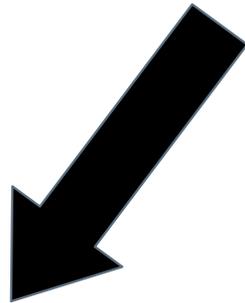
A detailed 3D rendering of a dense population of cells, likely representing mesenchymal stem cells. The cells are depicted with a textured, somewhat irregular surface and are arranged in a complex, overlapping pattern. The color palette is primarily dark blue and black, with some lighter blue and white highlights that suggest internal structures or specific components of the cells. The overall appearance is that of a microscopic view of a cell culture or a tissue section.

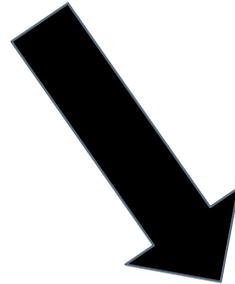
**ПРИМЕНЕНИЕ  
МЕЗЕНХИМАЛЬНЫХ КЛЕТОК  
КОСТНОГО МОЗГА В  
ТРАВМАТОЛОГИИ И  
ОРТОПЕДИИ.**

**Выполнил: Рашидов Н.Г.**

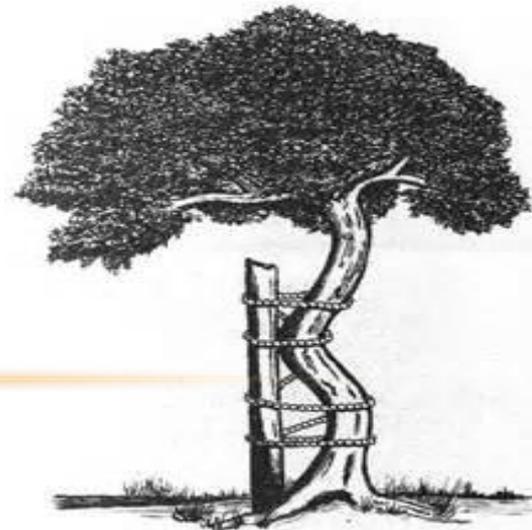
# Стволовая клетка



?!



MMCK



**-Тотипотентность**

**-Хоуминг**



# The Mesengenic Process

Bone Marrow/Perosteum

Mesenchymal Tissue



Mesenchymal Stem Cell (MSC)

