In vitro kinetic study of growth and mineralization of osteoblast-like cells (Saos-2) on titanium surface coated with a RGD functionalized bisphosphonate

Titre	In vitro kinetic study of growth and mineralization of osteoblast-like cells (Saos-2) on titanium surface coated with a RGD functionalized bisphosphonate
Type de publication	Article de revue
Auteur	Beuvelot, Johanne [1], Portet, David [2], Lecollinet, Grégory [3], Moreau, Marie-Françoise [4], Baslé, Michel-Félix [5], Chappard, Daniel [6], Marchand-Libouban, Hélène [7]
Editeur	Wiley
Type	Article scientifique dans une revue à comité de lecture
Année	2009
Langue	Anglais
Date	2009/08/01
Numéro	2
Pagination	873 - 881
Volume	90B
Titre de la revue	Journal of Biomedical Materials Research Part B: Applied Biomaterials
ISSN	1552-4981
Mots-clés	adhesion molecule [8], bisphosphonate [9], osteoblast [10], surface treatment [11], titanium [12]
Résumé en anglais	Osteoconduction and osseointegration are the critical stages for implantation success. Peptides containing RGD (Arg-Gly-Asp) adhesive sequence are known to promote cell adhesion and consequently to favor osseointegration of medical devices. In this study, RGD peptides were coupled to a bisphosphonate used as an anchor system and chemically adsorbed on polished titanium discs. Two different concentrations, 10−10 mol/L (RGD 10−10) and 10−4 mol/L (RGD 10−4) were compared to non coated discs (RGD 0). Adhesion, spreading, and mineralization of osteoblast-like cells (Saos-2) were assessed. Mineralization kinetic was done at 3, 6, 10, 14, and 18 days of culture; the extent of mineral deposits was quantified by image analysis. Histogram repartitions of nuclear area, characterizing cell spreading, showed a shift to higher values in cells cultured on RGD coated titanium disks. Mineralization started at day 3 in the three groups, but had a faster development in the RGD 10−10 group from day 6 to day 18 compared to RGD 0 and RGD 10−4. At day 18, the percentage of mineralized area was significantly higher for RGD 10−10 compared to RGD 0 ($p < 0.05$). In the present study, this new method was found suitable to anchor RGD containing species on titanium: this favored adhesion and spreading of osteoblast-like cells and mineralization compared to noncoated titanium.
URL de la notice	http://okina.univ-angers.fr/publications/ua3293 [13]

DOI	10.1002/jbm.b.31357 [14]
Lien vers le document	http://dx.doi.org/10.1002/jbm.b.31357 [14]

Liens
[1] http://okina.univ-angers.fr/publications?f[author]=3648
[2] http://okina.univ-angers.fr/publications?f[author]=4593
[3] http://okina.univ-angers.fr/publications?f[author]=4594
[4] http://okina.univ-angers.fr/publications?f[author]=4563
[5] http://okina.univ-angers.fr/publications?f[author]=3650
[6] http://okina.univ-angers.fr/daniel.chappard/publications
[7] http://okina.univ-angers.fr/helene.libouban/publications
[8] http://okina.univ-angers.fr/publications?f[keyword]=7194
[9] http://okina.univ-angers.fr/publications?f[keyword]=7195
[10] http://okina.univ-angers.fr/publications?f[keyword]=7196
[11] http://okina.univ-angers.fr/publications?f[keyword]=4852
[12] http://okina.univ-angers.fr/publications?f[keyword]=7197
[13] http://okina.univ-angers.fr/publications/ua3293
[14] http://dx.doi.org/10.1002/jbm.b.31357