WHAT IS CLAIMED IS:

1. A hyaluronan conjugate, comprising:

a hyaluronic acid (HA) or a salt thereof;

a sex hormone, selected from the group consisting of, estrone, estradiol, estriol, and 11-deoxycorticosterone; and

a linker, covalently coupling the sex hormone with one of the disaccharide units of the HA or salt thereof.

2. The hyaluronan conjugate of claim 1, wherein the linker is selected from the group consisting of, one or more amino acids, lipid, dihydrazide-C_2-C_{20} dicarboxylic acid, and C_2-C_{20} dicarboxylic acids.

3. The hyaluronan conjugate of claim 1, wherein the hyaluronan conjugate has a degree of substitution with the sex hormone of 0.1 to 60%.

4. The hyaluronan conjugate of claim 1, wherein the HA or salt thereof has a weight-average molecular weight (Mw) of about 5 to 500 kilodaltons (kDa).

5. The hyaluronan conjugate of claim 2, wherein the linker is covalently coupled to the hydroxyl group (–OH) of the sex hormone.

6. The hyaluronan conjugate of claim 2, wherein the amino acid is β-alanine (β-ALA).

7. The hyaluronan conjugate of claim 2, wherein the dihydrazide-C_2-C_{20} dicarboxylic acid is adipic dihydrazide (ADH)-succinate.

8. The hyaluronan conjugate of claim 2, wherein the C_2-C_{20} dicarboxylic acids is succinic acid.

9. Use of a hyaluronan conjugate in the manufacture of a medicament for use in the treatment or prevention of a neurodegenerative disease, wherein the hyaluronan conjugate is according to any of claims 1 to 8.

10. A pharmaceutical composition for treating or preventing a neurodegenerative disease, comprising an effective amount of a hyaluronan conjugate according to any of claims 1 to 8 and a pharmaceutically-acceptable excipient.

11. The pharmaceutical composition of claim 10, wherein the pharmaceutical composition is to be administered via oral, nasal, intracranial, intraspinal, intrathecal, intramedullary, intracerebral, intracerebroventricular, intravenous, intraarterial, intracardial, intracutaneous, subcutaneous, transdermal, intraperitoneal, or intramuscular administration.

12. The pharmaceutical composition of claim 10, wherein the neurodegenerative disease is Alzheimer's disease (AD), Parkinson's disease (PD), amyotrophic lateral sclerosis (ALS), multiple sclerosis (MS), Huntington's disease (HD), frontotemporal dementia, epilepsy, neuropathic pain, or ataxia.