

CLAIMS

1. A polynucleotide encoding a hSlo protein set forth in SEQ ID NO:8, wherein the polynucleotide comprises the 5' terminal sequence 5'-atggcaaacggtggcggcggcggcggcgagcagcg-3' set forth in SEQ ID NO: 6.
2. The polynucleotide of claim 1, wherein the nucleic acid sequence of the polynucleotide comprises a mutation encoding a T352S substitution in the hSlo protein set forth in SEQ ID NO:8.
3. A vector comprising an hSlo open reading frame sequence comprising the polynucleotide of claims 1 or 2.
4. The vector of claim 3, wherein the vector comprises a plasmid, an adenoviral vector, an adeno-associated virus (AAV) vector, a retroviral vector or a liposome.
5. The vector according to claim 4, wherein the plasmid is pVAX.
6. The vector of claim 5, wherein the pVAX has a sequence at least 95% identical to the pVAX sequence set forth in SEQ ID NO: 10.
7. The vector of claim 6, wherein the pVAX sequence comprises (i) a substitution of G for A at position 2 of SEQ ID NO: 10, (ii) an additional G at position 5 of SEQ ID NO: 10, (iii) a substitution of T for C at position 1158 of SEQ ID NO: 10, (iv) a missing A at position 2092 of SEQ ID NO: 10, (v) a substitution of T for C at position 2493 of SEQ ID NO: 10, or (vi) a combination thereof.
8. A pharmaceutical composition, comprising a vector comprising an hSlo open reading frame sequence comprising the polynucleotide of claim 1 and a pharmaceutically acceptable diluent or carrier in a unit dose, wherein the pharmaceutical composition is formulated for injection into smooth muscle.
9. The pharmaceutical composition of claims 8, wherein the unit dose is between about 5,000 mcg and 50,000 mcg, at least about 10,000 mcg, about 16,000 mcg, or about 24,000 mcg.
10. Use of a polynucleotide of claim 1 or 2, a vector of any one of claims 4 to 7, or a pharmaceutical composition of claim 8 or 9 for the manufacture of a medicament for treating or alleviating a sign or symptom of overactive bladder syndrome or detrusor overactivity in a human subject in need thereof.
11. The use according to claim 10, wherein the polynucleotide, vector, or pharmaceutical composition is to be administered into the detrusor muscle.
12. The use according to claim 10 or 11, wherein the polynucleotide, vector, or pharmaceutical composition is to be administered into the detrusor muscle by direct injection.
13. The use according to claim 12, wherein the direct injection is in at least 2, at least 5, at least 10, at least 15, at least 20, or more injection sites.

14. The use according to any one of claims 10 to 13, wherein the sign or symptom of overactive bladder syndrome is selected from urinary urgency, frequency of micturition, nocturia, urge urinary incontinence, or a combination thereof.
15. A kit comprising a polynucleotide of claim 1 or 2, a vector of any one of claims 4 to 7, or a pharmaceutical composition of claim 8 or 9, optionally a pharmaceutically acceptable diluent or carrier, and optionally instructions for use according to claims 10 to 14.