Health Promoting Efficacy of Chemically Profiled **Citrus Peel Extract**

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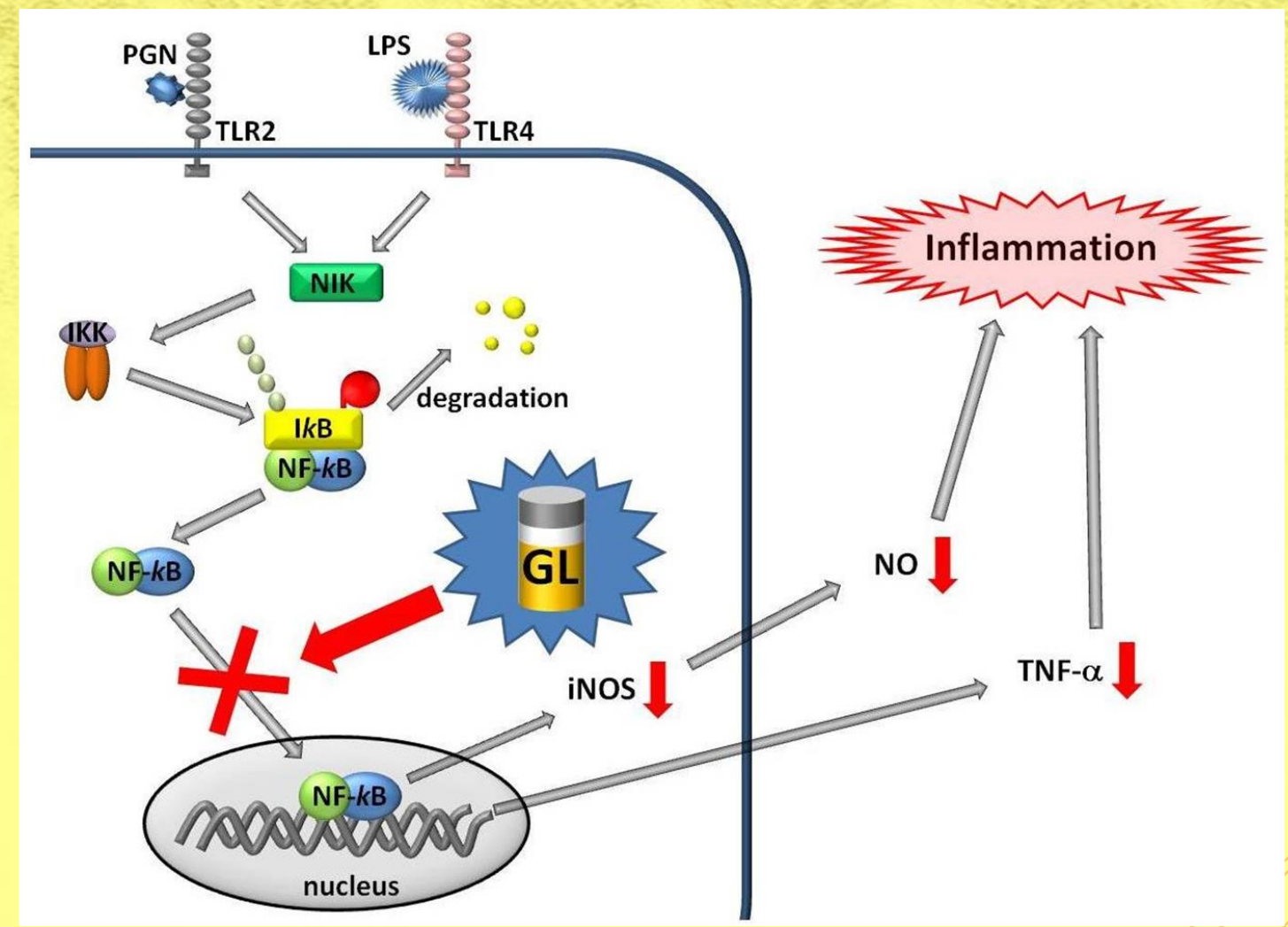
Outline

