021/OGL.IOD-i3L/XII/2015

Jakarta, 14 December 2015

To:
Ardiansyah PhD
Secretary of PATPI
Department of Food Science and Technology - Universitas Bakrie

Dear Mr. Ardiansyah PhD,

Greetings from Indonesia International Institute for Life Sciences (i3L), Jakarta.

The Seminar Events has become one of the pinnacles of our learning journey in i3L institution in combining the concept of academia, industry/business and government.

We cordially invite you be one of the **presenters** to present topic ***Rice bran stabilization and its functional properties in stroke-prone spontaneously hypertensive rats*** in the Half - Day Food Science Seminar with topic title "***Optimizing indigenous sources for foods creation - challenges and opportunities***", co-hosted by **i3L, PERGIZI PANGAN** and **PATPI.**

Details of the session are as follow:

Day/Date	: Tuesday, 22nd December 2015
Time	: 1.00 - 4.00 PM
Venue	: i3L Campus – Room 209
Address	: Jl. Pulomas Barat Kav. 88, Jakarta Timur 13210

This seminar will be moderated by Ir. Siti Muslimatun, M.Sc., Ph.D. - Head of Department of Food Science, i3L. We provide certificate of participation for audience and 1 *credit unit from PERGIZI PANGAN*.

Highly appreciate for your participation in this event and we are looking forward to welcome you in i3L Campus!

Sincerely yours,

Ir. Siti Muslimatun MSc PhD
Head of Food Science Department

ABSTRACT

Anti-allergic function of microbial-fermented tea in Ehime, Japan

Prof. Takuya Sugahara
Dept. of Bioresources, Faculty of Agriculutre, Ehime University, Japan

Ishiduchi Black Tea (IBT) is a microbial-fermented tea produced by a two-step fermentation method. The first fermentation is by fungi for 1 week, and the second fermentation is under anaerobic condition by Lactobacillus for 2 weeks. IBT suppressed degranulation of rat basophilic cell line, RBL-2H3 cells. IBT do not contain catechins such as EGCG, a well-known anti-allergic substance contained in green tea. Anti-degranulation activity of IBT was higher than that of green tea. The active substance in IBT was estimated as theabrown, with the molecular weight was approximately 24,000. Immunoblot analysis suggests that the inhibitory effect of IBT was a result of down-regulation of the phosphorylation of spleen tyrosine kinase (Syk), which induced inactivation of PLCγ1, PLCγ2, and PI3K. In addition to the anti-degranulation activity, IBT suppressed IgE production by human myeloma U266 cells in a dose-dependent manner. These findings suggest that IBT can mitigate allergic symptoms by suppression of both degranulation of basophils and IgE production by B cells.

Antioxidant capacity of selected Indonesian foods: Fruits and vegetables

Prof. Hardinsyah[1,2], PhD, Kristin DP[2], Musthafa Z[2], Mandarini NP[2]
[1]Indonesian Food and Nutrition Society, [2]Faculty of Human Ecology, Bogor Agricultural University.

This study aims at analyzing the capacity of antioxidant and total phenolic content in selected Indonesian fruits and vegetables. Thirty types of fruits and 20 types of vegetables marketed in Bogor were selected for this purpose. The antioxidant capacity of the fruit was evaluated by applying 1.1-diphenyl-2-picrylhydrazyl (DPPH) method. The results showed that among the selected fruits, tamarind has the highest antioxidant capacity of 1614.48 ± 0:05 mg/ 100g or 33.41 AAE, and start fruit is the lowest antioxidant capacity of 14.41 ± 0.07 mg/100g or 0.3 AAE. Red and purple fruit have higher antioxidant capacity then other fruit. Among the selected vegetables, the highest antioxidant capacity was found in Pohpohan 3043.6 ± 0.12 mg/100 g or 31.13 AAE, while the lowest was in carrot 14.7 ± 0.08 mg/100 g or 0.01 AAE. Green and red leafy vegetables have higher antioxidant capacity than others. This implies that the colored fruit and leafy vegetables have a high antioxidant level.

