

WE CLAIM:

1. A co-crystal of N-(2-(5-(((2*R*,3*R*,4*S*,5*R*)-3,4-dihydroxy-5-methoxy-6,6-dimethyltetrahydro-2H-pyran-2-yl)oxy)-3'-fluoro-[1,1'-biphenyl]-2-yl)ethyl)-acetamide and L-proline (1:2), characterized by an X-ray powder diffractogram comprising the following peaks: 14.76, 16.86, 19.00, and 21.05 °2θ ±0.20 °2θ as determined on a diffractometer using Cu-Kα radiation at a wavelength of 1.54178 Å.
2. The co-crystal according to claim 1, wherein the X-ray powder diffractogram further comprises peaks at 12.14, 17.51, 18.89, and 19.41 °2θ ±0.20 °2θ.
3. The co-crystal according to claim 1 or 2, wherein the X-ray powder diffractogram is substantially as shown in Figure 1.
4. The co-crystal according to any one of claims 1 - 3, characterized by a differential scanning calorimetry (DSC) thermogram comprising an exotherm at about 211 °C.
5. The co-crystal according to claim 4, wherein the DSC thermogram is substantially as shown in Figure 2.
6. A co-crystal of N-(2-(5-(((2*R*,3*R*,4*S*,5*R*)-3,4-dihydroxy-5-methoxy-6,6-dimethyltetrahydro-2H-pyran-2-yl)oxy)-3'-fluoro-[1,1'-biphenyl]-2-yl)ethyl)-acetamide and L-proline (1:2), characterized by an X-ray powder diffractogram comprising the following peaks: 9.20, 16.19, 18.45, and 24.51 °2θ ±0.20 °2θ as determined on a diffractometer using Cu-Kα radiation at a wavelength of 1.54178 Å.
7. The co-crystal according to claim 6, wherein the X-ray powder diffractogram further comprises peaks at 11.83, 17.16, 20.15, and 25.34 °2θ ±0.2 °2θ.
8. The co-crystal according to claim 6 or 7, wherein the X-ray powder diffractogram is substantially as shown in Figure 14.

9. The co-crystal according to any one of claims 6 - 8, characterized by a differential scanning calorimetry (DSC) thermogram comprising an endotherm having an onset temperature of about 211.2 °C.
10. The co-crystal according to claim 9, wherein the DSC thermogram is substantially as shown in Figure 15.
11. A co-crystal of N-(2-(5-(((2*R*,3*R*,4*S*,5*R*)-3,4-dihydroxy-5-methoxy-6,6-dimethyltetrahydro-2H-pyran-2-yl)oxy)-3'-fluoro-[1,1'-biphenyl]-2-yl)ethyl)-acetamide and L-proline acetone solvate (1:1:1), characterized by an X-ray powder diffractogram comprising the following peaks: 14.64, 17.53, 18.91, and 21.33 °2θ ±0.20 °2θ as determined on a diffractometer using Cu-Kα radiation at a wavelength of 1.54178 Å.
12. The co-crystal according to claim 11, wherein the X-ray powder diffractogram further comprises peaks at 12.10, 15.14, 18.26, and 19.56 °2θ ±0.2 °2θ.
13. The co-crystal according to claim 11 or 12, wherein the X-ray powder diffractogram is substantially as shown in Figure 10.
14. The co-crystal according to any one of claims 11 - 13, characterized by a thermogravimetric analysis (TGA) thermogram comprising weight loss steps that conclude at about 150 °C and about 220 °C.
15. The co-crystal according to claim 14, wherein the TGA thermogram is substantially as shown in Figure 11.
16. A co-crystal of N-(2-(5-(((2*R*,3*R*,4*S*,5*R*)-3,4-dihydroxy-5-methoxy-6,6-dimethyltetrahydro-2H-pyran-2-yl)oxy)-3'-fluoro-[1,1'-biphenyl]-2-yl)ethyl)-acetamide, L-proline, methyl ethyl ketone, and pyrazine in a molar ratio of about 1:1.2:0.6:0.1, characterized by an X-ray powder diffractogram comprising the following peaks: 10.42, 14.62, 19.28, and 21.14 °2θ ±0.20 °2θ as determined on a diffractometer using Cu-Kα radiation at a wavelength of 1.54178 Å.

17. The co-crystal according to claim 16, wherein the X-ray powder diffractogram further comprises peaks at 11.85, 14.93, 17.40, and $19.28^{\circ}2\theta \pm 0.2^{\circ}2\theta$.
18. The co-crystal according to claim 16 or 17, wherein the X-ray powder diffractogram is substantially as shown in Figure 17.
19. The co-crystal according to any one of claims 16 - 18, characterized by unit cell dimensions as follows: $a = 10.975 \text{ \AA}$, $b = 10.310 \text{ \AA}$, $c = 15.704 \text{ \AA}$, $\alpha = 90^{\circ}$, $\beta = 108.56^{\circ}$, and $\gamma = 90^{\circ}$.
20. A co-crystal of N-(2-(5-(((2*R*,3*R*,4*S*,5*R*)-3,4-dihydroxy-5-methoxy-6,6-dimethyltetrahydro-2H-pyran-2-yl)oxy)-3'-fluoro-[1,1'-biphenyl]-2-yl)ethyl)-acetamide and D-proline (1:1), characterized by an X-ray powder diffractogram comprising the following peaks: 11.77, 14.52, 19.54, and $21.23^{\circ}2\theta \pm 0.20^{\circ}2\theta$ as determined on a diffractometer using Cu- $K_{\alpha 1}$ radiation at a wavelength of 1.5405929 $\text{\AA}$.
21. The co-crystal according to claim 20, wherein the X-ray powder diffractogram further comprises peaks at 8.45, 13.18, 16.95, and $19.12^{\circ}2\theta \pm 0.2^{\circ}2\theta$.
22. The co-crystal according to claim 20 or 21, wherein the X-ray powder diffractogram is substantially as shown in Figure 18.
23. The co-crystal according to any one of claims 20 – 22 characterized by a differential scanning calorimetry (DSC) thermogram comprising an endotherm at about 130 $^{\circ}\text{C}$.
24. The co-crystal according to claim 23, wherein the DSC thermogram is substantially as shown in Figure 19.
25. A co-crystal of N-(2-(5-(((2*R*,3*R*,4*S*,5*R*)-3,4-dihydroxy-5-methoxy-6,6-dimethyltetrahydro-2H-pyran-2-yl)oxy)-3'-fluoro-[1,1'-biphenyl]-2-yl)ethyl)-acetamide and L-proline (1:1), characterized by an X-ray powder diffractogram comprising the following peaks: 8.52, 16.33,

