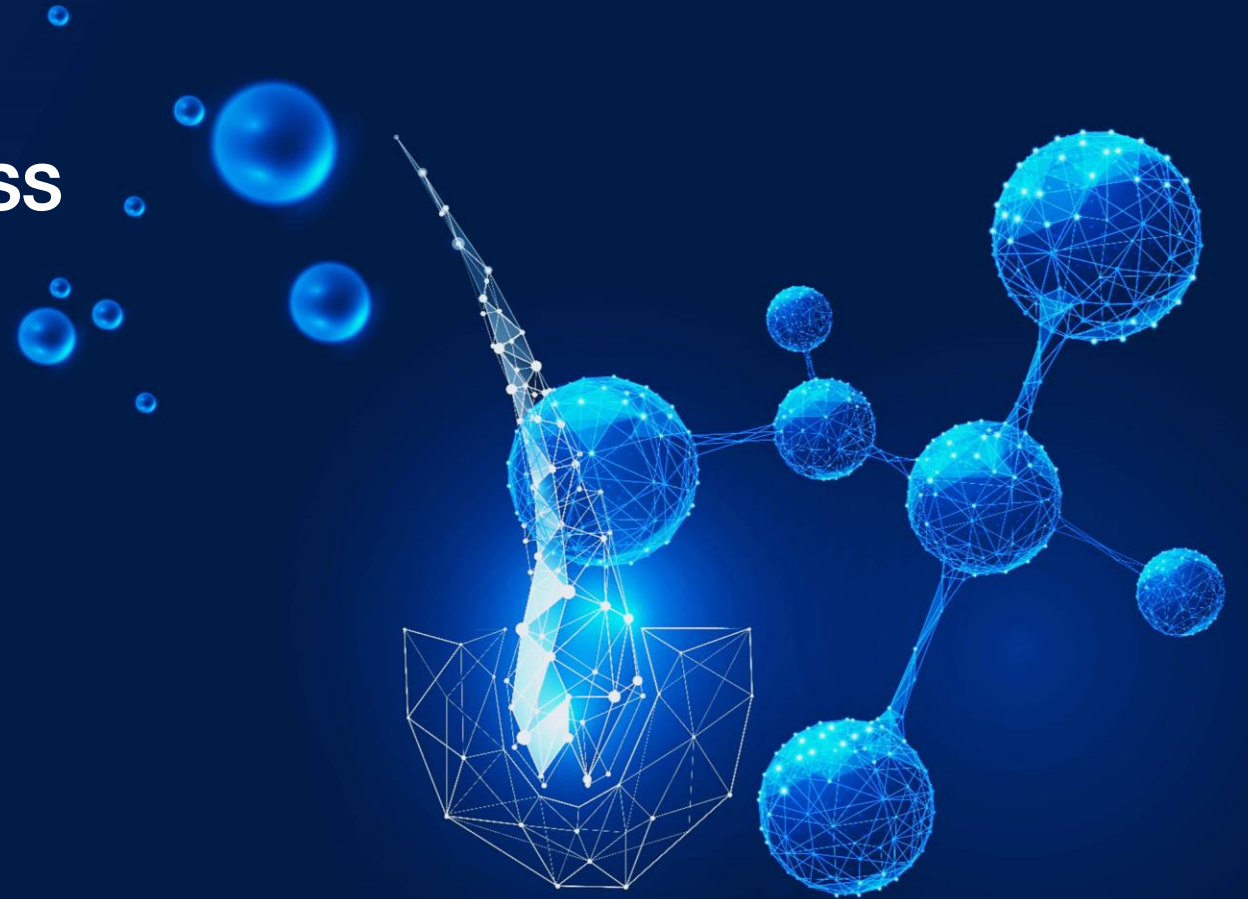


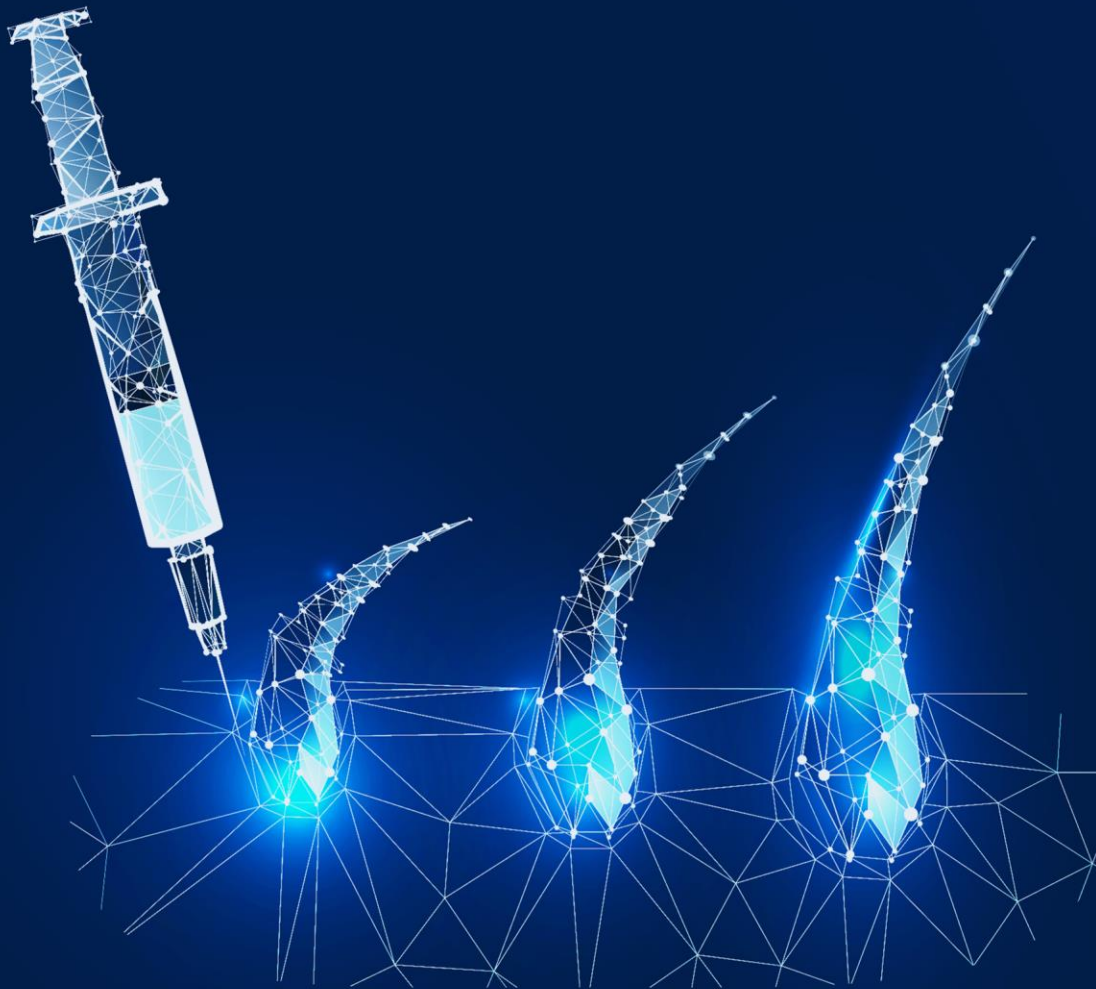
Developing Innovative Treatments for Hair Loss

