

Laboratory Introduction

PI: Stone S.T. Ding, PhD
Email: sding@ntu.edu.tw

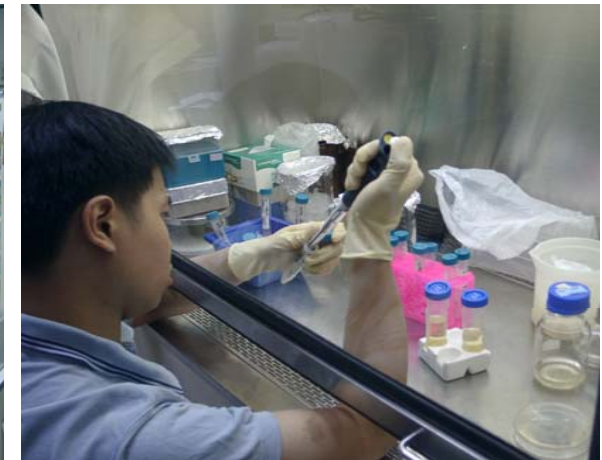


Molecular Biology Lab
Dept. of Animal Sci. and Techn.
National Taiwan University

Laboratory Members



Facility



On Going Research

- **Animal functional genomics**

Seven EST libraries for Taiwan Country chickens

One EST for goose liver; one for pig adipose tissue

Eight subtractive libraries

- **Gene function study**

(1) Functions of pig PPARs, adiponectin and it's receptor, visfatin, and SAA protein

(2) Chicken SREBP1

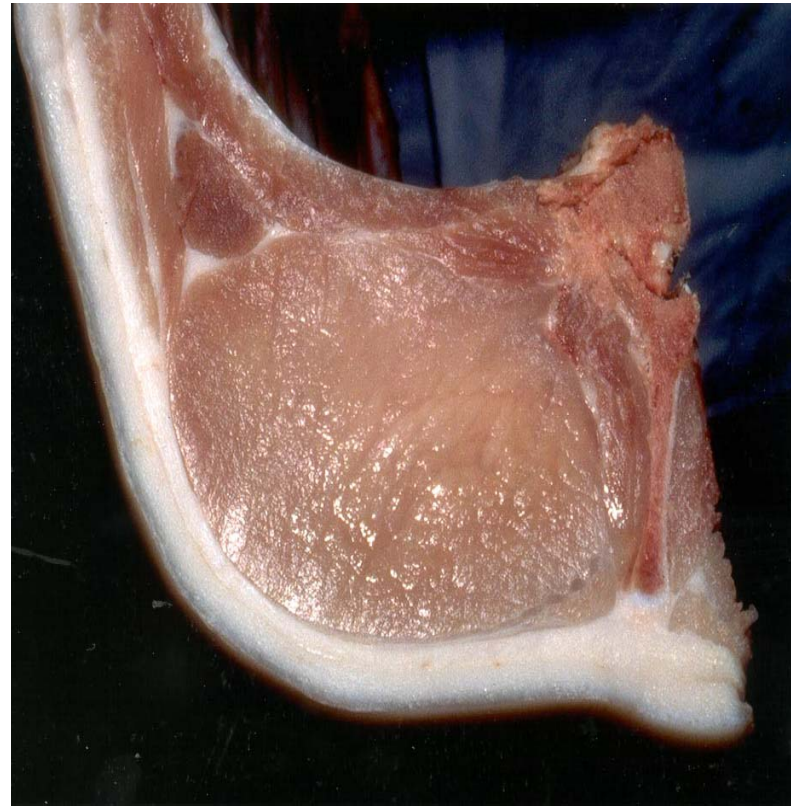
- **Nutrient gene interaction**

DHA on gene expression in pigs and chickens

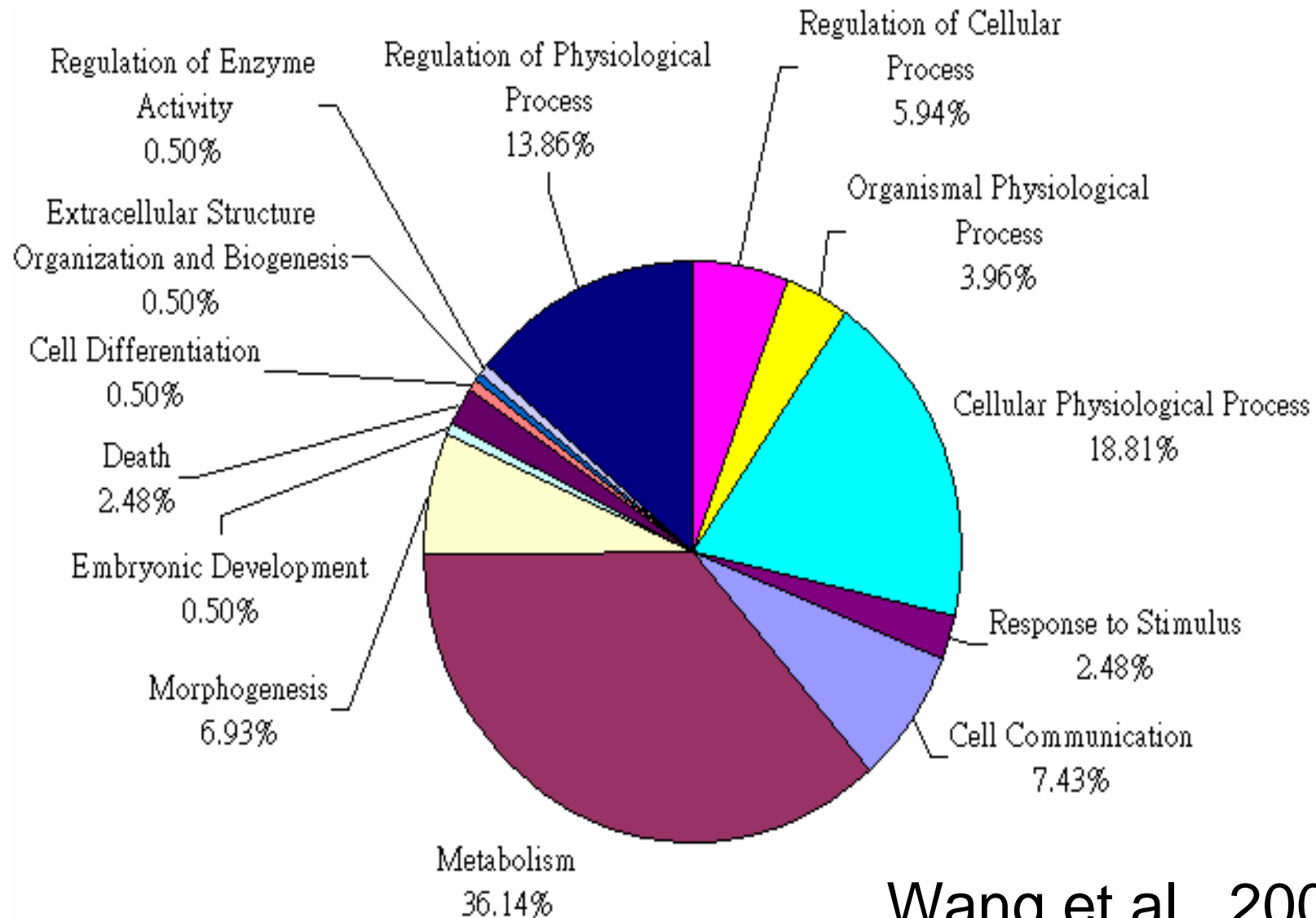
On Going Research

- Nutrient gene interaction
High DHA fungi for feed
It's effect on gene expression in pigs and chickens
- Establishment of immortalized porcine cells
Several clones of preadipocytes have been established
- Nutrients, hormones, and insulin sensitivity
 - (1) Adipogenesis
 - (2) FA, ADN, visfatin, and insulin sensitivity

