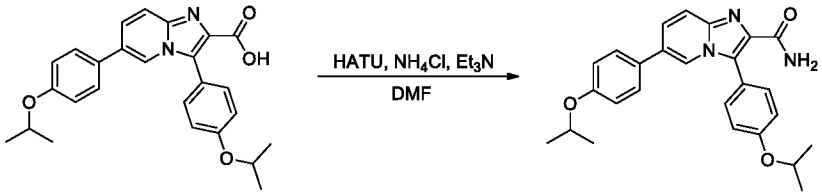
The title compound was prepared from ethyl 3,6-dibromoimidazo[1,2-*a*]pyridine-2-carboxylate and (4-isopropoxyphenyl)boronicacid in the same manner as described above for 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine (Example C2). LC/MS *m/z*: 459.27 $(M+H)^+$.

Example D21: 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine-2-carboxylic acid



To a solution of ethyl 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine-2-carboxylate (30 mg, 0.065 mmol) in a mixture of EtOH/THF (1:1) (1 mL) was added 2N NaOH (0.5 mL). The reaction mixture was stirred at r.t. for 4h, then concentrated *in vacuo*. The residue was acidified with 1N HCl, and then purified by preparative HPLC to afford 19.6 mg (70%) of the product as a white solid. LC/MS *m/z*: 431.25 $(M+H)^+$.

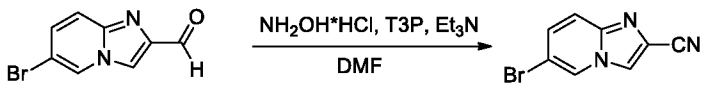
Example D22: 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine-2-carboxamide



To a solution of 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine-2-carboxylic acid (16 mg, 0.037 mmol) in DMF (0.5 mL) cooled to 10 ^{0}C were added Et_3N (11 mg, 0.11 mmol) and HATU (21 mg, 0.055 mmol). The reaction mixture was stirred at r.t. for 0.5 h, and then NH_4Cl (8 mg, 0.15 mmol) was added. The reaction mixture was stirred at r.t. overnight, then diluted with DCM. The organic phase was washed with saturated $NaHCO_3$ solution and water. The organic layer was dried over Na_2SO_4, filtered, and concentrated *in vacuo*. The residue was purified by preparative HPLC to afford 6 mg (37%) of the product as a white solid. LC/MS *m/z*: 430.28 $(M+H)^+$.

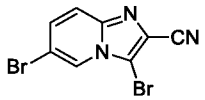
Example D23: 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine-2-carbonitrile

Step 1: 6-bromoimidazo[1,2-*a*]pyridine-2-carbonitrile



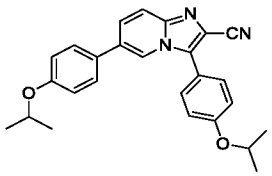
To a mixture of 6-bromoimidazo[1,2-*a*]pyridine-2-carbaldehyde (0.1 g, 0.44 mmol), hydroxylamine hydrochloride (34 mg, 0.49 mmol), and Et_3N (49 mg, 0.49 mmol) in DMF (0.5 mL) was added propylphosphonic anhydride solution in DMF (50 wt. %, 0.29 mL, 0.49 mmol). The reaction mixture was stirred at 100 ^{0}C for 3h. Then, the reaction mixture was cooled to r.t., diluted with EtOAc and washed with saturated $NaHCO_3$ solution and water. The organic layer was dried over Na_2SO_4, filtered, and concentrated *in vacuo*.The residue was purified by SiO_2 column chromatography (hexanes / EtOAc from 7:3 to 1:1) to give 35 mg (35%) of the product as a white solid. LC/MS *m/z*: 222.08 (^{79}Br, M+H)$^+$, 224.13 (^{81}Br, M+H)$^+$.

Step 2: 3,6-dibromoimidazo[1,2-*a*]pyridine-2-carbonitrile



The title compound was prepared from6-bromoimidazo[1,2-*a*]pyridine-2-carbonitrile in the same manner as described above for 3-bromo-6-(4-isopropoxyphenyl)-[1,2,4]triazolo[4,3-a]pyridine (Example D6, Step 1). LC/MS *m/z*: 340.92 (^{79}Br, M+CH_3CN+H)$^+$, 342.97 (^{81}Br, M+CH_3CN+H)$^+$.

Step 3: 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine-2-carbonitrile



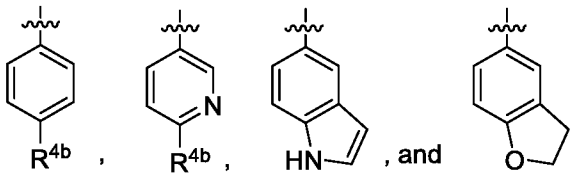
The title compound was prepared from 3,6-dibromoimidazo[1,2-*a*]pyridine-2-carbonitrile and (4-isopropoxyphenyl)boronicacid in the same manner as described above for 3,6-bis[4-(propan-2-yloxy)phenyl]imidazo[1,2-*a*]pyridine (Example C2). LC/MS *m/z*: 412.21 (M+H)$^+$.

Arenavirus GP Pseudotype Assay.

Utilizing a VSV pseudotype system expressing arenavirus glycoproteins (pseudotyped viruses here to referred to as LASV-p, MACV-p, JUNV-p, GTOV-p and TCRV-p) and the *Renilla* luciferase reporter gene heterocyclic compounds were screened to identify individual compounds that inhibit infectivity of the pseudotyped viruses but not the native VSV virus expressing the VSV glycoprotein. VSV viruses expressing the VSV glycoprotein or pseudotyped with LASV, MACV, JUNV, GTOV and TCRV glycoproteins (LASV-p, MACV-p, JUNV-p, GTOV-p and TCRV-p) were generated in cultured HEK-293T cells (ATCC CRL-3216), which were grown in 10 cm dishes in DMEM supplemented with 10% FBS, 1X Pen-Strep, non-essential amino acids and L-glutamine. When cells reached approximately 80% confluency, they were transfected with a mixture of 15 µg of the pCAGGS plasmid encoding the desired glycoprotein and 45 µl of PEI (polyethylenimine) transfection reagent (PEI MAX,

Polysciences Inc., #24765). The cells were incubated with the solution for 5 hours at 37°C at 5% CO_2 then washed and the mixture replaced with supplemented DMEM and incubated at 37°C at 5% CO_2 for approximately 16-18 hours. Subsequently cells were infected with approximately 50 µl of VSV reporter virus whereby the VSV glycoprotein was replaced with a luciferase reporter gene. The cells were infected for 1 hour, then washed 1X with PBS and incubated in supplemented media. 24 hours post-infection, supernatant was collected, clarified by centrifugation and filtration through a 0.45um filter, aliquoted and stored at -80°C. Both VSV-Luciferase and arenavirus glycoproteins pseudotypes were titrated for luminescence activity in Vero cells as described in the Luciferase assay protocol (below). Vero cells (ATCC: CCL-81) were grown in clear 384 well plates (3000 cells/well) in supplemented DMEM media. After incubating overnight at 37°C and 5% CO_2, cells were treated with compounds at desired concentrations and pseudotyped virus in assay media. Assay media consisted of 50% Opti-MEM, 50% DMEM, with 1% FBS, Pen-Strep, non-essential amino acids and L-glutamine. Each of the viral supernatants generated was diluted (from 1:100 to 1:2000) to give similar luminescence signal / background values of $\geq$ 200. Final DMSO concentration in the compound testing wells was kept $\leq$ 1% and control wells were treated with assay media and 1% DMSO. Cells were incubated for 24 hours at 37°C and 5% CO_2. The compound-virus mixture was aspirated off the cells 24 hours post-infection and washed 1X with PBS. Cells were then lysed using 20 µl of lysis buffer from a Luciferase kit diluted according to manufacturer's instructions. After incubating for approximately 20 minutes, 5 µl of cell lysate was transferred to an opaque white plate, and mixed with 12.5 µl of Coelenterazine diluted in buffer. This mixture was incubated at room temperature for 10 minutes on a plate shaker and then the luminescence was read using a plate reader (Beckman Coulter DTX 880 multimode detector with an emission of 535 nm). Luminescence signals were obtained for compound containing and control wells to determine % activity (inhibition of luciferase signal) for each compound.

Surprisingly, it was found that certain R^2 groups such as



, and , wherein

R^{4b} is selected from the group consisting of isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, and acetyl, can provide broad spectrum activity across multiple arenavirus strains.

Replicative Tacaribe virus testing

Selected compounds were tested against native replicating Tacaribe (TCRV) virus (TRVL-11573, BEI Resources) using an ELISA-based assay. Vero cells (ATCC: CCL-81) were grown in a 96-well format (5000 cells/well) in supplemented DMEM media. After overnight incubation, cells were treated with TCRV and compounds at desired concentrations, in MEM media with 1% FBS and

supplements. Final DMSO concentration in the compound testing wells was kept ≤ 1% and control wells were treated with TCRV or media and 1% DMSO. After 5 days of incubation at 37°C in 5%CO_2, cells were fixed with 2% paraformaldehyde for 45 minutes and then washed with PBS. Subsequently the cells were permeabilized with 0.25% triton-X, then TCRV was detected using ELISA with the following protocol. Monoclonal Anti-Junin Virus antibody (BEI #NR 41860), which cross reacts with TCRV nucleoprotein, was used to stain cells. After washing, cells were treated with biotin conjugated secondary antibody and subsequently, streptavidin conjugated horseradish peroxidase. TMB substrate was added to the wells, and the reaction was stopped using 2M sulfuric acid. The absorbance was read using a plate reader (Beckman Coulter DTX 880 multimode detector with an emission of 450 nm). OD readings were obtained for compound containing and control wells to determine % activity for each compound.

Cytotoxicity Screening

Active compounds in the pseudotype assays were also evaluated for cytotoxicity over a period of 7 days. Compounds were serially diluted and added to Vero cells (4000 cells/well) with final DMSO concentration maintained at 1% in growth media consisting of minimal essential media (MEM) with 1% FBS. The plates were incubated at 37 °C for 7 days, and then dead cells were removed by washing with Phosphate buffered saline (PBS). CPE was assessed by staining cells with neutral red dye for 1 hour and then de-staining with a solution of 50% ethanol/ 1% acetic acid solution. Absorbances were read at 540 nm and 690 nm on a Spectramax Plus 384 spectrophotometer. Data were analyzed as (540 nm – 690 nm) and then compared to untreated controls to obtain % cell survival.

Replicative LASV and JUNV inhibitory activity plaque assays

Confluent or near-confluent cell culture monolayers in 12-well disposable cell culture plates were prepared. Cells were maintained in MEM or DMEM supplemented with 10% FBS. For antiviral assays the same medium was used but with FBS reduced to 2% or less and supplemented with 1% penicillin/streptomycin. The test compounds were prepared at seven half log10 final concentrations, (01-10 µM) in 2X MEM or 2X DMEM. Test compounds and positive control compounds (favipiravir and ribavirin) were run in parallel in biological triplicates. The assay was initiated by first removing growth media from the 12-well plates of cells, which was challenged with compound at a given concentration and 0.01 MOI of virus or about 50 to 100 plaque forming units (pfu). Cells were incubated for 60 min: 100 µL inoculum/ well, at 37°C, 5% CO_2 with constant gentle rocking. Virus inoculum was removed, cells washed and overlaid with either 1% agarose or 1% methylcellulose diluted 1:1 with 2X MEM and supplemented with 2% FBS and 1% penicillin/streptomycin and along with the corresponding drug concentration. Cells were incubated at 37°C with 5% CO_2 for 5 days. The overlay was then removed and plates stained with 0.05% crystal violet in 10% buffered formalin for approximately twenty minutes at room temperature. The plates were washed, dried and the number of plaques counted. The number of plaques in each set of compound dilution was converted to a percentage relative to the untreated virus control. The 50% effective (EC_{50}, virus-inhibitory) concentrations were then

calculated by linear regression analysis. The quotient of CC_{50} divided by EC_{50} gives the selectivity index (SI) value. Compounds showing SI values $\geq$10 were considered active.

