Peptide-mediated synthesis of gold nanoparticles: effects of peptide halogenation

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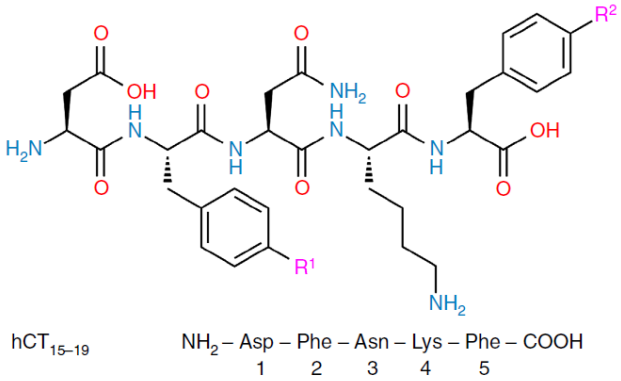
Self-assembled biological molecules have gathered increasing research attention for their ability to work as templates in the development of inorganic nanoengineered materials.[1] In this regards, peptides are considered promising materials, due to the possibility of tuning their physical-chemical properties by modification of the aminoacidic sequence or introducing unnatural derivatives.[2] In this contribution we report the synthesis of gold nanoparticles (NPs) mediated by an amyloidogenic peptide and its halogenated derivatives (Figure 1).[3] We found that halogenation strongly impacted the synthesis of NPs, which were formed in larger quantities and faster in the presence of the halogenated peptides and by using much lower peptide concentrations compared to the nonhalogenated derivative. Small models and mechanicistic considerations will be reported. Obtained systems were characterised by microscopy techniques and circular dicroism, to investigate the impact of peptides on the NPs optical properties. Varying the peptide concentration, Au NPs were prepared in both solution and gel regimes, exploiting the peptides gelation properties.



	R^1	R^2
DFNKF	H	H
DFNKF(I)	H	I
DF(I)NKF	I	H
DF(I)NKF(I)	I	I
DF(Br)NKF(Br)	Br	Br
DF(Cl)NKF(Cl)	Cl	Cl

Figure 1: Molecular formulae of the amyloidogenic peptide used in this study and its halogenated derivatives.

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