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Unusual aggregation behavior of colloids coated with palindromic DNA MIRJAM LEUNISSEN, REMI DREYFUS, DAVID PINE, PAUL CHAIKIN, New York University — Coating particles with single-stranded DNA ‘sticky ends’ gives excellent control over the specificity, strength and range of their interactions. Usually, a pair of complementary ‘Watson-Crick’ sequences is used to obtain thermoreversible binding of different colloids. However, for certain purposes one could also use self-complementary ‘palindrome’ sequences. Using light microscopy, we studied the aggregation behavior of micrometer-sized palindrome-coated colloids. Unlike Watson-Crick sticky ends, we found that it is of great importance whether the palindrome sticky end is attached to a flexible single strand or a rigid double-stranded ‘rod’. While the latter system displayed normal dissociation at elevated temperature, the former system showed enhanced aggregation with increasing temperature and no aggregation during fast temperature quenches. We explain these unusual observations by a competition between intra- and interparticle bonds. This provides us with an additional level of control over the interparticle bonding, besides the sequence of the sticky ends, the salt concentration and the DNA density on the beads.

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