Can glass be the answer for in-vitro bone differentiation?

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Non united fracture

Bone defect

Bone tumor

Bone cyst
Animal Models
Scaffolds

- Toxic products of degradation
- Loss of phenotype associated with solid scaffolds
- Inhibition of cell migration and cell-to-cell communication
- Obstruction of cell growth
- Stress shield of cells from mechano-transduction
Scaffold-FREE

- Pellet culture
- Spheroidal culture
- Organoid culture
Cells on Glass

Day 4

Day 7

Day 11

Day 13

Day 15

Day 17

Day 19

Day 21
Pellet Size

A/S stain

DNA/ RNA content

Configuration

Pellet Size

0.73 ng/ul /
10.5 ng/ul

178.9 ng/ul /
240 ng/ul
This model may have clinical application but still needs further characterization
Material effect or surface area effect?
A/S staining

Osteonectin immunostaining

Collagen I immunostaining

Osteonectin immunostaining
Three dimensional scaffold-free constructs are models for tissue culture that can resemble the physiological conditions.

Glass based model may have a potential in bone regeneration.

Further developments and characterization in different culture conditions may lead to new discoveries in the field of regenerative medicine.
Acknowledgement

* Prof. Richard Oreffo
* Dr. Trudy Roach
* Dr. Rahul Tare
* Dr. Janos Kancazler
* Dr. Jon Dawson

* Dr. Farhan Cyprian
* Dr. Hany Omar

* Prof. Moustapha Hassan
* Prof. Taher El-Serafi