# Biotech specialized in Hair Loss

## Epi Biotech

Making the insurmountable, possible





# Contents .

01

CRO Services

# Company Identity



## The only hair loss R&D company in Korea

Total solution for hair loss  
Biopharmaceutical research  
CDMO + CRO + Cosmetics



## Advanced Facilities and Pipeline

Research Labs (Cell & Gene, Antibody)  
Advanced GMP facilities



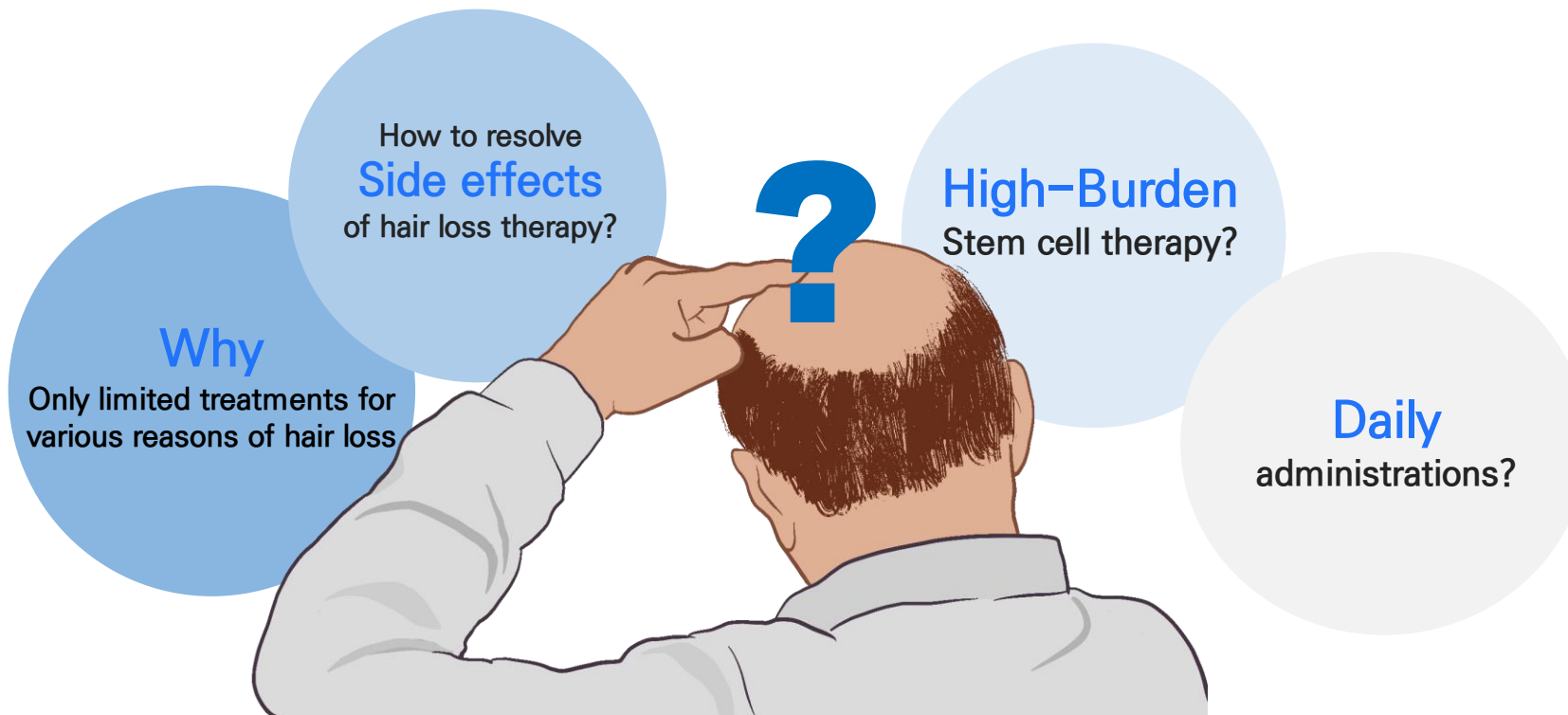
## Independent research technique

Hair growth efficacy assessment  
iPSC + HF differentiation technique  
Gene Editing Technique (Crispr/Cas9)



## Innovative hair loss solution

Develop treatments for various causes of hair loss  
Multiple pipelines by modality  
Improved safety and long-lasting effects



# Korea's leading Hair Loss R&D Capability

- Research Lab with over 10+ years of experience
- Over 30 SCI publications on Hair Loss
- Expertise in various cells composing the HF, **Validated efficacy animal models**
- IND approval with our own therapy pipeline –**Possess insights for efficacy evaluation, MoA, and consulting**



## Widely acclaimed #1 Hair Follicle Research Center

Epi Biotech designated “Excellent Corporate Institute (2022)” by the Ministry of science

Epi Biotech, awarded by Ministry of SMEs  
**Prize for Technological Innovation**

Developing the fundamental  
treatment that regenerates HF

Epi Biotech, Awarded KHIDI prize in 2020

Epi Bio “Only hair loss company with global capabilities”

Epi Biotech, granted patent for DPC isolation technique

Epi Biotech, granted patent for hair growth-  
promoting composition with novel MoA

Epi Biotech “Hair loss treatment through SC...”