Creating Value Added Animal Products

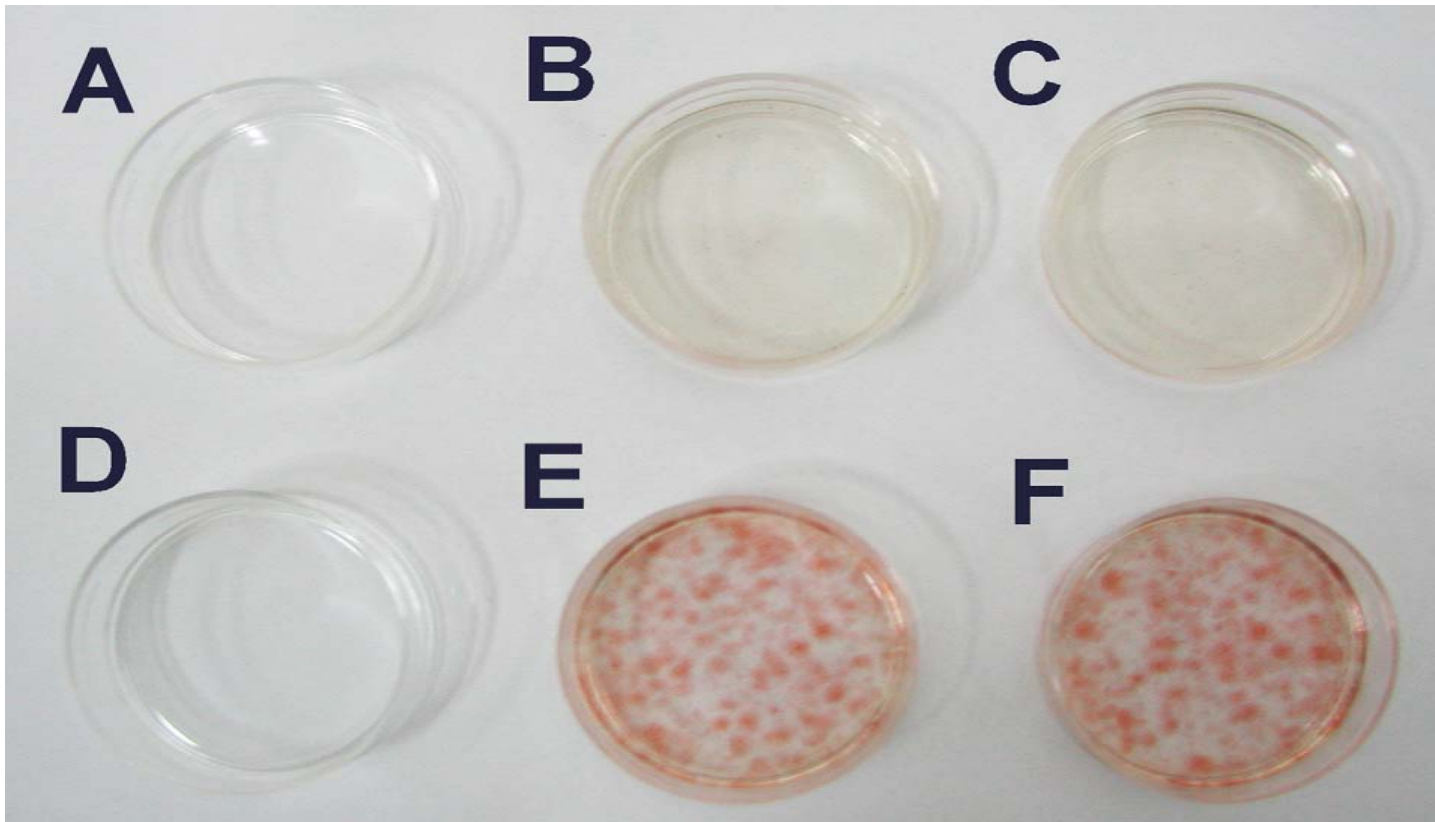


Gene Ontology Analysis for Adipose Expressed Genes



Wang et al., 2006

PPAR γ on Adipocyte Differentiation

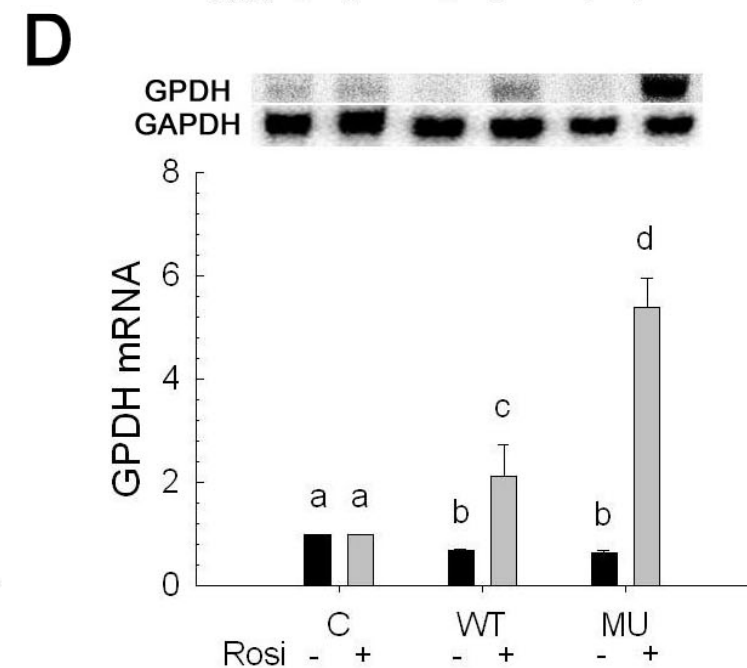