Proliferation

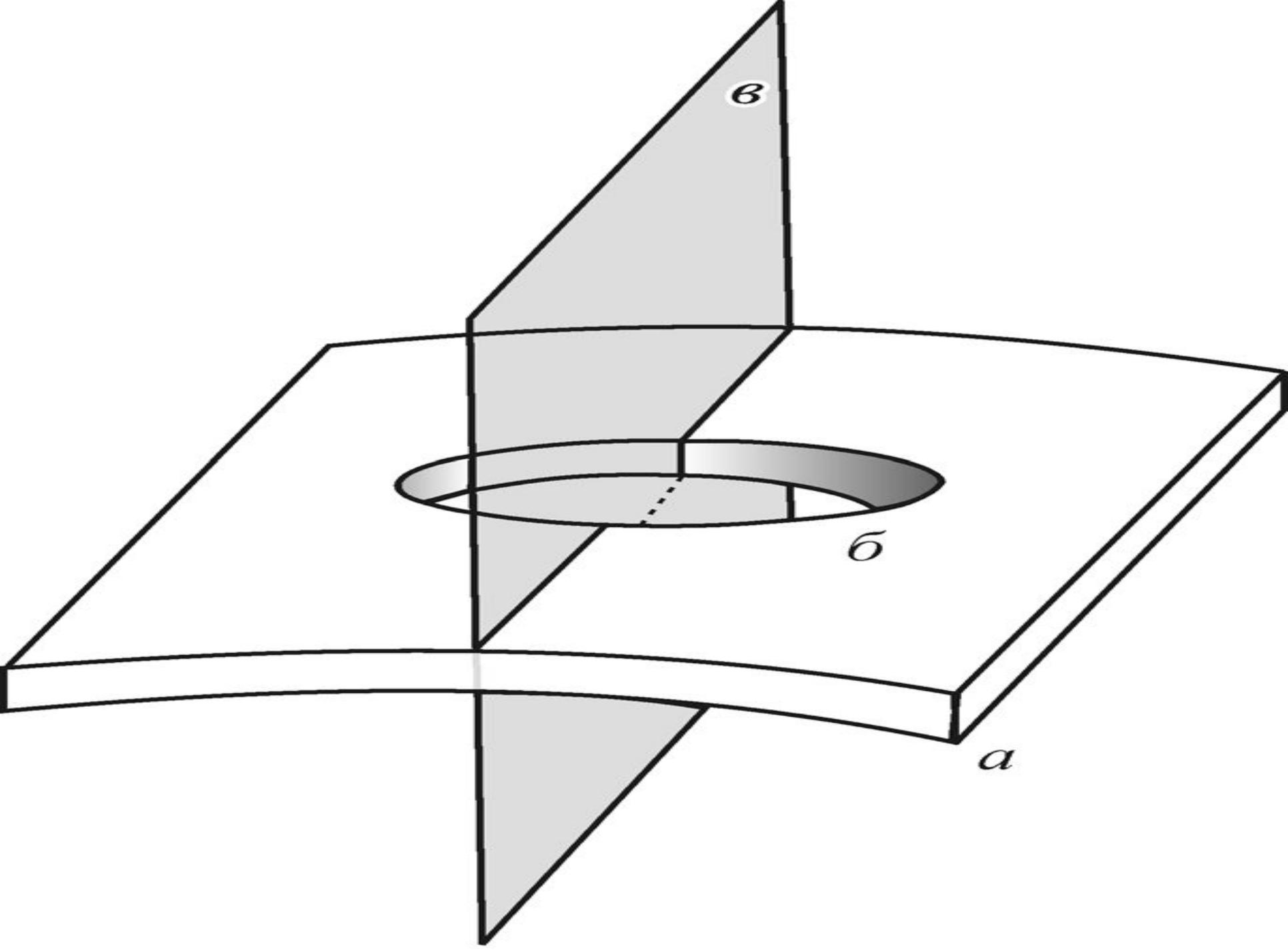
Commitment

Lineage Progression

Differentiation

Maturation





# 1-КОНТРОЛЬНАЯ ГРУППА.

I группа



15

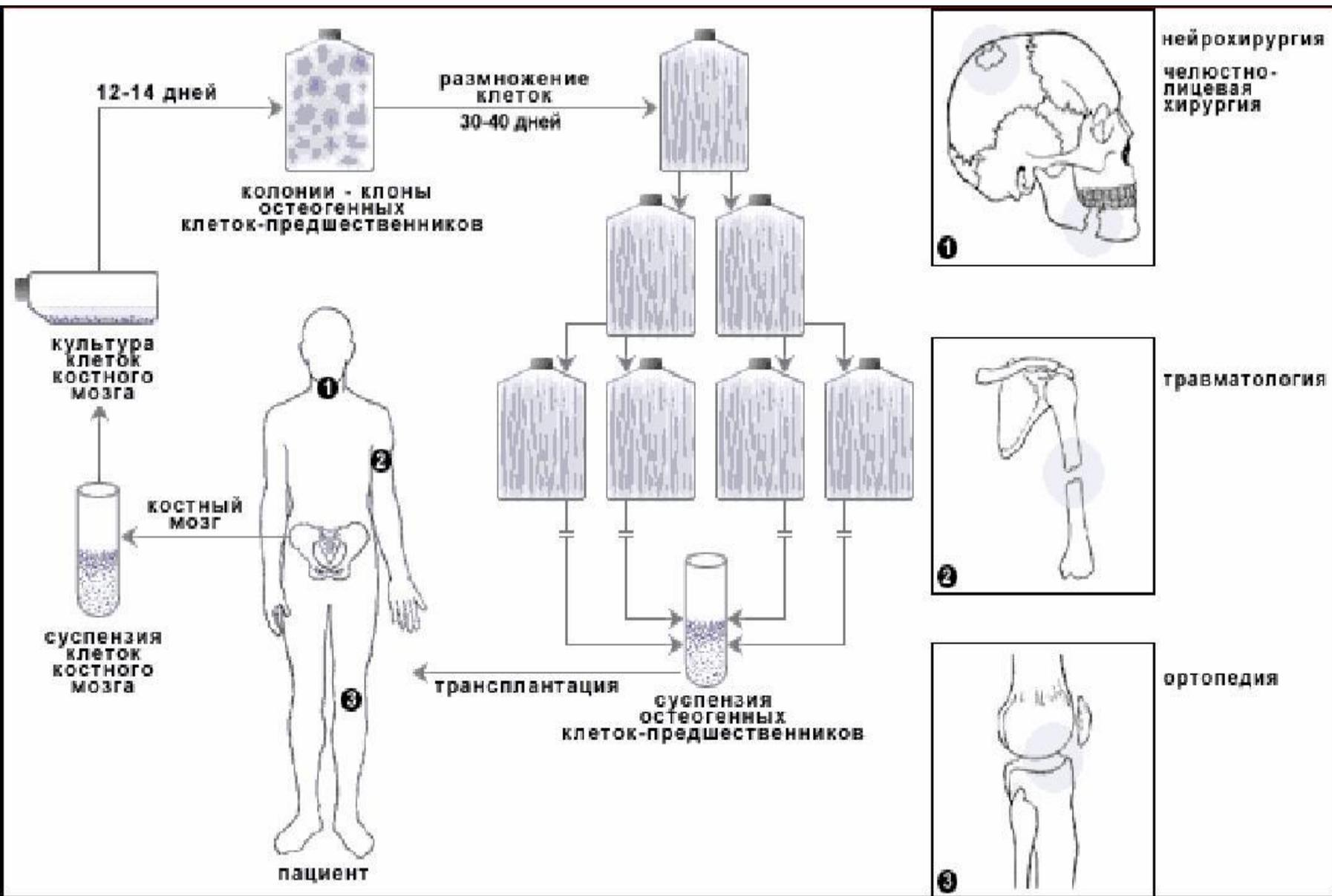
30

90

120

Время, сут