*01*

## CRO services

- Hair Growth Efficacy CRO
  - In Vivo
  - In Vitro
  - Ex Vivo

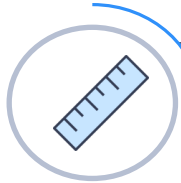


# Hair growth efficacy CRO

- Developed our own Alopecia Areata model and CRO service
- Conducted several contract researches for major Korean pharmaceutical companies
- Established a best-in-class efficacy evaluation system for therapy development

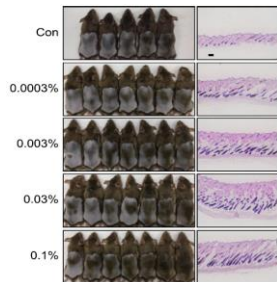


# In-vivo Hair growth efficacy test model



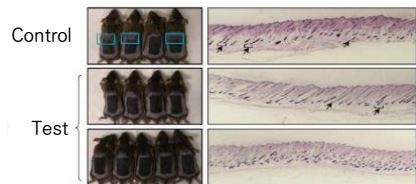
## Hair growth model

### Anagen induction (Hair growth promotion)



- telogen → anagen
- Hair growth eval → Hair growth promotion
- 3-4 week

### Anagen elongation



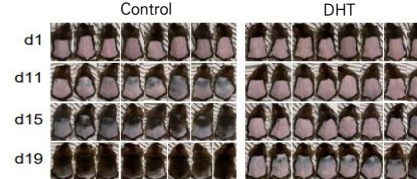
- Early anagen → late anagen
- Extended hair growth cycle → Hair loss prevention
- 3-4 weeks



## Hair Loss model

### Male pattern hair loss

- Hair growth evaluation
- DHT/TP induced hair loss model → Hair growth recovery
- 2~7weeks



### Female Pattern Hair loss

- Hair growth evaluation
- Ovx-induced hair loss model → Hair growth restoration
- 9-10 weeks



### Alopecia Areata

- Hair growth evaluation
- LNC induced hair loss → Hair growth restoration
- ~2 months

control



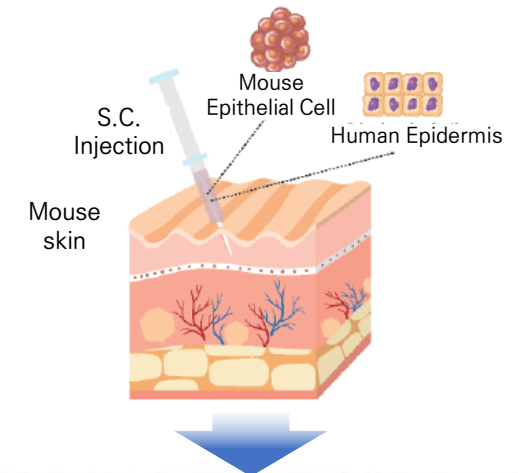
Test



## Hair follicle regeneration

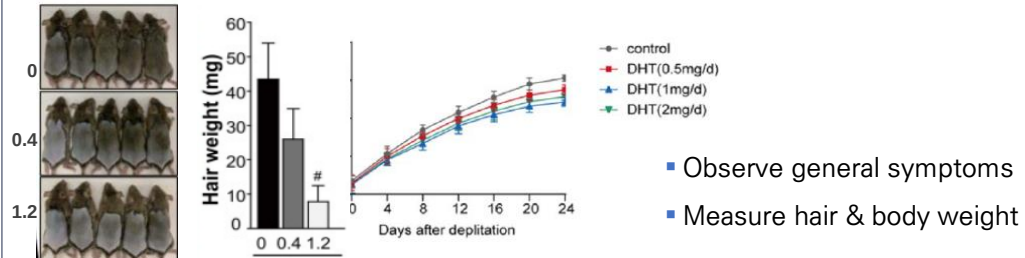
### Follicle regeneration ability

- Follicle regeneration evaluation
- Follicle regeneration by cell transplantation
- Follicle regeneration → follicle reconstruction
- 4-5 weeks