LMCV CPE inhibitory assay

Confluent or near-confluent cell culture monolayers in 96-well disposable microplates were prepared and maintained in MEM or DMEM supplemented with FBS, which was reduced to 2% or less for antiviral testing supplemented with 50 µg/ml gentamicin. The test compound was prepared at four log_{10} final concentrations. Four compounds were tested per microplate with five microwells per dilution: three for infected cultures and two for uninfected toxicity cultures. Controls for the experiment consist of six microwells that were infected (virus controls) and six that were untreated (cell controls). The virus control and cell control wells were on every microplate. In parallel, a known active drug ribavirin was tested as a positive control using the same method as applied for test compounds. The assay was initiated by first removing growth media from the 96-well plates of cells and the test compound was applied in 0.1 ml volume to wells at 2X concentration. Virus, normally at $\leq$100 50% cell culture infectious doses (CCID50) in 0.1 ml volume, were placed in those wells designated for virus infection. Medium devoid of virus was placed in toxicity control wells and cell control wells. Virus control wells were treated similarly with virus. Plates were incubated at 37°C with 5% CO_2 until maximum CPE (cytopathic effect or cell death) was observed in virus control wells. The plates were then stained with 0.011% neutral red for approximately two hours at 37°C in a 5% CO_2 incubator. The neutral red medium was removed by complete aspiration, and the cells rinsed 1X with phosphate buffered solution (PBS) to remove residual dye. The PBS was removed and the incorporated neutral red was eluted with 50% Sorensen's citrate buffer/50% ethanol for 30 minutes. Neutral red dye penetrates into living cells, thus, the more intense the red color, the larger the number of viable cells present in the wells. The dye content in each well was quantified using a 96-well spectrophotometer at 540 nm wavelength. The dye content in each set of wells was converted to a percentage of dye present in untreated control wells using a Microsoft Excel computer-based spreadsheet. The 90% effective (EC_{90}, virus-inhibitory) concentrations and 50% cytotoxic (CC_{50}, cell-inhibitory) concentrations were calculated by linear regression analysis. The quotient of CC_{50} divided by EC_{90} gives the selectivity index (SI_{90}) value. Compounds showing SI values $\geq$10 were considered active.

Microsomal Assays

In addition to the ability of compounds to demonstrate broad inhibitory activity against arenaviruses *in vitro*, compounds must also have certain drug-like properties for them to be used to inhibit arenaviruses and provide methods of treatment for arenavirus infection in mammals *in vivo.* Such compounds may exhibit drug-like properties including but not limited to chemical stability against metabolic degradation by liver microsomal CYP p450 enzymes, cell permeability and oral bioavailability (if the drug is to delivered orally) and lack of inhibition of the hERG ion channel,

which is associated with cardiac safety [Kerns, E.H. Li, D. *Drug-like Properties: Concepts, Structure Design and Methods from ADME to Toxicity Optimization*, (2008) Academic Press, Burlington MA]. To characterize drug-like properties of the chemical series example compounds were evaluated for metabolic stability in human, mouse, guinea pig, monkey, rat, mouse, and dog liver microsome assays (**Table 3**), and for inhibition of the hERG ion channel (**Table 4**). Compounds exhibiting > 60% remaining of parent indicate attractive chemical stability. The demonstration of good microsomal stability in human and nonhuman species facilitates the ability to test and optimize compounds in preclinical animal studies.

A reaction premixture was set up, containing 1 uM compound of interest, 1 mg/mL liver microsomes of desired species, 2.1 mM $MgCl_2$ and 0.1 M sodium phosphate buffer, pH 7.4. This premixture was incubated at 37*C for 30 minutes with gentle agitation to allow the compound to be completely dissolved in the mixture. Then freshly made NADPH solution in 0.1M sodium phosphate buffer was added at a concentration of 2mM to start the reaction. A 'Time 0' sample (30 uL) was taken out immediately after addition of NADPH and added to 140uL cold acetonitrile containing 1uM of pre-decided internal standard. The rest of the reaction mixture was incubated at 37°C for the remaining time period. Test compounds were left in the reaction mixture for 60 minutes before 'Time 60' sample was added to acetonitrile with internal standard. The control compound (Verapamil for human, monkey and dog LM, Lidocaine for Guinea pig LM, and diphenhydramine for rat and mouse LM) was incubated in reaction mixture for 15 minutes before 'Time 15' samples were collected and added to cold acetonitrile with internal standard. The samples were then spun in a centrifuge for 10 minutes at 4000 rpm, supernatant was collected and mixed with equal parts distilled water. These were then analyzed on a Varian 500-MS. Surprisingly, when R^{4b} was isopropoxy, better microsomal stability was observed across multiple species tested.

hERG Channel Assay

Drugs belonging to different classes have been shown to be associated with QT prolongation and in some cases serious ventricular arrhythmias. The most common mechanism for these adverse events is the inhibition of one or more cardiac potassium channels, in particular hERG. This current is important for cardiac myocyte repolarization and is a common target for drugs that prolong the QT interval. Test articles in this study were therefore, characterized to determine their ability to inhibit the hERG channel. Ion channel activity was measured using a stably transfected Chinese Hamster Ovary (CHO) cell line expressing the hERG mRNA. The pharmacology of this cloned channel expressed in the CHO cell line is very similar to that observed in native tissue. Cells were cultured in DMEM/F12 containing 10% FBS, 1% penicillin/streptomycin and 500 µg/ml G418. Before testing, cells were harvested using Accumax (Innovative Cell Technologies). For electrophysiological recordings, the following solutions were used: External solution: 2 mM CaCl2; 2 mM MgCl2; 4 mM KCl; 150 mM NaCl; 10 mM Glucose; 10 mM HEPES; 305-315 mOsm; pH 7.4 (adjusted with 5M NaOH); Internal solution: 140 mM KCl; 10 mM MgCl2; 6 mM EGTA; 5 mM HEPES-

Na; 5 mM ATP-Mg; 295-305 mOsm; pH 7.25 (adjusted with 1M KOH). Whole cell recordings were performed using PX 7000A (Axon Instruments) with AVIVA's SealChip™ technology. Cells were voltage clamped at a holding potential of -80 mV. The hERG current was then activated by a depolarizing step to -50 mV for 300 ms. This first step at –50 mV was used as a baseline for measuring peak amplitude of the tail current. Next, a voltage step to +20 mV was applied for 5 s to activate the channels. Finally, a step back to -50 mV for 5 s removed activation and the deactivating tail current was recorded. External solution containing 0.1% DMSO (vehicle) was applied to the cells to establish a baseline. After allowing the current to stabilize for 3 to 10 min, test articles were applied. Test article solutions were added to cells in 4 separate additions. Cells were kept in test solution until effect of the test article reached steady state, to a maximum of 12 min. Next, 1 μM cisapride (positive control) was added. Finally, washout with External Solution was performed until the recovery current reached steady state. Data analysis was performed using DataXpress (Axon Instruments), Clampfit (Axon Instruments) and Origin (OriginLab Corporation) software.

Table 1. Examples. Example compounds and their observed inhibitory activities against the indicated pseudotyped viruses (LASV-p, MACV-p, JUNV-p, TCRV-p, GTOV-p, VSV-p) or in cellular cytotoxicity assays; shown are EC_{50} for LASV-p, MACV-p, JUNV-p, TCRV-p, and GTOV-p, and VSV-p CC_{50} for cytotoxicity; nd: not determined

Ex.	LASV-p EC_{50} (nM)	MACV-p EC_{50} (nM)	JUNV-p EC_{50} (nM)	TCRV-p EC_{50} (nM)	GTOV-p EC_{50} (nM)	VSV-p EC_{50} (nM)	CC_{50} (nM)
A1	31.7	> 100	> 100	> 100	nd	nd	12,890
A2	6.6	> 100	> 100	> 100	nd	nd	25,580
A3	7.6	>25	>25	>25	nd	nd	<300
A4	>25	>25	>25	>25	nd	nd	<300
A5	> 25	> 25	> 25	> 25	nd	nd	<300
A6	> 25	> 25	> 25	> 25	nd	nd	9,720
A7	8.9	17.0	1.8	> 25	nd	980	3,960
A8	6.4	22.3	3.98	21.7	nd	> 1,000	9,540
A9	> 100	nd	nd	nd	nd	nd	nd
A10	21.8	> 25	> 25	> 25	nd	nd	4,560
A11	> 25	> 25	> 25	> 25	nd	nd	nd
A12	0.81	> 25	19.3	21.4	nd	800	200
A13	5.0	> 25	> 25	> 25	nd	nd	1,270
A14	7.4	> 25	> 25	> 25	nd	nd	1,950
A15	14.7	24.95	2.23	29.6	nd	nd	12,940

A16	17.2	> 25	15.29	> 25	nd	> 1,000	>100,000
A17	1.1	0.2	0.2	0.6	0.52	> 1,000	5,810
A18	1.08	2.27	1.55	12.50	0.07	> 1,000	14,000
A19	> 100	nd	nd	nd	nd	nd	nd
A20	> 100	nd	nd	nd	nd	nd	nd
A21	3.07	14.4	3.5	> 25	nd	nd	5,220
A22	> 25	> 25	> 25	> 25	nd	nd	nd
A23	> 25	> 25	> 25	> 25	nd	nd	nd
A24	0.91	3.7	1.7	15.9	0.3	nd	71,320
A25	1.61	7.1	4.9	28.0	0.2	nd	12,190
A26	0.59	0.70	0.81	1.45	0.73	nd	7,520
A27	0.60	0.38	0.39	2.57	nd	nd	3,860
A28	11.0	> 25	7.29	> 25	nd	nd	nd
A29	0.53	11.07	6.96	15.23	nd	nd	nd
A30	0.53	0.21	0.03	0.07	0.21	5.31	3,670
A31	2.6	0.9	0.18	0.7	nd	nd	3,790
B1	1.61	7.09	4.95	27.99	0.88	> 1,000	12,190
B2	0.41	0.935	0.21	5.53	0.07	>10,000	4,140
B3	1.01	10.27	1.79	27.73	nd	nd	>100,000
B4	0.956	18.63	4.31	14.95	nd	nd	19,740
B5	> 25	> 25	13.38	> 25	nd	nd	nd
B6	17.76	14.28	3.35	18.83	nd	nd	nd
B7	8.18	24.08	16.19	> 25	nd	nd	13,900
B8	> 25	> 25	> 25	> 25	nd	nd	nd
B9	19.72	29.7	11.88	> 25	nd	nd	27,700
B10	11.0	19.6	3.1	> 25	nd	nd	4,680
B11	6.4	25.0	25.0	> 25	nd	nd	24,200
B12	0.88	1.04	0.26	5.21	0.04	5,490	>100,000
B13	1.53	5.58	1.805	20.38	1.24	5,360	6,620
B14	1.055	15.43	1.36	> 25	nd	nd	7,390
B15	0.95	0.25	0.02	0.37	0.18	> 10,000	>100,000
C1	0.59	0.7	0.82	1.45	0.08	> 1,000	7,520
C2	0.6	0.38	0.4	2.57	0.14	> 1,000	3,860
C3	7.25	2.7	1.17	10.57	0.31	>10,000	6,160