Bioactivies and potential health benefits of collagen derived from jellyfish: an in vitro study

Agus Budiawan Naro Putra, PhD
Dept. of Food Science, i3L, Jakarta.

Collagen derived from jellyfish, in particular, stimulated Immunoglobulin (Ig)-A, IgG, and IgM production by mice splenocytes. Jellyfish collagen (JC) also highly stimulated tumor necrosis factor (TNF)-α and interleukin (IL)-6 production by mouse macrophage cell line J774.1 cells and the mRNA expression levels of TNF-α and IL-6 in J774.6 cells. Also, JC facilitated the phagocytotic activity of J774.1 cells in a dose-dependent manner. The mode of action of JC in stimulating TNF-α and IL-6 as well as the effect of JC on mouse bone marrow-derived dendritic cells (BMDCs) were investigated. DCs were induced by culturing mouse bone marrow cells in 10% FBS-RPMI 1640 medium supplemented with 20 ng/mL of recombinant mouse granulocyte-macrophage colony stimulating factor (rmGM-CSF) for 8 days. Toll-like receptor (TLR)-4 inhibitor suppressed the stimulatory effect of JC on cytokine production by J774.1 cells. Moreover, JC enhances the translocation of NF-κB from cytosol to nucleus, and promotes the activity of c-Jun N-terminal kinase (JNK). JC-treated BMDCs had more and longer pseudopodia on the cell surface compared with those of control cells. The $CD11c^{+}MHC\text{-}II^{high}$ cell population increased from 10.8% to 32.1% by JC treatment. Greater zymosan uptake was observed in control cells (92.1%) compared with JC-treated cells (86.3%). JC accelerated production of IL-12 by BMDCs through facilitation of mRNA expression level. These results suggest that JC is a potential substance to stimulate both acquired and innate immune systems, and thereby contributing to the health enhancement.

Rice bran stabilization and its functional properties in stroke-prone spontaneously hypertensive rats

Ardiansyah[1,2], PhD, Shirakawa H[3], Budijanto S[4], Koseki T[5], Komai M[3]
[1]PATPI, [2]Dept. of Food Science and Technology, Universitas Bakrie, Jakarta, [3]Graduate School of Agriculture Science, Tohoku University, [4]Department of Food Science and Technology, Bogor Agricultural University, [5]Faculty of Agriculture, Yamagata University.

Rice bran is the by-product of rice milling process. Rice bran is ubiquitous in Indonesia, but its application as food products to fulfill the nutritional needs is still limited. Rice bran contains lipid which may cause rancid and decrease rice bran quality. Rice bran processing technology shall halt the deterioration processes, but preserve the bioactive components. Rice bran contains many bioactive components which confer health benefits, such as γ-oryzanol for improving fat metabolism. Other benefit include the reduction of blood pressure and improvement of blood glucose in *stroke-prone spontaneously hypertensive rats* – rat species which is genetically hypertensive and hyperlipidemia.

Rice bran stabilization and its functional properties in stroke-prone spontaneously hypertensive rats

Ardiansyah[1], Hitoshi Shirakawa[2], Takuya Koseki[3], Slamet Budijanto[4], Michio Komai[2]

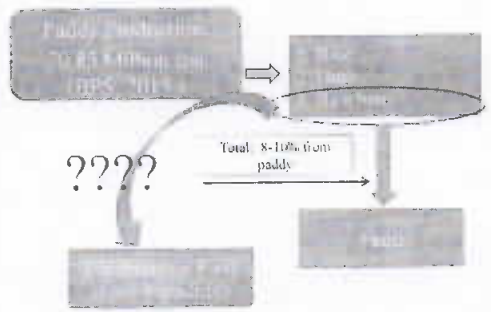
[1]Department of Food Science and Technology, Universitas Bakrie; [2]Graduate School of Agricultural Science, Tohoku University, Japan; [3]Faculty of Agriculture Yamagata University, Japan; [4]Department of Food Science and Technology, Bogor Agricultural University (IPB)

