CLAIMS

1. A stent assembly consisting of:

a stent, wherein the stent is a tube or a helical coil;

a first carrier comprising a first active agent, wherein the first carrier is disposed as one or more layers on at least a portion of an exterior surface of the stent; and

a swellable coating comprising a second active agent, wherein the swellable coating further comprises a second carrier comprising a third active agent, wherein the second carrier is in a form of particles, wherein the swellable coating is disposed on at least a portion of the one or more layers of the first carrier, wherein the swellable coating swells by 5 times to 160 times its volume under urinary conditions to make contact with a ureter wall of a subject.

2. The stent assembly according to claim 1, wherein the swellable coating comprises a swellable material selected from the group consisting of a hydrogel, a water swellable polymer, a superabsorbent polymer, copolymers of the water swellable polymer and the superabsorbent polymer, and combinations thereof.

3. The stent assembly according to claim 1, wherein the first, second and third active agents are independently selected from the group consisting of an antifibrotic agent, an anticancer agent, a discomfort reducing agent, an antibacterial agent, a gene, a gene vector, a growth factor, and combinations thereof.

4. The stent assembly according to claim 1, wherein amount of the first active agent in the first carrier is in the range of about 2 wt% to about 25 wt% of the carrier.

5. The stent assembly according to claim 1, wherein the one or more layers has a thickness in the range of about 10 μm to about 1000 μm.

6. The stent assembly according to claim 1, wherein the one or more layers comprises a thermoplastic elastomer.

7. A method of preparing a stent assembly of claim 1, the method comprising:

providing a stent, wherein the stent is a tube or a helical coil;

disposing a swellable coating on the stent, wherein the swellable coating is adapted to swell by 5 times to 160 times its volume under urinary conditions to make contact with a ureter wall of a subject; and disposing a first carrier on at least a portion of an exterior surface of the stent, wherein the first carrier comprises a first active agent, and wherein the swellable coating comprises a swellable material and a second active agent, the swellable coating further comprises a second carrier comprising a third active agent, the second carrier being in a form of particles.

8. The method according to claim 7, wherein providing the stent comprises physically treating the exterior surface of the stent by etching, and/or roughening the exterior surface with solid particles.

9. The method according to claim 7, wherein providing the stent comprises chemically treating the exterior surface of the stent with plasma treatment.

10. The method according to claim 7, wherein disposing the swellable coating on the stent comprises applying a liquid reagent comprising the swellable material and the second active agent on at least the portion of the exterior surface of the stent.

11. The method according to claim 7, wherein disposing the first carrier comprises dispersing the first carrier on the exterior surface of the stent.

12. The method according to claim 7, wherein the swellable material comprises a hydrogel.

13. The method according to claim 12, wherein disposing the swellable coating on the stent further comprises cross-linking a hydrogel-forming agent to form the hydrogel.

14. The method according to claim 13, wherein the swellable material further comprises a photoinitiator.