Claims:

What is claimed is:

1. A sustained-release pharmaceutical composition comprising a crystal or an amorphous form of a ketamine pamoate salt, and a pharmaceutically acceptable carrier thereof, wherein the ketamine pamoate salt is selected from the group consisting of *R*, *S*-ketamine pamoate salt, *S*-ketamine pamoate salt, *R*-ketamine pamoate salt, and any combination thereof, and the ketamine pamoate salt is a ketamine pamoate salt having a stoichiometry of 2:1 of ketamine to pamoate, a ketamine pamoate salt having a stoichiometry of 1:1 of ketamine to pamoate, or a combination thereof,

wherein the pharmaceutically acceptable carrier is selected from the group consisting of *N*-methyl-2-pyrrolidone, ethyl acetate, ethanol, butanol, 2-butanol, isobutanol, isopropanol, glycerin, benzyl benzoate, dimethyl sulfoxide, *N,N*-dimethylacetamide, propylene glycol, dimethyl glycol, benzyl alcohol, polyethylene glycol 4000 (PEG4000), polysorbate 80 (Tween 80), sodium carboxymethyl cellulose, sodium chloride, poly lactic acid, poly(lactic-co-glycolic) acid, and any combination thereof, and

wherein the sustained-release pharmaceutical composition has resistance to heat.

2. The sustained-release pharmaceutical composition according to claim 1, which is an injectable aqueous suspension, wherein the pharmaceutically acceptable carrier is polyethylene glycol 4000 (PEG4000), polysorbate 80 (Tween 80), sodium carboxymethyl cellulose, sodium chloride, or any combination thereof.

3. The sustained-release pharmaceutical composition according to claim 2, which has an average particle size (d50) of less than 20 μm and a specific surface area of more than 300 m^2/g.

4. The sustained-release pharmaceutical composition according to claim 1, which is an injectable solution, wherein the pharmaceutically acceptable carrier is *N*-methyl-2-pyrrolidone, ethyl acetate, ethanol, butanol, 2-butanol, isobutanol, isopropanol, glycerin, benzyl benzoate, dimethyl sulfoxide, *N,N*-dimethylacetamide, propylene glycol, dimethyl glycol, benzyl alcohol, or any combination thereof.

5. The sustained-release pharmaceutical composition according to claim 4, further comprising at least one of palmitic acid, oleic acid, stearic acid, decanoic acid, and linoleic acid.

6. The sustained-release pharmaceutical composition according to claim 1, which is an injectable matrix delivery system, wherein the pharmaceutically acceptable carrier is poly lactic acid, poly(lactic-co-glycolic) acid, or a combination thereof.

7. The sustained-release pharmaceutical composition according to claim 6, further comprising at least one of *N*-methyl-2-pyrrolidone, ethyl acetate, ethanol, butanol, 2-butanol, isobutanol, isopropanol, glycerin, benzyl benzoate, dimethyl sulfoxide, *N,N*-dimethylacetamide, propylene glycol, dimethyl glycol, benzyl alcohol, or any combination thereof.

8. The sustained-release pharmaceutical composition according to claim 1, further comprising one or more additional agents selected from the group consisting of a wetting agent, a suspending agent, a tonicity adjusting agent, a pH adjusting agent, a buffering agent, an antioxidant, and a preservative.

9. The sustained-release pharmaceutical composition according to claim 1, wherein the ketamine pamoate salt is present at a concentration of 1% to 99% w/w.

10. The sustained-release pharmaceutical composition according to claim 9, wherein the ketamine pamoate salt is present at a concentration of 5% to 60% w/w.

11. The sustained-release pharmaceutical composition according to claim 1, which is formulated for subcutaneous, intramuscular or intradermal injection.

12. A sustained-release pharmaceutical composition according to claim 1 for use in treating a disease or a condition, comprising administering to a subject in need thereof the sustained-release pharmaceutical composition, wherein the disease or the condition is selected from the group consisting of a central nervous system disease, depression, anti-inflammatory, pain, and any combination thereof.

13. The sustained-release pharmaceutical composition for use according to claim 12, wherein the disease or the condition is selected from the group consisting of major depressive disorder (MDD), treatment-resistant depression (TRD), suicidal ideation, bipolar disorder, obsessive-compulsive disorder, posttraumatic stress disorder (PTSD), autism spectrum disorder, tinnitus, refractory chronic migraine, asthma, anxiety, substance use disorder, alcohol use disorder, eating disorder, refractory status epilepticus, brain ischemia, Alzheimer's disease, Parkinson's disease, stroke,

traumatic brain injury, multiple sclerosis, and any combination thereof.

14. A sustained-release pharmaceutical composition according to claim 1 for use in anesthetizing a subject in need thereof, comprising administering to the subject the sustained-release pharmaceutical composition.