

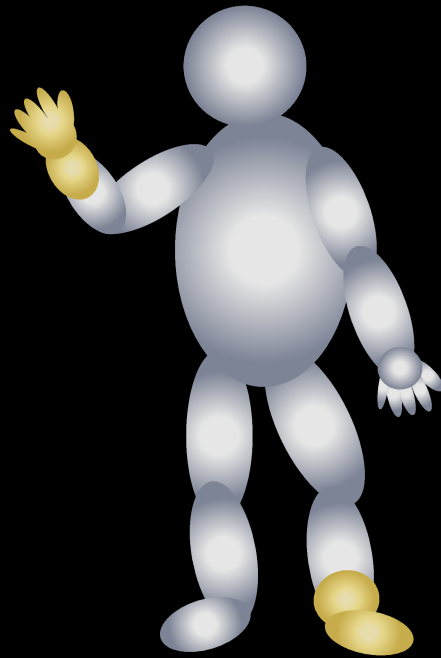


Development of Method for Complex Tissue Regeneration via Tissue Embryonization

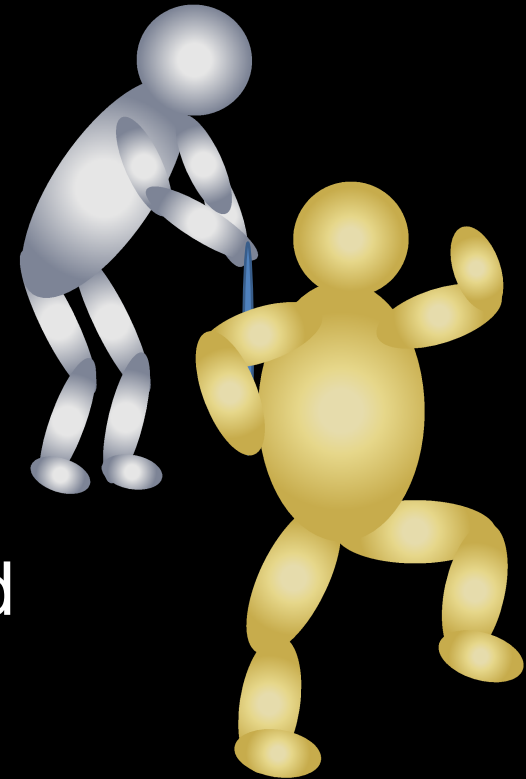
Department of Plastic Surgery
University of Tokyo Hospital
Masakazu KURITA

Society based on medicine & care aimed at this research project

Lost tissue and organ
Lost youth



Pave the way towards
reacquisition of
irreversibly lost
quality of life-associated
functions.



Society based on medicine & care aimed at this research project

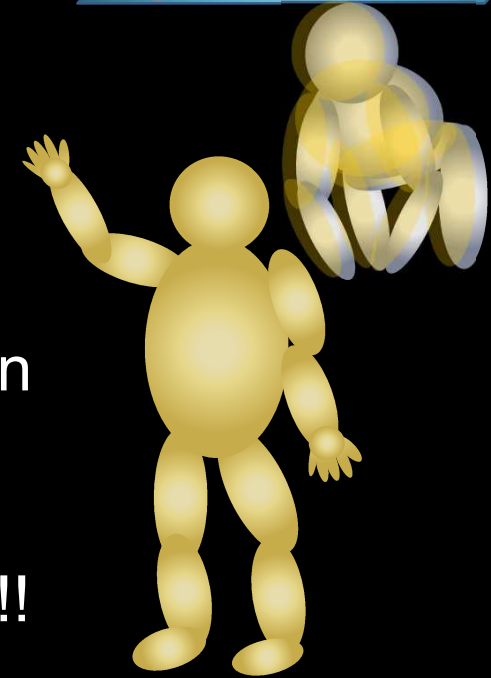
Limb regeneration
Rejuvenation of skin & fat
Rejuvenation of muscle & bone



Increase of personal activity
and
chances for social participation

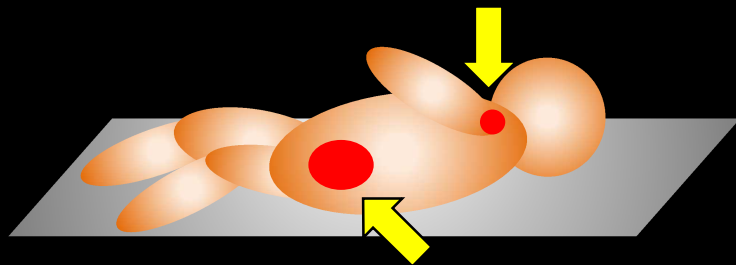


Increase of activity of society !!