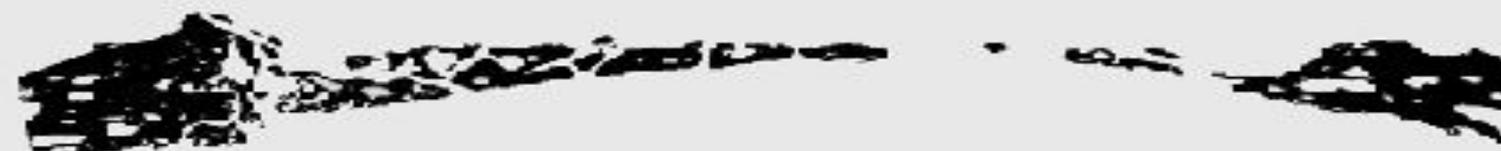
# 2 группа



## II группа



15



30



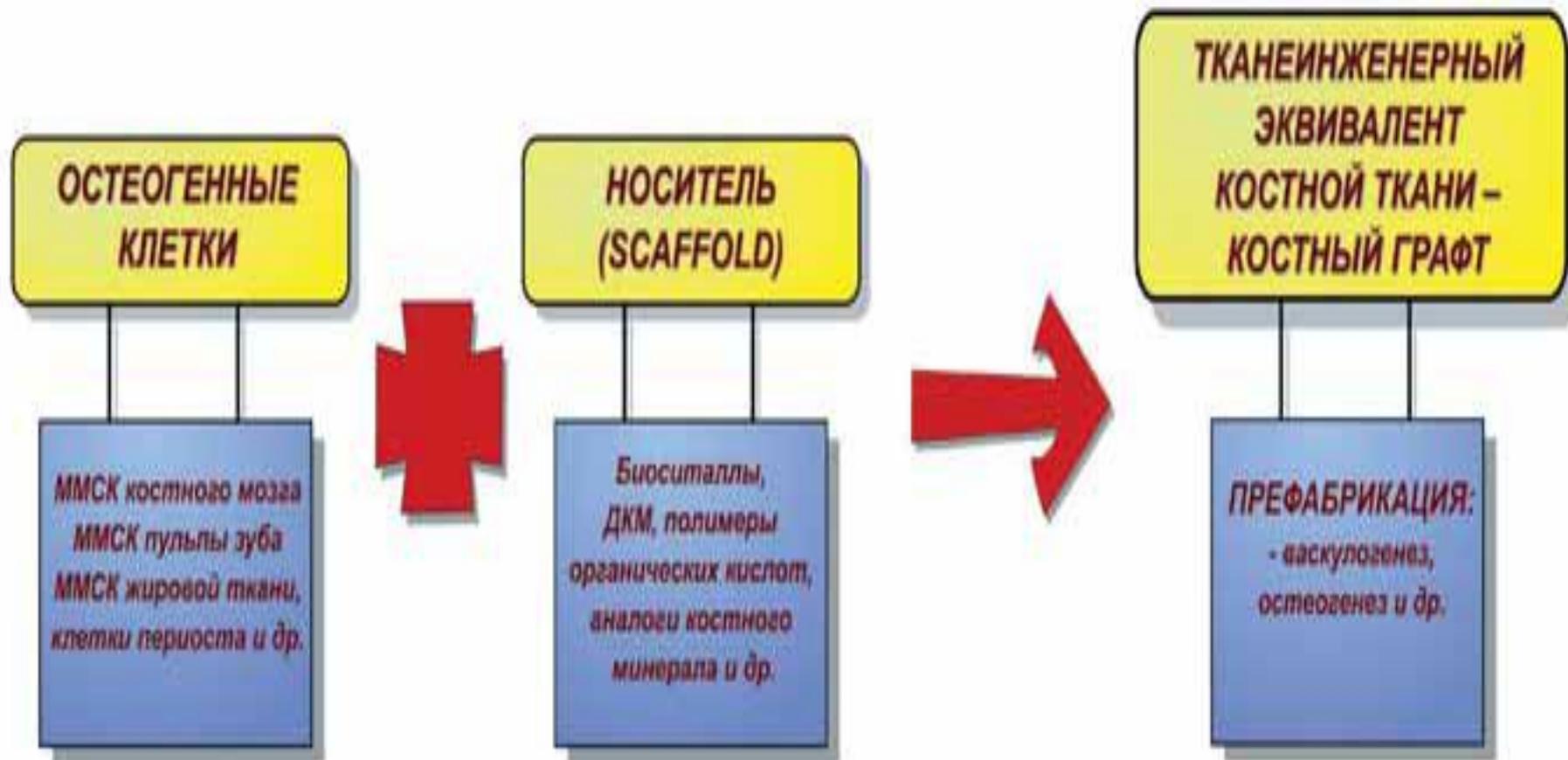
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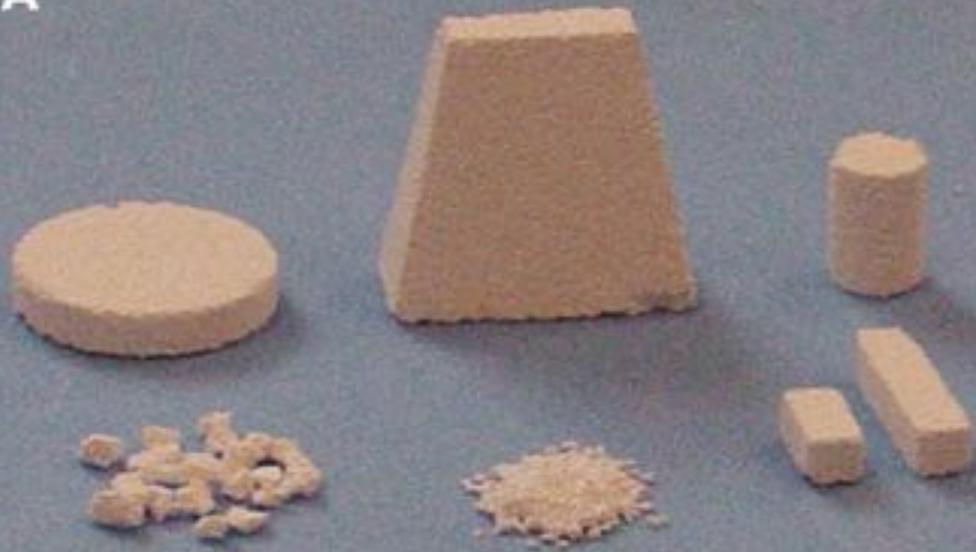
120