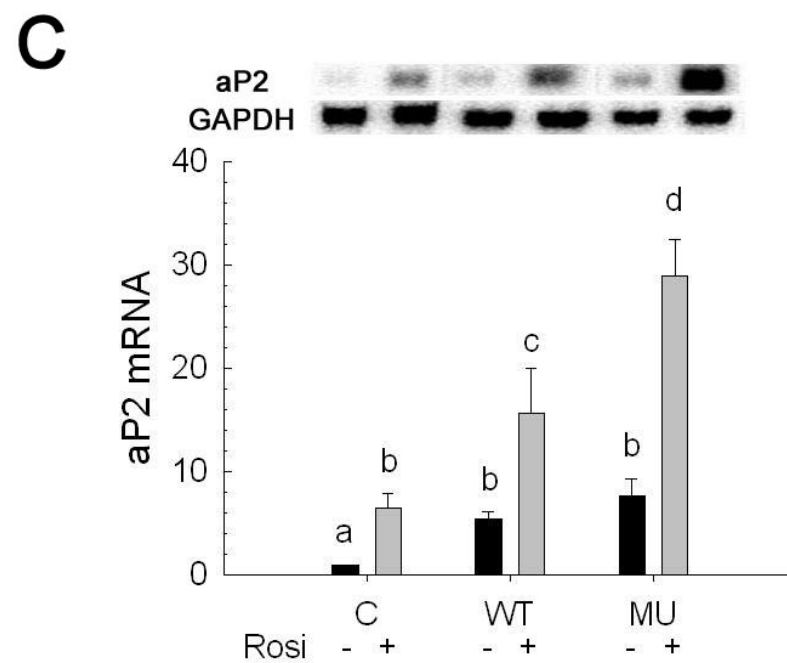
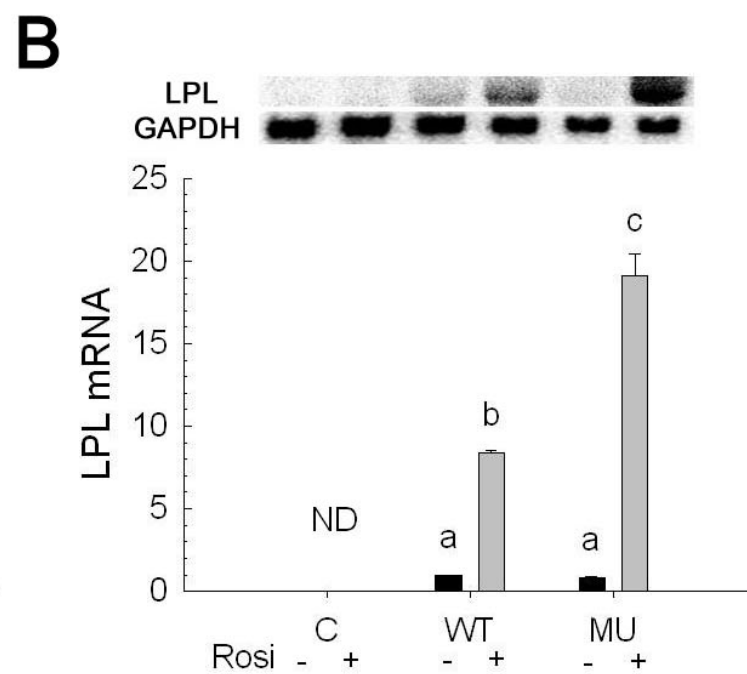
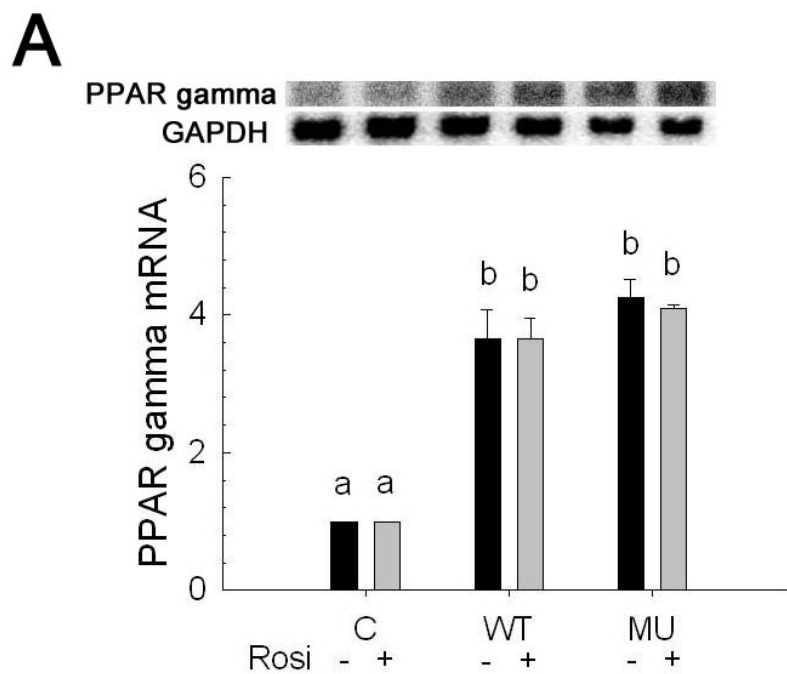


Control

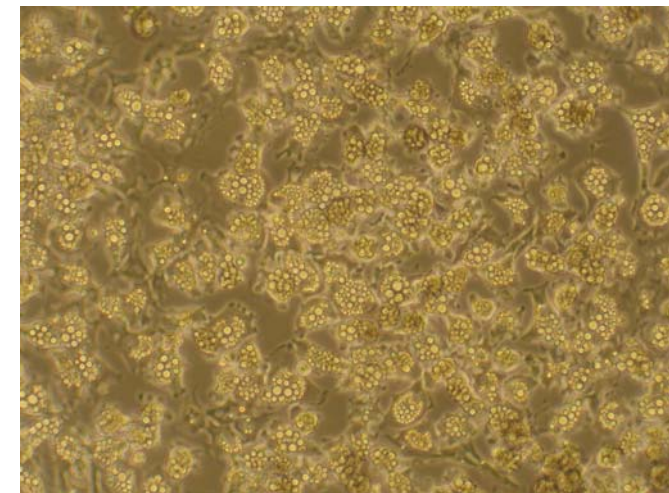
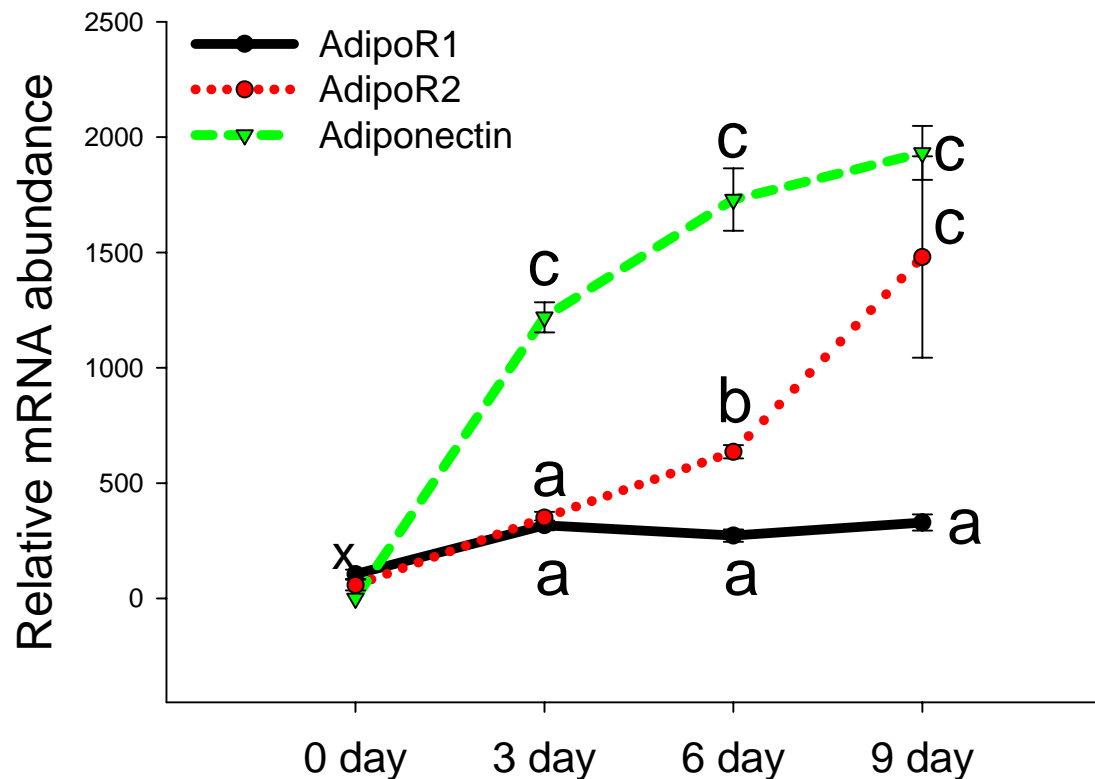
PPAR γ w