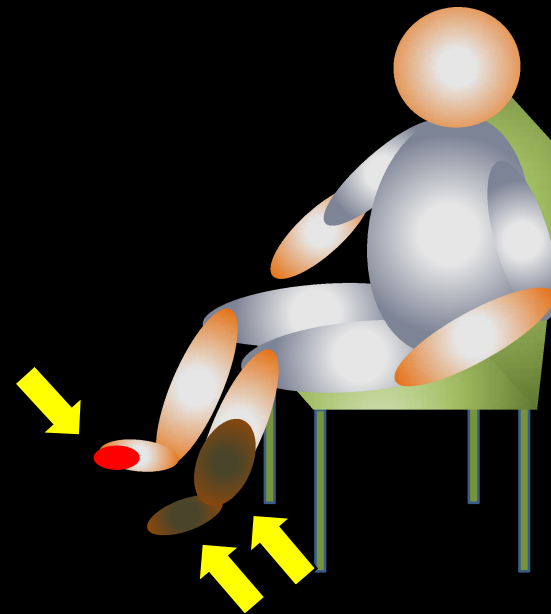


Skin ulcer

Pressure ulcer



Limb necrosis
(ex. Vascular insufficiency)



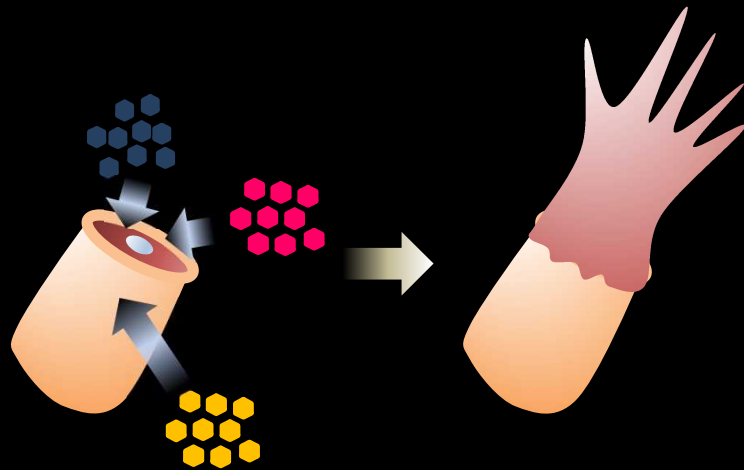
Official character of Japan Society of Plastic and Reconstructive Surgery
and Japan Society for Surgical Wound Care
Fairly of Bandage named **NAORUN**



