According to some embodiments of the invention, the pharmaceutical composition as described herein comprises microspheres dispersed in water for injection.

According to some embodiments of the invention, the pharmaceutical composition as described herein comprises the active agent (an agent that reduces nNOS activity as described herein) dispersed in a pasty biodegradable polymer carrier for injection.

According to an aspect of some embodiments of the present invention there is provided 7-nitoindazole salts with divalent and trivalent metal or ammonium counter-ions, as described herein.

According to an aspect of some embodiments of the present invention there is provided a method for treating autism spectrum disorder (ASD) comprising: administering to the subject in need of such treatment an effective amount of a neuronal NO-reducing composition.

According to some embodiments of the invention, the NO-reducing composition comprises one or more of a small molecule, an amino acid based molecule, or a nucleic acid based molecule (or a combination of several types of molecules, as described herein

According to some embodiments of the invention, the reduction in NO may be by one of the following mechanism:

Decrease in expression from the nNOS gene;

Inhibition of nNOS activity in the enzymatic level;

Decrease in the L-arginine level; and

Increase of GSNO reductase level or activity (decrease levels of GSNO).

According to an aspect of some embodiments of the present invention there is provided a method for producing an animal model for autism spectrum disorder the method comprising: administering to a laboratory animal an effective amount of a nitric oxide donor.

According to some embodiments of the invention, the administration is systemic

According to some embodiments of the invention, the administration is by a CNS targeted delivery system.

According to some embodiments of the invention, the administration is to the brain.

According to some embodiments of the invention, the administration is to the brain using nanoparticles delivered to the olfactory tissue.

In one aspect, there is provided a pharmaceutical composition comprising a therapeutically active agent and a pharmaceutically acceptable carrier, wherein (i) the therapeutically active agent reduces neuronal nitric oxide synthase (nNOS) activity selectively or preferentially in nervous tissue of a subject; and (ii) the pharmaceutically acceptable carrier comprises at least one of a lipid, a surfactant, and a water-miscible organic solvent in an aqueous solution.

In another aspect, there is provided a use of the pharmaceutical composition described herein in the manufacture of a medicament for the treatment of a condition associated with elevated neuronal nitric oxide synthase (nNOS) activity.

In yet another aspect, the present disclosure provides a use of the pharmaceutical composition as described herein in the manufacture of a medicament for the treatment of autism spectrum disorder (ASD).

In a further aspect, there is provided a use of the pharmaceutical composition as described herein in the manufacture of a medicament for the treatment of attention deficit hyperactivity disorder (ADHD) or attention deficit disorder (ADD).

In another aspect, the present disclosure provides a use of the pharmaceutical composition as described herein in the manufacture of a medicament for the treatment of a condition selected from the group consisting of Alzheimer's disease, Parkinson's disease, Huntington's disease, multiple sclerosis, schizophrenia, addiction, amyotrophic lateral sclerosis (ALS), epilepsy, bipolar disease and migraine.

In yet another aspect, the present disclosure provides a use of the pharmaceutical composition as described herein in the manufacture of a medicament for the treatment of a cancer of a neural origin or a neuroectodermal origin.

In a further aspect, the present disclosure provides a use of the pharmaceutical composition as described herein in the manufacture of a medicament for the treatment of a condition selected from the group consisting of neuroblastoma, glioma, ganglioglioma, central neurocytoma, ganglioneuroblastoma, medulloblastoma and a primitive neuroectodermal tumor (PNET).

In another aspect, the present disclosure provides a pharmaceutical composition comprising an active agent which reduces neuronal nitric oxide synthase (nNOS) activity for use in treating autism spectrum disorder (ASD).

In yet another aspect, there is provided a use of a pharmaceutical composition in the manufacture of a medicament for the treatment of autism spectrum disorder (ASD) in a subject in need thereof, wherein the pharmaceutical composition comprises an active agent which reduces neuronal nitric oxide synthase (nNOS) activity.

In a further aspect, there is provided a pharmaceutical composition comprising an active agent which reduces neuronal nitric oxide synthase (nNOS) activity for use in treating neuroblastoma.

In yet another aspect, the present disclosure provides a use of a pharmaceutical composition in the manufacture of a medicament for the treatment of neuroblastoma in a subject in need thereof,

wherein the pharmaceutical composition comprises an active agent which reduces neuronal nitric oxide synthase (nNOS) activity.

Unless otherwise defined, all technical and/or scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which the invention pertains. Although methods and materials similar or equivalent to those described herein can be used in the practice or testing of embodiments of the invention, exemplary methods and/or materials are described below. In case of conflict, the patent specification, including definitions, will control. In