19.50, and 21.22 °2 θ $\pm$ 0.20 °2 θ as determined on a diffractometer using Cu-K α 1 radiation at a wavelength of 1.5405929 Å.

26. The co-crystal according to claim 25, wherein the X-ray powder diffractogram further comprises peaks at 9.19, 13.22, 14.75, and 17.57 °2 θ $\pm$ 0.2 °2 θ .

27. The co-crystal according to claim 25 or 26, wherein the X-ray powder diffractogram is substantially as shown in Figure 23.

28. The co-crystal according to any one of claims 25 - 27, characterized by unit cell dimensions as follows: a = 10.126 Å, b = 11.021 Å, c = 30.259 Å, α = 90°, β = 90°, and γ = 90°.

29. The co-crystal according to any one of claims 25 - 27, characterized by a differential scanning calorimetry (DSC) thermogram comprising an endotherm at about 145 °C.

30. The co-crystal according to claim 29, wherein the DSC thermogram is substantially as shown in Figure 24.

31. A pharmaceutical composition comprising a co-crystal according to any one of claims 1 - 30 and a pharmaceutically acceptable solid carrier.

32. A method for inhibiting heat shock protein 90 (Hsp90) in a subject, comprising administering to the subject a therapeutically effective amount of a co-crystal according to any one of claims 1 - 30.

33. A method for treating or preventing a neurodegenerative disorder in a subject suffering therefrom, comprising administering to the subject a therapeutically effective amount of a co-crystal according to any one of claims 1 - 30.

34. The method according to claim 33, wherein the neurodegenerative disorder is diabetic peripheral neuropathy.

35. A method for preventing or reducing the likelihood of diabetic peripheral neuropathy from developing in a subject, comprising administering to the subject a therapeutically effective amount of a co-crystal according to any one of claims 1 - 30, wherein the subject suffers from Type 1 or Type 2 diabetes.
36. A method of increasing the concentration of N-(2-(5-(((2*R*,3*R*,4*S*,5*R*)-3,4-dihydroxy-5-methoxy-6,6-dimethyltetra-hydro-2H-pyran-2-yl)oxy)-3'-fluoro-[1,1'-biphenyl]-2-yl)ethyl)-acetamide (**4a**) relative to N-(2-(5-(((2*S*,3*R*,4*S*,5*R*)-3,4-dihydroxy-5-methoxy-6,6-dimethyltetra-hydro-2H-pyran-2-yl)oxy)-3'-fluoro-[1,1'-biphenyl]-2-yl)ethyl)-acetamide (**4b**) in a starting composition comprising **4a** and **4b**, comprising contacting the starting composition with proline in a solvent, and subjecting the starting composition, proline, and solvent to crystallization conditions, whereby a co-crystal of **4a** and proline is produced, wherein the bulk co-crystal exhibits a concentration of **4a** that is higher than in the starting composition comprising **4a** and **4b**.
37. The method according to claim 36, wherein the proline is L-proline.
38. The method according to claim 36, wherein the proline is D-proline.
39. The method according to any one of claims 36 to 38, wherein the method further comprises heating the starting composition, proline, and solvent.
40. The method according to any one of claims 36 to 39, wherein the concentration of **4a** is determined by HPLC.
41. The method according to any one of claims 36 to 40, wherein the concentration of **4a** in the bulk co-crystal of **4a** and proline is about 3 to about 20% (w/w) higher than in the starting composition.
42. The method according to any one of claims 36 to 41, wherein the concentration of **4a** in the bulk co-crystal of **4a** and proline is about 5 to about 15% (w/w) higher than in the starting composition.

43. The method according to any one of claims 36 to 42, wherein the concentration of **4a** in the bulk co-crystal of **4a** and proline increases by about 5%, about 10%, or about 15% (w/w).
44. A co-crystal according to any one of claims 1 - 30 for treating or preventing a neurodegenerative disorder in a subject suffering therefrom.
45. A co-crystal according to any one of claims 1 - 30 for preventing or reducing the likelihood of diabetic peripheral neuropathy from developing in a subject who suffers from Type 1 or Type 2 diabetes.
46. Use of a co-crystal according to any one of claims 1 - 30 in the manufacture of a medicament for treating or preventing a neurodegenerative disorder in a subject suffering therefrom.
47. Use of a co-crystal according to any one of claims 1 - 30 in the manufacture of a medicament for preventing or reducing the likelihood of diabetic peripheral neuropathy from developing in a subject who suffers from Type 1 or Type 2 diabetes.