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Well-defined thermo-responsive polymers as injectable gels

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Thermo responsive polymers have a broad range of biomedical applications including tissue engineering as injectable gels. In our group we have synthesised and characterised a variety of thermo responsive multiblock copolymers where the structural parameters (molecular weight, composition, architecture, chemistry) were systematically varied. These structural parameters of the polymers affected the physical-chemical properties of the polymers and their self-assembly behaviour as well as their ability to form injectable gels. For example the optimum molecular weight was found to be around 7000 g/mol and the optimum hydrophobic content around 35 wt%. Interestingly the architecture, specifically the position of the hydrophobic block within the polymer also influenced the thermo responsive, sol-gel transition of the polymer and it was demonstrated that the best transition was achieved when the hydrophobic block was in the middle of the polymer. In summary the results were able to demonstrate that the gelation temperature can easily be tailored that is essential for the application.

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