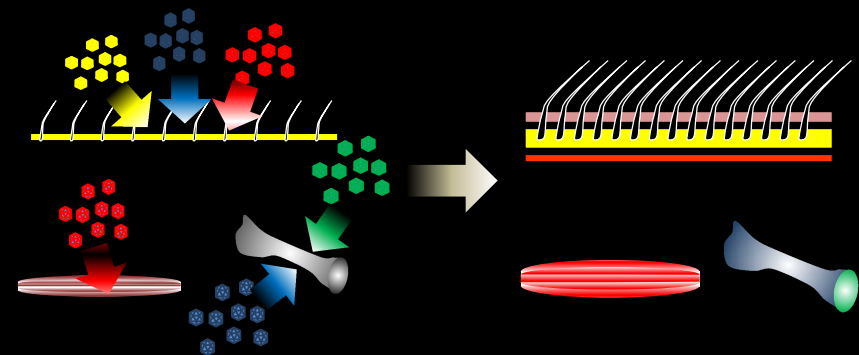
Tissue Embryonization

Making tissue similar to embryonic status
via *in vivo* gene transduction

Based on cellular reprogramming

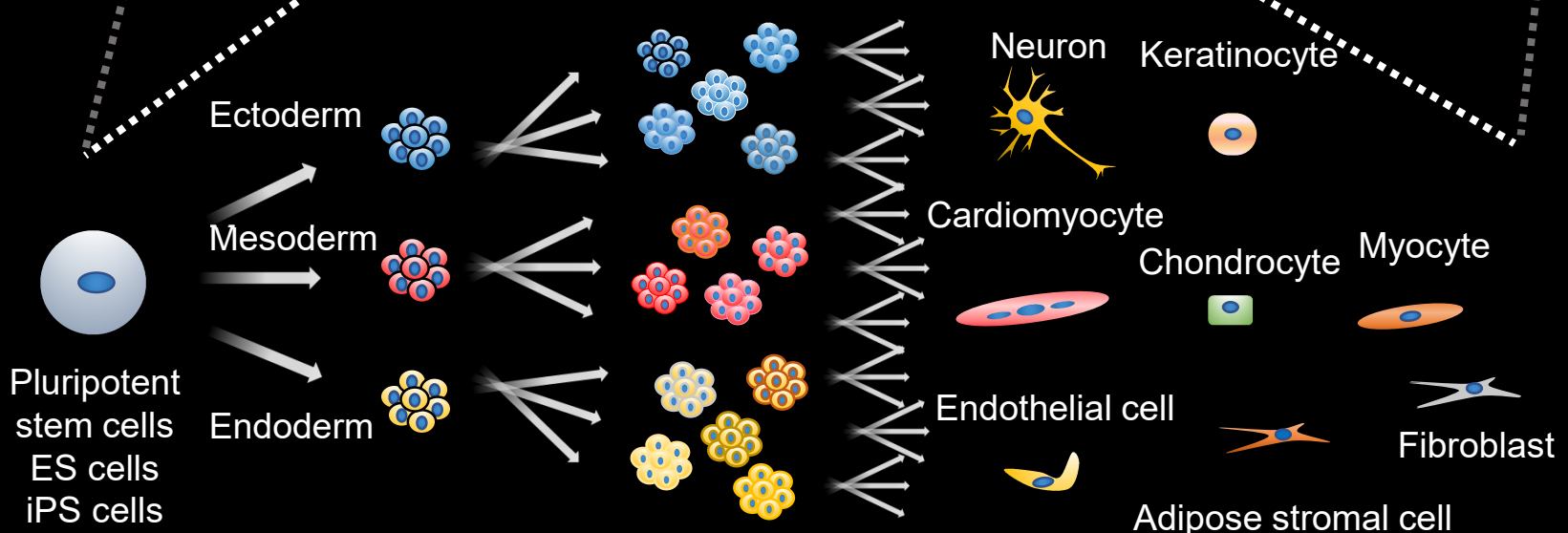
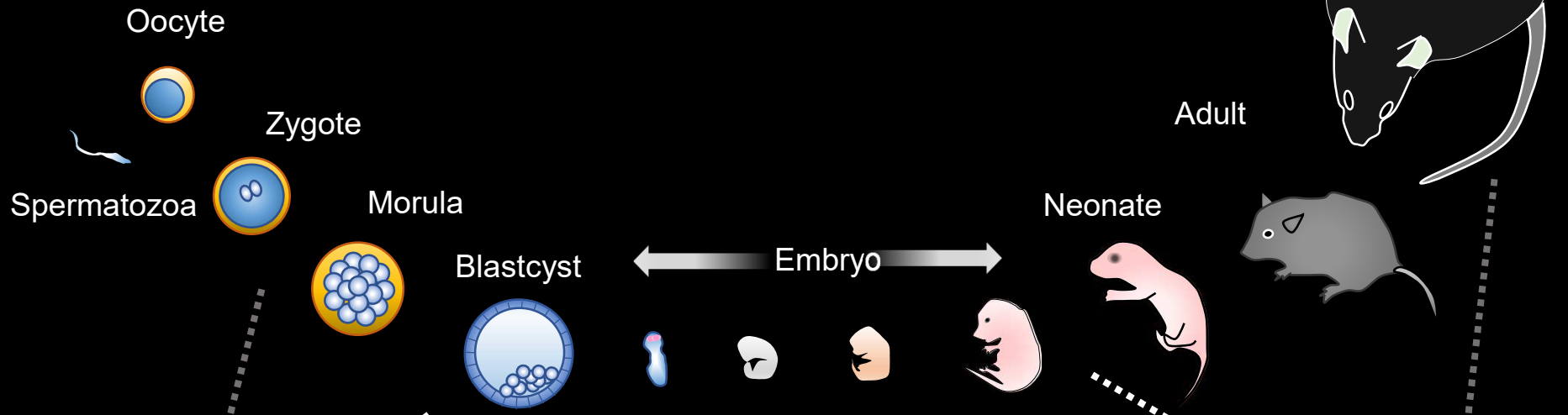