C4	4.35	23.94	4.62	29.88	nd	nd	4,560
C5	4.1	31.4	9.09	> 25	nd	nd	4,690
C6	2.7	18.59	7.02	> 25	nd	nd	10,510
C7	> 25	> 25	> 25	> 25	nd	nd	4,810
C8	2.03	1.7	1.08	9.44	0.21	8,120	31,130
C9	1.15	0.71	0.45	1.7	0.27	5,810	3,970
C10	4.61	28.93	19.04	>25	nd	nd	>100
C11	2.83	10.04	3.21	18.44	0.86	3,090	25,240
C12	6.07	3.12	1.32	7.76	0.44	5,060	4,020
C13	0.3	1.22	0.62	2.95	0.29	1,880	5,090
C14	> 25	> 25	> 25	> 25	nd	nd	nd
C15	7.97	13.46	2.85	7.6	0.58	5,060	nd
C16	> 25	> 25	>25	> 25	nd	nd	nd
C17	13.37	28.8	6.38	> 25	nd	nd	23,880
C18	18.13	0.59	0.305	2.68	nd	nd	3,980
C19	2.9	0.23	0.195	1.83	0.2	9.86	8,200
C20	4.98	6.82	1.43	5.12	0.15	>10,000	3,750
C21	0.51	0.16	0.115	> 25	0.2	>10,000	3,980
C22	2.33	0.335	0.415	4.94	0.45	nd	24,390
C23	> 25	> 25	> 25	> 25	nd	nd	nd
C24	4.58	0.875	0.416	3.91	0.15	9,810	4,180
C25	> 25	> 25	25	>25	nd	nd	nd
C26	0.56	0.2	0.1	0.2	0.27	4,530	3,540
C27	0.66	0.68	0.51	0.58	0.24	>10,000	5,280
C28	17.27	> 25	14.86	> 25	nd	nd	>100,000
C29	> 25.0	> 25	> 25	> 25	nd	nd	nd
C30	1.02	1.08	0.82	3.83	0.05	6,960	3,980
C31	1.35	2.09	0.65	2.65	0.76	>10,000	>10,000
C32	0.4	0.11	0.06	0.06	0.2	4,840	4,840
C33	1.3	5.31	2.3	6.57	0.91	4,770	4,770
C34	4.73	25.14	3.68	16.52	nd	nd	nd
C35	14.46	28.2	13.05	> 25	nd	nd	nd
C36	8.18	> 25	23.19	> 25	nd	nd	nd
C37	3.34	2.36	0.38	> 25	0.25	9,950	nd

C38	0.84	0.34	0.2	1.77	0.2	7,390	95,870
C39	8.41	2.67	0.73	9.86	nd	nd	>100,000
C40	3.83	5.85	0.97	22.64	1.35	6,170	4,110
C41	0.67	13.96	1.6	> 25	nd	nd	8,650
C42	3.08	23.08	2.6	11.67	nd	nd	5,360
C43	> 25	> 25	> 25	> 25	nd	nd	nd
C44	0.23	0.32	0.07	0.135	nd	nd	>100
C45	> 25	> 25	> 25	> 25	nd	nd	nd
C46	7.23	8.47	4.42	22.52	1.26	4,550	4,610
C47	1.8	0.5	0.55	1.17	0.44	4,340	7,860
C48	0.38	0.41	0.165	0.2	nd	nd	4,710
C49	8.02	0.86	0.16	1.1	nd	nd	5,270
C50	15.48	6.56	4.65	> 25	nd	nd	3,810
C51	0.31	0.13	0.15	0.37	0.21	nd	4,190
D1	> 25	> 25	13.98	> 25	nd	nd	nd
D2	7.99	22.46	17.78	> 25	nd	nd	4,340
D3	7.04	15.5	20.25	> 25	nd	nd	15,900
D4	> 25	16.94	8.1	> 25	nd	nd	nd
D5	12.47	> 25	27.81	>25	nd	nd	5.870
D6	9.6	2.56	1.005	15.45	0.53	6,420	4,410
D7	4.1	>25	18.04	26.33	nd	nd	1,870
D8	> 25	> 25	> 25	> 25	nd	nd	nd
D9	> 25	> 25	> 25	> 25	nd	nd	nd
D10	1.5	14.755	0.95	> 25	nd	9,360	7,720
D11	10.5	> 25	3.22	> 25	nd	nd	5,210
D12	2.95	16.37	2.605	20.68	0.93	6,980	8,510
D13	12.34	12.0	3.2911	10.35	nd	nd	>100,000
D14	6.77	25.0	13.53	20.25	nd	nd	13,030
D15	1.24	1.65	0.34	3.57	1.04	>10,000	6,230
D16	5.37	19.1	1.05	19.85	3.52	nd	7,530
D17	> 25	> 25	> 25	> 25	nd	nd	nd
D18	> 25	> 25	5.58	> 25	Nd	nd	>100,000
D19	> 25	> 25	> 25	> 25	nd	nd	7,540
D20	> 25	> 25	> 25	> 25	nd	nd	nd

D21	> 25	> 25	> 25	> 25	nd	nd	nd
D22	> 25	> 25	> 25	> 25	nd	nd	49,520
D23	27.35	> 25	3.78	> 25	nd	nd	>100,000

Table 2. Inhibition of Native Arenaviruses. Example compounds and their observed inhibitory activities and selectivity index values (SI) in replicative LASV, JUNV and LCMV inhibitory activity plaque assays

Ex.	LASV EC_{50} uM	SI	JUNV EC_{50} uM	SI	TCRV EC_{50} uM	SI_{50}	LCMV EC_{90} uM	SI_{90}
A17	0.06	249	0.115	82	0.023	609	0.71	12
A24	0.06	527	0.56	53	0.010	7100	0.56	18
C1	0.025	921	0.055	352	0.003	2500	0.82	37
C2	0.015	1200	0.035	509	0.002	1950	0.44	22

Table 3. Multi-species Microsomal Stability. Percent parent compound remaining at 60 minutes in liver microsomes

Ex.	Human	Guinea	Monkey	Rat	Mouse	Dog
A17	69	62	7	86	44	nd
A24	63	0	nd	32	nd	nd
A30	95	99	20	100	100	100
A31	93	100	40	nd	nd	nd
B2	100	81	68	85	100	93
B12	100	93	98	100	99	92
B15	100	100	5	100	100	100
C1	76	42	16	77	22	nd
C2	82	77	53	nd	103	nd
C51	100	95	21	75	92	82

Table 4: **hERG Channel Assay**

Ex.	Dose (uM)	hERG % Inhibition
A30	3	<10
A31	3	<10
B2	3	<10
B12	3	17
B15	3	<10
C1	3	55
C2	3	89
C51	3	49

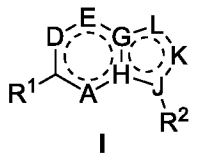
To determine if the compound series demonstrates oral exposure, an oral pharmacokinetic (PK) study was done with example compounds (A17, C2) in guinea pigs. 3 guinea pigs per compound were dosed at 10mg/kg via oral gavage and blood samples taken at times 0, 1, 2, 4, 8, 12 and 24 hr. Bioanalysis was done on a LC-MS/MS (Water Acquity- UPLC/API4000 mass spectrometer). Both compounds demonstrated oral exposure in guinea pigs with half-lives between 4 and 6 hours.

Table 5: **Pharmacokinetic (PK) data in guinea pig**

Example	Cmax (ng/mL)	Tmax (hr)	T ½ (hr)
A17	639.3	1	4-6
C2	156.0	1	4-6

WHAT IS CLAIMED IS:

1. A method of treating arenavirus infection comprising administration of a therapeutically effective amount of a compound of Structural Formula I



I

,

or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, E, and K are independently N or C-R^3;

G, H, and J are independently N or C;

L is N, N-R^3, or C-R^3;

and A, D, E, G, H, J, K, and L together cannot have more than 4 N;

R^1 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group, and wherein said (C_2 to C_9) heteroaryl is C-attached;

R^2 is selected from (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl, wherein

each of the said (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

each of the R^3 is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^5$, $-C(O)NR^{6a}R^{6b}$, $-NR^{6a}R^{6b}$, $-S(O)_mR^5$, $-S(O)_mNR^{6a}R^{6b}$, $-NR^{6a}S(O)_mR^5$, $-(CH_2)_nC(O)OR^5$, $-(CH_2)_nC(O)NR^{6a}R^{6b}$, $-OC(O)R^5$, $-NR^{6a}C(O)R^5$, and $-NR^{6c}C(O)NR^{5a}R^{5b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^4 group;

R^4 is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^5$, $-C(O)NR^{6a}R^{6b}$, $-NR^{6a}R^{6b}$, $-S(O)_mR^5$, $-S(O)_mNR^{6a}R^{6b}$, $-NR^{6a}S(O)_mR^5$, $-(CH_2)_nC(O)OR^5$, $-(CH_2)_nC(O)NR^{6a}R^{6b}$, $-OC(O)R^5$, $-NR^{6a}C(O)R^5$, and $-NR^{6c}C(O)NR^{6a}R^{6b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

each of the R^5 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

each of the R^{6a}, R^{6b}, and R^{6c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl,

or R^{6a} and R^{6b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted with at least one R^7 group;

R^7 is independently selected from hydrogen, halogen, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, cyano, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^8$, $-C(O)NR^{9a}R^{9b}$, $-NR^{9a}R^{9b}$, $-S(O)_mR^8$, $-S(O)_mNR^{9a}R^{9b}$, $-NR^{9a}S(O)_mR^8$, $-(CH_2)_nC(O)OR^8$, $-(CH_2)_nC(O)N(R^{9a}R^{9b})$, $-OC(O)R^8$, $-NR^{9a}C(O)R^8$, and $-NR^{9a}C(O)N(R^{9a}R^{9b})$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, is optionally substituted with at least one R^{10} group;

each of the R^8 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^{10} group;

each of the R^{9a}, R^{9b}, and R^{9c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl,

or R^{9a} and R^{9b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted;

R^{10} is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

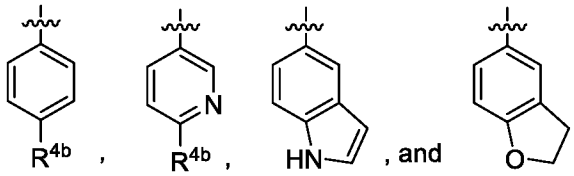
each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted;

m is 0, 1, or 2;

n is 0, 1, 2, 3, 4, 5, or 6.

2. The method of claim 1, wherein:

R^2 is selected from the group consisting of



, wherein

R^{4b} is selected from (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^5$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group.

3. The method of claim 2, wherein:

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, acetyl, n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, isobutyl, *sec*-butyl, cyclobutyl, cyclopentyl, *tert*-butyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl.

4. The method of claim 3, wherein:

R^{4b} is isopropoxy.

5. The method of claim 1, wherein:

G and H are C;

J and L are N;

K is C-R^3.

6. The method of claim 2, wherein:

G and H are C;

J and L are N;

K is C-R^3.

7. The method of claim 3, wherein:

G and H are C;

J and L are N;

K is C-R^3.

8. The method of claim 4, wherein:

G and H are C;

J and L are N;

K is C-R^3.

9. The method of claim 6, wherein:

A, D, E, and K are independently C-R^3.

10. The method of claim 6, wherein:

D, E, and K are independently C-R^3;

A is N.

11. The method of claim 6, wherein:

A, E, and K are independently C-R^3;

D is N.

