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Self-Assembling Behavior of Cysteine-Modified Oligopeptides: an XPS and NEXAFS Study

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The achieving of rigorous control over the procedures aiming at modifying surfaces by selective adhesion of bioactive molecules is a mandatory step in view of the realistic applicability of bioengineered materials in the field of tissue engineering. In this context, we report a proof-of-concept study carried out on a Self Assembling Peptide (SAP) on purpose functionalized with cysteine (Cys), as to ideally grant the molecule grafting to gold surfaces. The effectiveness of the surface functionalization in monolayer regime and the molecular stability of the SAP-Cys were probed by X-Ray Photoelectron Spectroscopy (XPS); the highly ordered self-organization attained by the grafting molecules was assessed by means of Angular Dependent Near Edge X-Ray Absorption Fine Structure (NEXAFS) spectroscopy studies. This study opens wide perspectives for efficient chemical modification of surfaces with biomolecules, following a path that involves biocompatible agents only, differently from state-of-the-art paths usually involving specific molecules (as for example APTES) as linkers.

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