Время, сут

# 3 группа



A

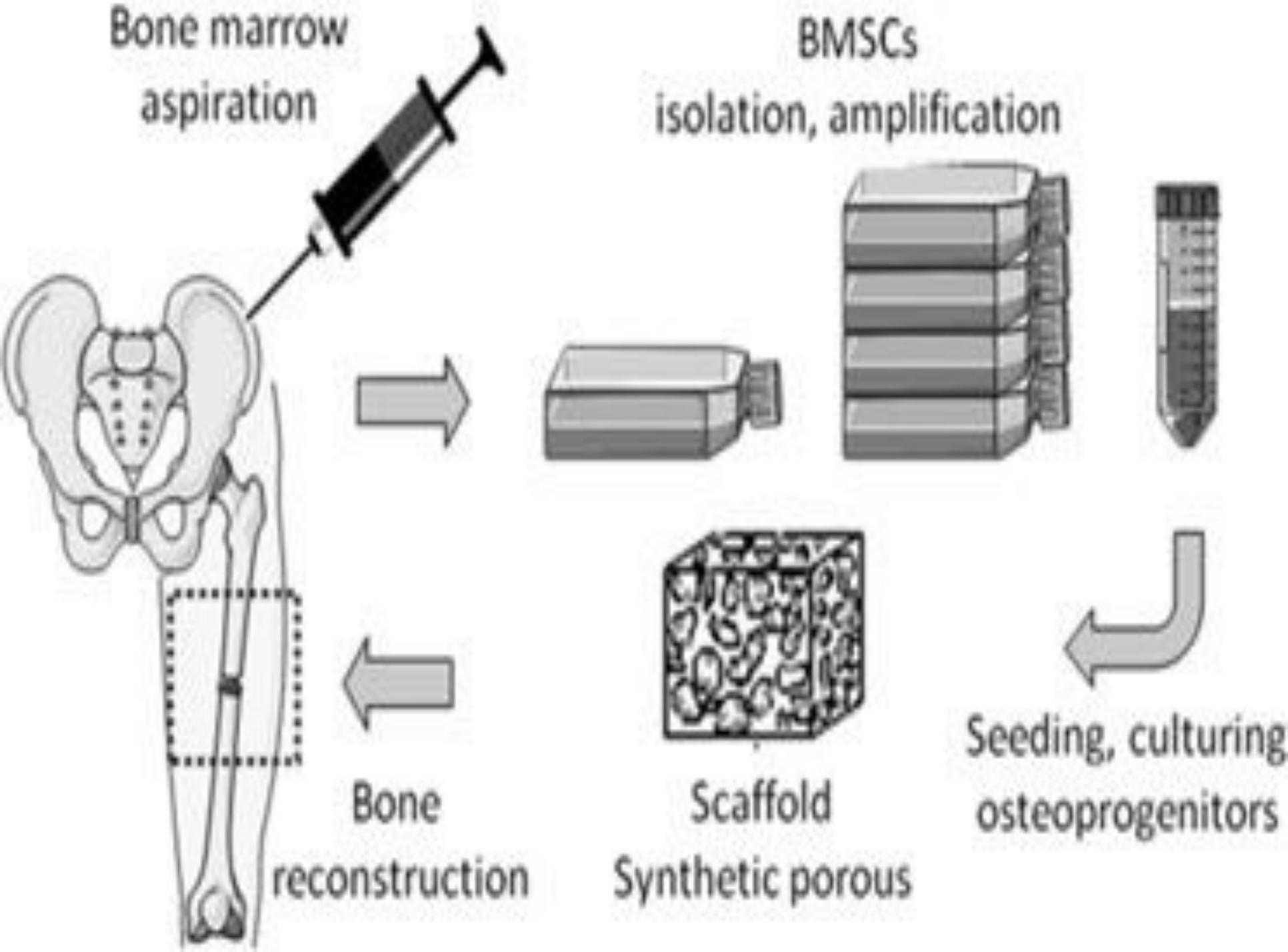


*Examples of biomaterials for scaffolding of human MSCs.*

- A) *Porous BCP ceramics and*
- B) *(B) injectable paste made of CaP particles suspended in hydrogel for minimal invasive surgery.*

B





III группа



15

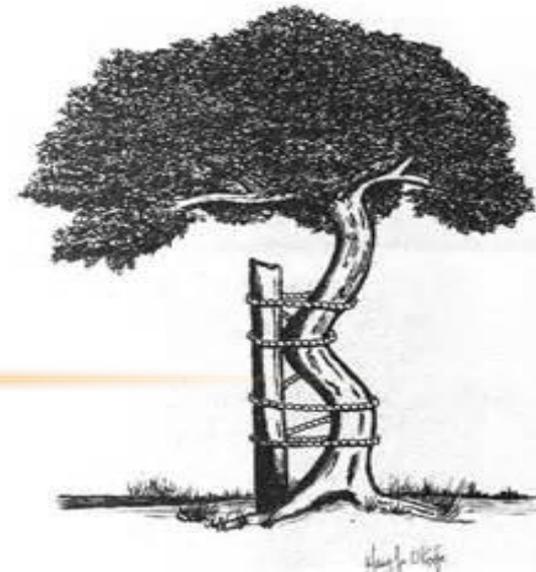
30

90

120

Время, сут

# Применение ММСК на практике в травматологии и ортопедии.



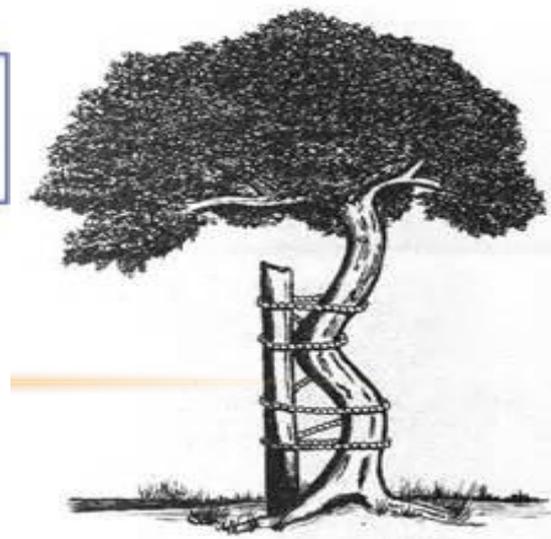
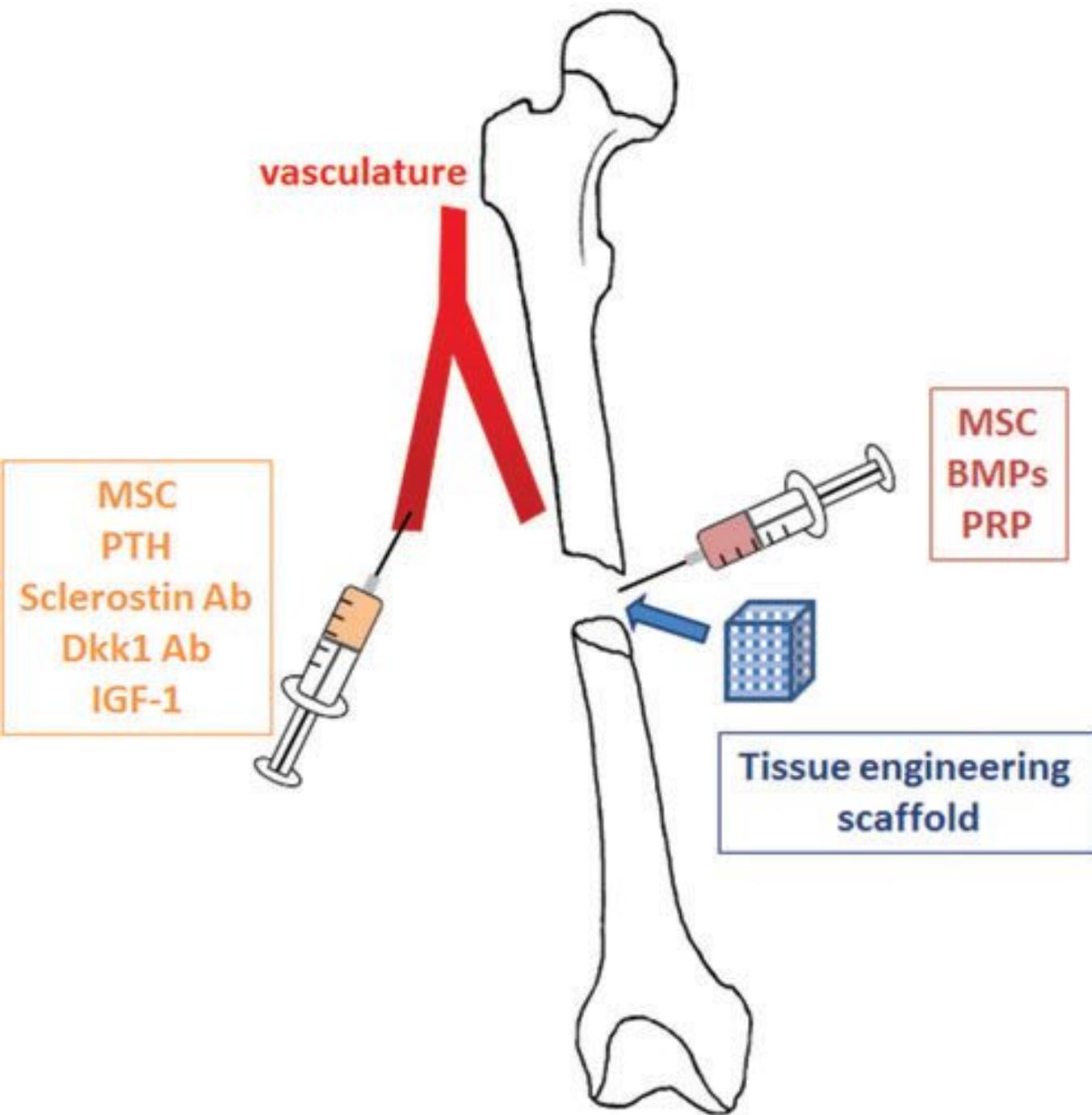
# **Показания к применению клеточных технологий в ТО:**

