Supporting Information

**Title: Tailoring the Multistability of Origami-Inspired, Buckled Magnetic Structures via Compression and Creasing**

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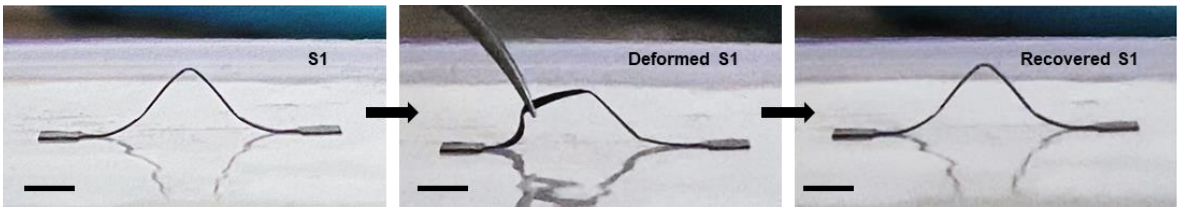



**Figure S1**. Deformation and recovery of state 1 of the 3-crease ribbon structure. Scale bars, 2 mm.

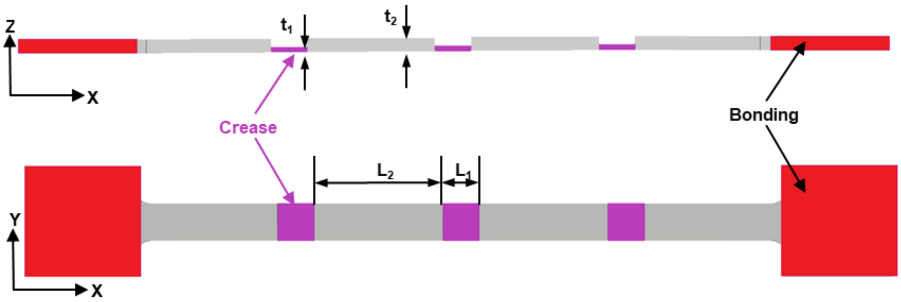



**Figure S2**. Schematic illustration of the dimensions of creases and non-crease segments.

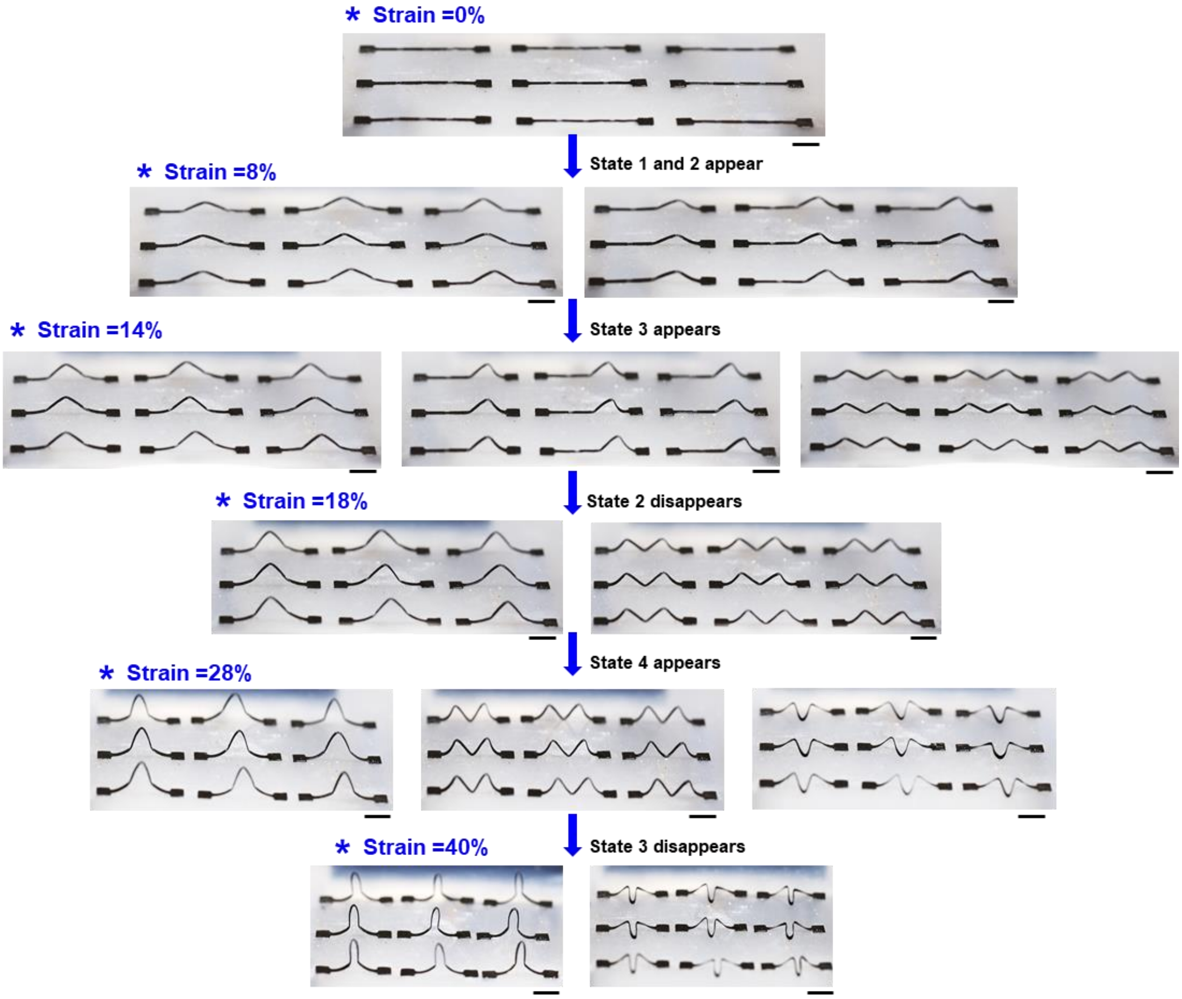



**Figure S3.** Multistable states of a creased-ribbon structure array under the strain of  0%, 8%, 14%, 18% and 28%, 34%, respectively. Scale bars, 3 mm.