PPAR γ mutant

Yu et al., 2006



Expression of Adiponectin and AdipoRs during Adipogenesis

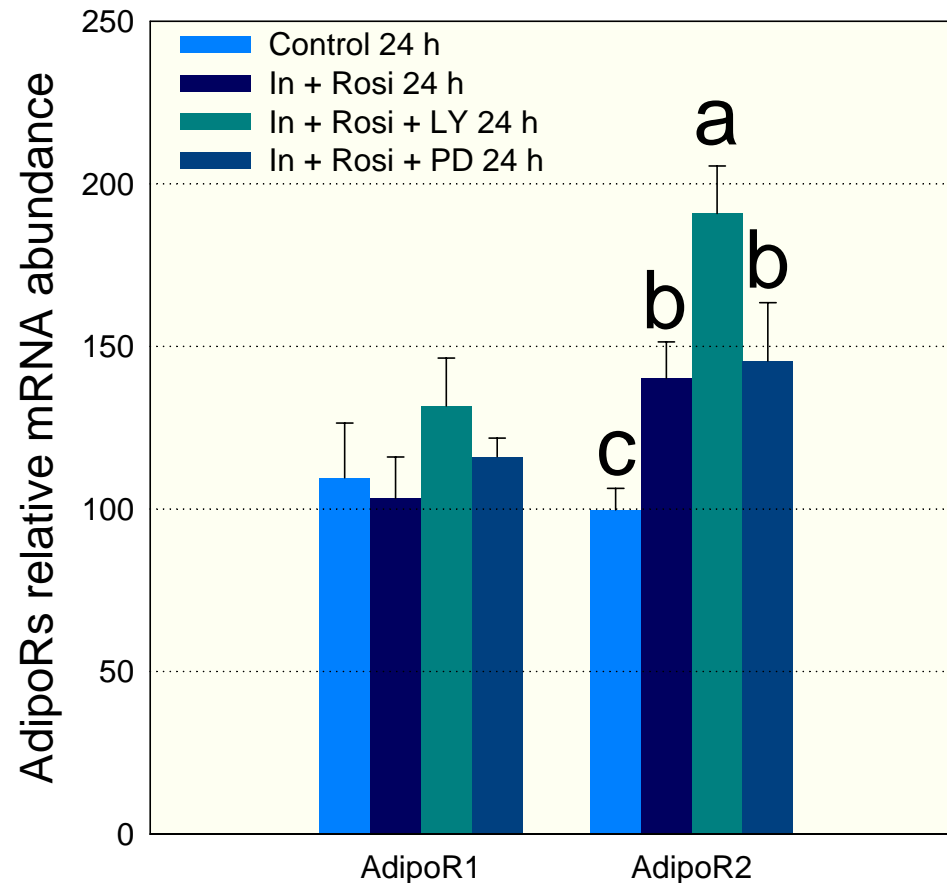


Porcine adipogenesis in 9 days

All of the adiponectin and AdipoRs were increased during adipogenesis

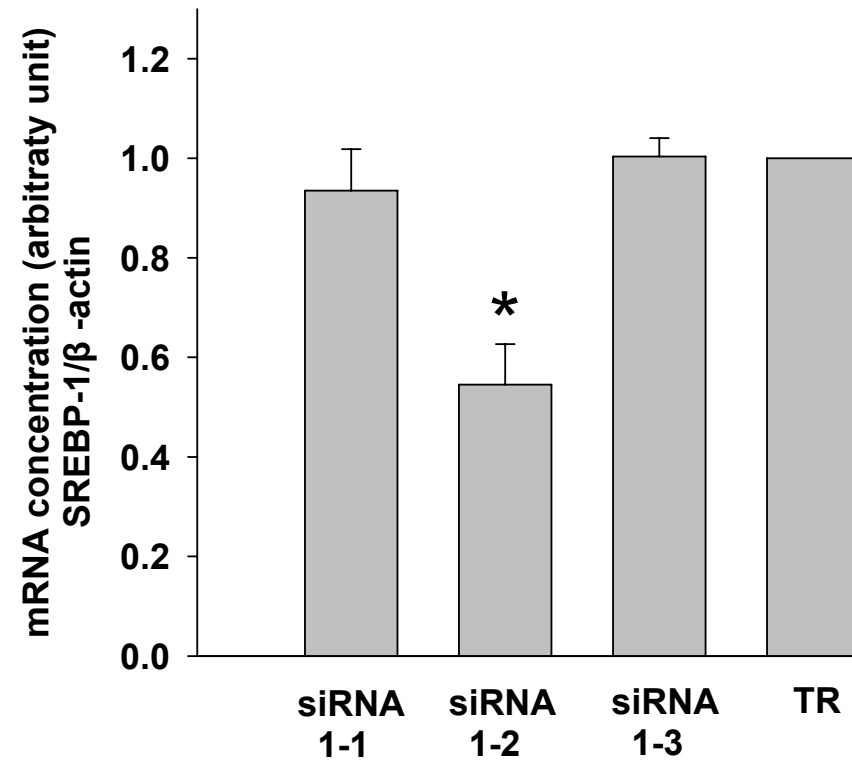
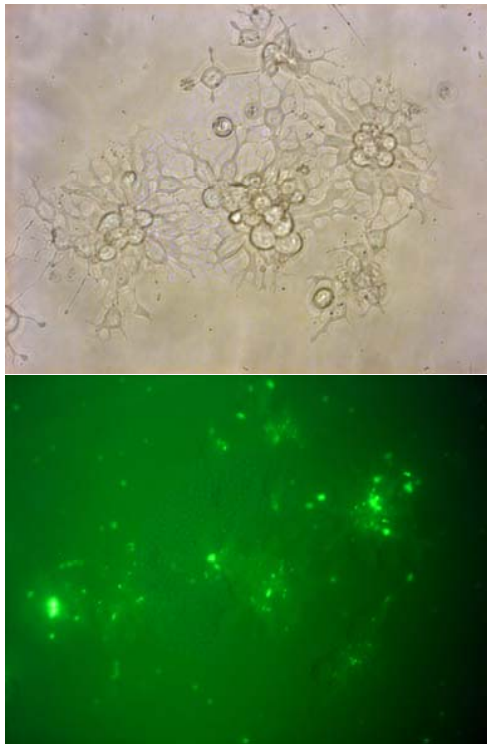
Liu et al., 2006