- большие дефекты костей**
- ложные суставы**
- замедленная консолидация**
- пострезекционные дефекты по  
онкологическим показаниям**
- постостеомиелотические дефекты**

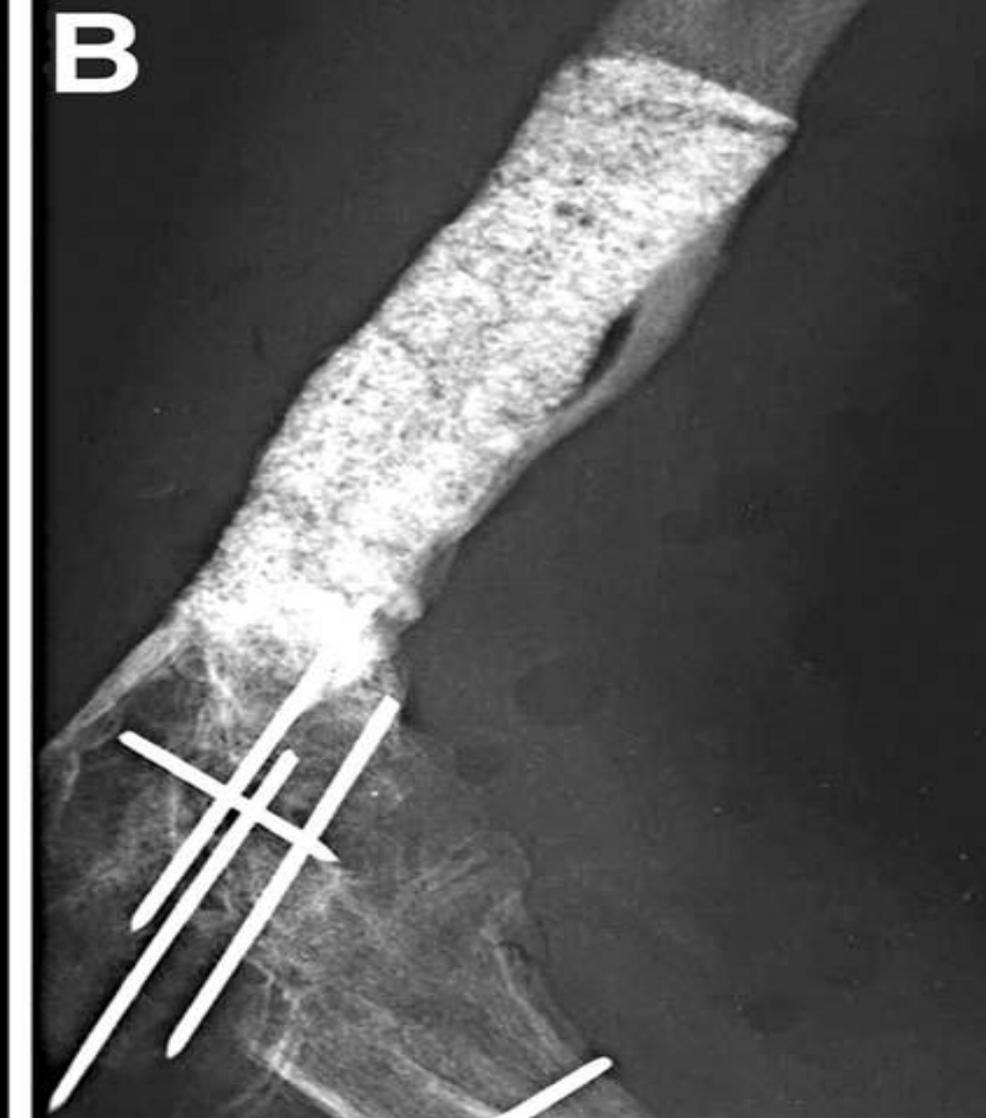


# Дефекты длинных костей+ММСК



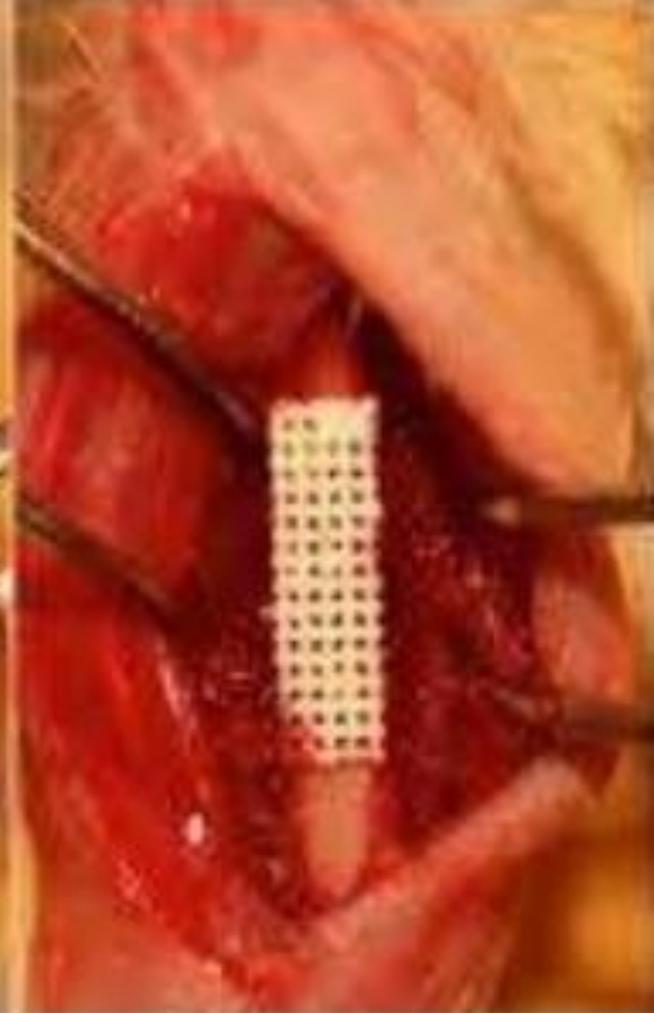


Walter J. O'Keefe

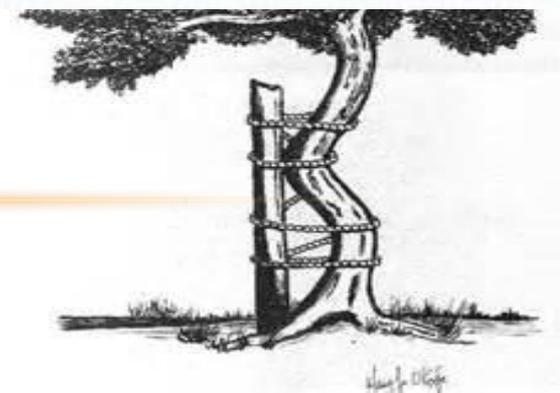


***Repair of a large bone defect in the humerus of a 22-year-old patient by autologous BM stromal cells. A) Film obtained before surgery. B) X-ray postoperative control view 18 months after surgery. Performed in collaboration with M. Marcacci and E. Kon, Bologna, Italy.***





