ACCSCIENCE PUBLISHING

International Journal of Bioprinting

RESEARCH ARTICLE

4D printing and simulation of body temperature-responsive shape-memory polymers for advanced biomedical applications

Supplementary file

Table S1. Printability (strand thickness) of the shape-memory polymer with 20 phr polylactic acid and polyethylene glycol (PLA+PEG 20 phr)

Pressure (kPa)	Feed rate (mm/min)	Strand thickness (mm)
100	340	-
	420	301.42 ± 7.28
	500	-
150	340	352.06 ± 5.93
	420	341.85 ± 6.76
	500	-
200	340	411.99 ± 6.45
	420	397.25 ± 4.99 *
	500	-
250	340	437.32 ± 6.98
	420	417.54 ± 7.94
	500	-
300	340	469.79 ± 6.12
	420	-
	500	-

Note: * denotes optimum strand thickness at a feed rate of 420 mm/min and pressure of 200 kPa.

Supplementary videos

Video S1. Cylindrical structure used in the simulation of shape-memory polymer to analyze the properties and behaviors of shape-memory polymers.

Video S2. Star-shaped structure of a shape-memory polymer, demonstrating the polymer's ability to maintain complex geometries through the memory effect.

Video S3. Construction of a stent utilizing shape-memory polymers, highlighting the material's potential in medical device manufacturing.

Video S4. Expansion of a stent fabricated with shape-memory polymers, demonstrating how shape-memory polymers can be activated to change shape.

Video S5. Application of rigid bodies and shape-memory polymers as hinges to provide structural support and flexibility to a folded box.

Video S6. Utilization of rigid bodies and shape-memory polymers as hinges to provide structural support and flexibility to a folded box configuration.