- Inhibition of inflammation
- In vivo anti-carcinogenic activity
  - Skin cancer
  - Colon cancer
  - Prostate cancer
- Anecdotal examples in human diseases
- Analysis of Gold Lotion™ (GL)
- Summary

【Mechanism of inhibitory action of GL on NO and TNF-α production】



Dr. Komiyama, Kitasato Research Center of Environmental Science
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Gold Lotion™

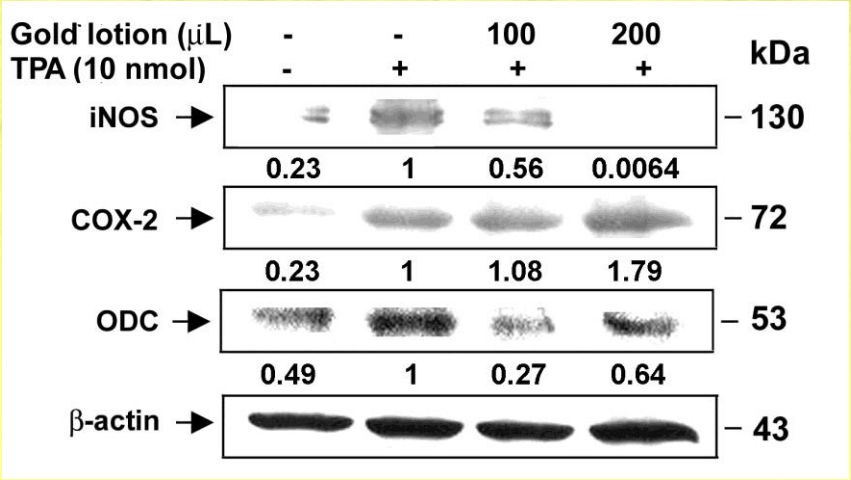
Anti-inflammatory effects	Anti-tumor promoting effects	Anti-colonic carcinogenesis effects	Anti-cancer effects
TPA-induced skin inflammation model	Skin two-stage carcinogenesis model	AOM-induced colonic carcinogenesis model	Xenograft model (SCID mice)
Epidermal hyperplasia	Tumor incidence, tumor number and tumor volume	ACF and tumor (number and incidence)	Tumor volume and tumor/body weight ratio
Infiltrated leukocytes	Molecular mechanism (inflammatory, angiogenic and apoptotic molecules)		Molecular mechanism (inflammatory, angiogenic and apoptotic molecules)
iNOS and COX-2 protein and gene expression			

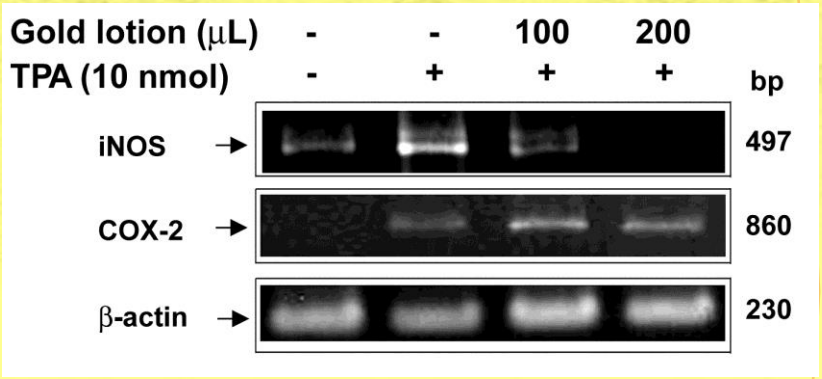
TPA-induced skin inflammation

Inhibitory effects of Gold Lotion™ on phorbol ester-induced iNOS and COX-2 gene and protein expression. (A) Mice were treated topically with 100 or 200 μL of GL 30 min prior to the application of 10 nmol TPA, then animals were killed at 2 and 4 hrs, respectively. The epidermal proteins were analyzed for iNOS, COX-2 and ODC by western blot analysis.

