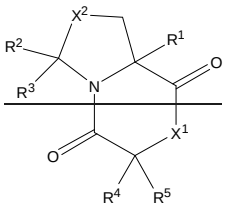
What is Claimed is

1. A method for treating a mammal having Pitt Hopkins Syndrome, comprising administering to the mammal, a compound having the formula:



or a pharmaceutically acceptable salt or hydrate thereof, wherein

X^1 is selected from the group consisting of NR', O and S;

X^2 is selected from the group consisting of CH_2, NR', O and S;

R^1, R^2, R^3, R^4 and R^5 are independently selected from the group consisting of H, OR', SR', NR'R', NO_2, CN, C(O)R', C(O)OR', C(O)NR'R', C(NR')NR'R', trihalomethyl, halogen, alkyl, substituted alkyl, heteroalkyl, substituted heteroalkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, arylalkyl, substituted arylalkyl, heteroarylalkyl and substituted heteroarylalkyl; each R' is independently selected from the group consisting of H, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, arylalkyl, heteroaryl and heteroarylalkyl;

or R^4 and R^5 taken together are $-CH_2-(CH_2)_n-CH_2-$ where n is an integer from 0-6;

or R^2 and R^3 taken together are $-CH_2-(CH_2)_n-CH_2-$ where n is an integer from 0-6;

with the proviso that when R^1 = methyl and R^2=R^3=R^4=H then $R^5 \neq$ benzyl and;

when R^1 = H, at least one of R^2 and $R^3 \neq$ H.

2. The method of Claim 1 where R^1 = methyl.

3. The method of Claim 1 where R^1 = allyl.

4. The method of Claim 1 where R^2 = R^3 = methyl and X^2 = S.

5. The method of Claim 1 where R^1 = allyl, R^2 =R^3 = R^4 = R^5 = H, X^1 = NH, X^2 = CH_2.

6. The method of Claim 1 where R^1 = methyl, R^2 =R^3 = H, R^4 and R^5 taken together are -CH_2-$(CH_2)_3$-CH_2-, X^1 = NH, X^2 = CH_2.

7. The method of Claim 1 where R^1 = methyl, R^2 =R^3 =H, R^4 and R^5 taken together are -CH_2-$(CH_2)_2$-CH_2-, X^1 = NH, X^2 = CH_2.

8. The method of any of Claims 1 to 7, where the method further comprises administering said compound along with a pharmaceutically acceptable excipient, or in a gel.

9. The method of any of Claims 1 to 8, where the method further comprises administering said compound along with a pharmaceutically acceptable excipient and a binder.

10. The method of any of Claims 1 to 9, where the method further comprises administering said compound along with a pharmaceutically acceptable excipient, or in a capsule.

11. The method of any of Claims 1 to 10, further comprising administering at least one anti-apoptotic compound, anti-necrotic compound, neuroprotective agent or an anti-inflammatory agent.

12. The method of Claim 11 where the anti-apoptotic compound, anti-necrotic compound, or neuroprotective agent is selected from the group consisting of insulin-like growth factor I (IGF-I), insulin like growth factor II (IGF II), transforming growth factor β1, activin, growth hormone, nerve growth factor, growth hormone binding protein, IGFBP 3, basic fibroblast growth factor, acidic fibroblast growth factor, the hst/Kfgk gene product, FGF 3, FGF 4, FGF 6, keratinocyte growth factor, androgen induced growth factor, int 2, fibroblast growth factor homologous factor 1 (FHF 1), FHF 2, FHF 3, FHF 4, keratinocyte growth factor 2, glial-activating factor, FGF-10, FGF-16, ciliary neurotrophic factor, brain derived growth factor, neurotrophin 3, neurotrophin 4, bone morphogenetic protein 2 (BMP 2), glial cell line derived neurotrophic factor, activity dependant neurotrophic factor, cytokine leukaemia inhibiting factor, oncostatin M, an interleukin, α-interferon, β-interferon, γ-interferon, consensus interferon, TNF-α, clomethiazole; kynurenic acid, Semax, tacrolimus, L-threo-1-phenyl-2-decanoylamino-

3-morpholino-1-propanol, adrenocorticotropin (4-9) analogue (ORG-2766), dizolcipine [MK-801], selegiline, NPS1506, GV1505260, MK-801, GV150526, 2,3-dihydroxy-6-nitro-7-sulfamoylbenzo(f)quinoxaline (NBQX), LY303070, LY300164, and the anti-MAdCAM-1 antibody MECA-367.

13. The method of Claim 1, wherein said compound is cG-2-AllylP.

14. The method of Claim 1, wherein said compound is cyclic cyclohexyl-G-2MeP.

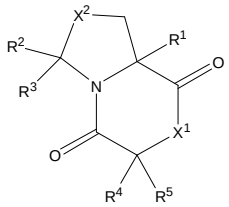
15. The method of Claim 1, wherein said compound is cyclic cyclopentyl-G-2MeP.