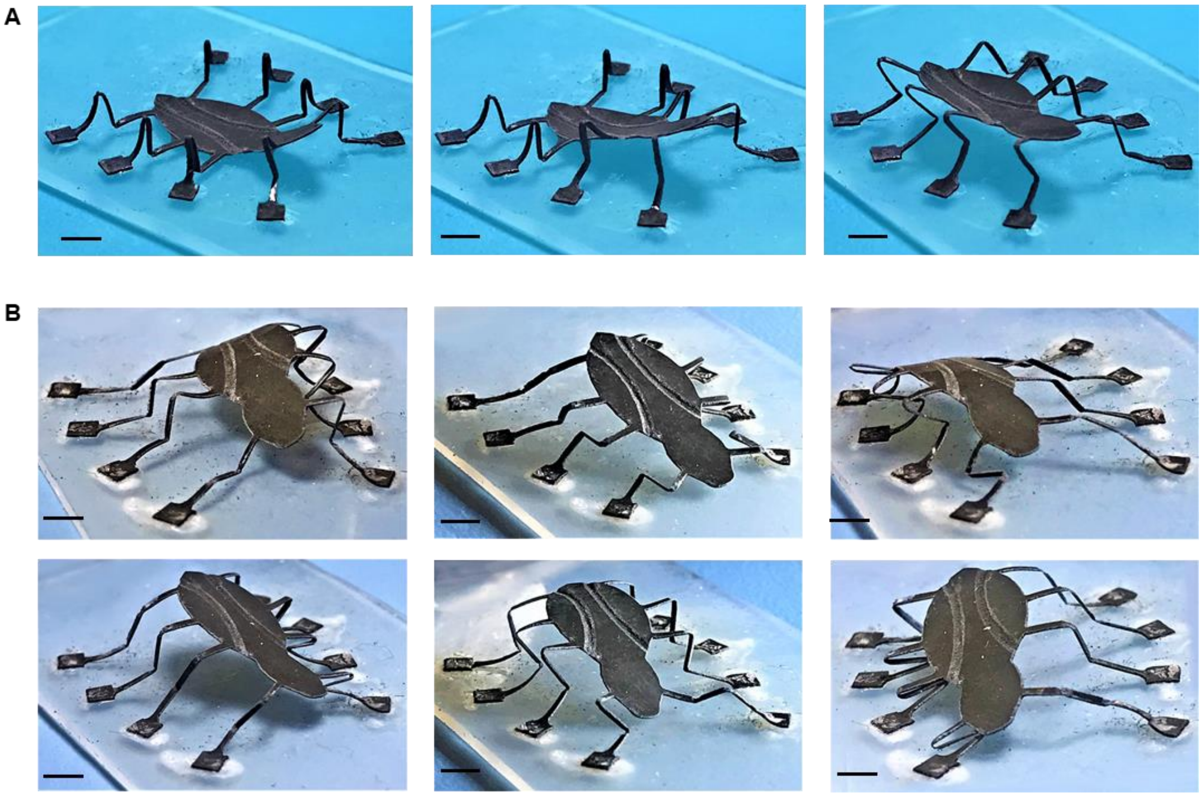



**Figure S4.** Reconfiguration of a multistable biomimetic insect. (A) Three stable states of the structure from being completely flat to being fully standing. Scale bars, 2 mm. (B) Snapshots of the motions of the structure, including forward, backward, lateral forward, and lateral backward states. Please note that the