Professor Min-Hsiung Pan, Taiwan University, Taiwan
Professor Chi-Tang Ho, Rutgers University, USA
Food Sci. & Human Wellness. **2012**, 1, 65-73

GL inhibition on TPA-induced iNOS and COX-2 expression in mouse skin



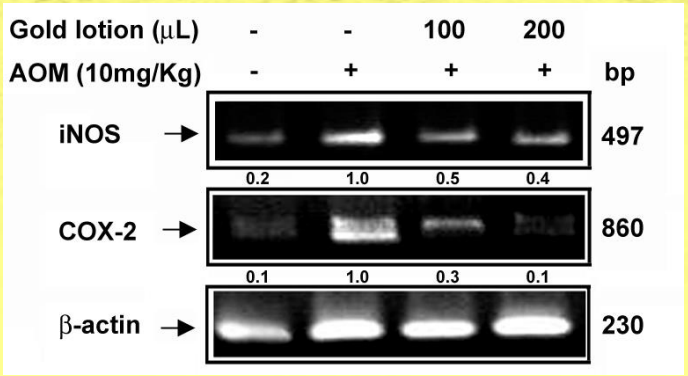


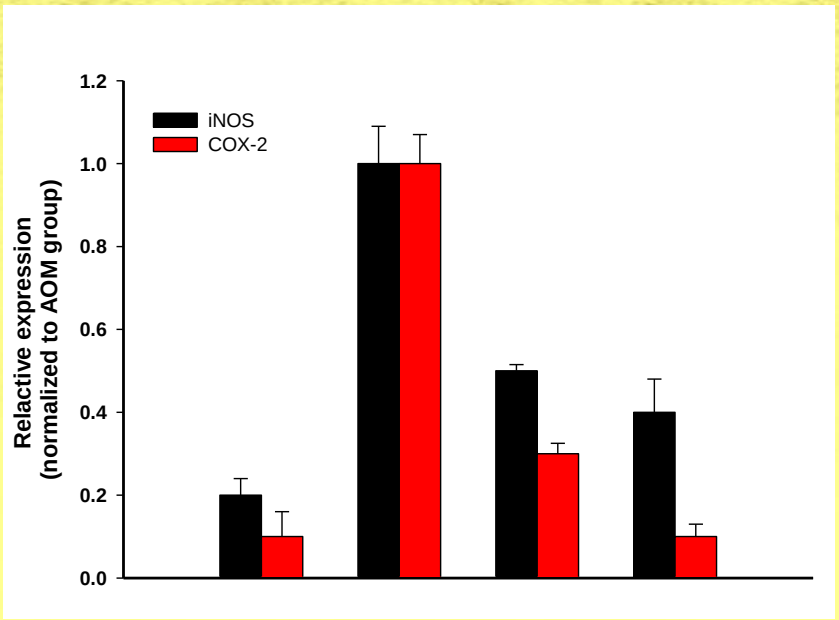
(A) Mice were treated topically with 100 or 200 μL GL 30 min prior to 10 nmol TPA application, then animals were killed 2 and 4 hrs, respectively. The epidermal proteins were analyzed for iNOS, COX-2 and ODC by western blot analysis. The western blot is representative of at least three independent experiments.

(B). Mice were treated topically with 100 or 200 μL GL 30 min prior to 10 nmol TPA application, then animals were killed at 1 and 2 hrs, respectively. A total of 2 mg of complementary DNA were subject to RT-PCR analysis.

Pan *et al*, *Food Sci. Human Wellness*. **2012**, 1, 65-73

GL on AOM-induced iNOS and COX-2 gene expression





Gold Lotion (μL)	**-**	**-**	**100**	**200**
AOM (10 mg/Kg)	**-**	**+**	**+**	**+**

Inhibitory effects of GL on AOM-induced gene expression of inflammatory enzymes in colonic tissue. mRNA from normal colonic mucosa and ACF were extracted and subjected to RT-PCR analysis for iNOS and COX-2 gene expression.

