

Accepted Manuscript

Title: Embryo development in dynamic microfluidic systems

Authors: Gina Greco, Matteo Agostini, Stefano Barone,
Marco Cecchini



PII: S0925-4005(17)30803-1

DOI: <http://dx.doi.org/doi:10.1016/j.snb.2017.04.186>

Reference: SNB 22274

To appear in: *Sensors and Actuators B*

Received date: 26-1-2017

Revised date: 6-4-2017

Accepted date: 28-4-2017

Please cite this article as: Gina Greco, Matteo Agostini, Stefano Barone, Marco Cecchini, Embryo development in dynamic microfluidic systems, *Sensors and Actuators B: Chemical* <http://dx.doi.org/10.1016/j.snb.2017.04.186>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Embryo development in dynamic microfluidic systems

Gina Greco¹, Matteo Agostini^{1,2}, Stefano Barone³ and Marco Cecchini^{1,*}

1. NEST, Istituto Nanoscienze-CNR and Scuola Normale Superiore

Piazza San Silvestro 12, 56127 Pisa, Italy

2. Center for Nanotechnology Innovation@NEST, Istituto Italiano di Tecnologia

Piazza San Silvestro 12, 56127 Pisa, Italy

3. Centro Procreazione Assistita-Ospedale Versilia-USL Toscana Nordovest,

Viareggio, Italy

* Corresponding Author: marco.cecchini@nano.cnr.it

Abstract

Infertility has become a highly-spread disease but the efficiency of standard *in vitro* fertilization (IVF) cycles is only 30%, and their cost is very high. Recently, strategies based on microfluidics and dynamic *in vitro* systems have been proposed to improve the throughput of successful assisted hatchings. Here, these novel methods are presented and categorized in three main groups: microdroplet dynamic bioreactors, microchannel based cultures and microcontainers. In contraposition to the conventional static cultures, these devices introduce a dynamic microenvironment in order to mimic the physiological dynamic stimulations that are crucial for embryo development. The critical parameters-such as embryo density, medium flow rate, shear stress and microvibration frequency-are discussed and critically compared

Download English Version:

<https://daneshyari.com/en/article/5008807>

Download Persian Version:

<https://daneshyari.com/article/5008807>

[Daneshyari.com](https://daneshyari.com)