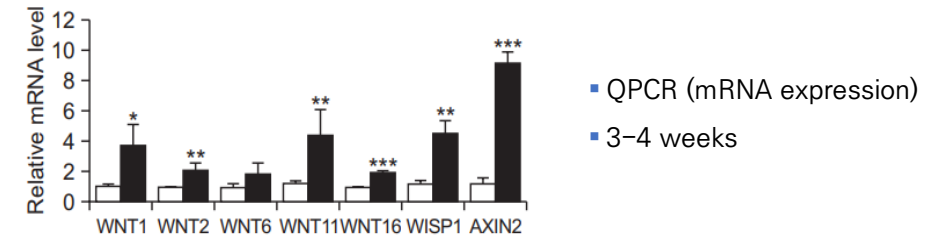


# In-vivo: Types of Hair Growth Efficacy Test

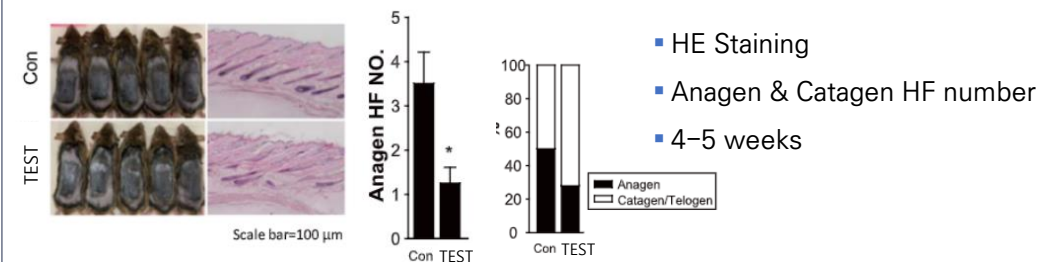
## Hair & Body weight measurement



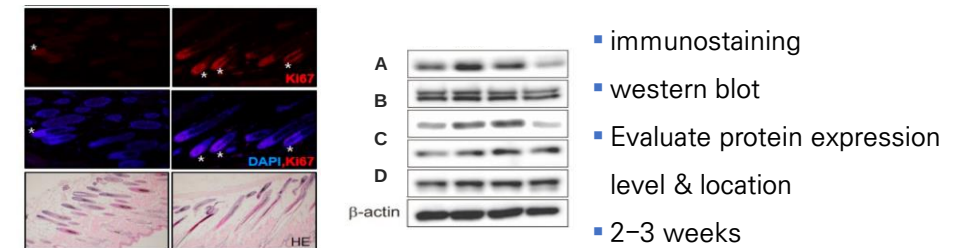
## Gene expression evaluation



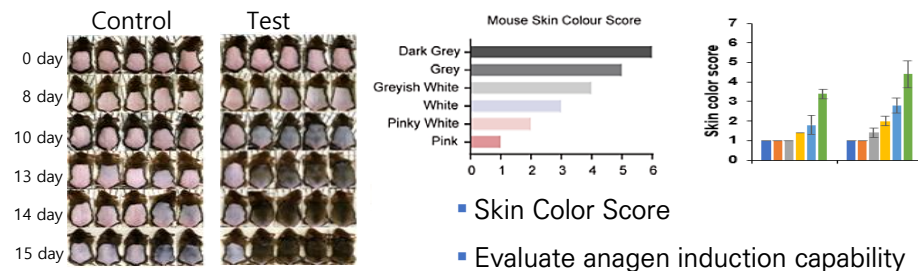
## Evaluation of anagen hair follicle (HF) ratio