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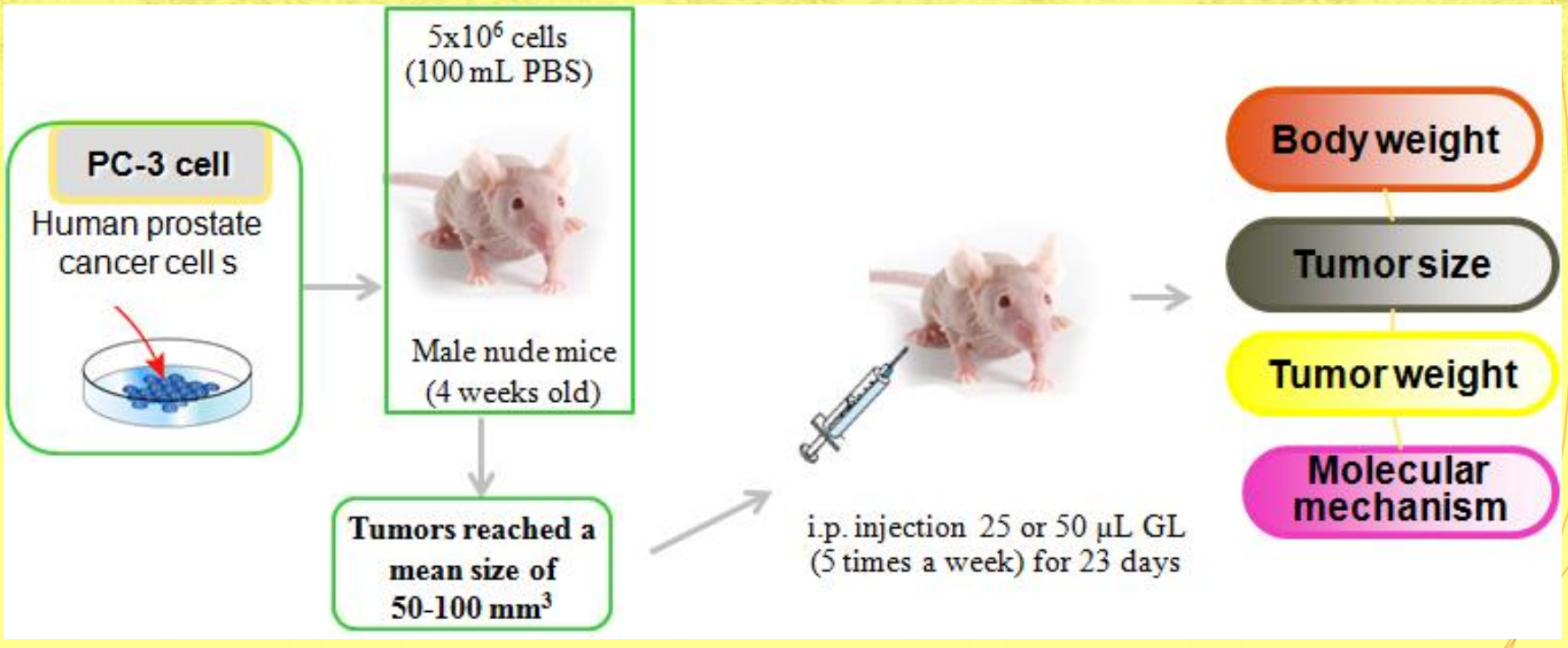
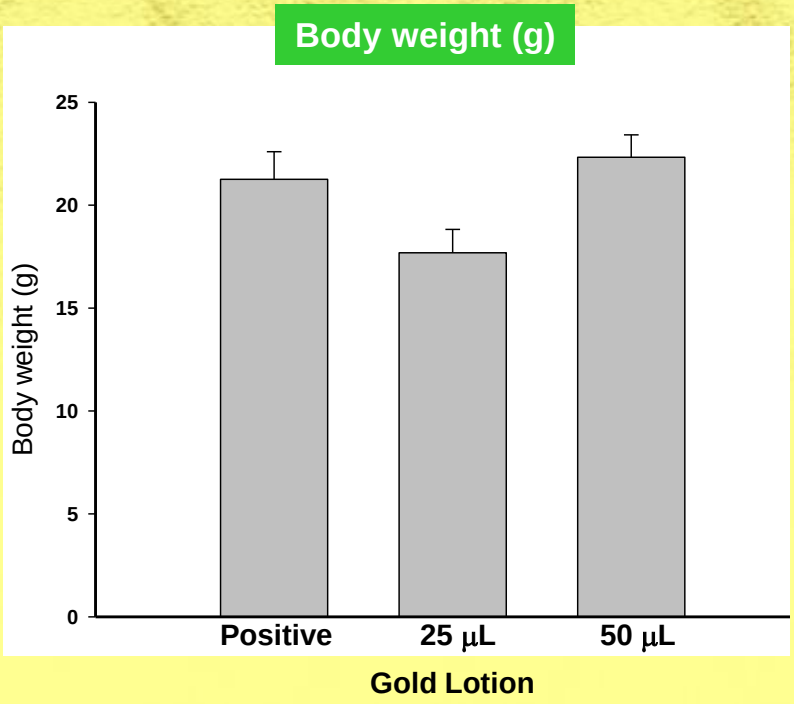
Mol. Nutr. Food Res. **2013**, 57, 551-555

