CLAIMS

1. An expandable coaptation element for inhibiting regurgitation between native heart valve leaflets comprising:

an expandable mechanism configured to move between an expanded configuration and a collapsed configuration;

an expandable frame attached around the expandable mechanism; and

wherein the expandable mechanism is configured to expand in only two opposite directions.

2. The expandable coaptation element of claim 1, wherein the expandable frame has a circular cross-section when the expandable mechanism is in the collapsed configuration and the expandable frame has an oval cross-section when the expandable mechanism is in the expanded configuration.

3. The expandable coaptation element of claim 1, wherein the expandable frame comprises two or more shell components attached to the expandable mechanism.

4. The expandable coaptation element of claim 1, wherein the expandable frame comprises an expandable sleeve disposed around the expandable mechanism.

5. The expandable coaptation element of claim 1, further comprising a stretchable cover that covers at least a portion of the expandable frame.

6. The expandable coaptation element of claim 1, wherein the expandable mechanism comprises a plurality of struts.

7. The expandable coaptation element of claim 1, further comprising an actuation mechanism mounted inside the expandable mechanism, the actuation mechanism configured to move the expandable mechanism and the expandable frame between the expanded configuration and the collapsed configuration.

8. The expandable coaptation element of claim 7, wherein the expandable mechanism includes a distal end portion, a proximal end portion opposite the distal end portion, and an

intermediate portion between the distal end portion and the proximal end portion, wherein the intermediate portion expands when the expandable frame moves from the collapsed configuration to the expanded configuration.

9. The expandable coaptation element of claim 8, wherein the intermediate portion comprises a plurality of strips the extend longitudinally and are spaced apart, the plurality of strips being configured to bend when the intermediate portion expands.

10. A valve repair device comprising:

an anchor configured for attachment to a leaflet of a native heart valve;

an expandable coaptation element connected to the anchor, the expandable coaptation element comprising:

an expandable mechanism configured to move between an expanded configuration and a collapsed configuration;

an expandable frame attached around the expandable mechanism; and

wherein the expandable mechanism is configured to expand in two opposite directions.

11. The valve repair device of claim 12, wherein the expandable frame has a circular cross-section when the expandable mechanism is in the collapsed configuration and the expandable frame has an oval cross-section when the expandable mechanism is in the expanded configuration.

12. The valve repair device of claim 13, wherein the expandable frame comprises two or more shell components attached to the expandable mechanism.

13. The valve repair device of claim 10, wherein the expandable frame comprises an expandable sleeve disposed around the expandable mechanism.

14. The valve repair device of claim 10, wherein the expandable mechanism comprises a plurality of struts.

15. The valve repair device of claim 10, further comprising an actuation mechanism mounted inside the expandable mechanism, the actuation mechanism configured to move the expandable

mechanism and the expandable frame between the expanded configuration and the collapsed configuration.

16. The valve repair device of claim 15, wherein the expandable mechanism includes a distal end portion, a proximal end portion opposite the distal end portion, and an intermediate portion between the distal end portion and the proximal end portion, wherein the intermediate portion expands when the expandable frame moves from the collapsed configuration to the expanded configuration.

17. The valve repair device of claim 16, wherein the intermediate portion comprises a plurality of strips the extend longitudinally and are spaced apart, the plurality of strips being configured to bend when the intermediate portion expands.

18. The valve repair device of claim 10, further comprising a stretchable cover that covers at least a portion of the expandable frame.

19. A valve repair system comprising:

a delivery device;

a valve repair device attached to the delivery device;

wherein the valve repair device comprises:

an anchor configured for attachment to a leaflet of a native heart valve;

an expandable coaptation element connected to the anchor, the expandable coaptation element comprising:

an expandable mechanism configured to move between an expanded configuration and a collapsed configuration;

an expandable frame attached around the expandable mechanism; and

wherein the expandable mechanism is configured to expand in two opposite directions.

20. The valve repair system of claim 19, further comprising an actuation mechanism mounted inside the expandable mechanism, the actuation mechanism configured to move the expandable mechanism and the expandable frame between the expanded configuration and the collapsed configuration.