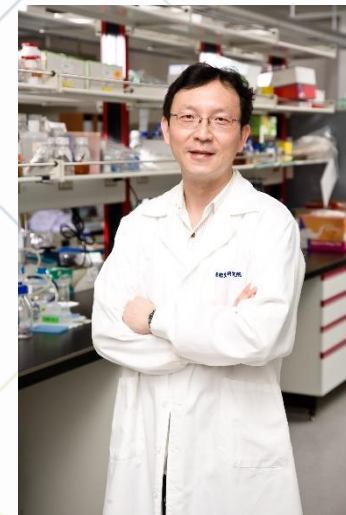


**National Health Research Institutes**  
**Institute of Cellular and System Medicine**

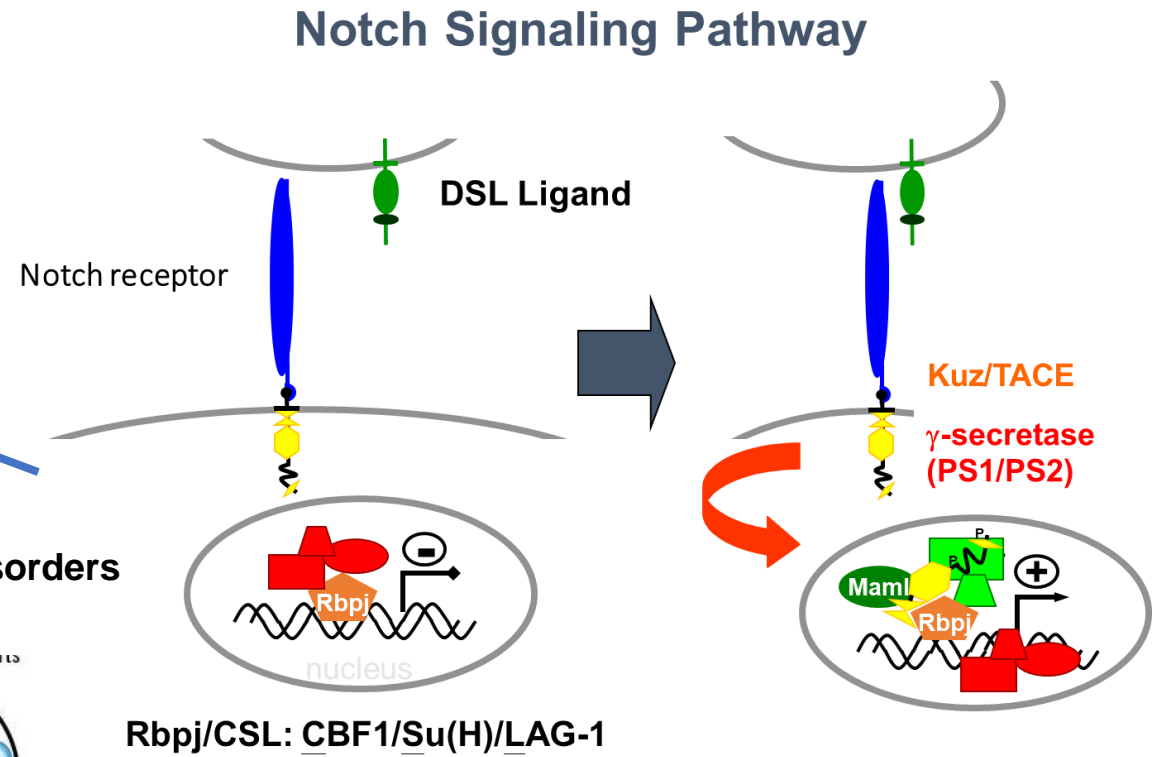
**Method and composition for treatment of hair  
loss disorders by a soluble signaling factor**