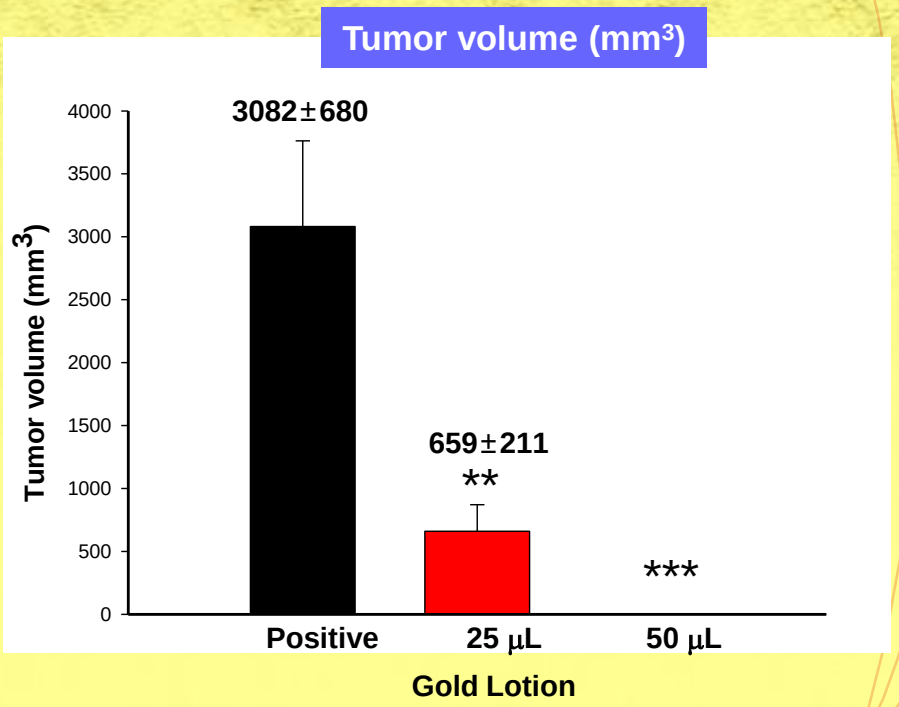
PC-3 derived xenograft model



Professor Min-Hsiung Pan, Taiwan University, Taiwan
Professor Chi-Tang Ho, Rutgers University, USA
Food & Function, 2013, DOI: 10.1039/c3fo60037h