Limb regeneration



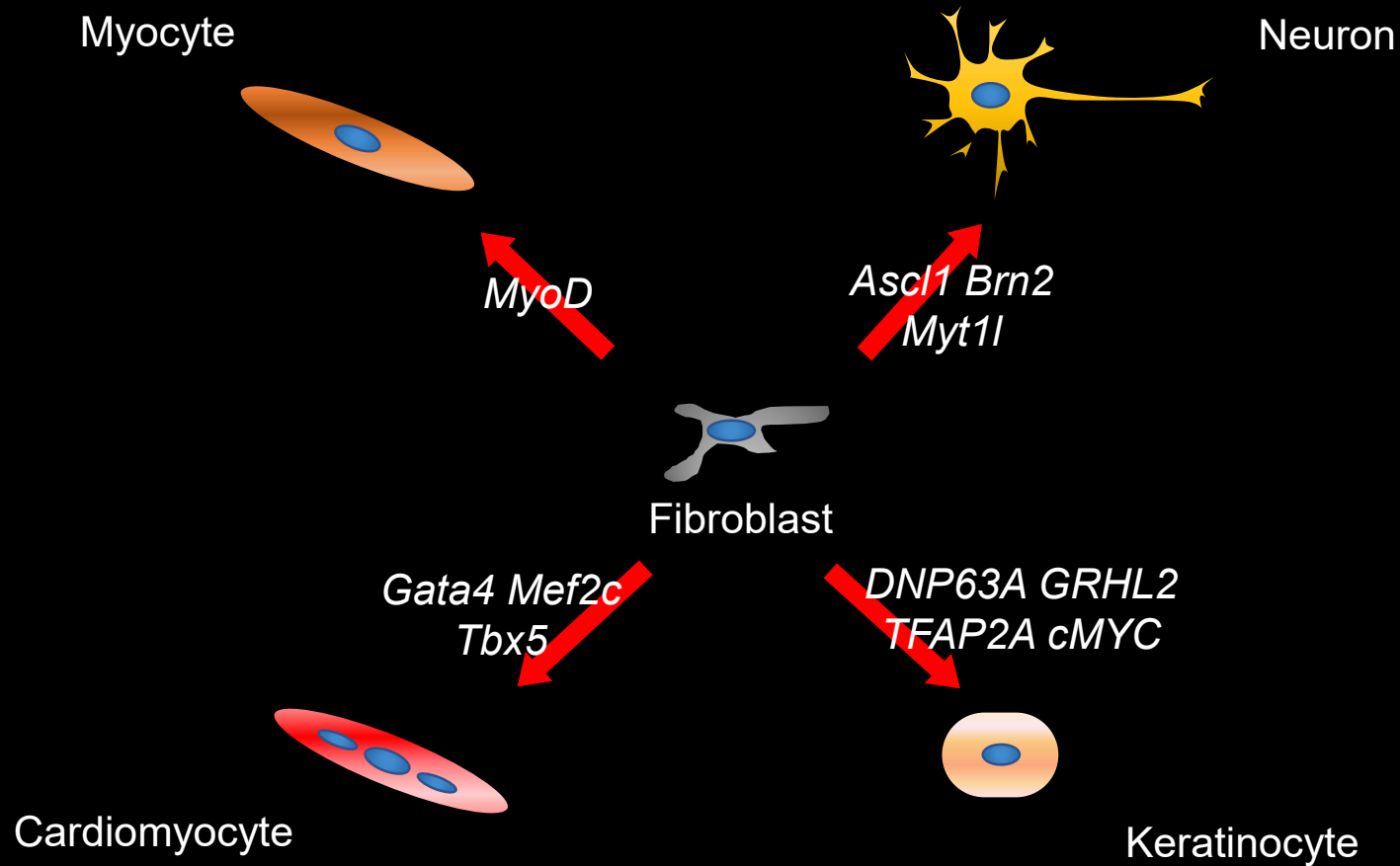
Rejuvenation of
Skin & muscle & bone

Life of mammals



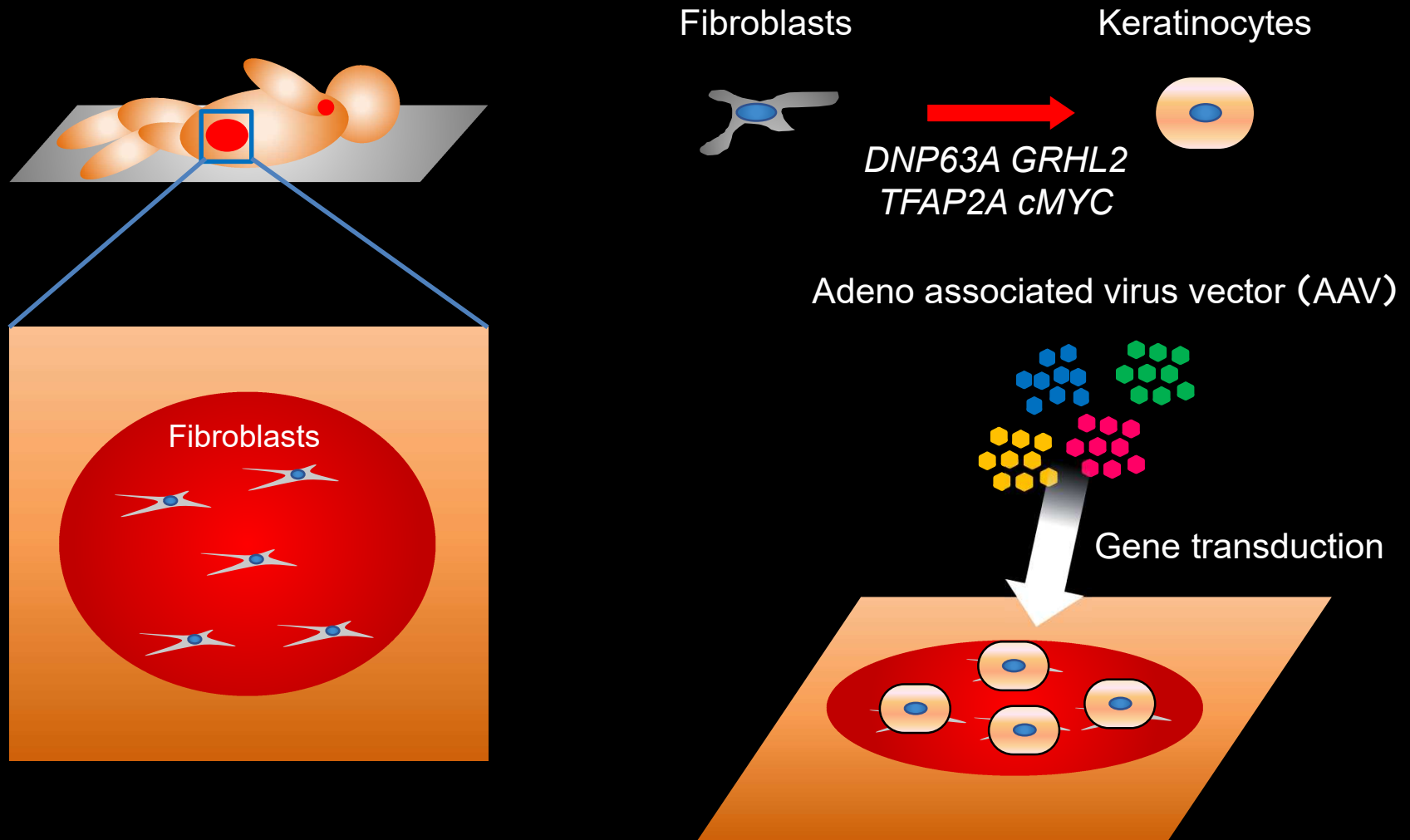
Cell differentiation

Direct reprogramming (Direct conversion)



(from Kurita et al. IGAKU-NO-AYUMI 2020 modified)

Direct reprogramming for prompt wound closure



(Kurita et al. 2018 *Nature*)

