

Article

# Microstructured Polymeric Fabrics Modulating the Paracrine Activity of Adipose-Derived Stem Cells

Federica Grilli <sup>1,2</sup>, Ennio Albanesi <sup>3</sup>, Beatriz Pelacho <sup>4,5</sup>, Felipe Prosper <sup>4,5</sup>,  
Paolo Decuzzi <sup>1,†</sup> and Daniele Di Mascolo <sup>1,6,\*†</sup>

<sup>1</sup>Laboratory of Nanotechnology for Precision Medicine, Fondazione Istituto Italiano di Tecnologia, Via Morego 30, Genoa 16163, Italy

<sup>2</sup>Department of Informatics, Bioengineering, Robotics, and Systems Engineering (DIBRIS), University of Genoa, 16145 Genoa, Italy

<sup>3</sup>Department of Neuroscience and Brain Technologies, Fondazione Istituto Italiano di Tecnologia, Via Morego 30, Genoa 16163, Italy

<sup>4</sup>Laboratory of Regenerative Medicine, Center for Applied Medical Research - University of Navarra, Av.DaPio XII, 55, 31008 Pamplona, Spain

<sup>5</sup>Instituto de Investigación Sanitaria de Navarra (IdiSNA), 31008 Pamplona, Spain

<sup>6</sup> Department of Electrical and Information Engineering, Politecnico di Bari, 70126, Bari, Italy

†These authors share the senior authorship

\* Correspondence: Daniele Di Mascolo, PhD – daniele.dimascolo@iit.it

## SUPPORTING INFORMATION

	Tukey's multiple comparisons test	p-value
24h	5x5 vs 10x10	0.1331
	5x5 vs 20x20	0.2040
	10x10 vs 20x20	0.8872
48h	5x5 vs 10x10	0.4994
	5x5 vs 20x20	0.9452
	10x10 vs 20x20	0.6328
72h	5x5 vs 10x10	0.9454
	5x5 vs 20x20	0.9076
	10x10 vs 20x20	0.7348

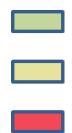
	Tukey's multiple comparisons test	p-value
24h	5x5 vs 10x10	0.0356(*)
	5x5 vs 20x20	<0.0001 (****)
	10x10 vs 20x20	<0.0001 (****)
48h	5x5 vs 10x10	0.9613
	5x5 vs 20x20	<0.0001 (****)
	10x10 vs 20x20	<0.0001 (****)
72h	5x5 vs 10x10	0.0382(*)
	5x5 vs 20x20	<0.0001 (****)
	10x10 vs 20x20	<0.0001 (****)

	Tukey's multiple comparisons test	p-value
24h	5x5 vs 10x10	0.0001 (**)
	5x5 vs 20x20	<0.0001 (****)
	10x10 vs 20x20	0.5820
48h	5x5 vs 10x10	<0.0001 (****)
	5x5 vs 20x20	0.0790
	10x10 vs 20x20	0.0008 (**)
72h	5x5 vs 10x10	0.2256
	5x5 vs 20x20	0.9919
	10x10 vs 20x20	0.1310

- Comparison among the three PLGA fabrics at 24h
- Comparison among the three PLGA fabrics at 48h
- Comparison among the three PLGA fabrics at 72h

**Supporting Figure S1. Statistical Analysis for the stem cell spheroid growth as a function of time and for three different PLGA fabrics.** Differences are considered statistically significant when p<0.05 (\*), p<0.01 (\*\*), and p<0.0001 (\*\*\*\*).

	Tukey's multiple comparisons test	p-value	
2D	LIVE	24h vs 48h	0.2742
		24h vs 72h	0.1675
		48h vs 72h	0.9407
APOPTOTIC	24h vs 48h	0.2399	
	24h vs 72h	0.1432	
	48h vs 72h	0.9387	
DEAD	24h vs 48h	0.8383	
	24h vs 72h	0.1539	
	48h vs 72h	0.3498	
2D collagen			
	Tukey's multiple comparisons test	p-value	
2D	LIVE	24h vs 48h	0.7550
		24h vs 72h	0.0322 (*)
		48h vs 72h	0.1221
APOPTOTIC	24h vs 48h	0.8354	
	24h vs 72h	0.0895	
	48h vs 72h	0.0304 (*)	
DEAD	24h vs 48h	0.0011 (**)	
	24h vs 72h	0.1598	
	48h vs 72h	0.0507	
5x5µm PLGA fabric	LIVE	24h vs 48h	0.9433
		24h vs 72h	0.9859
		48h vs 72h	0.8986
	APOPTOTIC	24h vs 48h	0.9606
		24h vs 72h	0.9951
		48h vs 72h	0.9427
	DEAD	24h vs 48h	0.8178
		24h vs 72h	0.7942
		48h vs 72h	0.4889
10x10µm PLGA fabric			
	Tukey's multiple comparisons test	p-value	
10x10µm PLGA fabric	LIVE	24h vs 48h	0.8631
		24h vs 72h	0.7167
		48h vs 72h	0.9611
APOPTOTIC	24h vs 48h	0.9533	
	24h vs 72h	0.6794	
	48h vs 72h	0.8452	
DEAD	24h vs 48h	0.6307	
	24h vs 72h	>0.9999	
	48h vs 72h	0.6242	
20x20µm PLGA fabric	LIVE	24h vs 48h	0.8309
		24h vs 72h	0.7608
		48h vs 72h	0.9918
	APOPTOTIC	24h vs 48h	0.7737
		24h vs 72h	0.8457
		48h vs 72h	0.9910
	DEAD	24h vs 48h	0.5590
		24h vs 72h	0.7943
		48h vs 72h	0.2802


 % of live cells over time on different substrates  

 % of apoptotic cells over time on different substrates  

 % of dead cells over time on different substrates

**Supporting Figure S2. Statistical Analysis for the stem cell spheroid viability as a function of time and for three different PLGA fabrics.** Differences were considered statistically significant for  $p<0.05$  (\*) and  $p<0.01$  (\*\*).