Inhibition of prostate tumor growth in vivo

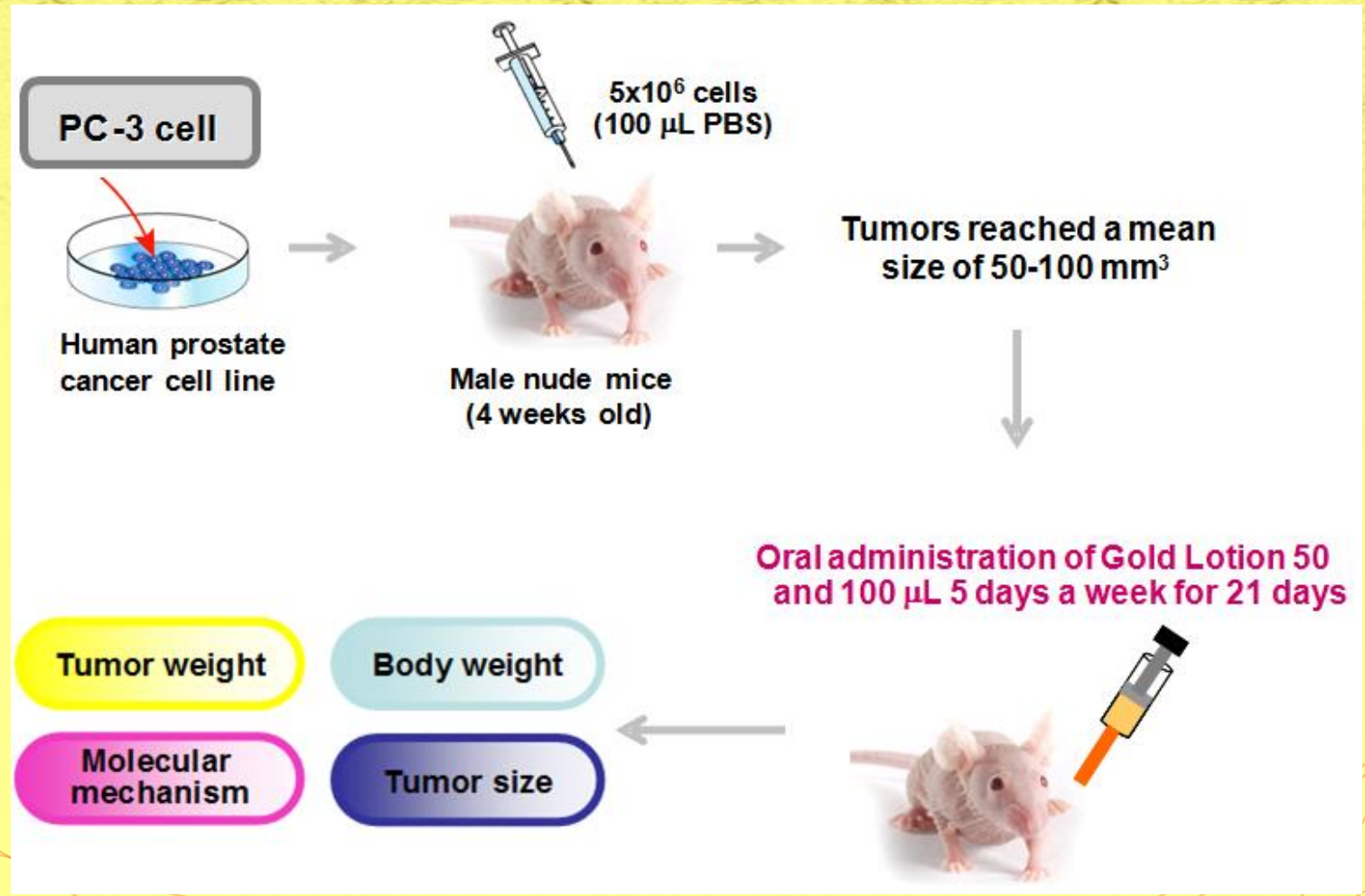




PC-3 cells were injected subcutaneously between the scapulas of nude mice. Once tumor volume reached approximately 50 -100mm^3, the animal received an injection of 25 or 50 µL GL five times per week for 23 days. Average body weight and tumor volume were measured at the end of experiment. Five samples were analyzed in each group, and value represent the mean ± SD. Significantly different at *P<0.05.