# ММСК+НОСИТЕЛЬ





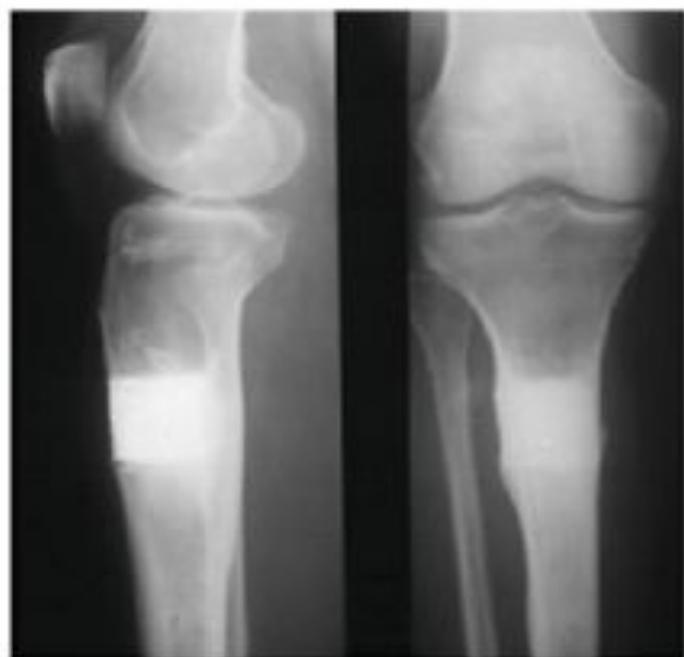
pre-operation



2 months



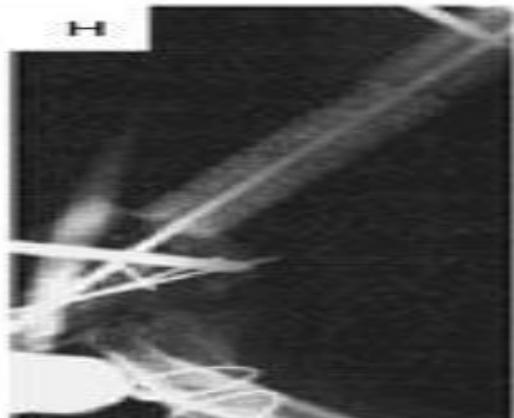
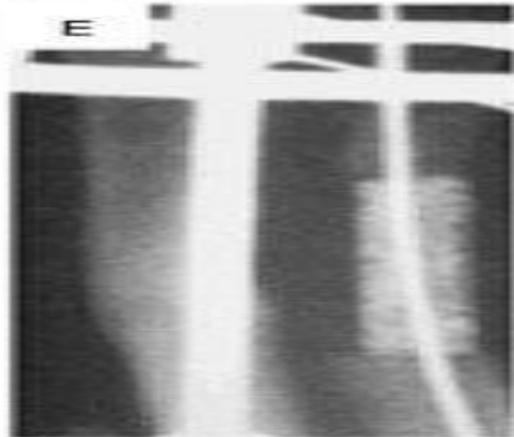
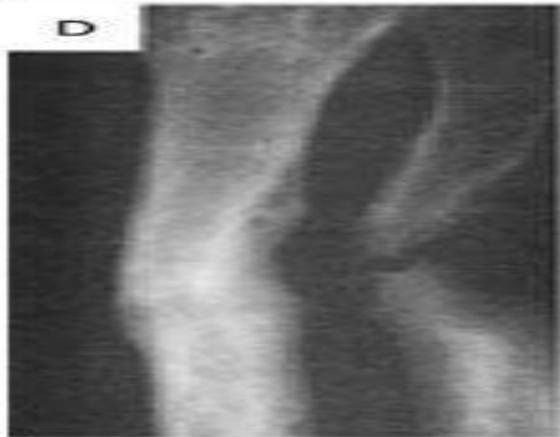
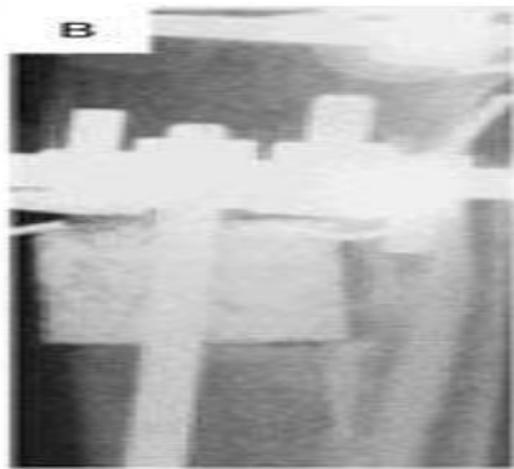
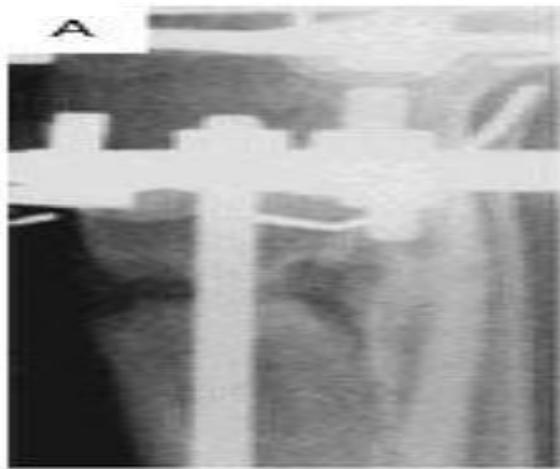
6 months