16. The method of any of Claims 1-15, wherein said treatment produces an improvement in a symptom of the disorder as assessed using one or more clinical tests selected from the group consisting of Aberrant Behavior Checklist-Community Edition (ABC), Vineland Adaptive Behavior Scales, Clinical Global Impression of Severity (CGI-S), Clinical Global Impression Improvement (CGI-I), the Caregiver Strain Questionnaire (CSQ), electroencephalogram (EEG) spike frequency, overall power in frequency bands of an EEG, hemispheric coherence of EEG frequencies, stereotypic hand movement, eye tracking, QTc variability, heart rate variability (HRV), respiratory irregularities, and abnormal coupling of cardiac and respiratory function compared to control animals not suffering from said disorder.

17. The method of any of Claims 1 to 16, where said treatment reduces at least one symptom selected from the group consisting of anxiety, depression, cognitive impairment, cognitive dysfunction, memory loss, loss of spatial orientation, decreased ability to learn, decreased ability to form short- or long-term memory, decreased episodic memory, decreased ability to consolidate memory, decreased spatial memory, decreased synaptogenesis, decreased synaptic stability, deficits in executive function, deficits in cognitive mapping and scene memory, deficits in declarative and relational memory, decreased rapid acquisition of configural or conjunctive associations, decreased context-specific encoding and retrieval of specific events, decreased episodic and/or episodic-like memory, abnormal fear conditioning, abnormal social behaviour, repetitive behaviour, abnormal nocturnal behavior, seizure activity, abnormal locomotion,

~~abnormal expression of Phospho-ERK1/2, abnormal expression of Phospho-Akt, and bradycardia.~~

~~18.~~1. ~~A~~Use of a composition in the manufacture of a medicament for treating a symptom of Pitt Hopkins Syndrome in a mammal suffering from such a disorder, said composition comprising a compound having the formula:



or a pharmaceutically acceptable salt or hydrate thereof, wherein

X^1 is selected from the group consisting of NR', O and S;

X^2 is selected from the group consisting of CH_2, NR', O and S;

R^1, R^2, R^3, R^4 and R^5 are independently selected from the group consisting of -H, -OR', -SR', -NR'R', $-NO_2$, -CN, -C(O)R', -C(O)OR', -C(O)NR'R', -C(NR')NR'R', trihalomethyl, halogen, alkyl, substituted alkyl, heteroalkyl, substituted heteroalkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, arylalkyl, substituted arylalkyl, heteroarylalkyl and substituted heteroarylalkyl; each R' is independently selected from the group consisting of –H, alkyl, heteroalkyl, alkenyl, alkynyl, aryl, arylalkyl, heteroaryl and heteroarylalkyl;

or R^4 and R^5 taken together are $-CH_2-(CH_2)_n-CH_2-$ where n is an integer from 0-6;

or R^2 and R^3 taken together are $-CH_2-(CH_2)_n-CH_2-$ where n is an integer from 0-6;

with the proviso that when R^1= methyl and R^2=R^3=R^4=H then $R^5 \neq$ benzyl and;

when R^1 = H, at least one of R^2 and $R^3 \neq$ H.

~~19.~~2. The ~~composition~~use of Claim ~~18~~1, where R^1 = methyl.

~~20.~~3. The ~~composition~~use of Claim ~~18~~1, where R^1 = allyl.

~~21.~~4, The ~~composition~~use of Claim ~~18~~1, where R^2 = R^3 = methyl and X^2 = S.

~~22.~~5. The ~~composition~~use of Claim ~~18~~1, where R^1 = allyl, R^2 =R^3 = R^4 = R^5 = H, X^1 = NH, X^2 = CH_2.

~~23.~~6. The ~~composition~~use of Claim ~~18~~1, where R^1 = methyl, R^2 =R^3 = H, R^4 and R^5 taken together are -CH_2-$(CH_2)_3$-CH_2-, X^1 = NH, X^2 = CH_2.

~~24.~~7. The ~~composition~~use of Claim ~~18~~1, where R^1 = methyl, R^2 =R^3 =H, R^4 and R^5 taken together are -CH_2-$(CH_2)_2$-CH_2-, X^1 = NH, X^2 = CH_2.

~~25.~~8. The ~~composition~~use of any of Claims ~~18 to 24~~1 to 7, further comprising said compound in a pharmaceutically acceptable excipient, or in a gel~~.~~, or in a capsule, or further comprising an aqueous solution for oral administration.

~~26. The composition of any of Claims 18 to 25, further comprising said compound with a pharmaceutically acceptable excipient and a binder.~~

~~27. The composition of any of Claims 18 to 26, where the use further comprises said compound with a pharmaceutically acceptable excipient, or in a capsule.~~

~~28.~~9. The ~~composition~~use of any of Claims ~~18 to 27~~1 to 8, further comprising least one anti-apoptotic compound, anti-necrotic compound, neuroprotective agent or an anti-inflammatory agent.