12. The method of claim 6, wherein:

E and K are independently C-R^3;

A and D are N.

13. The method of claim 2, wherein:

G and H are C;

J is N;

K and L are independently C-R^3.

14. The method of claim 2, wherein:

G and H are C;

J and K are N;

L is C-R^3.

15. The method of claim 2, wherein:

G, H, and J are C;

K and L are independently N or N-R^3.

16. The method of claim 2, wherein:

G and J are C;

H and L are N;

K is C-R^3.

17. The method of claim 3, wherein:

G and J are C;

H and L are N;

K is C-R^3.

18. The method of claim 4, wherein:

G and J are C;

H and L are N;

K is C-R^3.

19. The method of claim 16, wherein:

A, D, and E are independently C-R^3.

20. The method of claim 16, wherein:

A is N;

D and E are independently C-R^3.

21. The method of claim 2, wherein:

A, D, and E are independently C-R^3;

G and H are C;

J, K, and L are N.

22. The method of claim 3, wherein:

A, D, and E are independently C-R^3;

G and H are C;

J, K, and L are N.

23. The method of claim 4, wherein:

A, D, and E are independently C-R^3;

G and H are C;

J, K, and L are N.

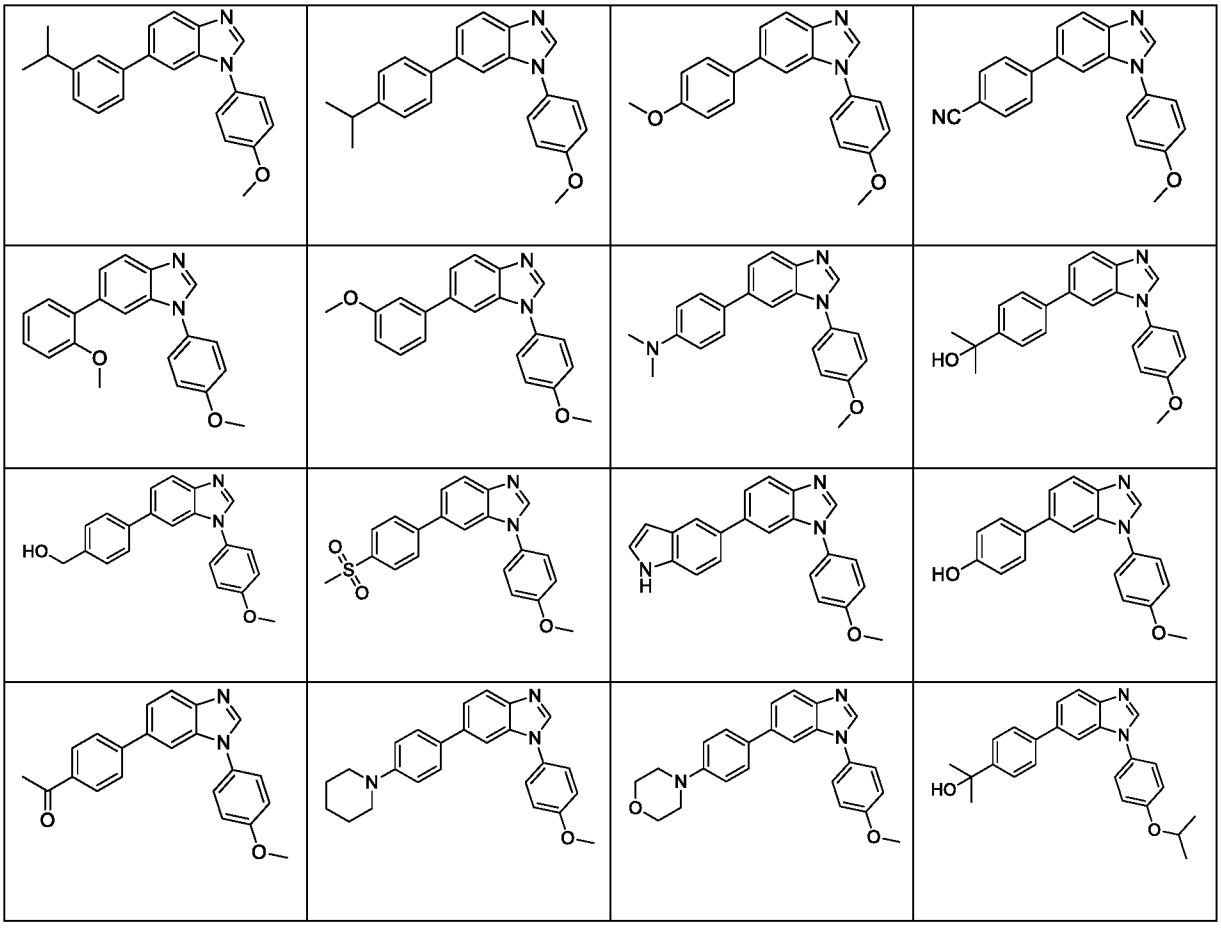
24. The method of claim 2, wherein:

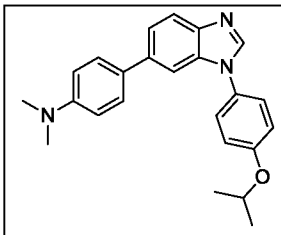
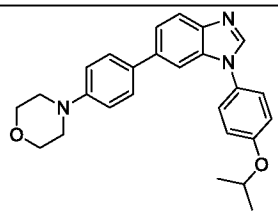
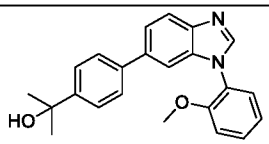
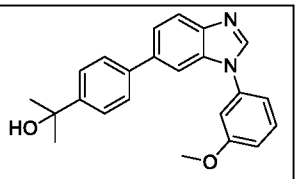
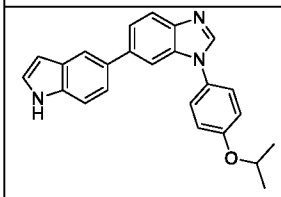
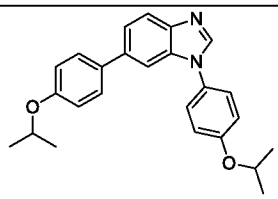
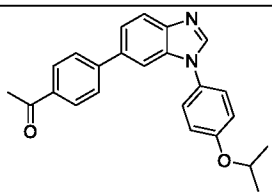
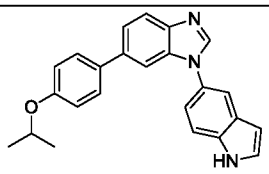
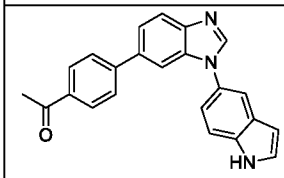
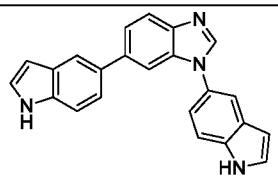
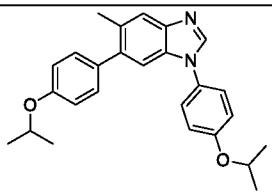
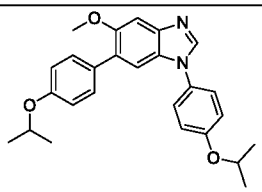
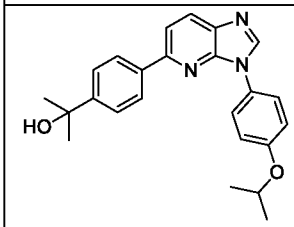
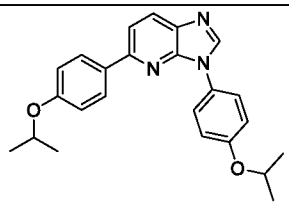
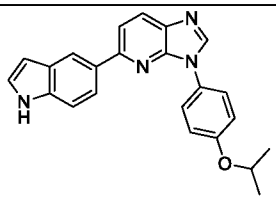
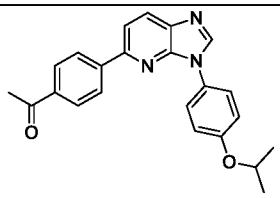
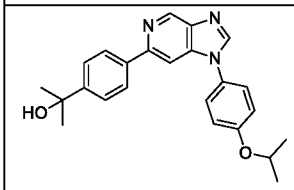
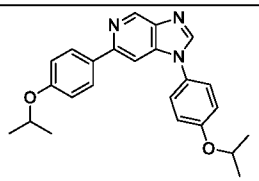
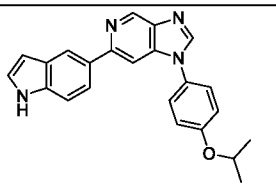
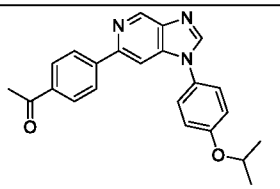
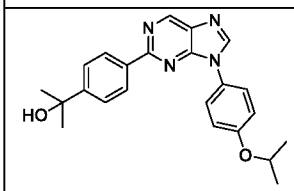
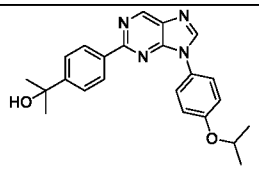
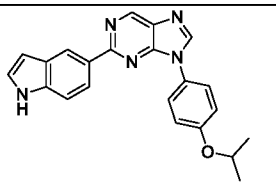
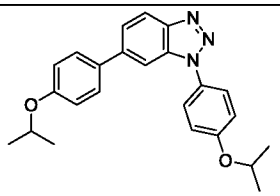
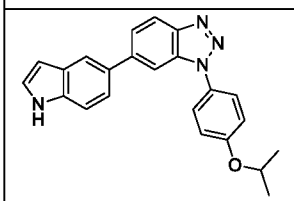
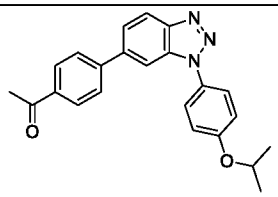
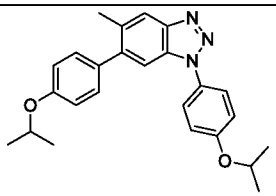
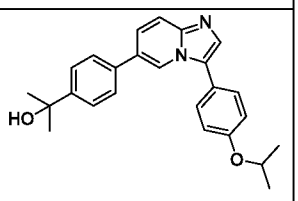
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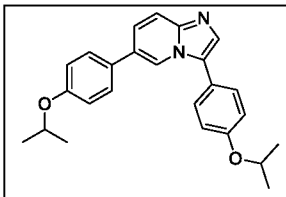
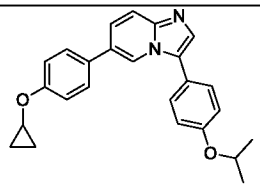
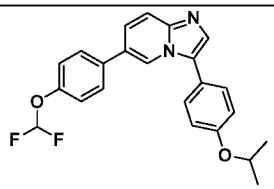
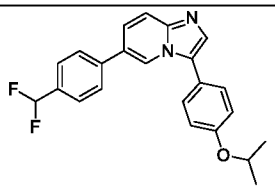
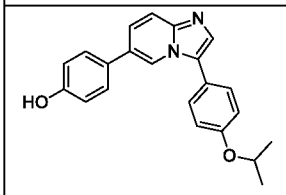
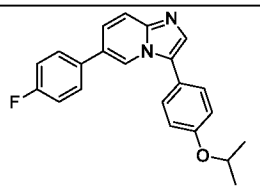
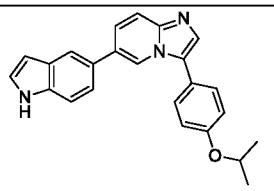
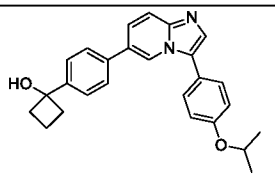
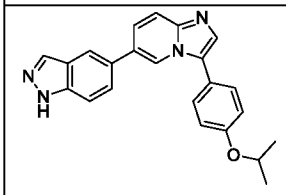
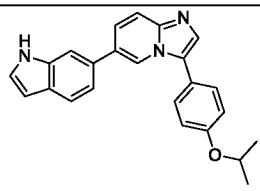
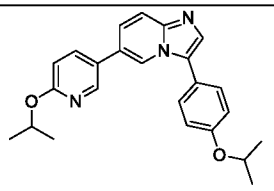
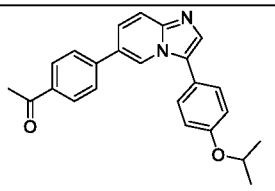
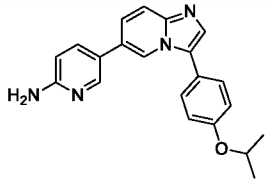
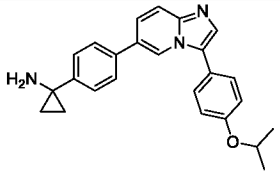
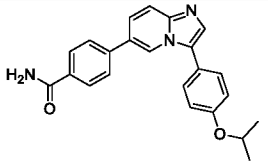
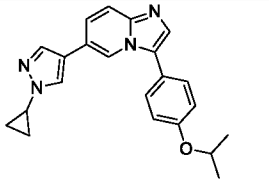
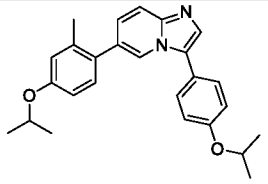
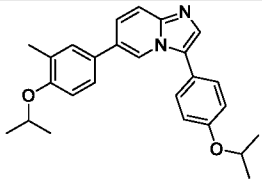
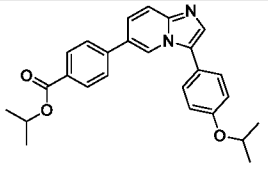
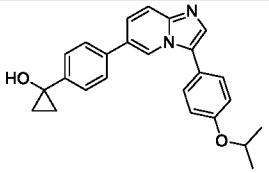
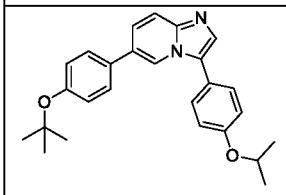
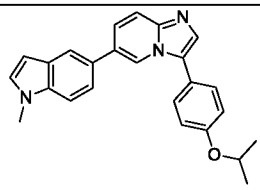
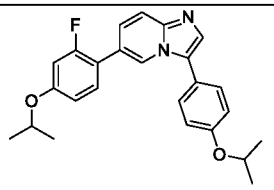
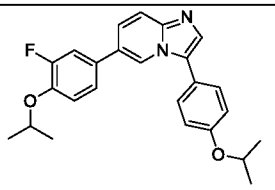
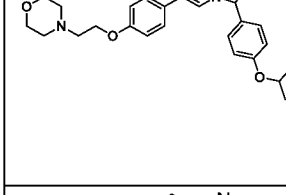
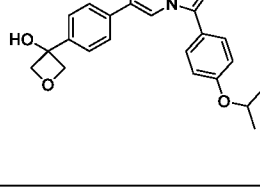
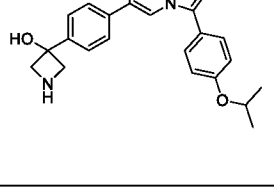
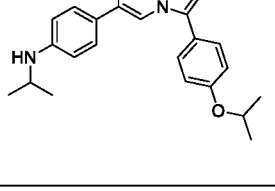
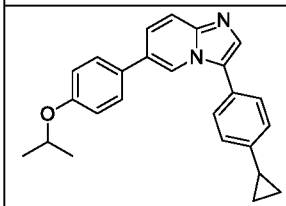
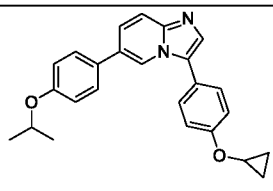
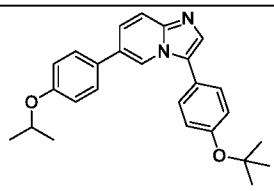
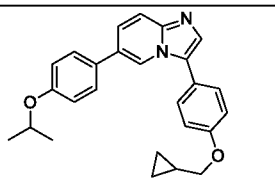
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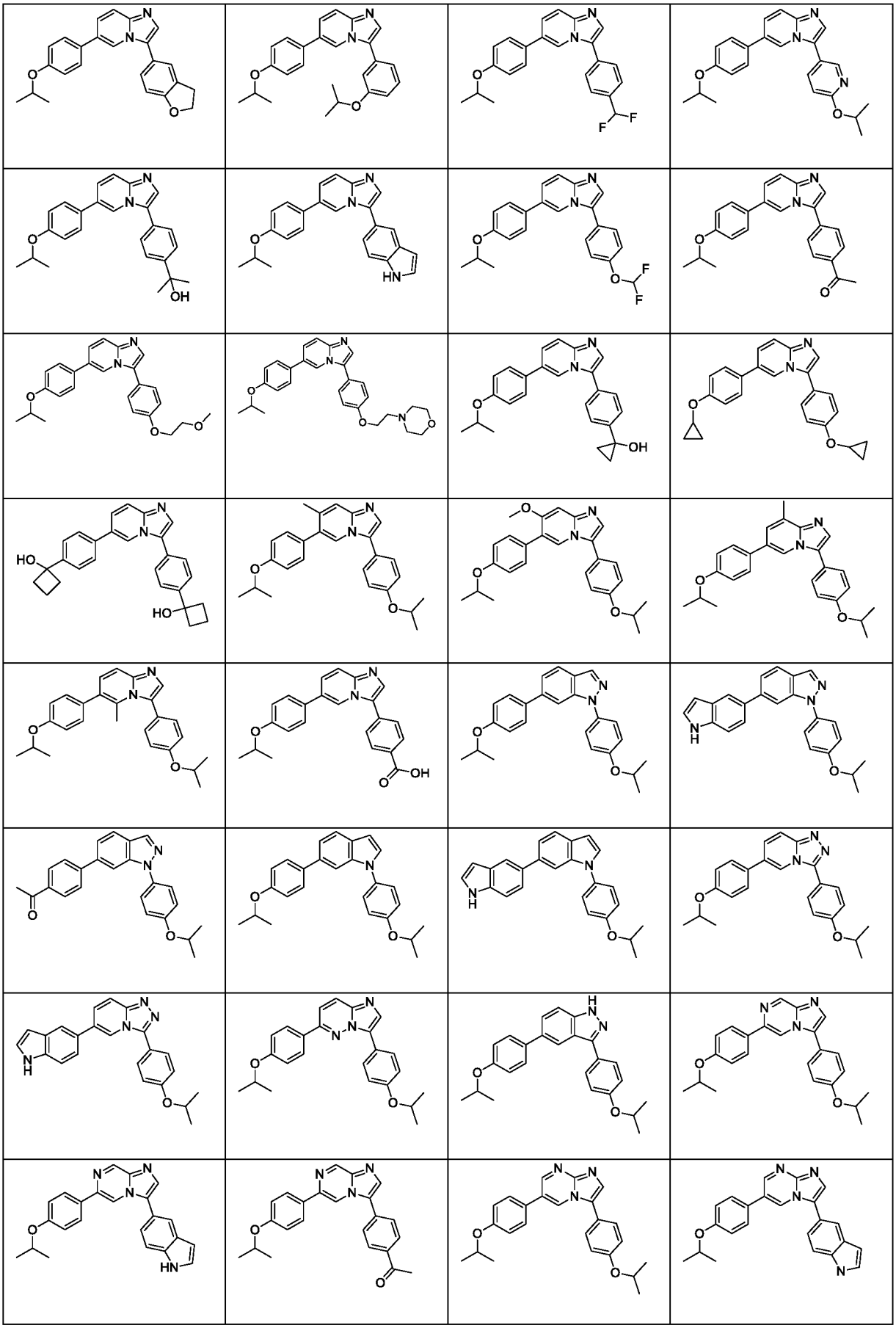
A, D, and E are independently C-R^3.

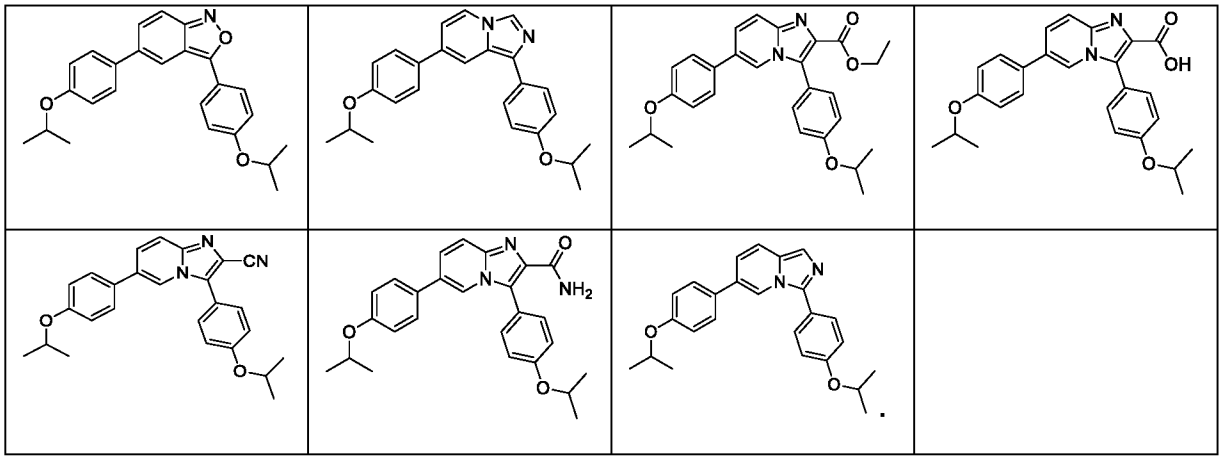
25. A method of treating arenavirus infection comprising administration of a therapeutically effective amount of a compound selected from the group consisting of



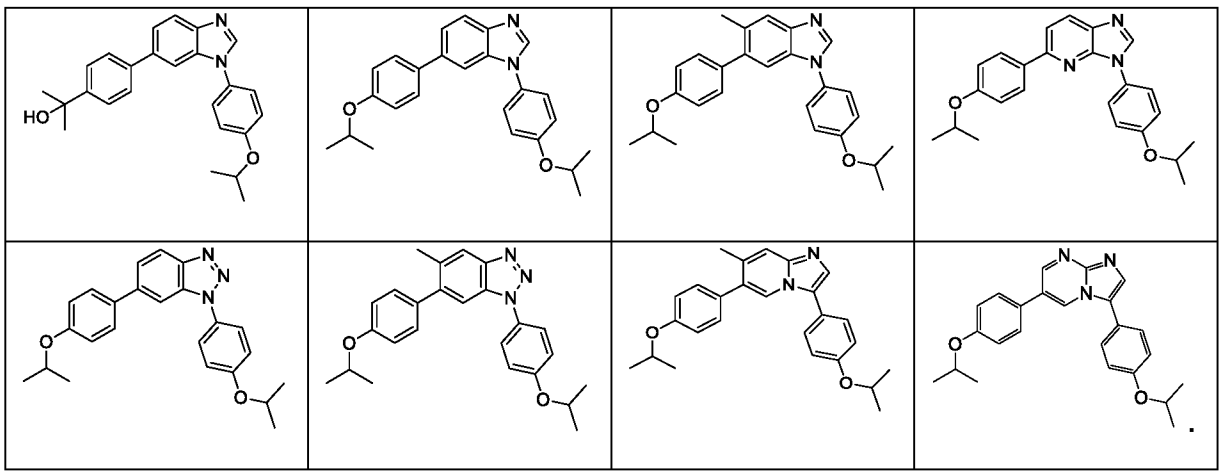
			
			
			
			
			
			
			





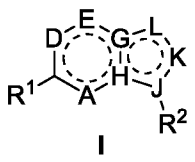
26. The method of claim 25, wherein the compound is selected from the group consisting of



27. The method of claim 3 including administrating a therapeutic amount of a therapeutic agent selected from the group consisting of Ribavirin, viral RNA-dependent-RNA-polymerase inhibitors, Triazavirin, small interfering RNAs (siRNAs) and microRNAs, vaccines, and immunomodulators.