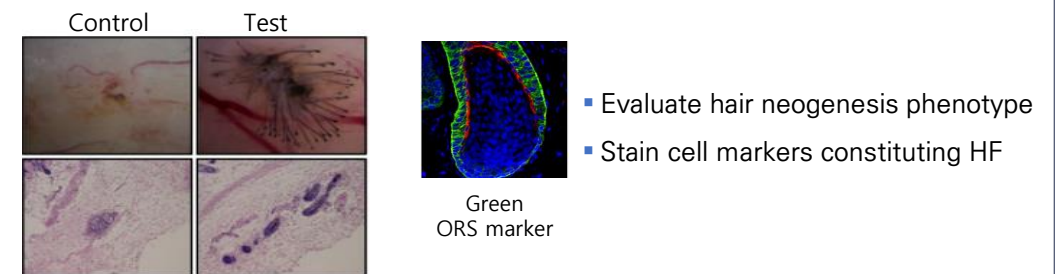
## Evaluation of protein expression



## Evaluation of skin color



## Evaluation of HF regeneration

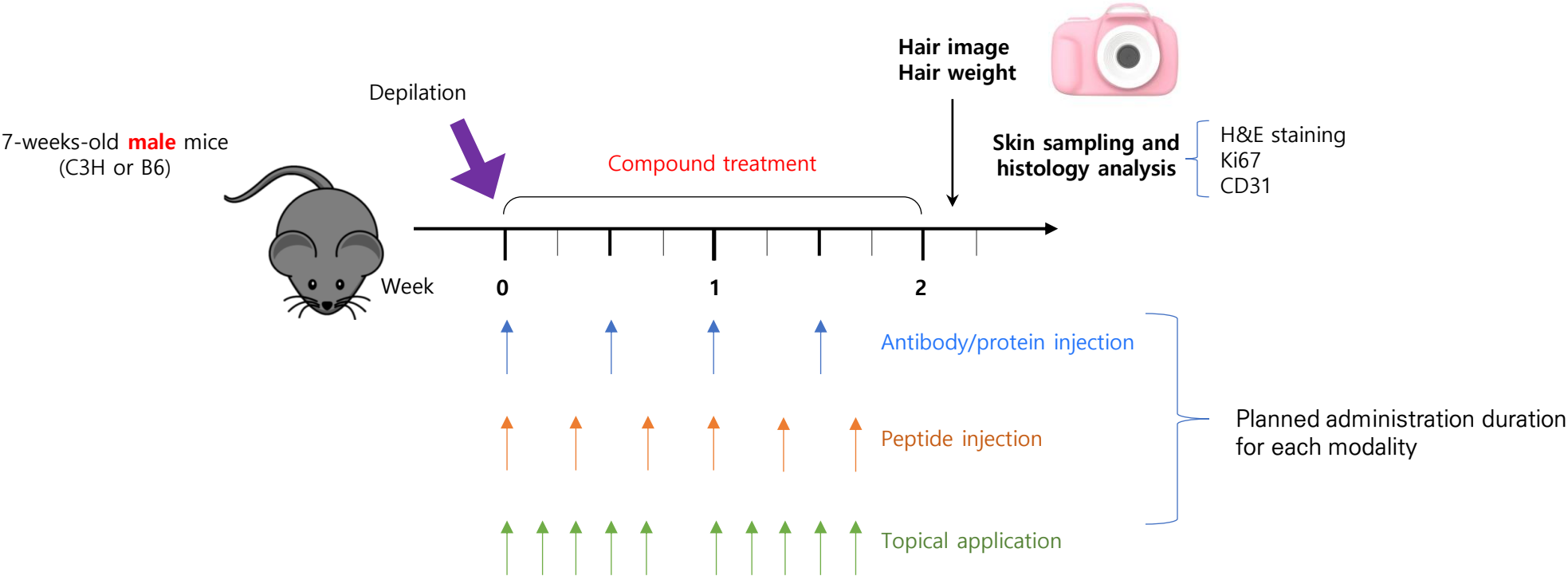




# Telogen-to-anagen transition model (anagen induction) Scheme

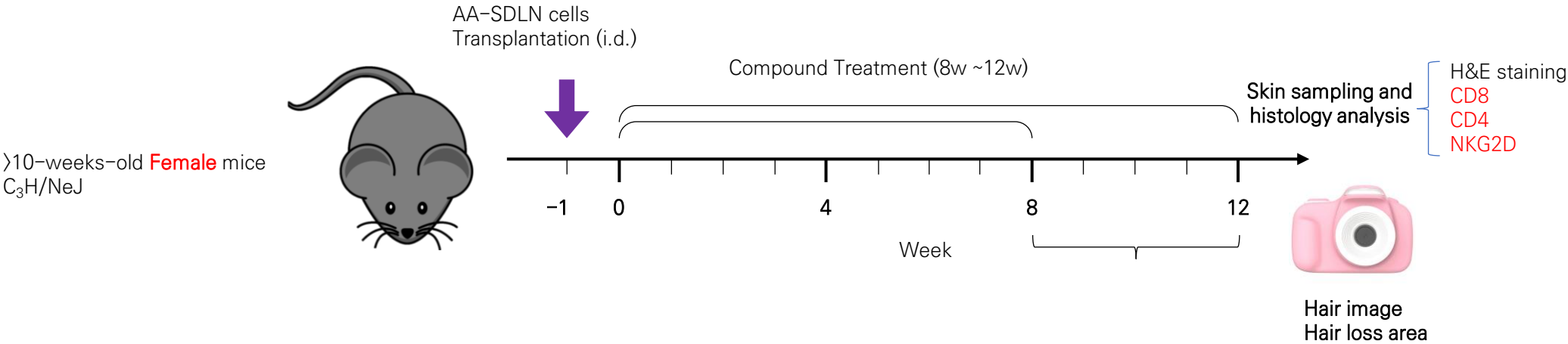
Provide Final Report, pictures of skin color, measurements of hair length & hair weight

| Category              | Details                  |
|-----------------------|--------------------------|
| Number per group      | 8 (C3H or B6 mice)       |
| Histological Analysis | H&E staining, Ki67, CD31 |
| Positive Control      | Minoxidil                |
| Duration              | 2 weeks                  |



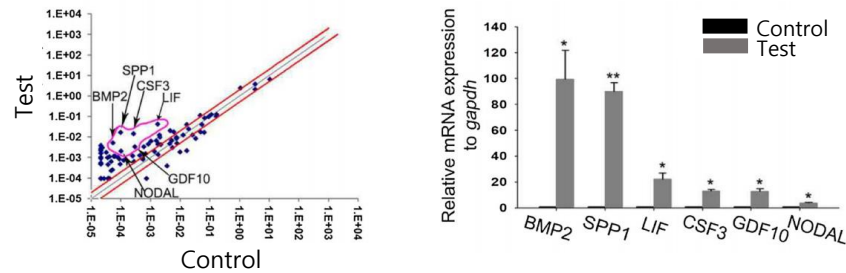
# Alopecia Areata (AA) onset model

| Category              | Details                       |
|-----------------------|-------------------------------|
| Number per group      | 10 ~ 12 (C3H/HeN Mice)        |
| Histological Analysis | H&E staining, CD4, CD8, NKG2D |
| Positive Control      | Jak Inhibitor                 |
| Duration              | 12 weeks                      |



# In-vitro Hair growth efficacy model

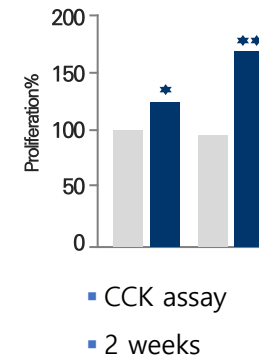
## Evaluation of bio marker expression



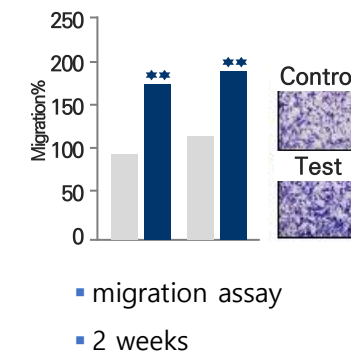
- QPCR array (hair growth factor)
- 2-3 weeks
- QPCR (hair growth factor)
- 3-4 weeks

## Cell Evaluation

### Cell growth

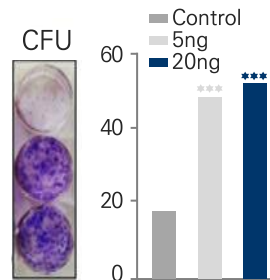


### Cell migration



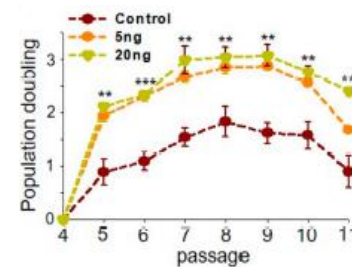
- CCK assay
- 2 weeks
- migration assay
- 2 weeks

## Colony Forming Unit (CFU)



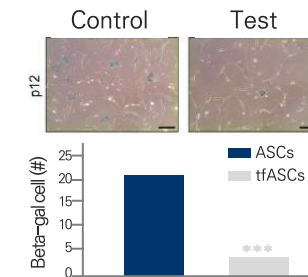
- Evaluation of self-renewal
- 2-3 weeks