2.5 years



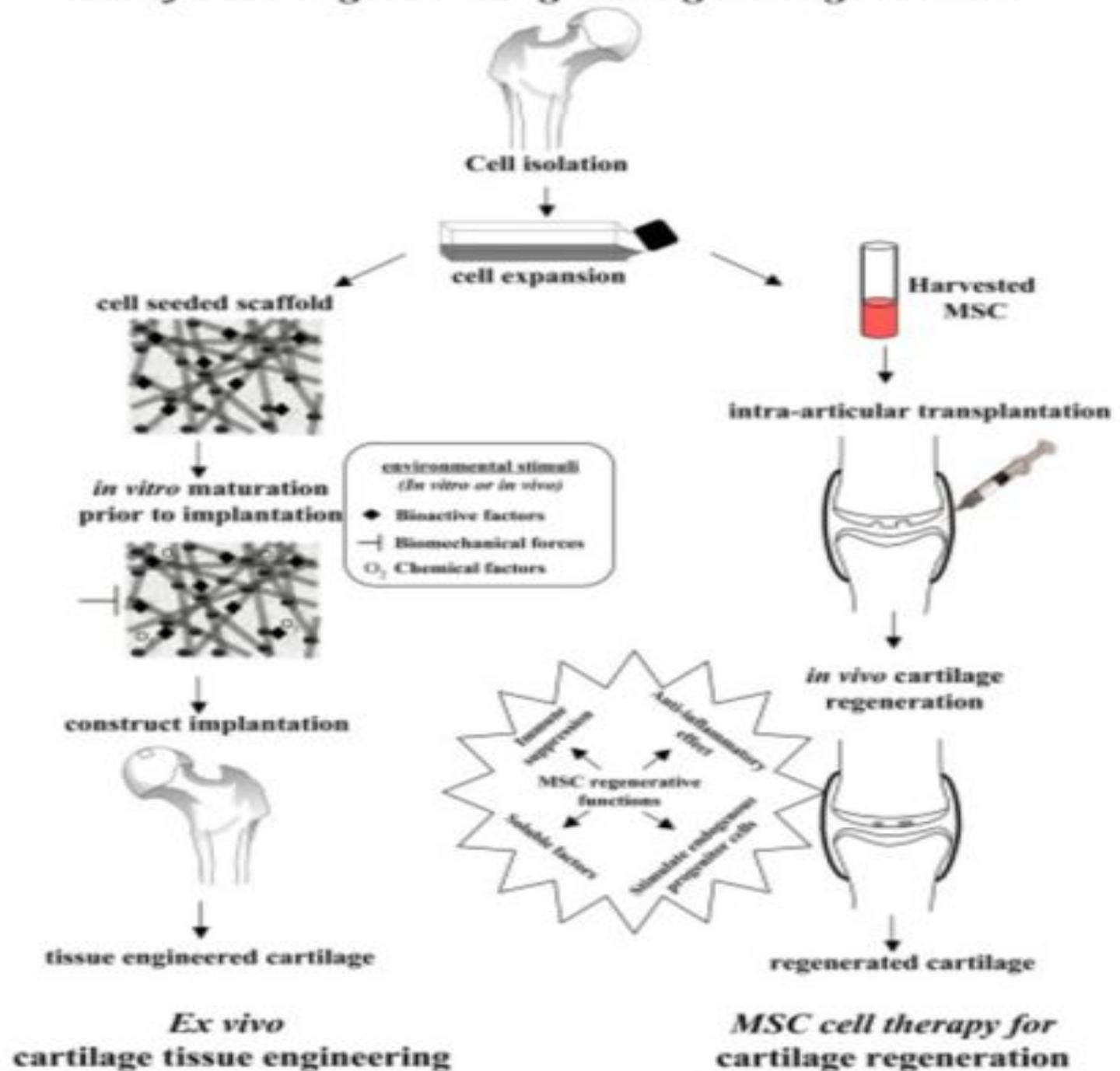
7 years



# Хирургия суставов+ММСК



# MSC for cartilage tissue engineering and regeneration





Cartilage lesions

**Transferred cells**



**Cultured cells**



**Cells in biomaterials**

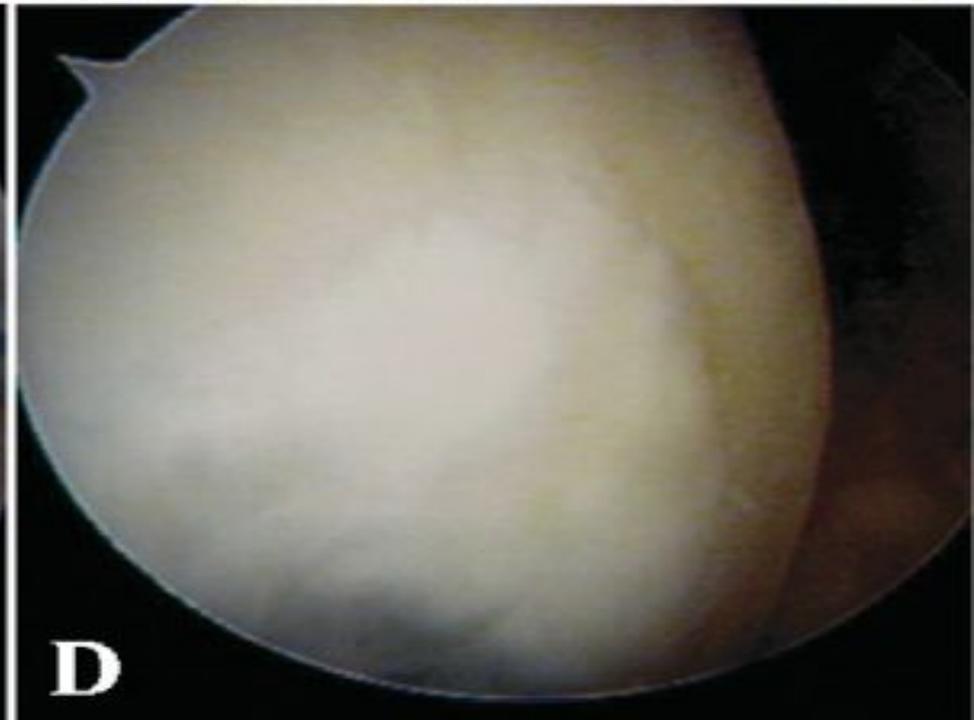