states shown in Figure S2B are not stable. Scale bars, 2 mm.

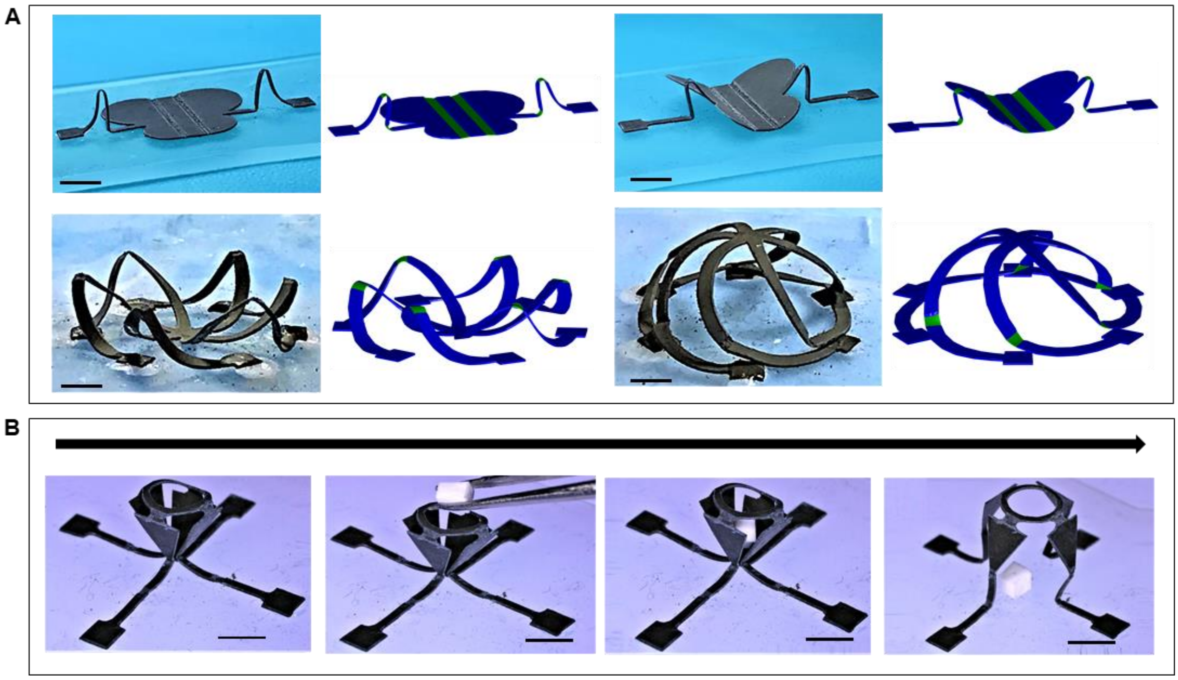



**Figure S5.** (A) Reconfiguration of a biomimetic butterfly structure and flower structure. Scale bars, 4 mm. (B) Experimental demonstration of the hold-release behavior of a drug-release system based on the magnetic actuation strategy. Scale bars, 4 mm.

