Temperature responsive poly (N-vinyl caprolactam) microparticles for controlled drug delivery

노윤호, 심민석[1], 봉기완†
고려대학교; [1]인천대학교
(bong98@korea.ac.kr†)

Controlled drug delivery system is important for the realization of therapeutic efficacy. Systems using temperature responsive polymers have drawn much attention because this stimuli occur in the body and can be given from outside, which makes it easier to control the drug release rate. Here, we introduce Poly(N-vinyl caprolactam) (PVCL) microparticles for controlled drug release. PVCL is one of the famous thermo-sensitive polymers. Unlike Poly(N-isopropyl acrylamide) (PNIPAAm), PVCL has high biocompatibility and therefore, has a potential to be utilized in controlled drug delivery system. PVCL microparticles were synthesized via Stop Flow Lithography (SFL) technique. We confirmed that particles collapse above certain temperature known as lower critical solution temperature (LCST). By adding PEG 700 DA as a hydrophilic component, we found that LCST increases proportional to the concentration of PEG 700 DA. After fitting the LCST to body temperature, we conducted the drug release test using FITC-BSA and revealed that the release rates were significantly higher at below LCST than above LCST. Also, we synthesized multi-temperature modulated microparticles by taking advantage of SFL.