Application of direct reprogramming for better wound cure

— Regeneration of skin appendage —



Healthy skin



Embryonic age

E13

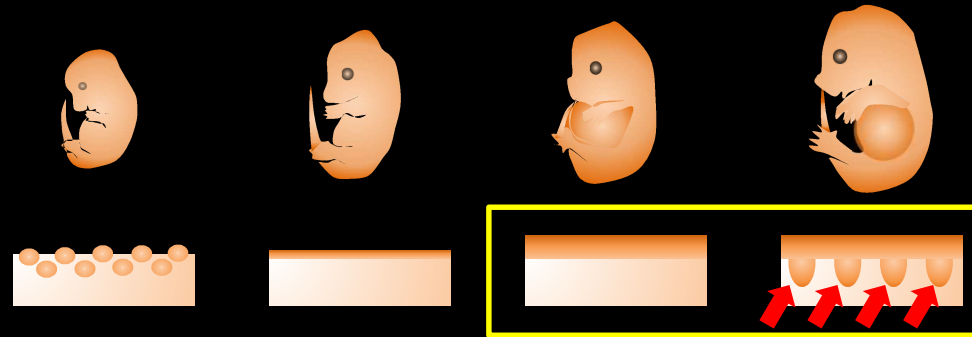
E14

E16

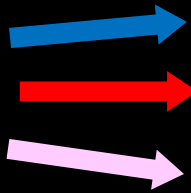
E18

Body

Skin



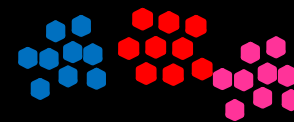
Fibroblast



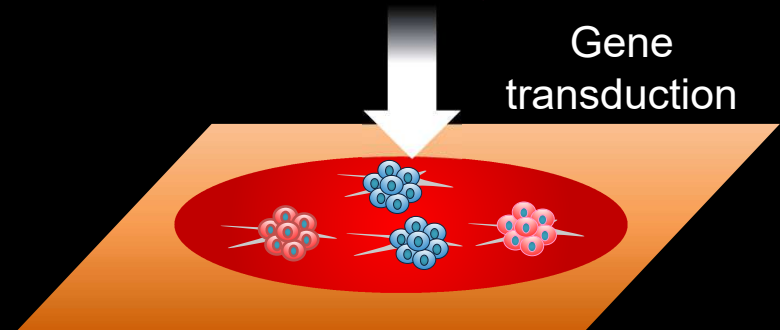
Embryonic
progenitors



Adeno associated virus vector (AAV)



