

Fracture
↓
↑ increased bone
or bone loss → osteoporosis

osteoporosis model
Surg cal. incision covered with
PPGel or post-nasal gel

Rat skin cell
Rat skin model
Purified skin fibroblasts
Transfection of ADMs
14 and 28 days analysis

ADMs
Human cell and model
Transfected skin fibroblasts
14 and 28 days analysis
analysis after 2 and 6 weeks

Human cells on rat model
Collagenase induced injury
Transfection of ADMs
analysis after 2 and 6 weeks

Human skin rat model. Bone
Analysis lesion patch injury
Injection of skin cells analysis
2 and 6 weeks after injury

TGF- β
(transforming growth factor β)
① promotion
② role in bone healing
③ connective tissue development
④ role in bone healing
⑤ role in bone development

Human
Proliferating
Bone
Differentiating

Transfection
- use of rat skin
model & fibroblasts
- analysis of gene
expression in rat skin
fibroblasts

Phosphorylation
- role of kinase &
phosphatase in
bone

ADMs: role of
the mechanism
of (transfection)
bone

THE REALITY
PROCESSES OF TRANSFECTING
(Kosher) (in culture)
None in post-transfection

Gene delivery
- using
Osteopontin

Tissue Stress
+ Porosity

① role of
transfection
- using
Osteopontin

② role of
transfection
- using
Osteopontin

③ role of
transfection
- using
Osteopontin

④ role of
transfection
- using
Osteopontin

Current treatments

Current treatments
- using
Osteopontin

How stem cell +
ES can be
used for regeneration