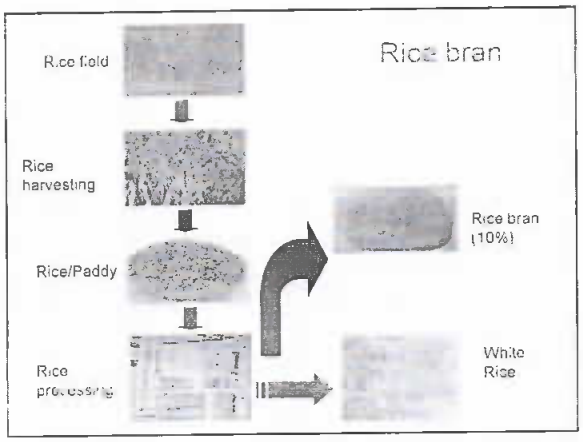
Seminar
IBL Campus
Jakarta, 22 December 2015

BAKRIE

Patpi

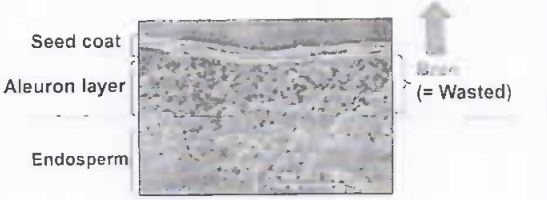
Background

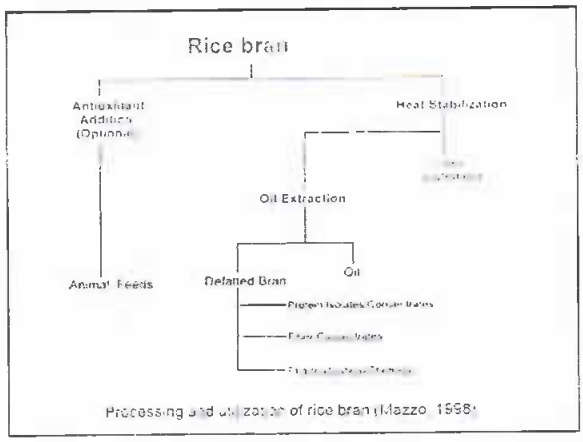




Rice grain morphology

Rice bran oil, et al.
(Many bioactive compounds)





Processing and utilization of rice bran (Mazzo, 1998)

Fatty Acids Composition of Rice Bran

	C14:0	C16:0	C16:1	C18:0	C18:1	C18:2	C18:3	C20:0	C20:1
IR64	0.42	21.10	0.20	2.03	42.47	32.72	1.39	0.63	-
Ciherang	1.15	22.61	0.20	1.92	37.71	33.96	1.31	0.68	-
Pandan wang	0.88	25.65	0.25	1.89	32.93	34.90	1.42	0.58	0.40
Sintanur	0.91	26.84	0.24	1.87	32.18	34.71	1.46	0.61	0.36

(Budijanto, 2010)

Several heating methods to inactivate lipase in rice bran have been reported.

- Randall *et al.* (1985) reported that heat treatment is practical and inexpensive method to deactivate lipase in fresh rice bran immediately after milling.
- Microwave heated rice bran showed that FFA content only slightly increased during 4 weeks of storage at 25° C (Tao, 1993).
- Randall *et al.* (1985) using a temperature of 125-135° C for 1-3 seconds with a single screw extruder.
- Twin screw extruder was used for rice bran stabilization. The method has successfully inactivated rice bran lipase which was shown by only 1.48 increase of FFA. However, more energy is needed in the operation, so the method is less suitable for small rice milling units (Budijanto, 2010).