~~29.~~10. The ~~composition~~use of Claim ~~28~~9 where the anti-apoptotic compound, anti-necrotic compound, or neuroprotective agent is selected from the group consisting of insulin-like growth factor-I (IGF-I), insulin-like growth factor-II (IGF-II), transforming growth factor-β1, activin, growth hormone, nerve growth factor, growth hormone binding protein, IGFBP-3, basic fibroblast growth factor, acidic fibroblast growth factor, the hst/Kfgk gene product, FGF-3, FGF-4, FGF-6, keratinocyte growth factor, androgen-induced growth factor, int-2, fibroblast growth factor homologous factor-1 (FHF-1), FHF-2, FHF-3, FHF-4, keratinocyte growth factor 2, glial-activating factor, FGF-10, FGF-16, ciliary neurotrophic factor, brain derived growth factor,

neurotrophin 3, neurotrophin 4, bone morphogenetic protein 2 (BMP-2), glial-cell line derived neurotrophic factor, activity-dependant neurotrophic factor, cytokine leukaemia inhibiting factor, oncostatin M, an interleukin, α-interferon, β-interferon, γ-interferon, consensus interferon, TNF-α, clomethiazole; kynurenic acid, Semax, tacrolimus, L-threo-1-phenyl-2-decanoylamino-3-morpholino-1-propanol, adrenocorticotropin-(4-9) analogue (ORG 2766), dizolcipine [MK-801], selegiline, NPS1506, GV1505260, MK-801, GV150526, 2,3-dihydroxy-6-nitro-7-sulfamoylbenzo(f)quinoxaline (NBQX), LY303070, LY300164, and the anti-MAdCAM-1 antibody MECA-367.

~~30.~~11. The ~~composition~~use of any of Claims ~~18 to 29~~1 to 10, said compound being cyclic G-2-AllylP.

~~31.~~12. The ~~composition~~use of any of Claims ~~18 to 29~~1 to 10, wherein said compound is cyclic cyclohexyl-G-2MeP.

~~32.~~13. The ~~composition~~use of any of Claims ~~18 to 29~~1 to 10, wherein said compound is cyclic cyclopentyl-G-2MeP.

~~33.~~14. The ~~composition~~use of any of Claims ~~18 to 32~~1 to 13, further comprising one or more excipients, carriers, additives, adjuvants or binders in a tablet.

~~34.~~15. The ~~composition~~use of any of Claims ~~18 to 33~~1 to 14, further comprising a microemulsion, coarse emulsion, or liquid crystal in a capsule.

~~35.~~16. The ~~method~~use of any of Claims 1 to ~~17~~15, where the dose of the compound is from about 0.001 mg/kg to about 600 mg/kg.

~~36.~~17. The ~~composition~~use of any of Claims ~~18 to 34~~1 to 16, wherein the amount of compound is sufficient to produce an administered dose of compound in the range of about 0.001 mg/kg to about 600 mg/kg.

~~37.~~18. ~~Any~~The use of any one or more of Claims 1 to ~~36~~17, wherein said animal or mammal is a human being.

19. The use of any of Claims 1 to 18, wherein said treatment produces an improvement in a symptom of the disorder as assessed using one or more clinical tests selected from the group consisting of Aberrant Behavior Checklist Community Edition (ABC), Vineland Adaptive Behavior Scales, Clinical Global Impression of Severity (CGI-S), Clinical Global Impression Improvement (CGI-I), the Caregiver Strain Questionnaire (CSQ), electroencephalogram (EEG) spike frequency, overall power in frequency bands of an EEG, hemispheric coherence of EEG frequencies, stereotypic hand movement, eye tracking, QTc variability, heart rate variability (HRV), respiratory irregularities, and abnormal coupling of cardiac and respiratory function compared to control animals not suffering from said disorder.

20. The use of any of Claims 1 to 19, where said treatment reduces at least one symptom selected from the group consisting of anxiety, depression, cognitive impairment, cognitive dysfunction, memory loss, loss of spatial orientation, decreased ability to learn, decreased ability to form short- or long-term memory, decreased episodic memory, decreased ability to consolidate memory, decreased spatial memory, decreased synaptogenesis, decreased synaptic stability, deficits in executive function, deficits in cognitive mapping and scene memory, deficits in declarative and relational memory, decreased rapid acquisition of configural or conjunctive associations, decreased context-specific encoding and retrieval of specific events, decreased episodic and/or episodic-like memory, abnormal fear conditioning, abnormal social behaviour, repetitive behaviour, abnormal nocturnal behavior, seizure activity, abnormal locomotion, abnormal expression of Phospho-ERK1/2, abnormal expression of Phospho-Akt, and bradycardia.