Insulin on Rosiglitazone - Mediated Induction of AdipoR Expression



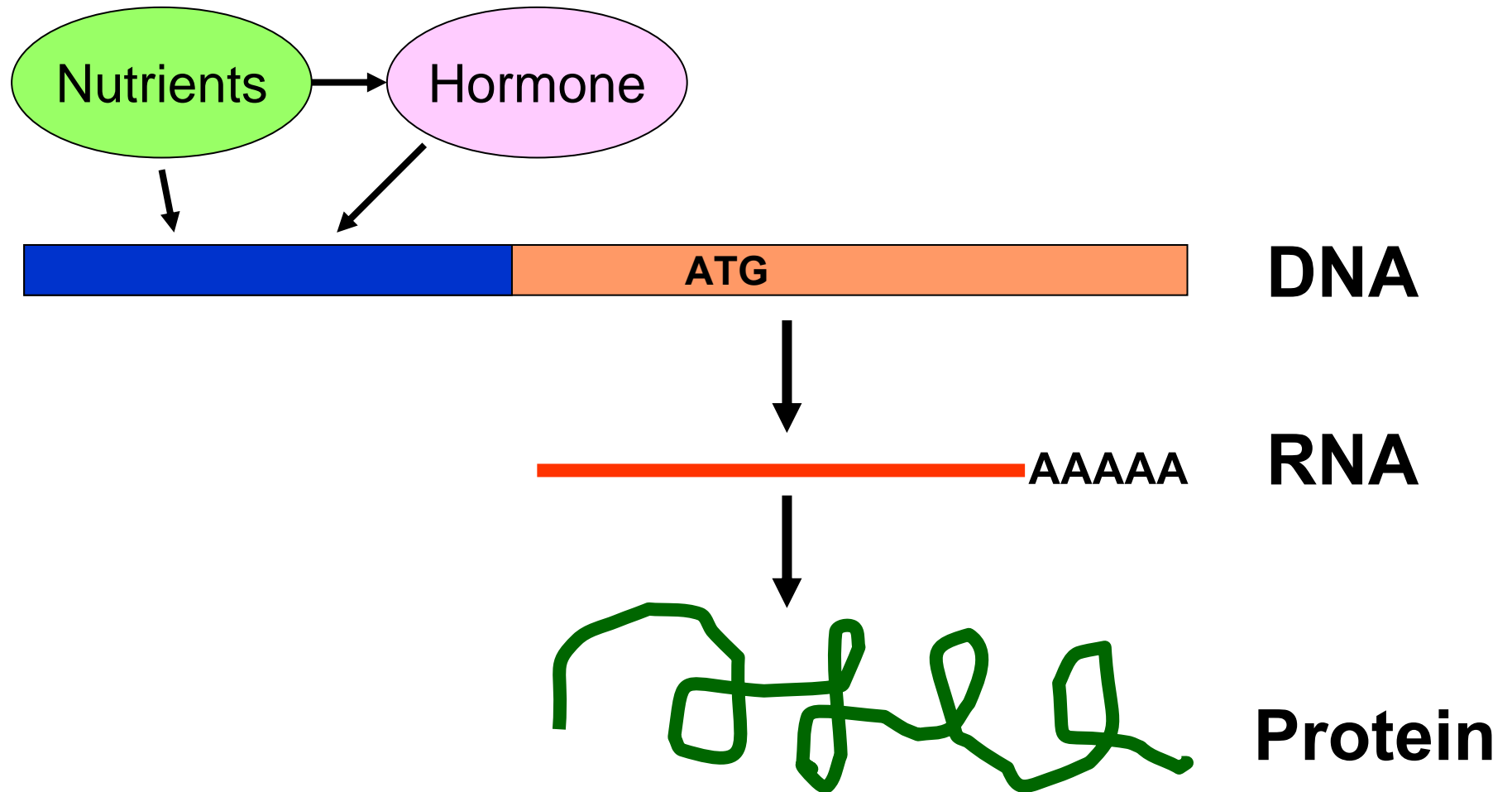
- Insulin decrease AdipoR2 mRNA concentration through PI3K signal pathway.

siRNA of SREBP1 on Gene Expression

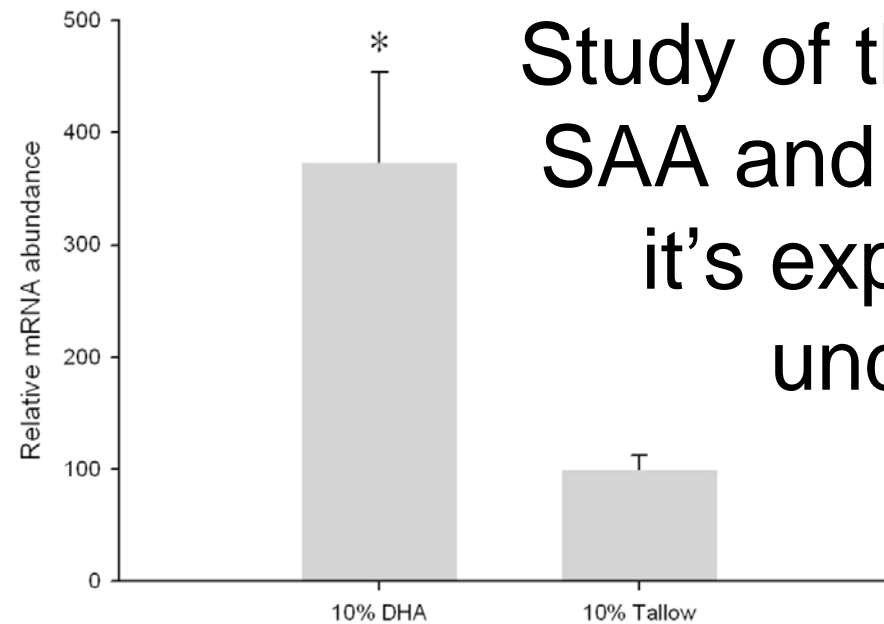
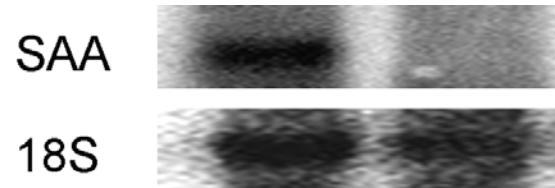


Ko et al., 2006

Nutrients and gene expression



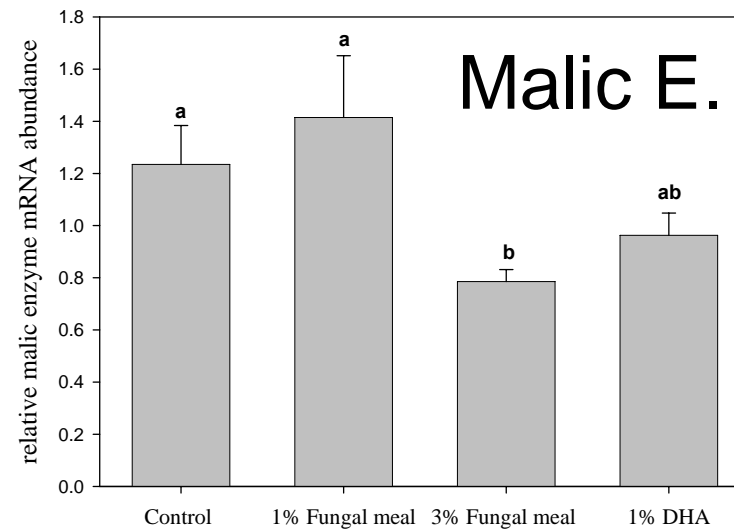
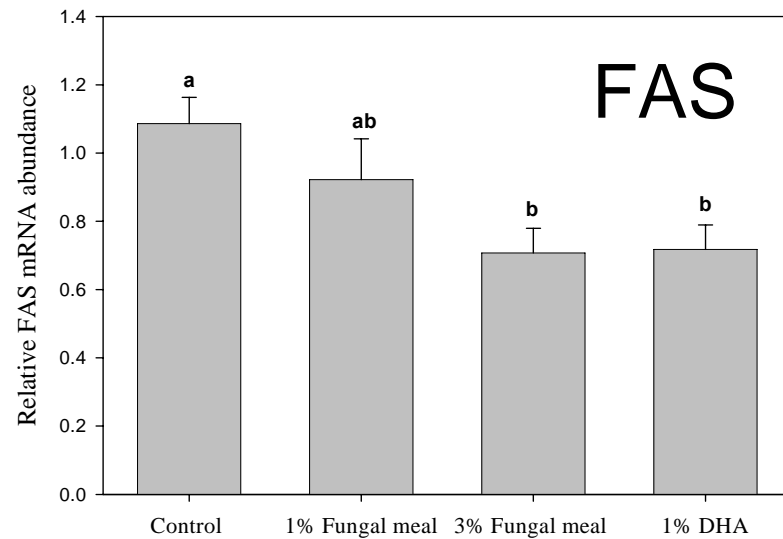
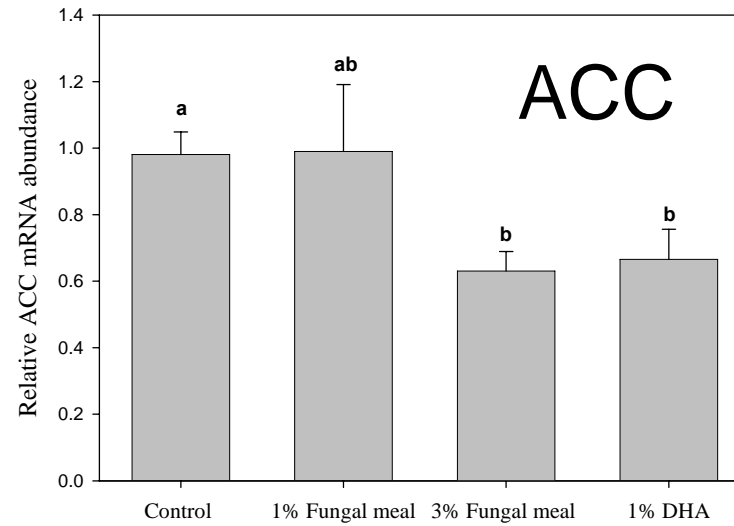
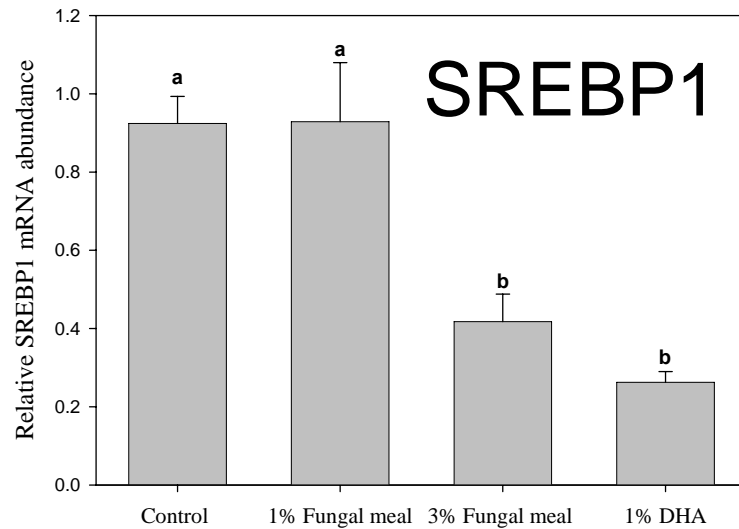
DHA on Hepatic SAA



