Impact of hierarchical Quatsome-RGD nanoarchitectonic surfaces on integrin-mediated cell adhesion

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The RGD peptide has been widely used in cell adhesion studies due to being one of the main integrin ligands.[1] While RGD has been immobilized with different ligand to ligand spacing in a homogeneous approach,[2] its quantitative effect on cell adhesion when locally clustered on nanocarriers has not been assessed. Quatsomes are non-liposomal nanovesicles proposed as a versatile nanocarrier platform for the nanoarchitectonic immobilization of the RGD peptide on surfaces. Quatsomes functionalized with RGD peptide and a SH group were produced using a technology based on supercritical CO_2.[3,4] Those Quatsomes were anchored on gold surfaces through the gold-thiol interaction, forming SAM structures and used to perform cell adhesion experiments on an osteosarcoma cell line. Substrates were additionally characterized through AFM to assess Quatsome integrity[5] and through EIS to assess the presence and accessibility of the RGD peptides. The immobilization of Quatsomes on surfaces was successful and allowed to present RGD peptides incorporated in its fluid membrane with an enhanced format in comparison with traditionally used homogeneous RGD-functionalized surfaces regarding cell adhesion.[6]

References

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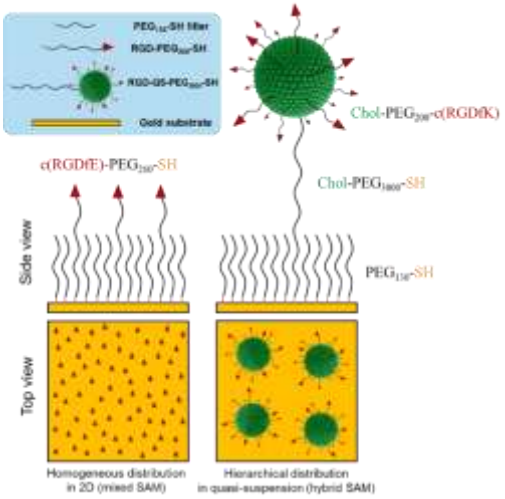

Figure 1: Schematic representation of the produced substrates, featuring either a homogeneous distribution of RGD or locally clustered RGD through Nanocarriers.