Gene
transduction



Limb regeneration via tissue embryonization

Embryonic age

E9

E10

E11

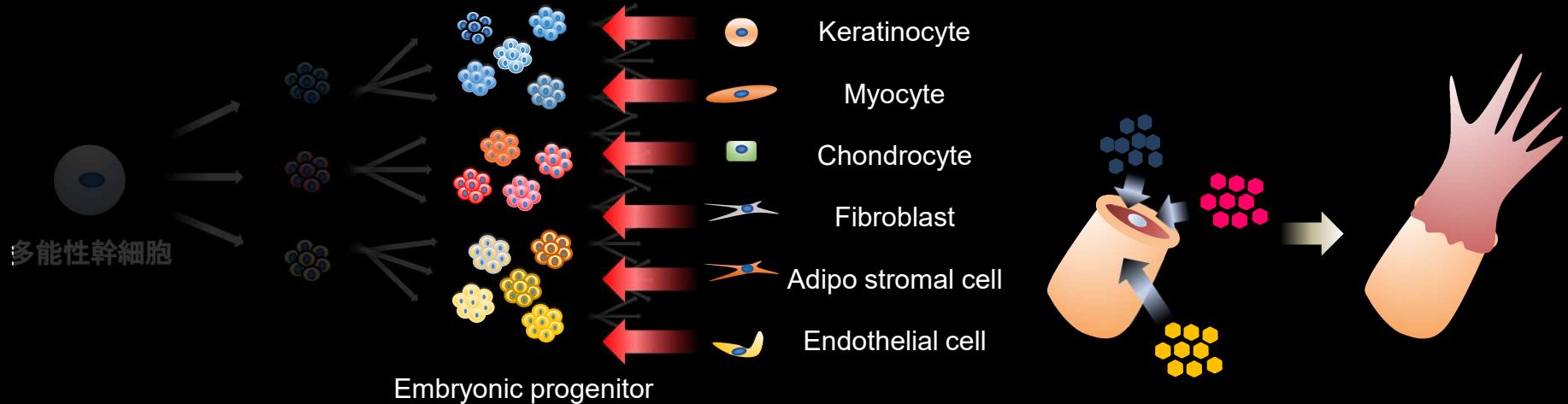
E12

E13

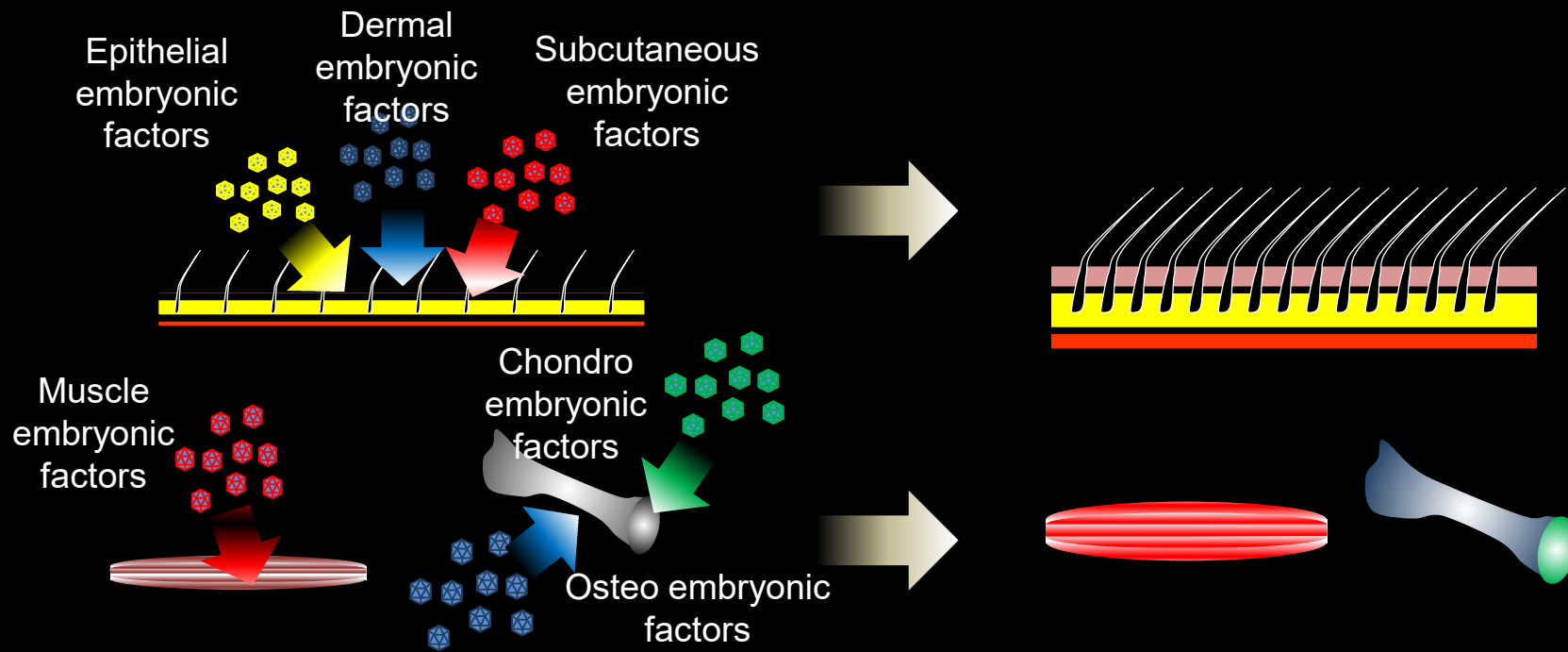
Body

Limb bud

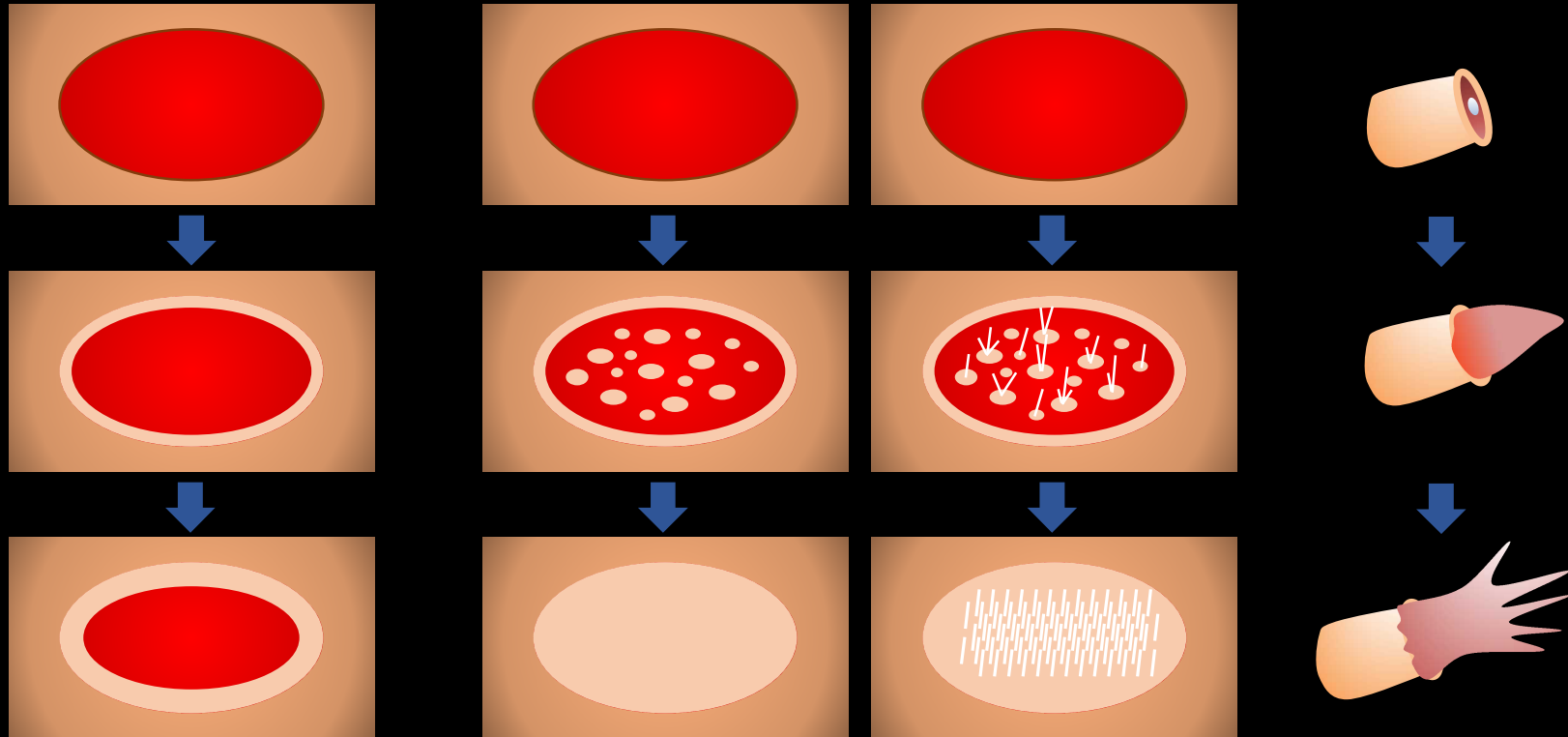
← Appearance of limb bud →



Rejuvenation via tissue embryonization



Idea



Generate
skin

Generate
hair

Generate
limb

Collaborator