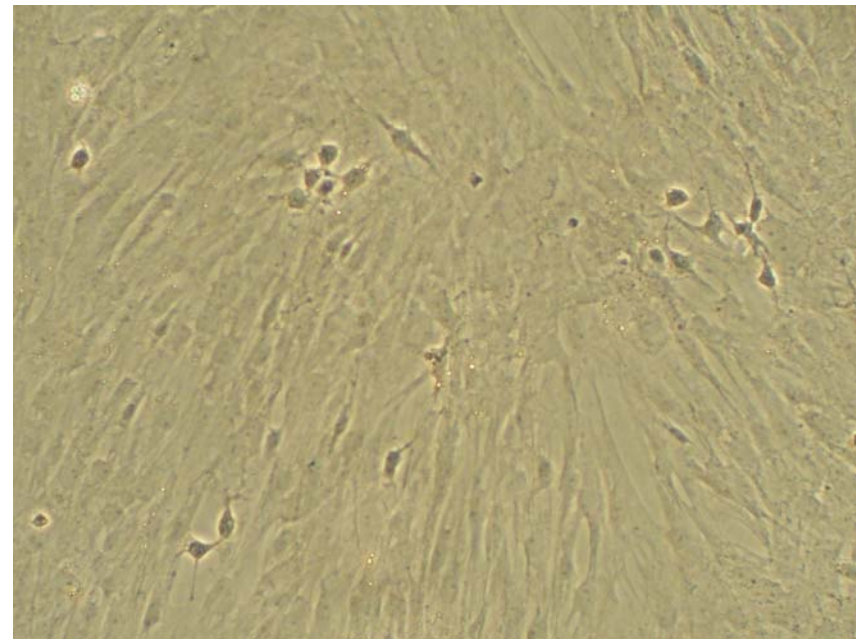
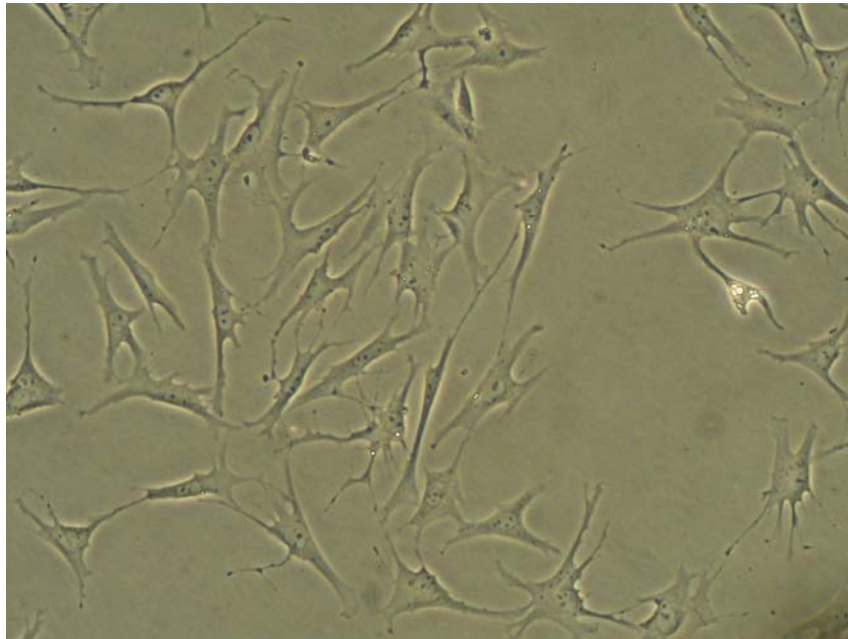
Study of the function of SAA and regulation of its expression is underway