**Table S1.** Effect of the crease thickness ratio on the multistability of the ribbon structure (strain: 14%; L1/L2: 0.32)

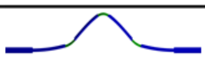
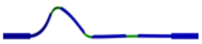
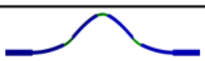
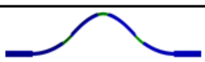
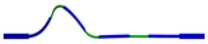
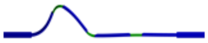
| $t_1/t_2$ | State 1 | State 2 | State 3 | State 4 |
|---|---|---|---|---|
| 0.25 |  | x |  | x |
| 0.33 |  | x |  |  |
| 0.4 |  | x |  | x |
| 0.46 |  |  |  | x |
| 0.56 |  |  | x | x |
| 0.67 |  | x | x | x |
| 1 |  | x | x | x |

**Table S2:** Effect of the crease length ratio on the multistability of the ribbon structure (strain: 14%; $t_1/t_2$: 0.46)

| $L_1/L_2$ | State 1 | State 2 | State 3 | State 4 |
|---|---|---|---|---|
| 1 |  | x |  |  |
| 0.56 |  |  |  |  |
| 0.32 |  |  |  | x |
| 0.18 |  |  | x | x |
| 0.1 |  | x | x | x |

**Legends for supplementary movies 1 to 7**

**Supplementary Movie 1.** Dynamic progression of the five regimes of the ribbon structure shown in Figure 2A when the compressive strain increases from 0% to 40%, as well as magnetic reconfiguration among the stable states within each regime.

**Supplementary Movie 2.** A single pathway ($P_{1\text{-}2}$) along which the structure is reconfigured between states S1 and S2, at a strain of 8% and crease number of 3.

**Supplementary Movie 3. Three pathways ($P_{1\text{-}2}$, $P_{1\text{-}3}$ and $P_{2\text{-}3}$) at the strain of 14% and crease number of 3. (A)** A single pathway ($P_{1\text{-}2}$) along which the structure is reconfigured between states S1 and S2. **(B)** A single pathway ($P_{1\text{-}3}$) along which the structure is reconfigured between states S1 and S3. **(C)** A single pathway ($P_{2\text{-}3}$) along which the structure is reconfigured between states S2 and S3.

**Supplementary Movie 4. Two pathways ($P_{1\text{-}2*\text{-}3}$ and $P_{1\text{-}3}$), at the strain of 18% and crease number of 3. (A)** A merged pathway ($P_{1\text{-}2*\text{-}3}$) along which the structure is reconfigured between states S1 and S3. 2* denotes that state S2 is no longer stable. **(B)** A single pathway ($P_{1\text{-}3}$) along which the structure is reconfigured between states S1 and S3.

**Supplementary Movie 5. Three pathways ($P_{1\text{-}2*\text{-}3}$, $P_{1\text{-}3}$ and $P_{3\text{-}4}$) at the strain of 24% and crease number of 3. Scale bar, 2 mm. (A)** A merged pathway ($P_{1\text{-}2*\text{-}3}$) along which the structure is reconfigured between states S1 and S3. **(B)** A single pathway ($P_{1\text{-}3}$) along which the structure is reconfigured between states S1 and S3. **(C)** A single pathway ($P_{3\text{-}4}$) along which the structure is reconfigured between states S3 and S4.

**Supplementary Movie 6. Two merged pathways ($P_{1\text{-}2*\text{-}3*\text{-}4}$ and $P_{1\text{-}3*\text{-}4}$) at the strain of 34% and crease number of 3. Scale bar, 2 mm. (A)** A merged pathway ($P_{1\text{-}2*\text{-}3*\text{-}4}$) along which the structure is reconfigured between states S1 and S4. **(B)** A merged pathway ($P_{1\text{-}3*\text{-}4}$) along which the structure is reconfigured between states S1 and S4.

**Supplementary Movie 7.** Remote, magnetic actuation process of an origami-inspired multistable robot.