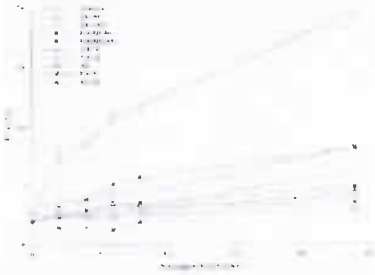
Three conveyor temperatures (100 °C, 120 °C, and 140 °C) and two screw rotation speeds (15 Hz and 25 Hz) were applied. The samples were coded according to the given treatments (**A100**=screw speed 15 Hz, 100 °C, **A120**= screw speed 15 Hz, 120 °C, **A140**=screw speed 15 Hz, 140 °C, **B100**= screw speed 25 Hz, 100 °C, **B120**=screw speed 25 Hz, 120 °C, **B140**=screw speed 25 Hz, 140 °C).

Single screw extruder

(Kurniawati et al. 2014)

FFA, γ-oryzanol, and α-tocopherol content in rice bran during 2 weeks storage at 37° C(Kurniawati et al. 2014)

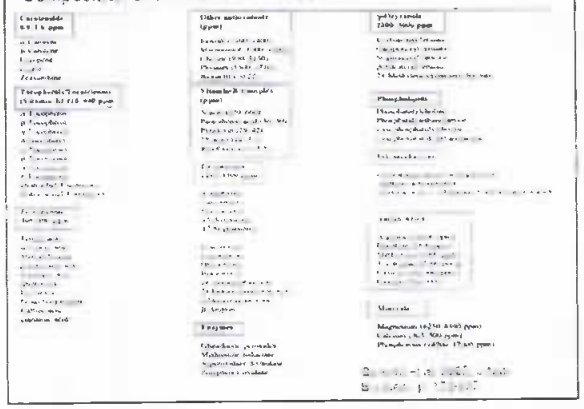
	36.9 ± 0.7	44.5	2436.0±5.0		242.1±6.3	
	3.9 ± 0.3	8.5	1871.4±12.1	22.3	230.7±4.7	4.7
	3.1 ± 0.2	8.3	1571.8±22.8	34.3	227.8±7.0	5.9
	4.5 ± 0.2	10.2	1807.2±7.1	25.0	236.9±0.9	2.2
	2.7 ± 0.1	7.8	1793.4±64.9	25.5	227.5±1.8	6.1
	3.1 ± 0.3	7.6	1765.8±75.0	26.6	192.8±2.2	20.4



Free fatty acid (FFA) contents in the rice brans treated by dry heating (DH), freeze-drying followed by dry heating (FDDH), microwave heating (MH), autoclaving (AC), or ethanol vapor exposure (EV), and then stored for 24 weeks at room temperature

(Kim et al. 2014)

Composition of stabilized rice bran

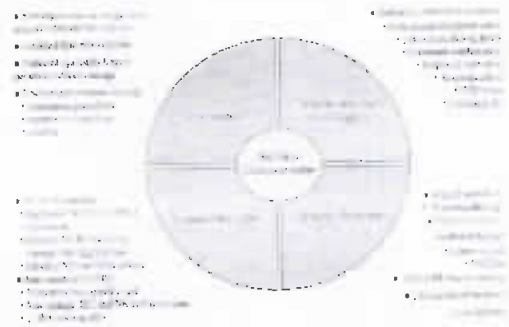


In their review, Rohman et al. (2014) concluded that rice and its products are:

- decreasing low density lipoprotein level,
- lowering cholesterol,
- reducing blood pressure and

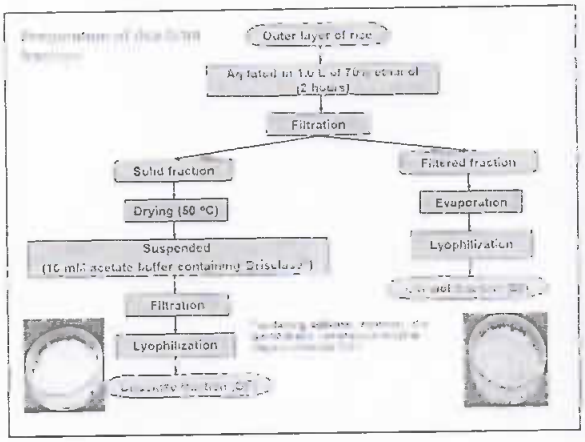
- The rice/rice bran constituent γ-oryzanol has been intensively investigated for cholesterol regulation and antioxidant/anti-inflammatory activities.
- Rice bran derivatives and other products are used for dermatologic and cosmetic applications.
- Pharmacologically relevant compounds could be extracted from rice by-products