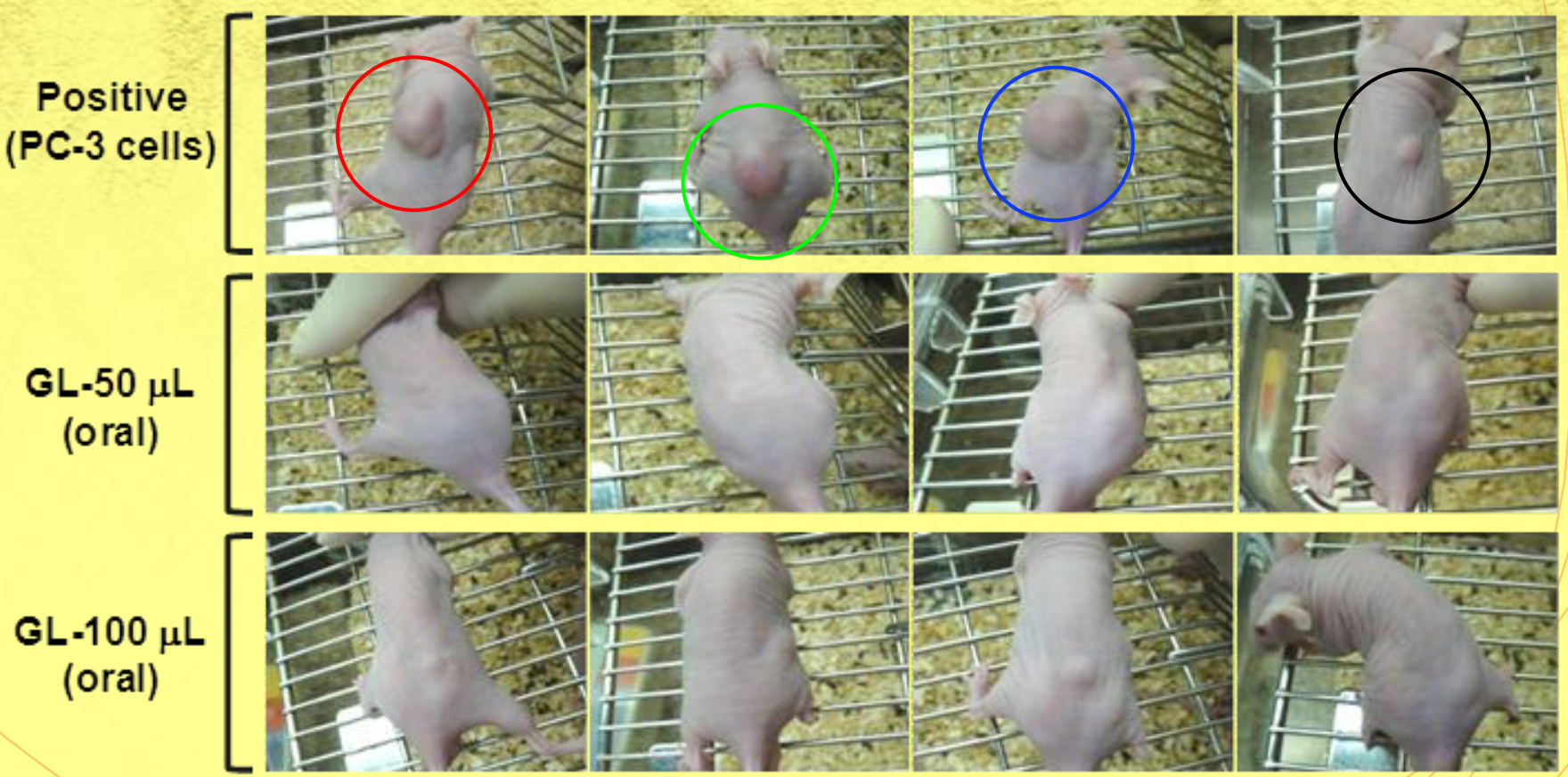
Pan *et al*, *Food & Function*, 2013, DOI: 10.1039/c3fo60037h
Miyauchi, 2013, US Patent No. 8,425,952