## Population Doubling (PD)



- Evaluation of self-renewal
- 4-5 weeks

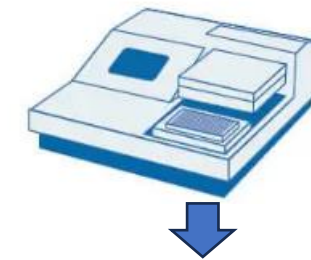
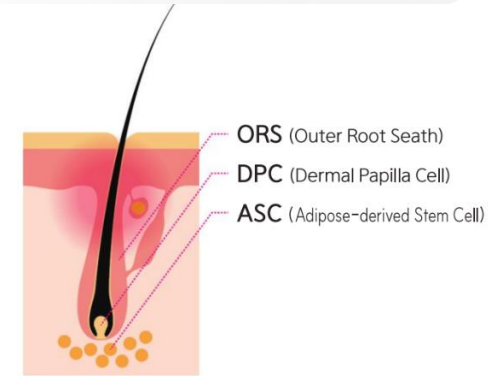
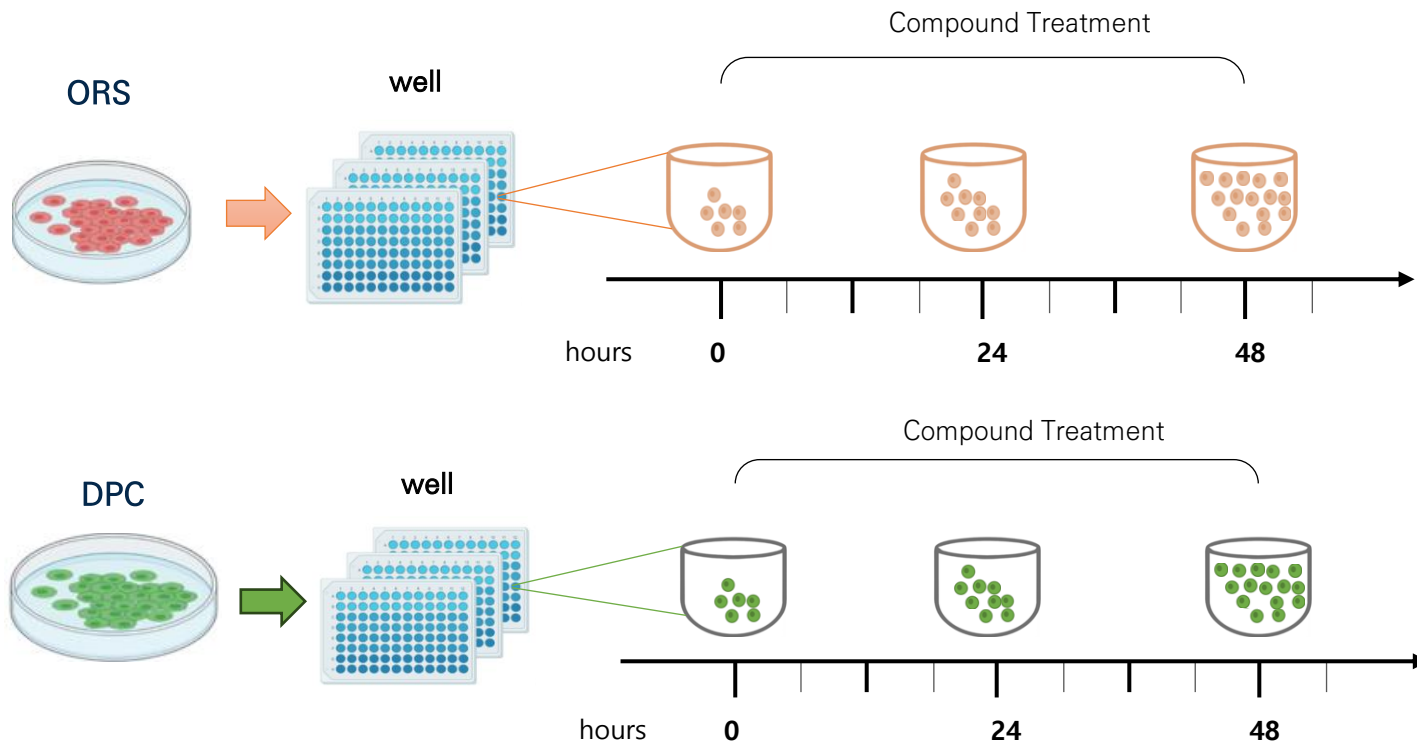
## Cell Senescence



- Evaluation of cell senescence
- 2 weeks

# In-vitro: Cell proliferation (DPC, ORS)

- Outer Root Sheath Cell (ORS) & Dermal Papilla Cell (DPC) proliferation
- Results in 2 weeks

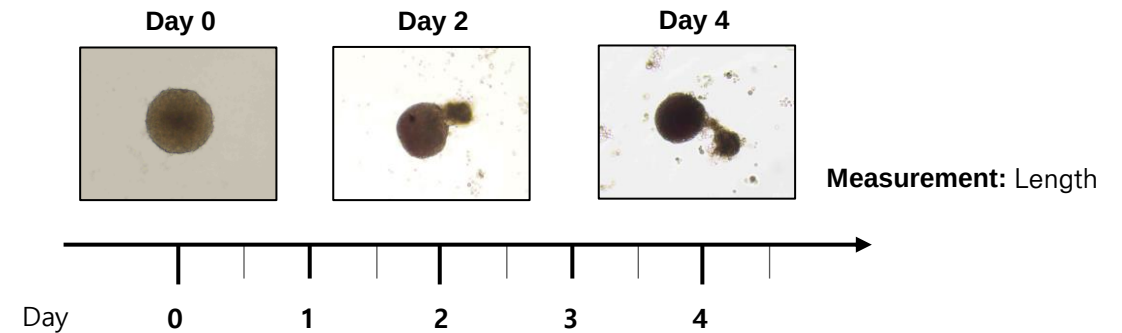
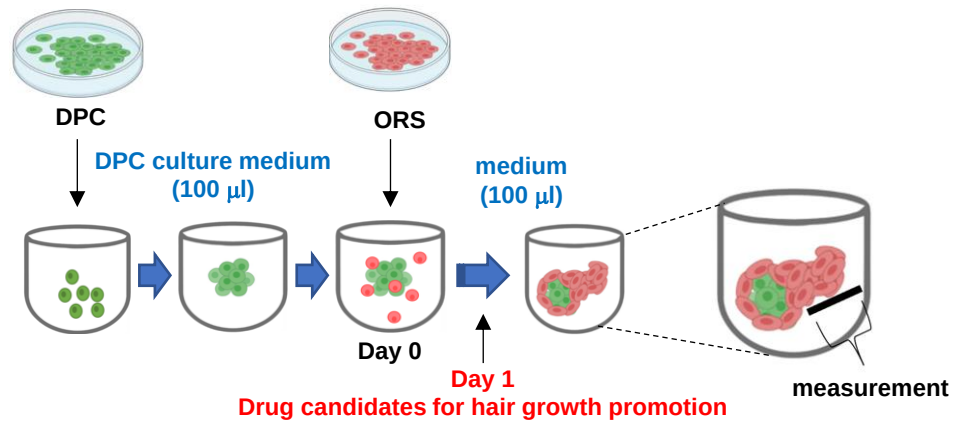




