Enhanced engraftment and repairing ability of human adipose-derived stem cells, conveyed by pharmacologically active microcarriers continuously releasing HGF and IGF-1, in healing myocardial infarction in rats

Titre	Enhanced engraftment and repairing ability of human adipose-derived stem cells, conveyed by pharmacologically active microcarriers continuously releasing HGF and IGF-1, in healing myocardial infarction in rats
Type de publication	Article de revue
Auteur	Savi, Monia [1], Bocchi, Leonardo [2], Fiumana, Emanuela [3], Karam, Jean-Pierre [4], Frati, Caterina [5], Bonafé, Francesca [6], Cavalli, Stefano [7], Morselli, Paolo G [8], Guarnieri, Carlo [9], Caldarera, Claudio M [10], Muscari, Claudio [11], Montero-Menei, Claudia [12], Stilli, Donatella [13], Quaini, Federico [14], Musso, Ezio [15]
Pays	Etats-Unis
Editeur	Wiley
Ville	Hoboken, N.J.
Type	Article scientifique dans une revue à comité de lecture
Année	2015
Langue	Anglais
Date	2015 Feb 26
Pagination	3012–3025
Titre de la revue	Journal of Biomedical Materials Research Part A
ISSN	1552-4965
Mots-clés	adipose-derived stem cell [16], arrhythmia [17], Hepatocyte Growth Factor [18], insulin-like growth factor 1 [19], Myocardial Infarction [20], pharmacologically active microcarrier [21]

Résumé en anglais	One of the main cause of ineffective cell therapy in repairing the damaged heart is the poor yield of grafted cells. To overcome this drawback, rats with 4-week-old myocardial infarction (MI) were injected in the border zone with human adipose-derived stem cells (ADSCs) conveyed by poly(lactic-co-glycolic acid) microcarriers (PAMs) releasing hepatocyte growth factor (HGF) and insulin-like growth factor-1 (IGF-1) (GFsPAMs). According to treatments, animals were subdivided into different groups: MI_ADSC, MI_ADSC/PAM, MI_GFsPAM, MI_ADSC/GFsPAM, and untreated MI_V. Two weeks after injection, a 31% increase in ADSC engraftment was observed in MI_ADSC/PAM compared with MI_ADSC ($p < 0.05$). A further ADSC retention was obtained in MI_ADSC/GFsPAM with respect to MI_ADSC (106%, $p < 0.05$) and MI_ADSC/PAM (57%, $p < 0.05$). A 130% higher density of blood vessels of medium size was present in MI_ADSC/GFsPAM compared with MI_ADSC ($p < 0.01$). MI_ADSC/GFsPAM also improved, albeit slightly, left ventricular remodeling and hemodynamics with respect to the other groups. Notably, ADSCs and/or PAMs, with or without HGF/IGF-1, trended to induce arrhythmias in electrically driven, Langendorff-perfused, hearts of all groups. Thus, PAMs releasing HGF/IGF-1 markedly increase ADSC engraftment 2 weeks after injection and stimulate healing in chronically infarcted myocardium, but attention should be paid to potentially negative electrophysiological consequences.
URL de la notice	http://okina.univ-angers.fr/publications/ua13175 [22]
DOI	10.1002/jbm.a.35442 [23]
Autre titre	J Biomed Mater Res A
Identifiant (ID) PubMed	25727843 [24]

Liens

[1] http://okina.univ-angers.fr/publications?f[author]=23140
[2] http://okina.univ-angers.fr/publications?f[author]=23141
[3] http://okina.univ-angers.fr/publications?f[author]=23142
[4] http://okina.univ-angers.fr/publications?f[author]=23143
[5] http://okina.univ-angers.fr/publications?f[author]=23144
[6] http://okina.univ-angers.fr/publications?f[author]=23145
[7] http://okina.univ-angers.fr/publications?f[author]=23146
[8] http://okina.univ-angers.fr/publications?f[author]=23147
[9] http://okina.univ-angers.fr/publications?f[author]=23148
[10] http://okina.univ-angers.fr/publications?f[author]=23149
[11] http://okina.univ-angers.fr/publications?f[author]=23150
[12] http://okina.univ-angers.fr/c.menei/publications
[13] http://okina.univ-angers.fr/publications?f[author]=23151
[14] http://okina.univ-angers.fr/publications?f[author]=23152
[15] http://okina.univ-angers.fr/publications?f[author]=23153
[16] http://okina.univ-angers.fr/publications?f[keyword]=19128
[17] http://okina.univ-angers.fr/publications?f[keyword]=10577
[18] http://okina.univ-angers.fr/publications?f[keyword]=8333
[19] http://okina.univ-angers.fr/publications?f[keyword]=19129
[20] http://okina.univ-angers.fr/publications?f[keyword]=6068
[21] http://okina.univ-angers.fr/publications?f[keyword]=19130
[22] http://okina.univ-angers.fr/publications/ua13175
[23] http://dx.doi.org/10.1002/jbm.a.35442
[24] http://www.ncbi.nlm.nih.gov/pubmed/25727843?dopt=Abstract