University of Tokyo
Faculty of medicine



Hironori HOJO

Bone regeneration
Bioinformatics

University of Tokyo
Faculty of engineering



Takamasa SAKAI

Bio material

University of Tokyo
Faculty of medicine



Gojiro NAKAGAMI

Geriatric nursing
Nursing science
and engineering

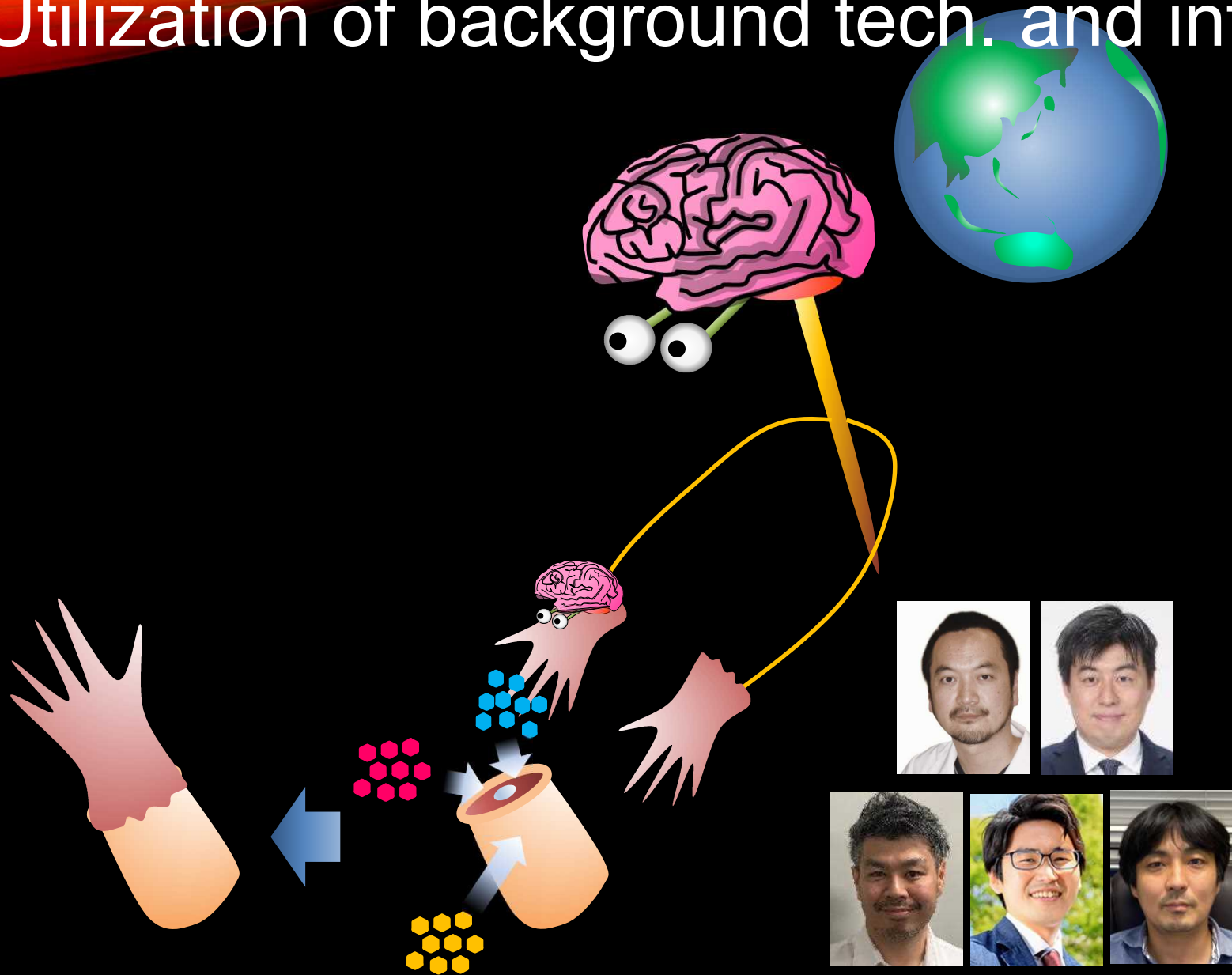
Osaka University
Faculty of engineering



Keiichiro SUZUKI

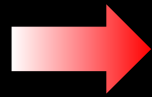
Genome editing
Molecular Biology

Utilization of background tech. and info.



Outcome of this project

Regeneration of motor organ



Participation of people
with disabilities

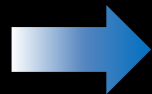


Promotion of gene therapy

Expansion to other integral organs



Recovery of aging alteration



Participation of aged people

