

Claims

1. An expander for widening and holding apart an opening of a tissue, the expander comprising a body configured to deform from a compacted state into a pre-determined shape in an expanded state in response to a pre-determined physiological condition the body is exposed to,
5 wherein the body with the pre-determined shape in the expanded state is configured to hold apart the opening of the tissue,
wherein the body, in the compacted state, is in a folded shape, wherein the folded shape comprises a spiral shape or a coiled shape,
10 wherein the pre-determined shape in the expanded state comprises an annular circular shape with a broken connection, an annular oval shape with a broken connection, an annular elliptical shape with a broken connection, or a horseshoe shape,
wherein the body, in the expanded state, comprises a continuous recess along a
15 circumferential surface of the body to engage the tissue, wherein the continuous recess encircles the body,
characterised in that the expander further comprises a pouch enclosing the body to maintain the body in the compacted state, or the body further comprises a glue or a coating configured to maintain the body in the compacted state, and
20 in that the pouch, the glue, or the coating are configured to be dissolvable in the tissue to expose the body for deforming from the compacted state to the pre-determined shape in the expanded state.
2. The expander as claimed in claim 1, wherein deformation of the body is
25 gradual over a period of time of at least one second, or 1 to 10 seconds, or 5 to 15 seconds, or 10 to 20 seconds, or 15 to 25 seconds, or 20 to 30 seconds, or 25 to 35 seconds.
3. The expander as claimed in claim 1 or claim 2, wherein deformation of the
30 body from the compacted state into the pre-determined shape in the expanded state causes the widening of the opening of the tissue.

4. The expander as claimed in any one of claims 1 to 3, wherein the body, in the expanded state, is configured to be elastically deformable under an applied force for bending the body, and configured to return to the pre-determined shape upon the removal of the applied force.
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5. The expander as claimed in any one of claims 1 to 4, wherein the pre-determined physiological condition comprises a temperature, a pressure, or a fluid concentration, or a gaseous concentration inside the opening of the issue.
- 10 6. The expander as claimed in any one of claims 1 to 5, wherein the physiological condition comprises a pre-determined temperature.
7. The expander as claimed in any one of claims 1 to 6, wherein the body is further configured to deform from the compacted state into the pre-determined shape
- 15 in the expanded state in response to an external stimulation, preferably, wherein the external stimulation comprises a thermal source external to the tissue, or a fluid with a predetermined temperature.
8. The expander as claimed in claim 7, wherein a portion of the circumferential
- 20 surface of the body, in the compacted state, is configured to engage a holder of an injector, preferably, wherein the holder comprises a pair of rod-like structures.
9. The expander as claimed in any one of claims 1 to 8, wherein the body comprises a C-shaped cross section, a U-shaped cross section or a horseshoe-shaped
- 25 cross section.
10. The expander as claimed in any one of claims 1 to 9, wherein the tissue comprises an iris and the opening of the tissue comprises a pupil.