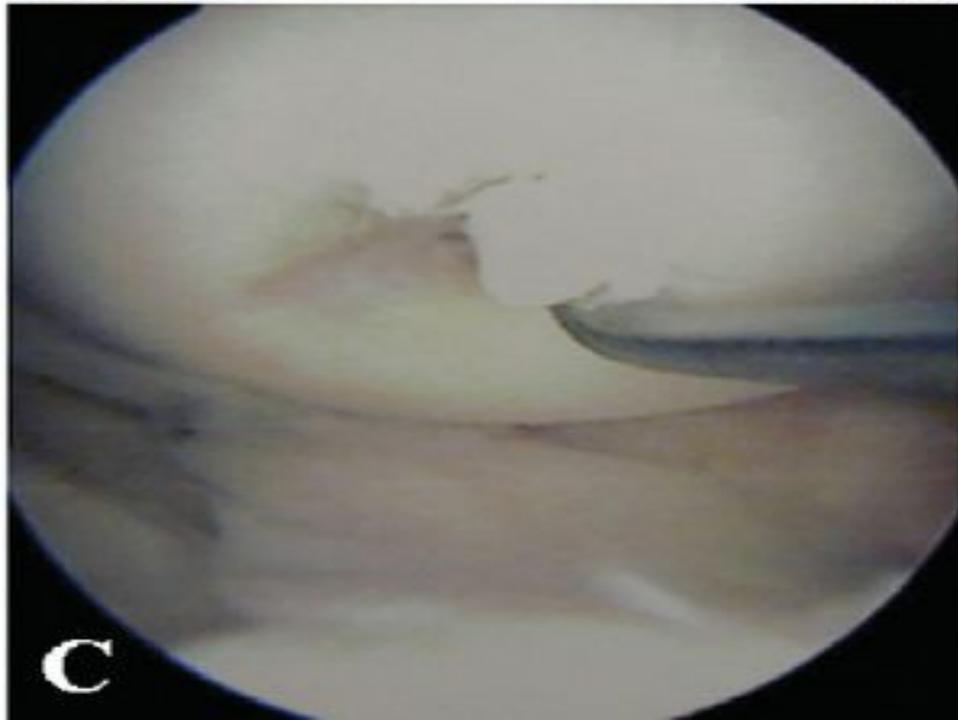
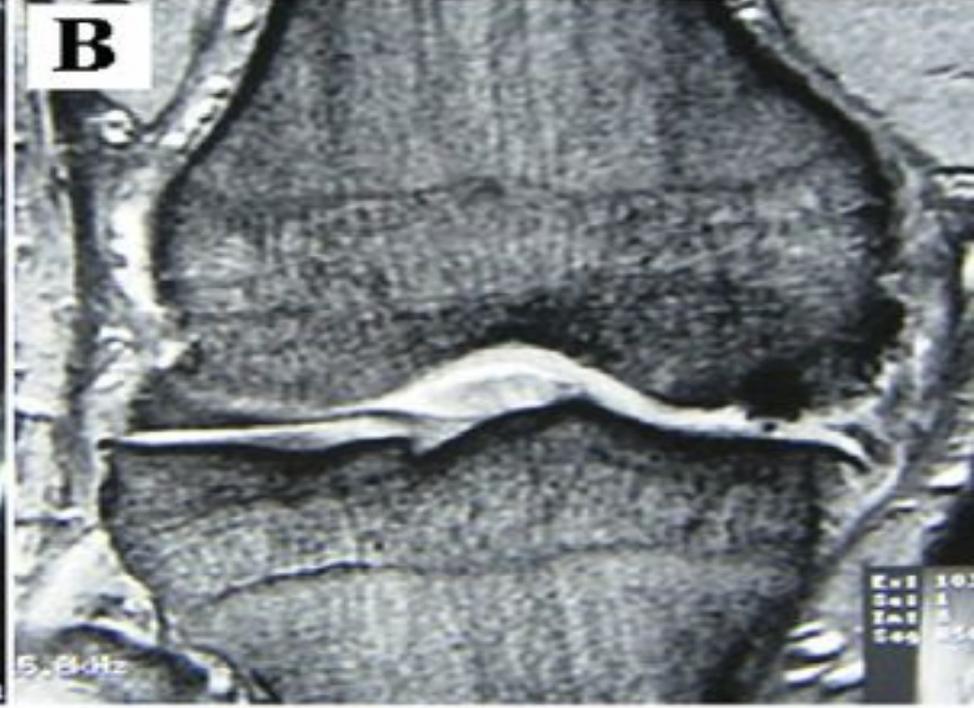
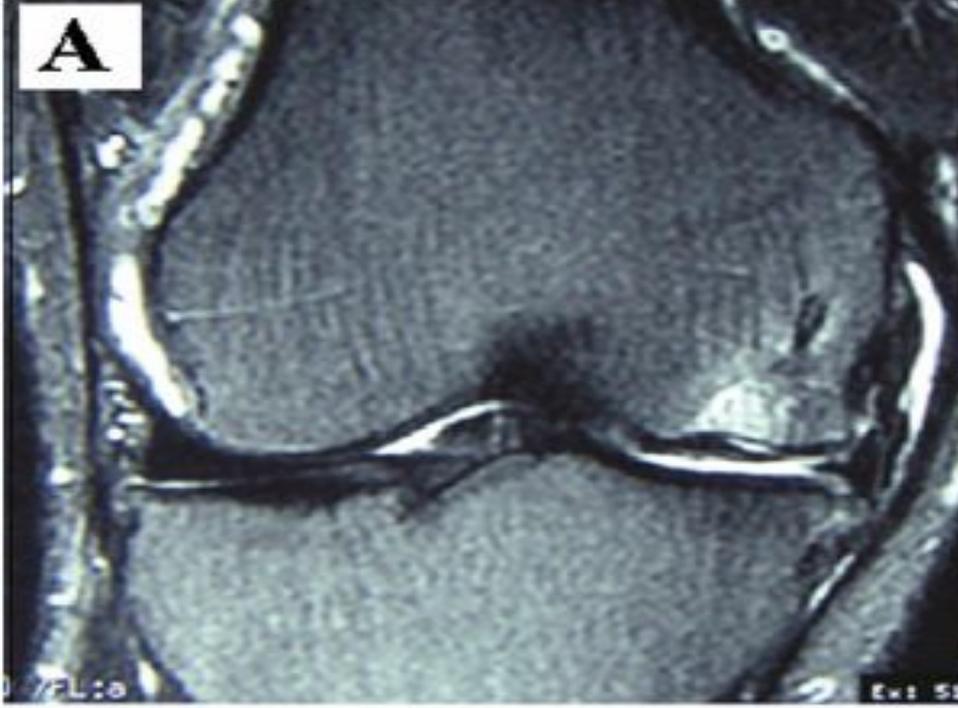
Strategies for cartilage repair.



Autologous chondrocyte transplantation (ACT). Stage 1.



Autologous chondrocyte transplantation (ACT). Stage 2.



**Спасибо за  
внимание!**