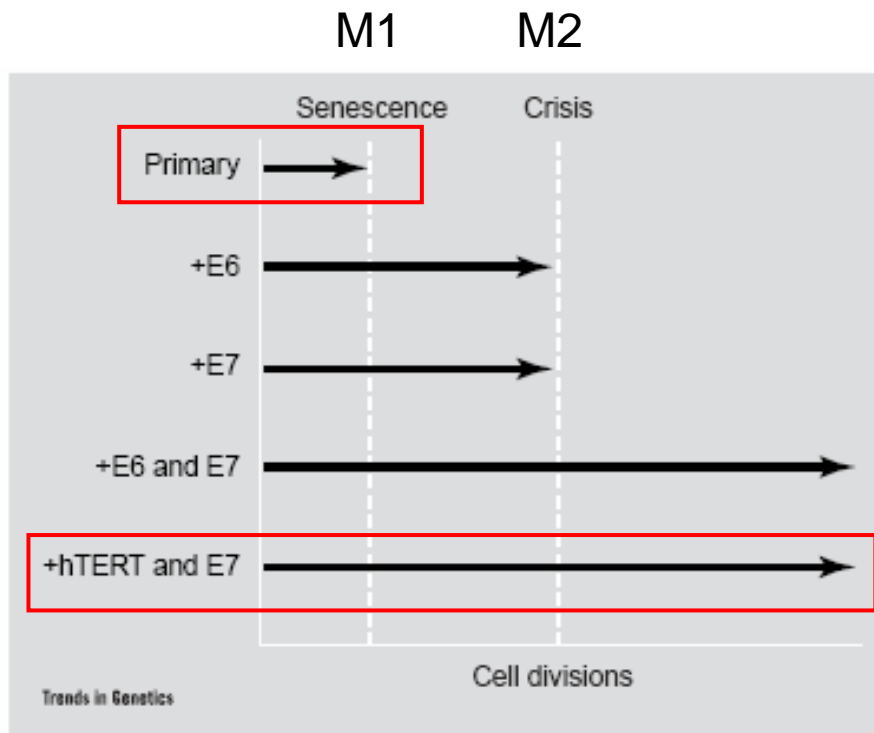
Chang et al., 2007

Fungal DHA on Gene Expression in Chicken livers



Primary Porcine Preadipocytes Proliferation





M1: Mortality stage 1
M2: Mortality stage 2

Immortalization

Greider, 1999

Procedures

Primary culture



Transfect hTERT



2000ng/ml puromycin selection for 14 days

Transfect HPV-E7

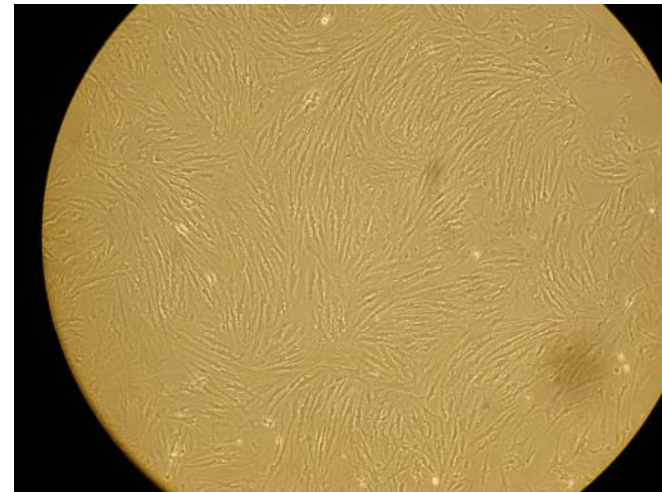


50mM Histidinol (L-) Dihydrochloride selection for 14 days

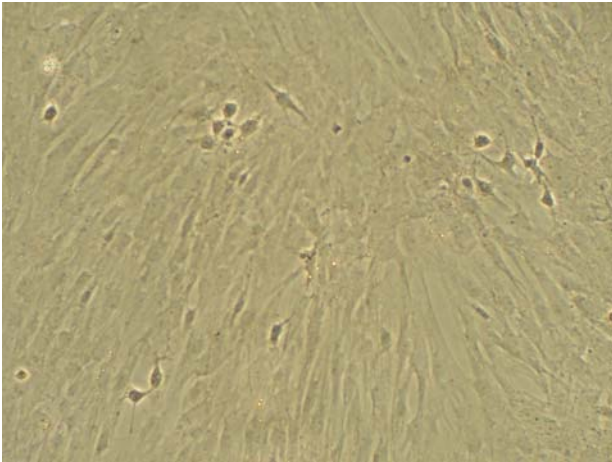
Cell clone 9 clones



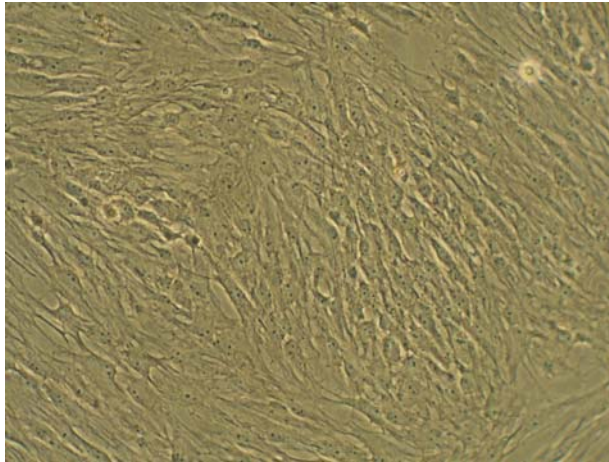
Differentiation test



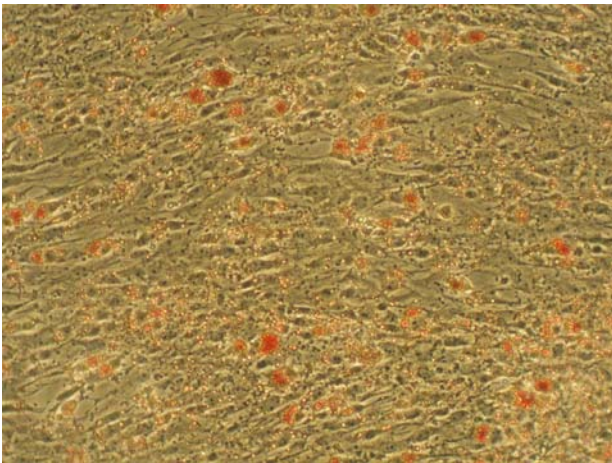
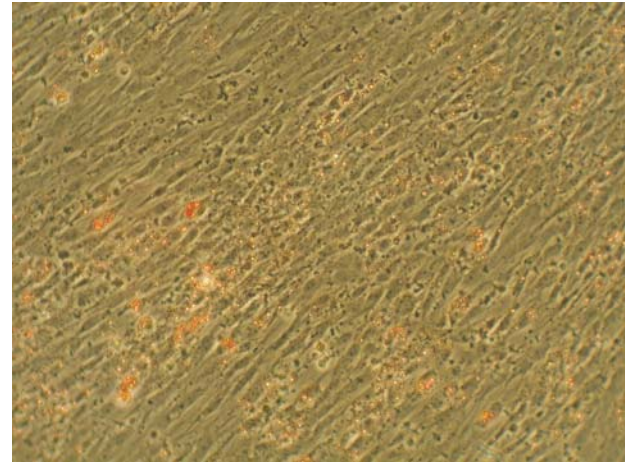
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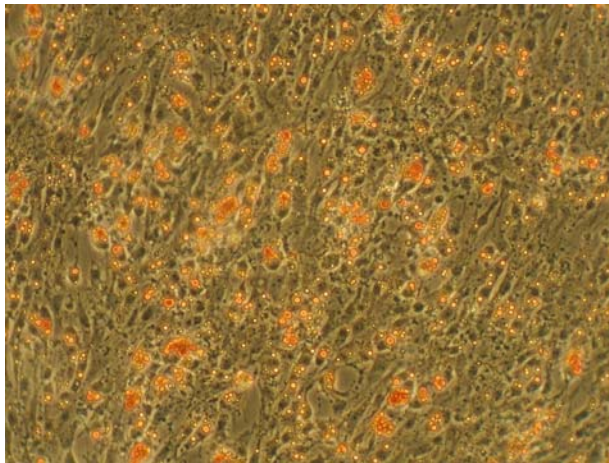
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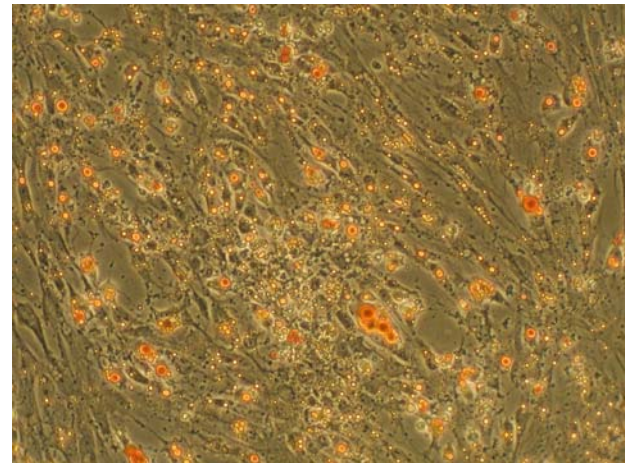
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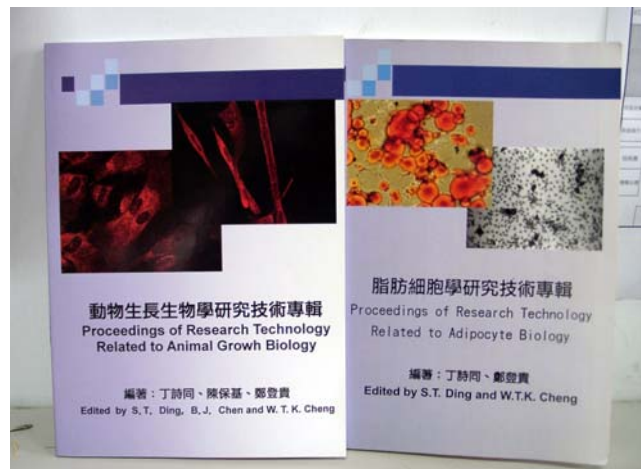
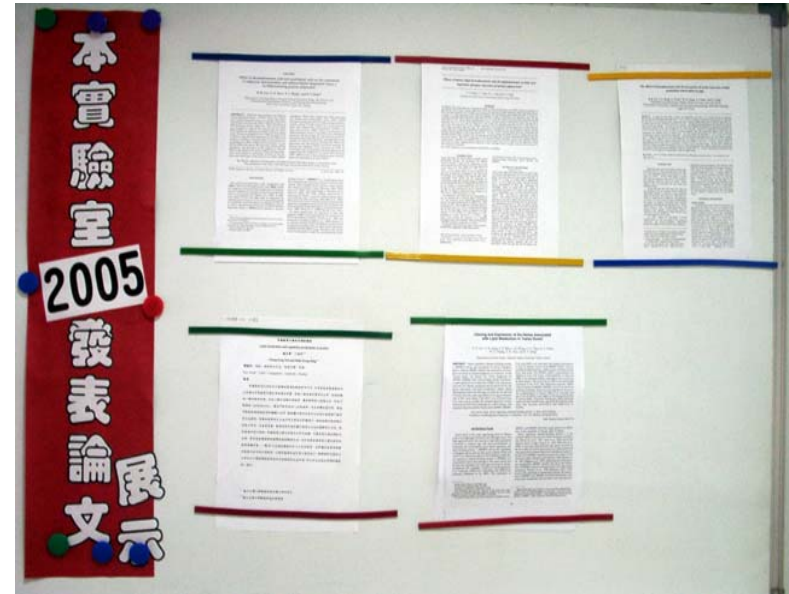
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Immortalization of other cell types is on-going