# In-vitro: DPC & ORS Co-culture, ORS Migration

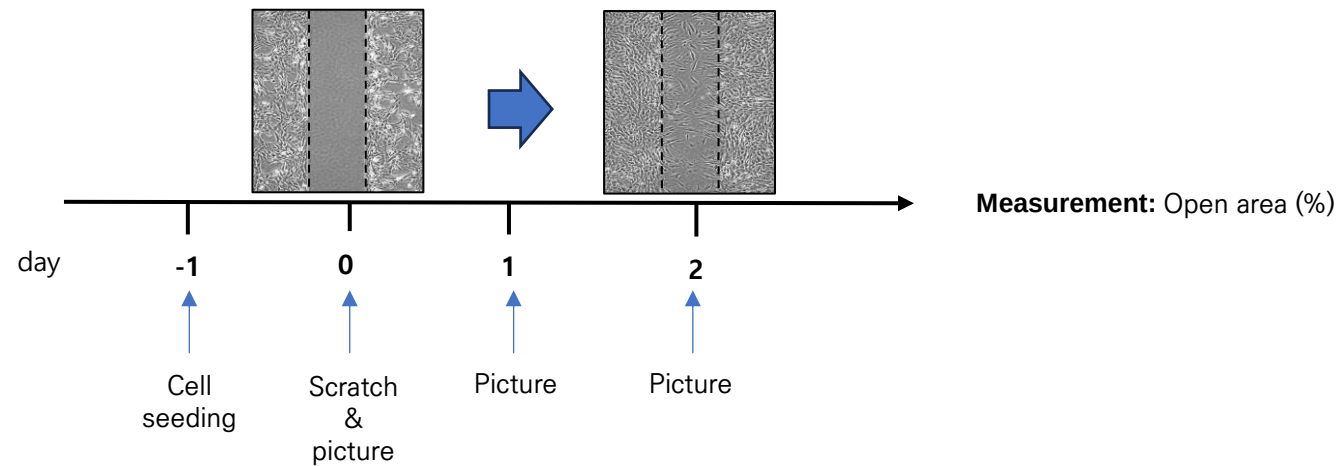
## DPC & ORS Co-Culture

– Results in 4 weeks



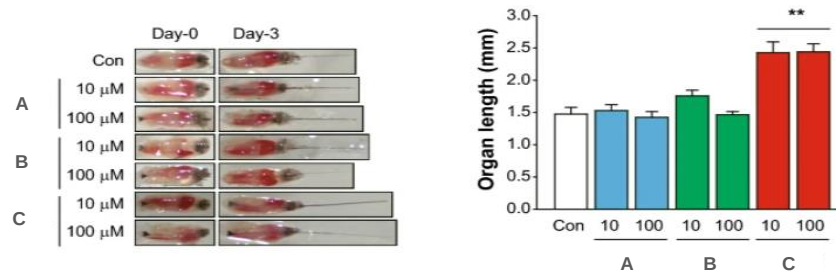
## ORS Migration

– Results in 2 weeks

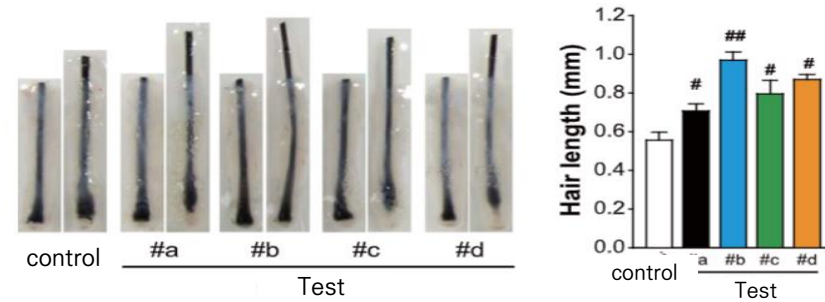


# Ex-vivo hair growth efficacy test model

## Hair length measurement (Hair growth promotion)

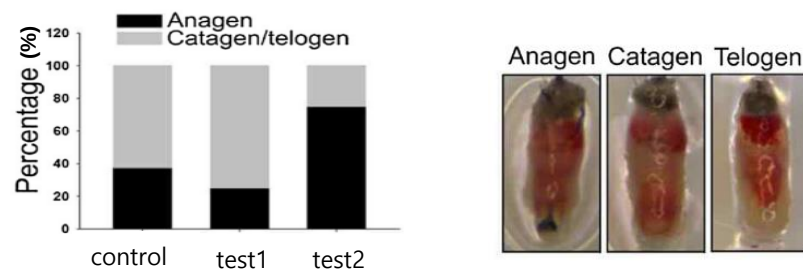


- Organ culture
- Evaluate growth of Mouse vibrissa follicle length
- 2 weeks



- Organ culture
- Evaluate growth of Human hair follicle length
- 2-3 weeks

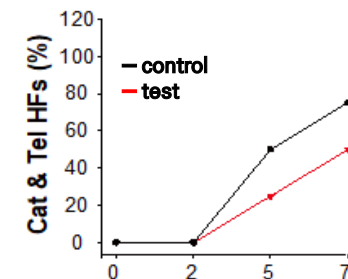
## Hair cycle measurement



- Organ culture
- Evaluate Mouse anagen hair follicle ratio
- 2 weeks

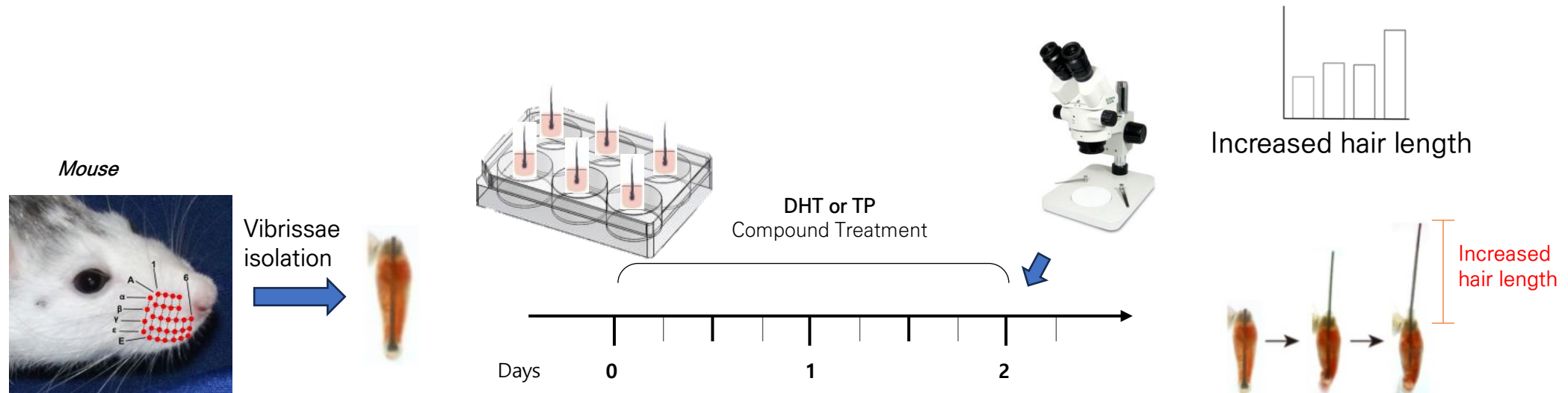


- Organ culture
- Evaluate Human anagen hair follicle ratio
- 2-3 weeks



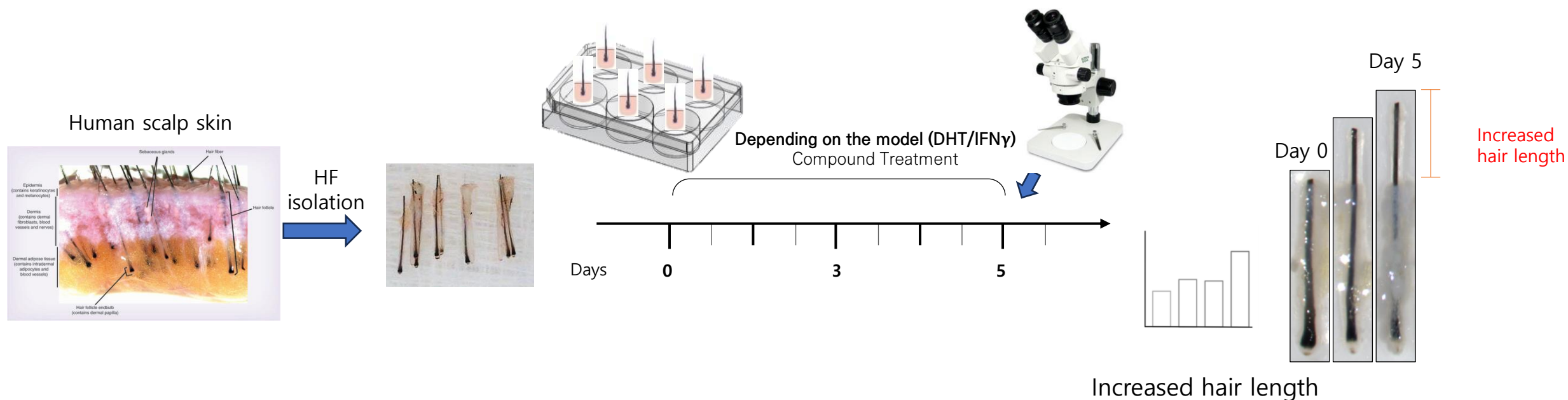
# Ex-vivo: Mouse organ culture scheme (AGA model)

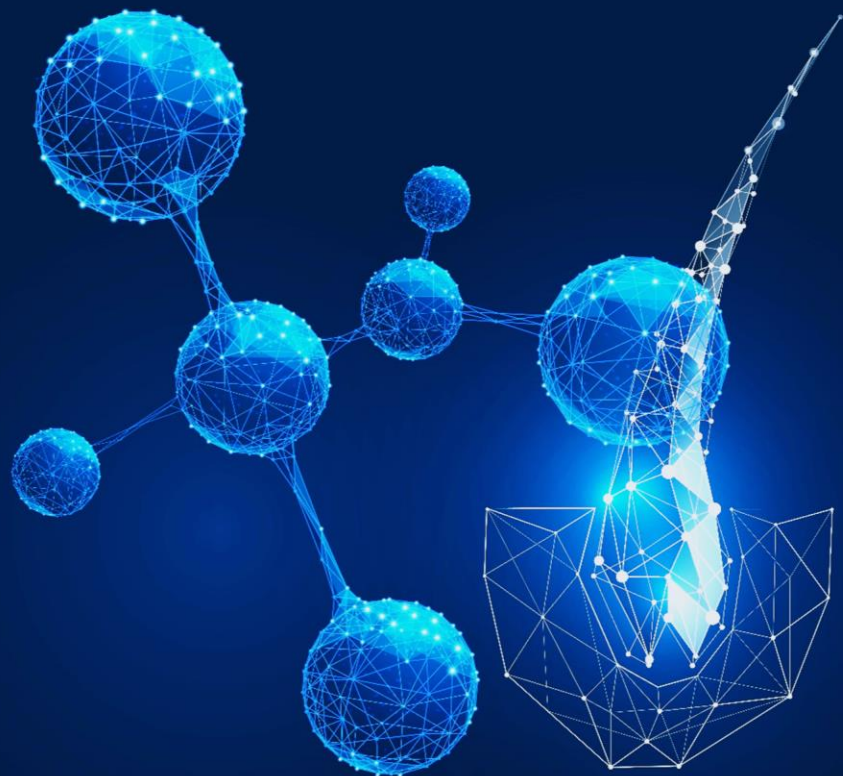
- Results in 2 weeks.
- (Optional) Androgen Receptor (AR) staining



# Ex-vivo: Human HF organ culture scheme

| Category              | Details                 |                            |                         |
|-----------------------|-------------------------|----------------------------|-------------------------|
| Number per group      | 8 ~ 10 (Hair Follicles) |                            |                         |
| Histological Analysis | Normal                  | AGA model                  | AA model                |
|                       | Ki67 Staining           | Androgen Receptor staining | Jak/Stat staining       |
| Treatment             | –                       | DHT or TP                  | IFN $\gamma$ /Poly(I:C) |
| Duration              | 5 days                  |                            |                         |





epibiotech 

Biotech specialized in hair loss, Epi Biotech  
Best DPC technology for hair loss treatment