CLAIMS

1. A sterile and desiccated biomaterial comprising devitalized differentiated cells having tissue regenerating and/or repairing properties, and a particulate material, the cells and the particulate material being embedded in an extracellular matrix, wherein the cells secrete the extracellular matrix and synthesize a factors content, so as to acquire tissue regenerating and/or repairing properties.

2. The biomaterial according to claim **1**, wherein said cells are selected in a group comprising primary cells, stem cells, genetically modified cells, and a combination thereof.

3. The biomaterial according to claim **1** or **2**, wherein at most 10% of said cells are viable, preferably at most 1%.

4. The biomaterial according to any one of claims **1** to **3**, wherein said particulate material is selected from the group comprising or consisting of:

- an organic material, including demineralized bone matrix (DBM), gelatin, agar/agarose, alginates chitosan, chondroitin sulfate, collagen, elastin or elastin-like peptides (ELP), fibrinogen, fibrin, fibronectin, proteoglycans, heparan sulfate proteoglycans, hyaluronic acid, polysaccharides, laminins and cellulose derivatives;

- a ceramic material, including particles of calcium phosphate (CaP), calcium carbonate ($CaCO_3$), calcium sulfate ($CaSO_4$), or calcium hydroxide ($Ca(OH)_2$), or combinations thereof;

- a polymer, including polyanhydrides, polylactic acid (PLA), poly(lactic-co-glycolic acid) (PLGA), polyethylene oxide/ polyethylene glycol (PEO/PEG), poly(vinyl alcohol) (PVA), fumarate-based polymers such as, for example poly(propylene fumarate) (PPF) or poly(propylene fumarate-co-ethylene glycol) (P(PF-co-EG)), oligo(poly(ethylene glycol) fumarate) (OPF), poly (n-isopropylacrylamide) (PNIPPAAm), poly(aldehyde guluronate) (PAG), poly(n-vinyl pyrrolidone) (PNVP), or combinations thereof;

- a gel, including a self-assembling oligopeptide gel, a microgel, a nanogel, a particulate gel, a hydrogel, a thixotropic gel, a xerogel, a responsive gel, or combinations thereof;

- a creamer;

and any combination thereof.

5. The biomaterial according to any one of claims **1** to **4**, wherein said biomaterial comprises an altered factors content as compared to the factors content obtained from a corresponding fresh, non-sterile, non-desiccated biomaterial.

6. The biomaterial according to claim **5**, wherein the factors content includes growth factors and/or transcription factors.

7. The biomaterial according to claim **5** or **6**, wherein the factors content comprises IGF-1 and/or VEGF and/or SDF-1α and/or OPG.

8. The biomaterial according to claim **5**, wherein said factors content includes a RNAs content.

9. The biomaterial according to any one of claims **1** to **8**, wherein said desiccated biomaterial is obtained by freeze-drying.

10. The biomaterial according to any one of claims **1** to **9**, wherein said sterile biomaterial is obtained by gamma-irradiation, preferably at a dose of about 7 kGy to about 45 kGy, more preferably at room temperature.

11. A method for generating a sterile and desiccated biomaterial comprising devitalized differentiated cells and a particulate material, the cells and the particulate material being embedded in an extracellular matrix, said method comprising the steps of:

- (1) contacting (i) viable cells capable to undergo differentiation with (ii) a particulate material, so as to obtain a first combination;

- (2) culturing the first combination obtained in step (1) in a culture medium such that the cells secrete an extracellular matrix and synthesize a factors content, so as to acquire tissue regenerating and/or repairing properties, and wherein the cells and the particulate material are embedded in the extracellular matrix, so as to form a multidimensional structure;

- (3) submitting the multidimensional structure obtained at step (2) to desiccation, so as to obtain a desiccated biomaterial;

- (4) submitting the desiccated biomaterial obtained at step (3) to sterilization, preferably by gamma-irradiation, so as to obtain a sterile, desiccated biomaterial.

12. A pharmaceutical composition comprising a biomaterial according to any one of claims **1** to **10**, or according to claim **11**, and a pharmaceutically acceptable vehicle.

13. A medical device comprising a biomaterial according to any one of claims **1** to **10**, according to claim **11**, or a pharmaceutical composition according to claim 12.

14. A biomaterial according to any one of claims **1** to **10**, according to claim **11**, or a pharmaceutical composition according to claim 12, for use as a medicament.

15. The biomaterial or the pharmaceutical composition for use according to claim **14**, for preventing and/or treating a tissue disorder.