28. The method of claim 26 including administrating a therapeutic amount of a therapeutic agent selected from the group consisting of Ribavirin, viral RNA-dependent-RNA-polymerase inhibitors, Triazavirin, small interfering RNAs (siRNAs) and microRNAs, vaccines, and immunomodulators.

29. A compound of Structural Formula I



I ,

or a pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier, diluent, or vehicle thereof, wherein:

A, D, and E are independently N or C-R^3;

G, H, and J are independently N or C;

K is N or C-H;

L isN, N-R^3, or C-R^3;

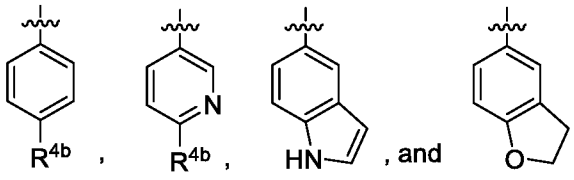
and A, D, E, G, H, J, K, and L together cannot have more than 4 N;

R^1 is selected from (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, and 5-indolyl, wherein

each of the said (C_6 to C_{10}) aryl and (C_2 to C_9) heteroaryl is substituted with at least one R^{4a} group, and wherein said (C_2 to C_9) heteroaryl is C-attached;

with the proviso that R^1 is not selected from the group consisting of substituted 3-carbamoyl-2-phenyl-1-benzofuran-5-yl, substituted 1,3,4-oxadiazolyl, substituted 1,3,4-triazolyl, substituted 1,3,4-thiadiazolyl, substituted oxazoyl, substituted thiazoyl, substituted 1*H*-pyrazol-4-yl, substituted 1*H*-pyrazol-5-yl, optionally substituted 1-phenyl-1*H*-imidazol-5-yl, 4-{[(2-aminoethyl)amino]methyl}phenyl, (2-amino-1,3-benzoxazol)-5-yl; (2-amino-1,3-benzoxazol)-4-yl, 2-chloropyridyl-3-yl, 2-methylpyridinyl-4-yl, 2-fluoropyridyl-4-yl, 6-aminopyridyl-3-yl, 6-methoxypyridyl-3-yl, pyridyl-4-yl-*N*-oxide, 3,4-difluorphenyl, and substituted 1*H*-pyrrol-3-yl;

R^2 is selected from the group consisting of



;

each of the R^3 is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^5$, $-C(O)NR^{6a}R^{6b}$, $-NR^{6a}R^{6b}$, $-S(O)_mR^5$, $-S(O)_mNR^{6a}R^{6b}$, $-NR^{6a}S(O)_mR^5$, $-(CH_2)_nC(O)OR^5$, $-(CH_2)_nC(O)NR^{6a}R^{6b}$, $-OC(O)R^5$, $-NR^{6a}C(O)R^5$, and $-NR^{6c}C(O)NR^{5a}R^{5b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

R^{4a} is independently selected from halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^5$, $-NR^{6a}R^{6b}$, $-S(O)_mR^5$, $-S(O)_mNR^{6a}R^{6b}$, $-NR^{6a}S(O)_mR^5$, $-OC(O)R^5$, $-NR^{6a}C(O)R^5$, and $-NR^{6c}C(O)NR^{6a}R^{6b}$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

R^{4b} is selected from the group consisting of

isopropoxy, cyclopropoxy, tert-butoxy, cyclopropylmethoxy, (2-hydroxypropan)-2-yl, (1-hydroxycyclopropan)-1-yl, (1-hydroxycyclobutan)-1-yl, difluoromethoxy, methoxyethoxy, difluoromethyl, cyclopropyl, acetyl, n-propyloxy, n-butyloxy, isobutyloxy, *sec*-butyloxy, cyclobutyloxy, cyclopentyloxy, (1-hydroxycyclopentan)-1-yl, hydroxyethoxy, ethoxyethoxy, isopropoxyethoxy, isopropyl, n-propyl, n-butyl, *sec*-butyl, cyclobutyl, cyclopentyl, propanoyl, isobutanoyl, sec-butanoyl, *tert*-butanoyl, cyclopropanoyl, cyclobutanoyl, and cyclopentanoyl;

each of the R^5 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^7 group;

each of the R^{6a}, R^{6b}, and R^{6c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl,

or R^{6a} and R^{6b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted with at least one R^7 group;

R^7 is independently selected from hydrogen, halogen, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, cyano, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl, $-C(O)R^8$, $-C(O)NR^{9a}R^{9b}$, $-NR^{9a}R^{9b}$, $-S(O)_mR^8$, $-S(O)_mNR^{9a}R^{9b}$, $-NR^{9a}S(O)_mR^8$, $-(CH_2)_nC(O)OR^8$, $-(CH_2)_nC(O)N(R^{9a}R^{9b})$, $-OC(O)R^8$, $-NR^{9a}C(O)R^8$, and $-NR^{9a}C(O)N(R^{9a}R^{9b})$, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, is optionally substituted with at least one R^{10} group;

each of the R^8 is independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted with at least one R^{10} group;

each of the R^{9a}, R^{9b}, and R^{9c} are independently selected from hydrogen, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, (C_2 to C_9) heteroaryl,

or R^{9a} and R^{9b} may be taken together with the nitrogen atom to which they are attached to form a 4 to 8 membered cycloheteroalkyl ring, wherein

said 4 to 8 membered cycloheteroalkyl ring has 1 to 3 ring heteroatoms selected from the group consisting of N, O, and S, and wherein

the said 4 to 8 membered cycloheteroalkyl ring is optionally substituted;

R^{10} is independently selected from hydrogen, halogen, cyano, OH, CF_3, (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl, wherein

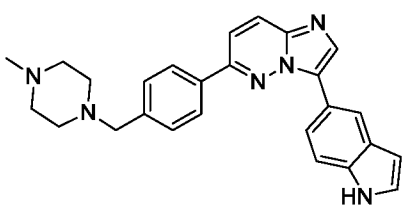
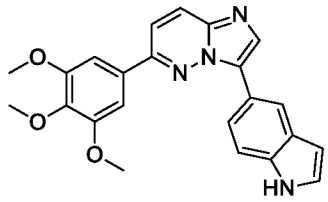
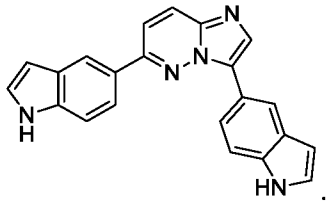
each of the said (C_1 to C_6) alkyl, (C_1 to C_6) alkenyl, (C_1 to C_6) alkynyl, (C_1 to C_6) alkoxy, aryloxy, (C_3 to C_{10}) cycloalkyl, (C_5 to C_{10}) cycloalkenyl, (C_2 to C_9) cycloheteroalkyl, (C_6 to C_{10}) aryl, and (C_2 to C_9) heteroaryl is optionally substituted;

m is 0, 1, or 2;

n is 1, 2, 3, 4, 5, or 6;

with the proviso that

the following compounds are excluded:


,

, and

.

30. The compound of claim 29, wherein R^{4b} is isopropoxy.

31. The compound of claim 29, wherein:

G and H are C;

J and L are N;

K is C-H.

32. The compound of claim 30, wherein:

G and H are C;

J and L are N;

K is C-H.

33. The compound of claim 31, wherein:

A, D, and E are independently C-R^3.

34. The compound of claim 31, wherein:

D and E are independently C-R^3;

A is N.

35. The compound of claim 31, wherein:

A and E are independently C-R^3;

D is N.

36. The compound of claim 31, wherein:

E is C-R^3;

A and D are N.

37. The compound of claim 29, wherein:

G and H are C;

J is N;

K is CH;

L is C-R^3.

38. The compound of claim 29, wherein:

G and H are C;

J and K are N;

L is C-R^3.

39. The compound of claim 29, wherein:

G, H, and J are C;

K and L are independently is N or N-R^3.

40. The compound of claim 29, wherein:

G and J are C;

H and L are N;

K is C-H.

41. The compound of claim 30, wherein:

G and J are C;

H and L are N;

K is C-H.

42. The compound of claim 40, wherein:

A, D, and E are independently C-R^3.

43. The compound of claim 40, wherein:

A is N;

D and E are independently C-R^3.

44. The compound of claim 40, wherein:

A and D are independently C-R^3;

E is N.

45. The compound of claim 29, wherein:

A, D, and E are independently C-R^3,

G and H are C;

J, K, and L are N.

46. The compound of claim 30, wherein:

A, D, and E are independently C-R^3;

G and H are C;

J, K, and L are N.

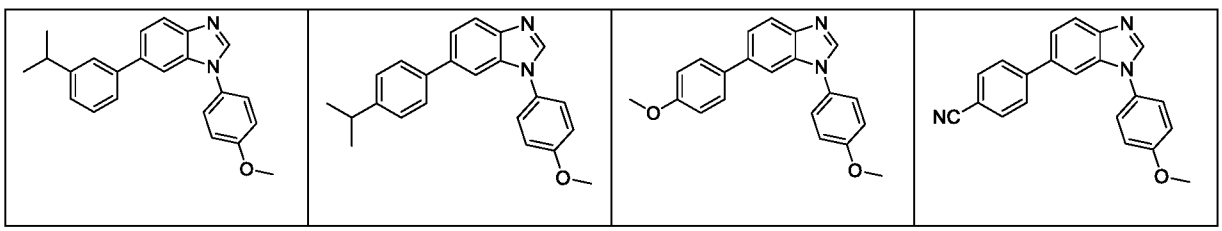
47. The compound of claim 29, wherein:

