

### Bio-inspired fabrication of 4D helices

전석진<sup>†</sup>  
금오공과대학교  
(sjeon@kumoh.ac.kr<sup>†</sup>)

Various natural systems have helical structures and the structure has important roles for their survival. For example, helical coiling of Bauhinia seed pods helps preserve their species by dispersing seeds to a distance. Recent study on Bauhinia seed pods unveiled the seed pods' strategy for the formation of helices. In this talk, fabrication of artificial seed pods by mimicking their strategy is presented. Hydrogel hybrids composed of soft responsive hydrogels and rigid glassy polymers which substitute soft cells and rigid celluloses inside Bauhinia seed pods were used for the fabrication. Fabricated helices are able to shape shift between one shape, a flat sheet, and the other shape, a helix, respond to temperature due to the thermo-responsive behavior of responsive hydrogels, called "4D materials". The method is applicable to the fabrication of various 4D materials capable of useful motions, and thus potentially applicable to soft robotics.