2023 USBIO

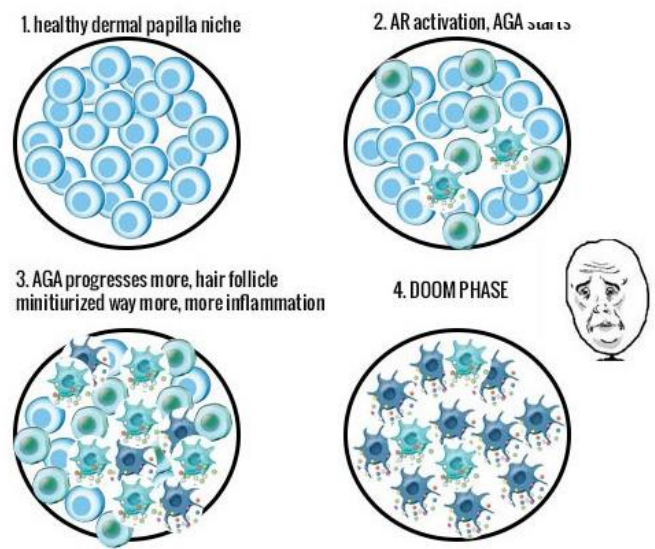
Inventer : **Dr. Liang-Tung Yang**



# Hair loss and hair miniaturization



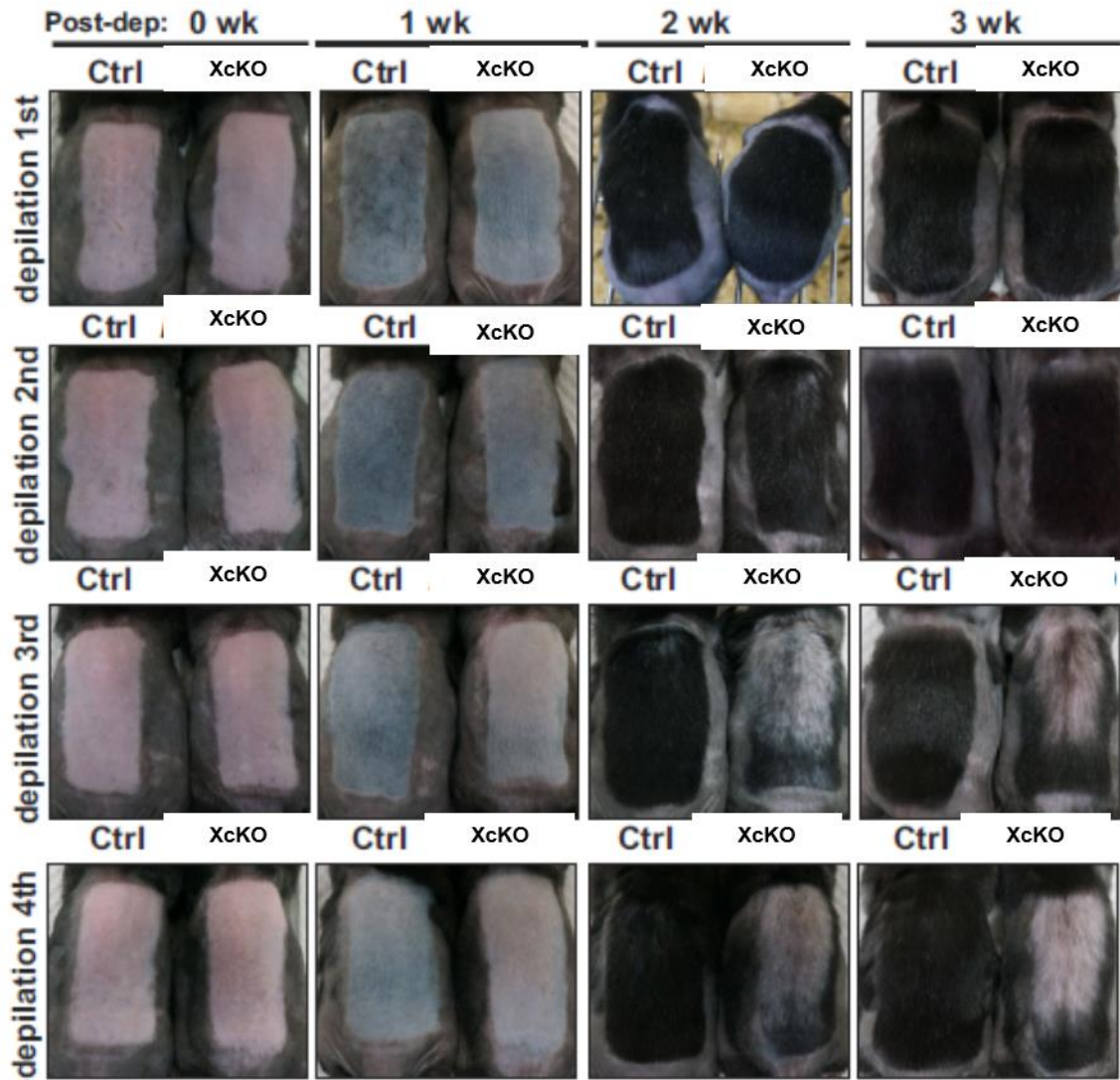
## Derma Papillae in Male Bald Disorders