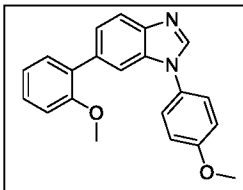
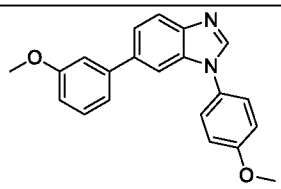
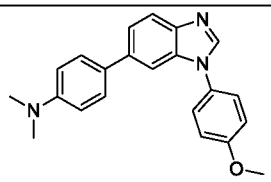
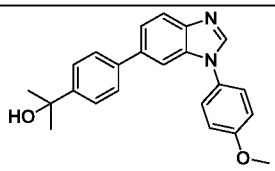
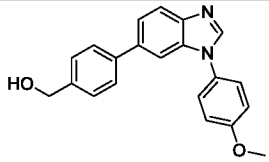
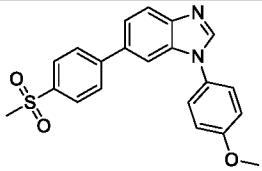
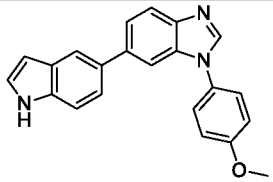
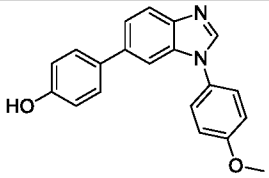
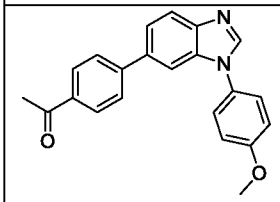
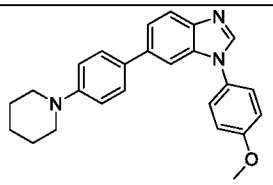
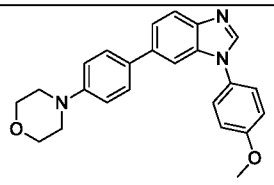
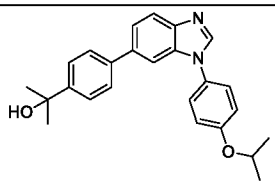
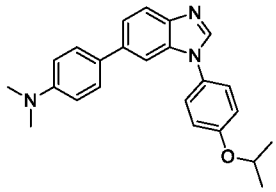
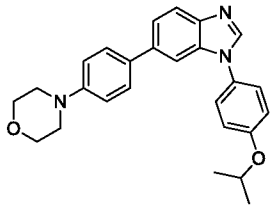
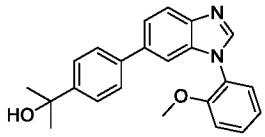
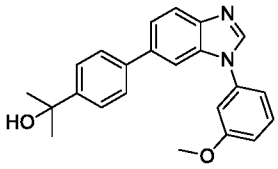
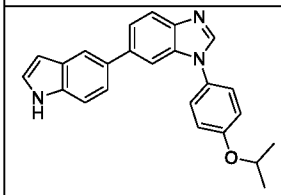
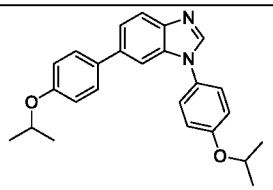
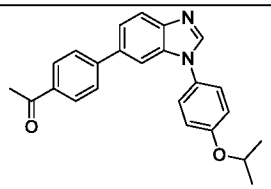
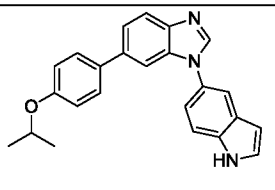
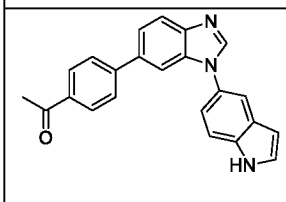
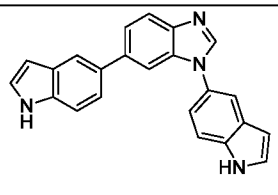
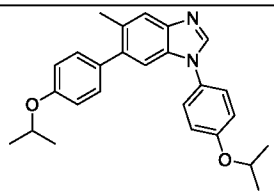
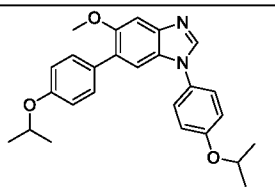
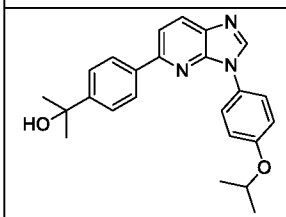
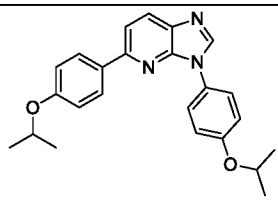
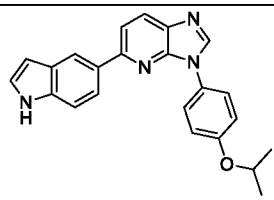
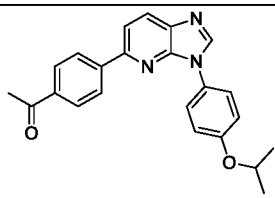
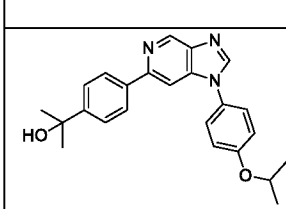
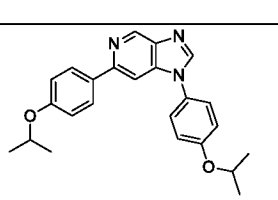
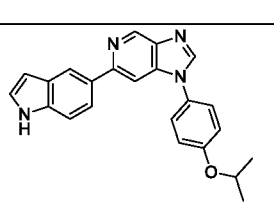
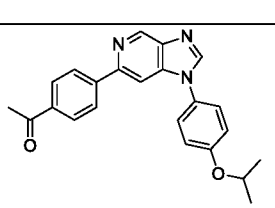
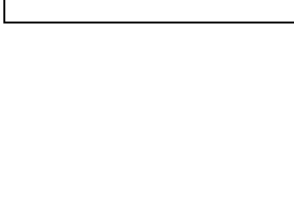
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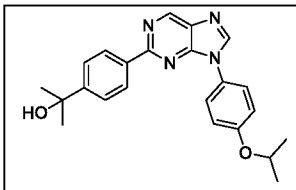
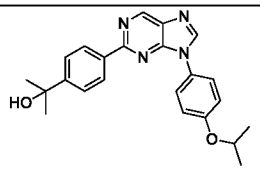
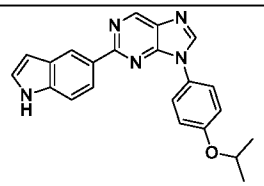
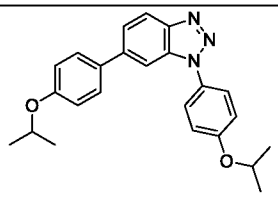
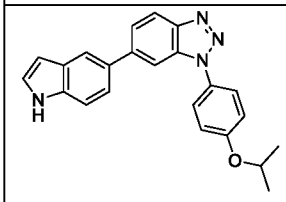
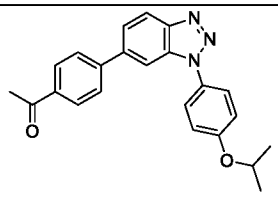
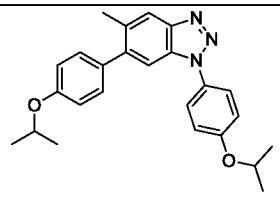
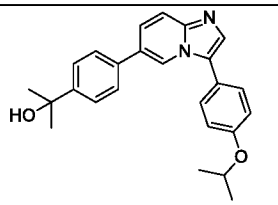
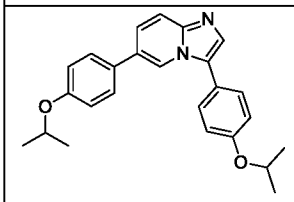
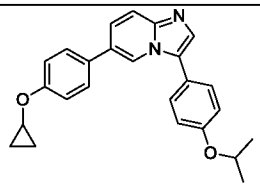
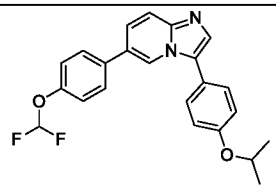
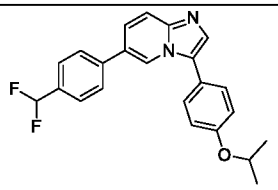
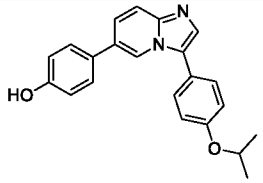
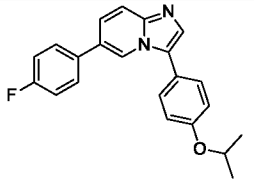
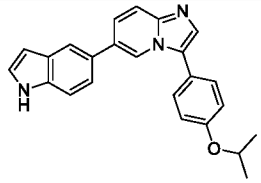
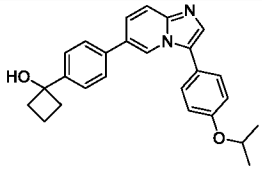
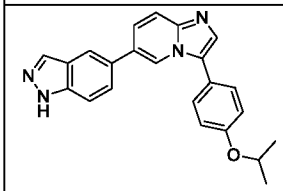
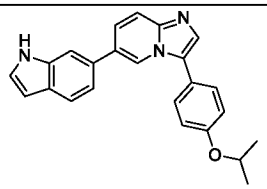
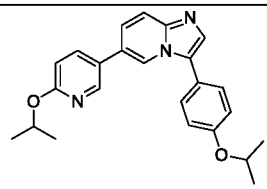
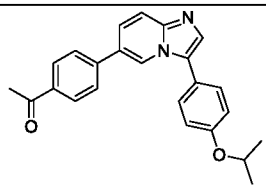
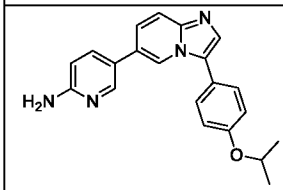
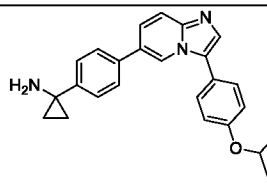
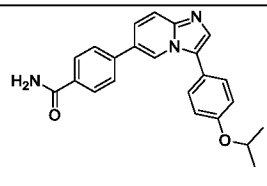
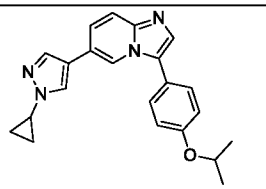
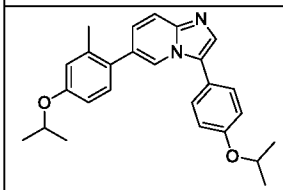
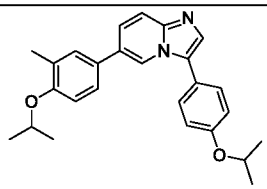
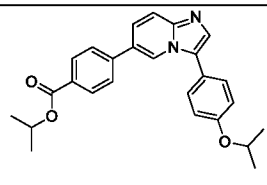
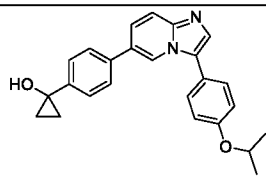
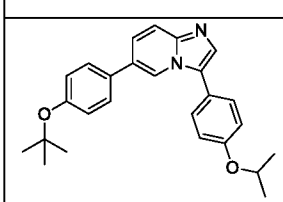
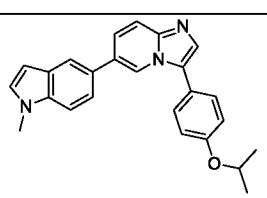
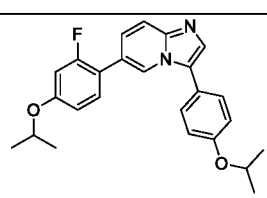
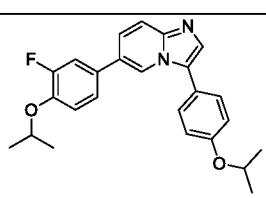
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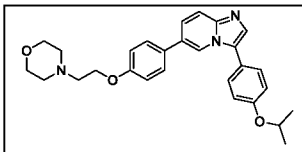
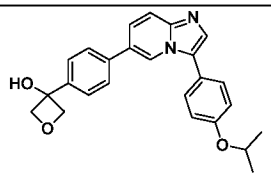
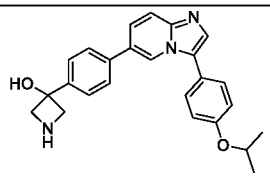
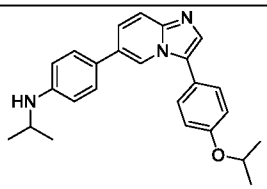
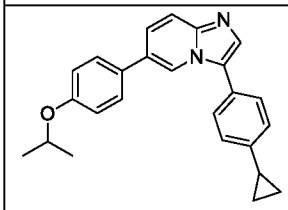
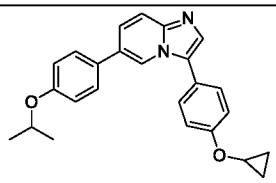
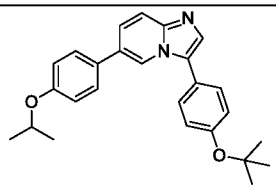
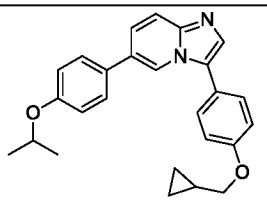
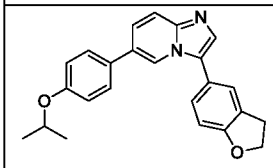
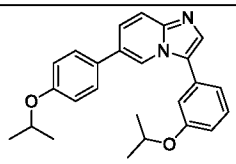
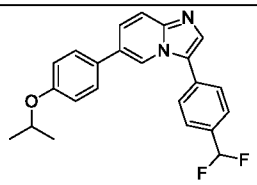
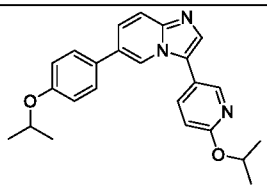
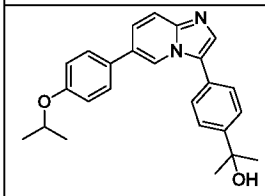
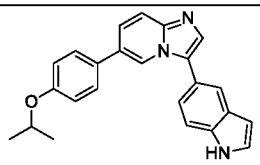
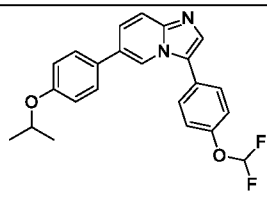
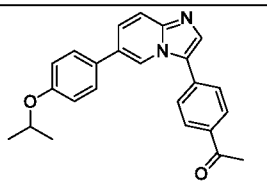
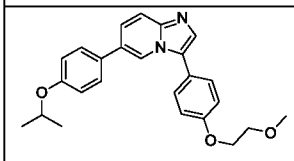
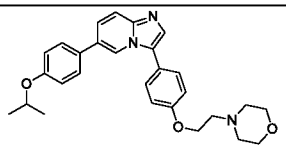
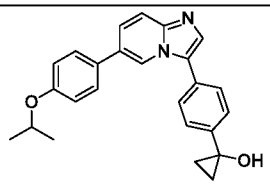
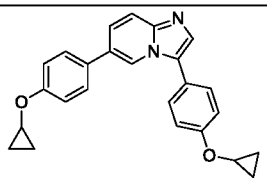
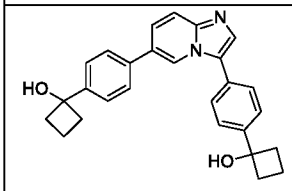
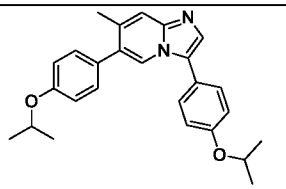
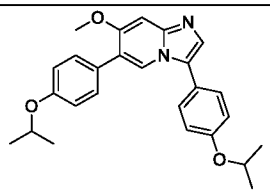
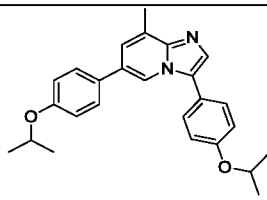
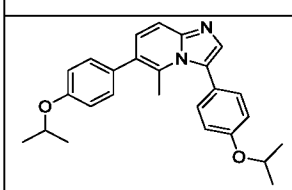
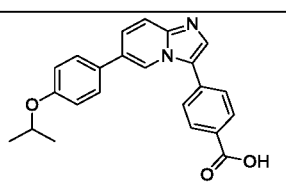
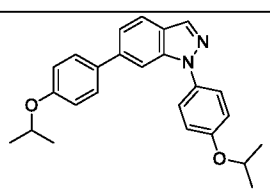
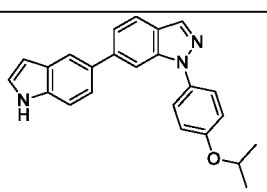
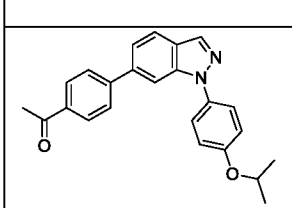
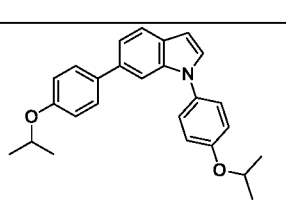
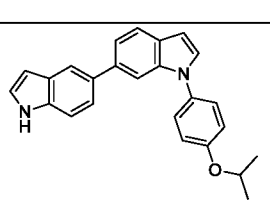
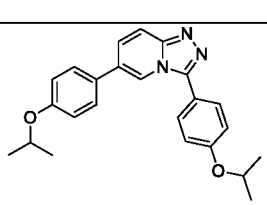
H, K, and L are N.