Inhibition of prostate tumor growth



Professors Ho &Pan, *Food & Function*, 2013, DOI: 10.1039/c3fo60037h

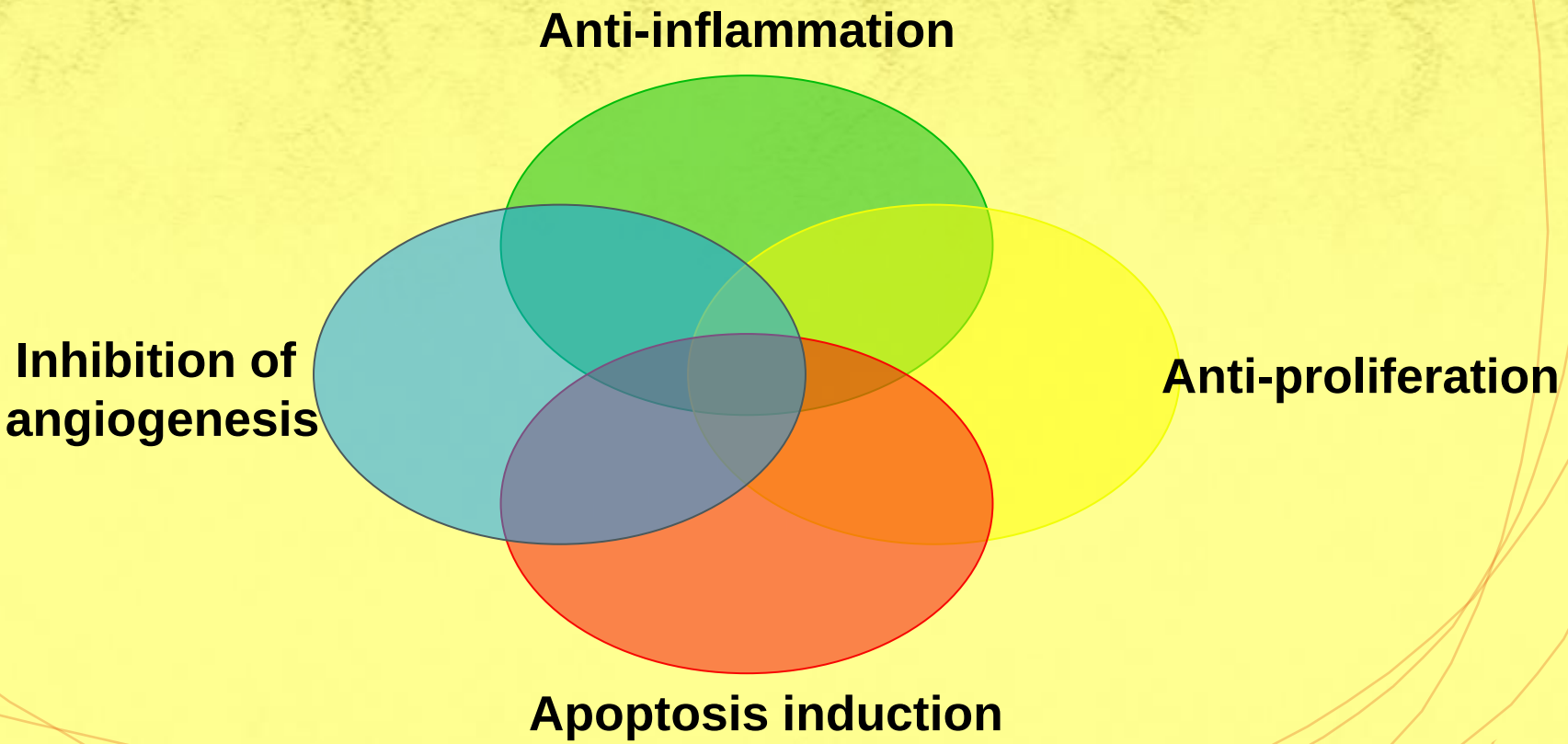
GL Oral Efficacy



Mice bearing human prostate cancer cell line PC-3 tumor xenografts

Miyauchi, 2013, US Patent No. 8,425,952

Mechanisms of Chemoprevention and Anti-cancer properties of GL



Summary

- **Gold Lotion**™ has been proved very efficacious in many human diseases involved in liver, lung, blood, prostate, breast and GI tract etc.

- Phytochemicals in GL include rich **PMF**s, OH-PMFs, high concentration of **flavonoid**s and many volatile and semi-volatile compounds.

“医　食　同　源”

“Let food be thy medicine, and medicine be thy food.”

and

“Primum non nocere.”

(First, do no harm)

Hippocrates, c400 BC