Publications - 2004 & 2005



2006, 8 SCI research articles
And one Chinese publication

Systems Biology Lab-1

- Dr. En-Chung Lin
- PhD from Iowa State University
- Research emphases
 - Bioinformative tools construction
 - Genomic data analysis
 - Biostatistics
 - Animal breeding potential evaluation

Systems Biology Lab-2

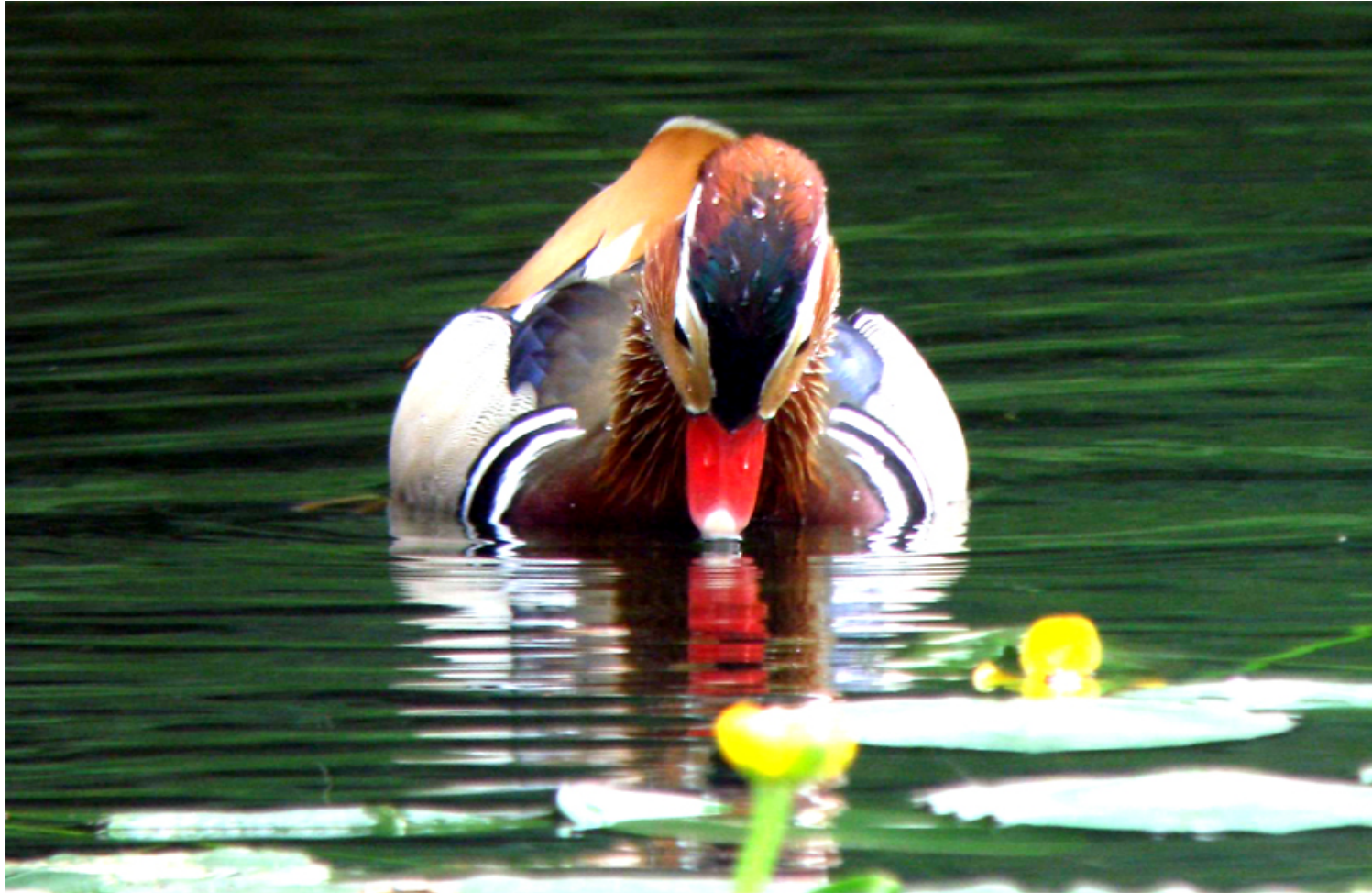
- Dr. Pei-Hwa Wang
- PhD from National Taiwan University
- Research emphases
 - Animal breeding evaluation
 - Genome-wide polymorphism search
 - Miniature pig breeding for tissue engineering
 - Functional genomics

Possible Collaboration Directions

- Immortalized cell lines are available for research
- Bioinformatics tools are available
- Miniature pigs for study models

Looking for UIUC to help with:

- Genomic and functional research enhancement
- PhD candidate's education (one year)



Thank you very much for your time