# Biocompatible Tough and Flexible Polymeric Materials

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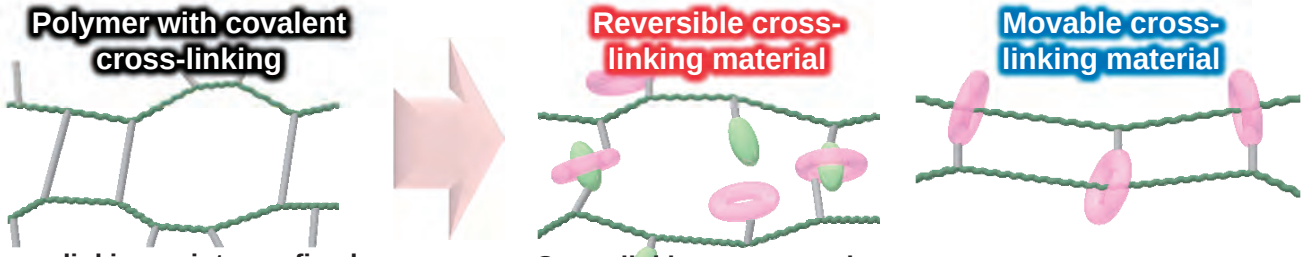
## Project Outline

**Conventional polymers:** Cross-linked by covalent bonds.

**Our work:** We prepared polymeric materials cross-linked by non-covalent bonds, which can make conventional polymers tough and flexible.

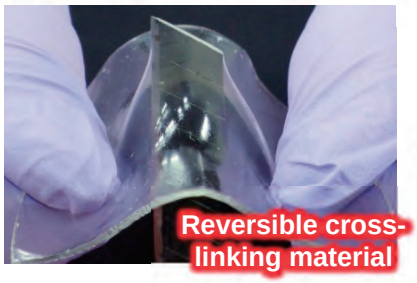



Cross-linking points are fixed.

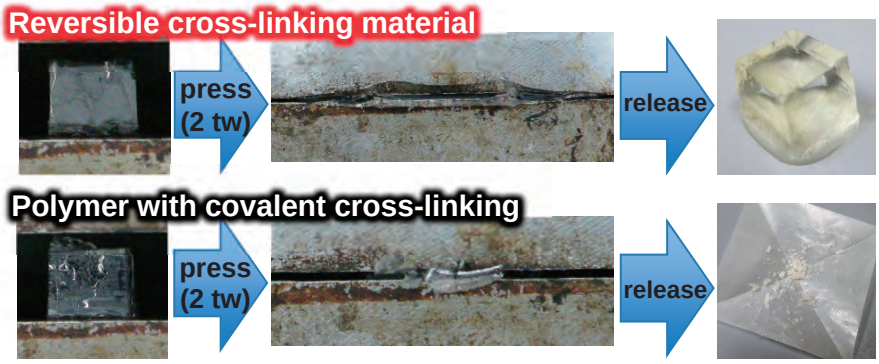
Cross-linking can associate and dissociate easily.

Cross-linking can slide to dissipate external stress.

### (1) Tough & Flexible

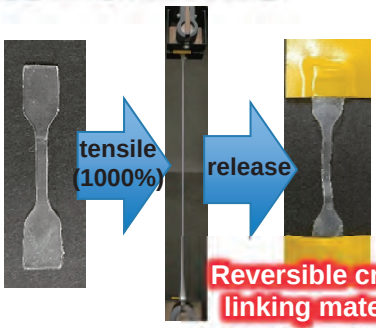



Stub-resistant test



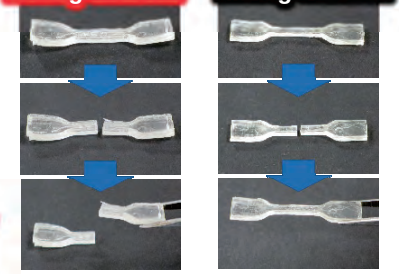

The reversible cross-linking material is unbreakable against pressing.

### (2) Shape Recovery



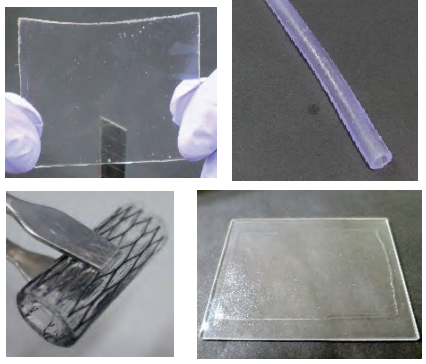

The material recovered its shape through 1000% extending.

### (3) Self-Healing




The reversible cross-linking can readhere via the interaction.

### Trial Products



**Targets:** Medical devices required toughness / long life.

**Vascular disease:** Stent coating material for vascular surgery, catheter, tubes, balloons, intravascular embolic materials.
**Trauma:** Hemostatic sheet, surgical tape.
**Pressure ulcer:** Bedding contact surface material.
**Arthropathy:** Artificial cartilage.
**Tubular organ disease:** Scaffolding material during surgery.
**Diaphragmatic hernia / abdominal wall rupture:** patch closure material.

### Patents

1. JP 5951758
2. JP 5951758
3. JP 6257633
4. JP 6300926
5. JP 6529052
6. JP 6636610
7. Application 2016-148725
8. Application 2018-036986
9. Application 2017-039908
10. Application 2017-095058
11. Application 2017-152059
12. Application 2019-188135