## Common hair loss causes

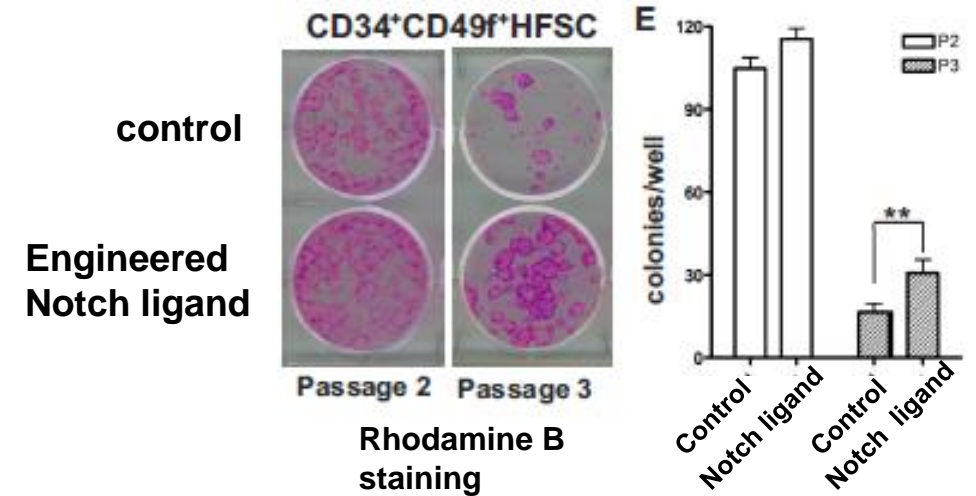
1. Genetics (bald and DHT)
2. Stress and Truma
3. Nutrition, Diet, and Medication
4. Health and Environment

# Assess the self-renewal of HF stem cells in the animal and in *in vitro* HF stem cell culture



**Epithelial Deletion of Gene X under Notch pathway**  
 Gradual hair loss after sequential depilation

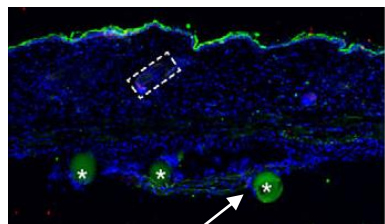
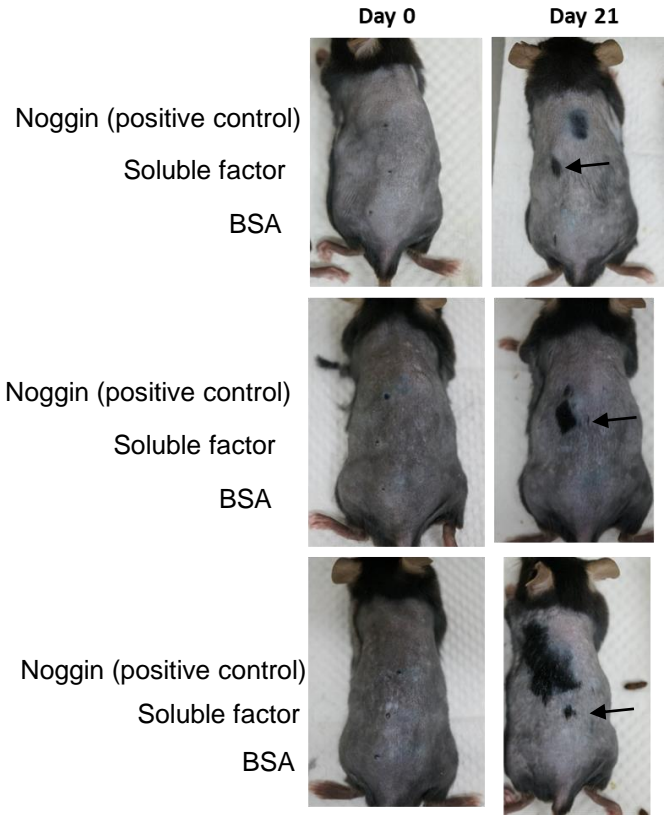
## Engineered Notch ligand supports HFSC self-renewal



Using the colony forming assay to assess the self-renewal of HFSCs



# *In vivo* intradermal delivery of a soluble signaling factor promotes the hair growth



protein-soaked Blue beads

Our invention is unique in that we found a substance that can be used locally on the scalp and should not have global effect on the body, and that can promote the anagen initiation in hair growth and sustain the self-renewal of hair follicle stem cells.

Our invention can be used to sustain the hair follicle regeneration, which is of great help for people who lost their hair by aging or under stress. The invention can also be applied to accelerate the hair regrowth after radiation therapy or chemotherapy accompanied by cancer treatment. Treatment of hair loss/alopecia has a great market potential, and we predict that our invention can be applied to make hair regrowth kit.