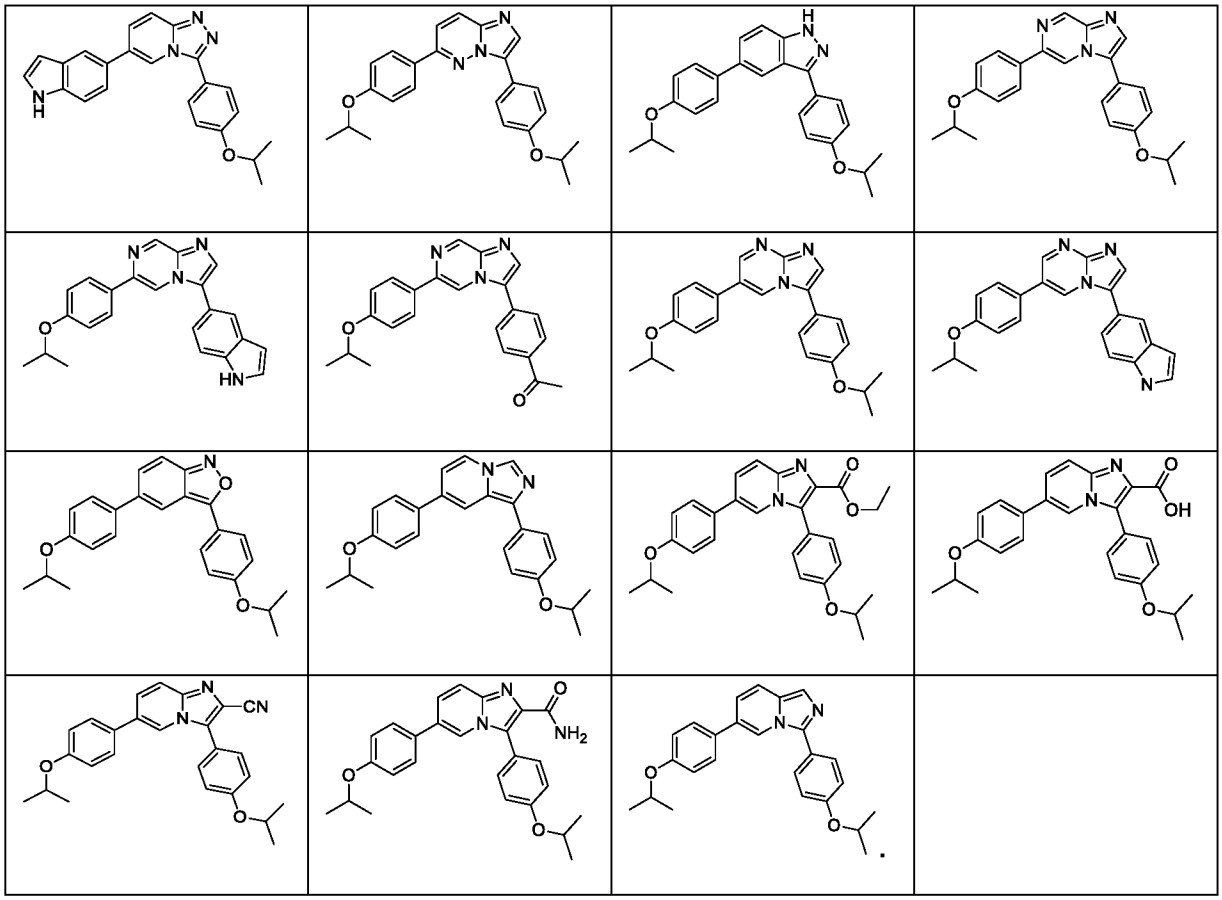
48. A compound selected from the group consisting of



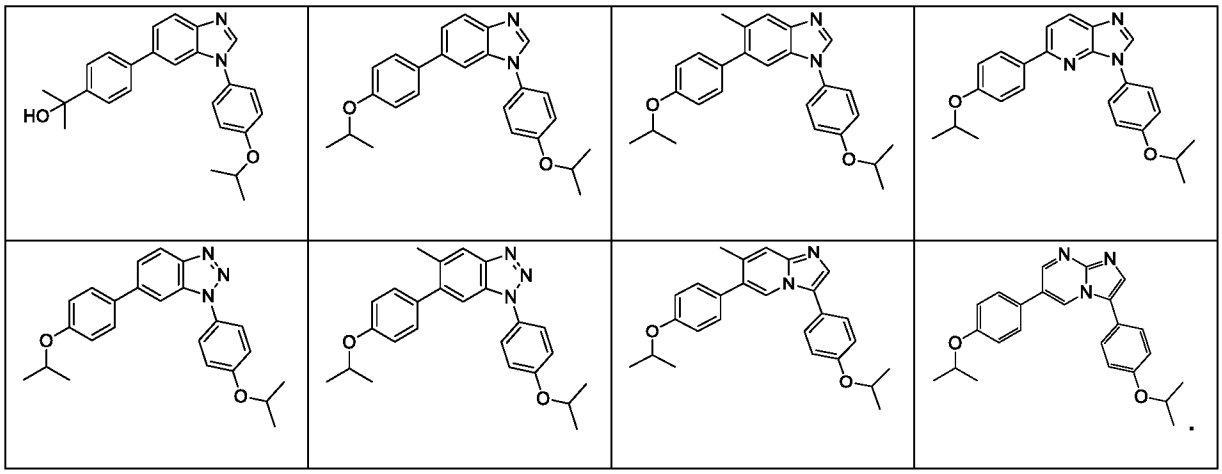
			
			
			
			
			
			
			
			
			



49. The compound of claim 48, wherein the compound is selected from the group consisting of



50. The compound of claim 29, wherein said compound is incorporated into a composition comprising a therapeutically effective amount of said compound, and a pharmaceutically acceptable carrier, diluent, or vehicle.

51. The compound of claim 49, wherein said compound is incorporated into a composition comprising a therapeutically effective amount of said compound, and a pharmaceutically acceptable carrier, diluent, or vehicle.