Chemopreventive mechanisms of action associated with dietary rice bran and brown rice bioactive components.



Henderson A J et al. Adv Nutr 2012;3:643-653

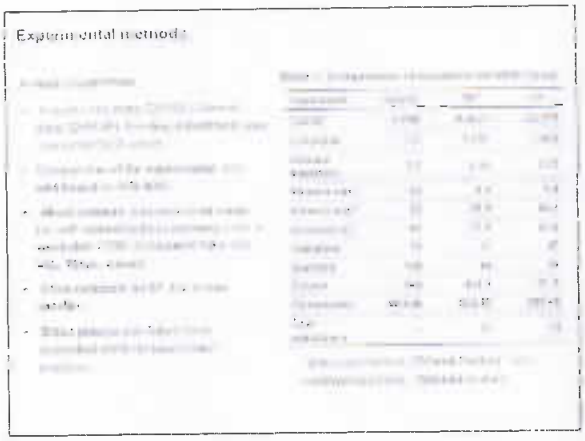
1. Driselase-treated fraction of rice bran is effective to improve life-style related diseases in SHRSP

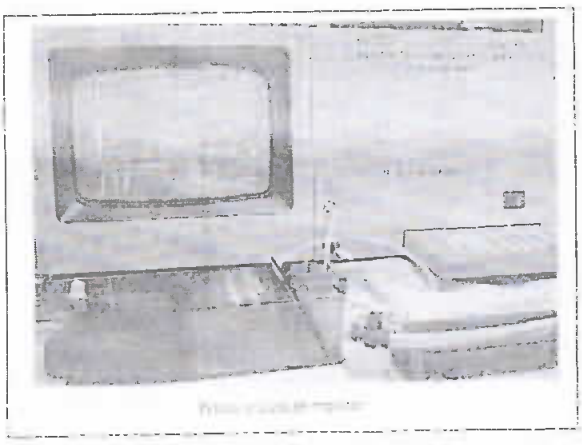


SHRSP as an animal model

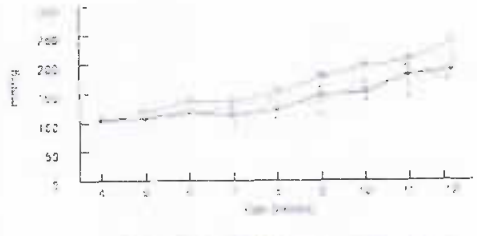
- ❑Hypertension
- ❑Hyperlipidemia
- ❑Albuminuria (a sign of damage and progressive involvement of the kidney (proteinuria)
- ❑Insulin resistance syndrome
- ❑Higher oxidative stress in the brain

Experimental method

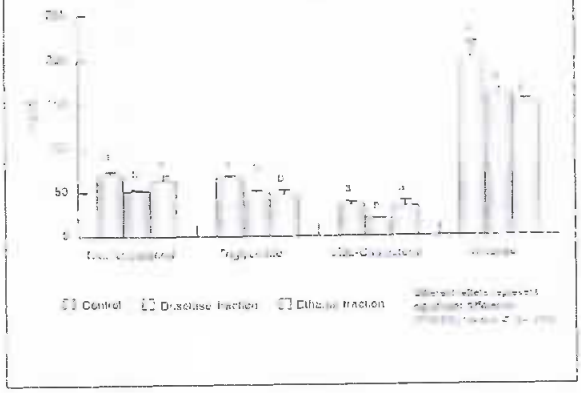


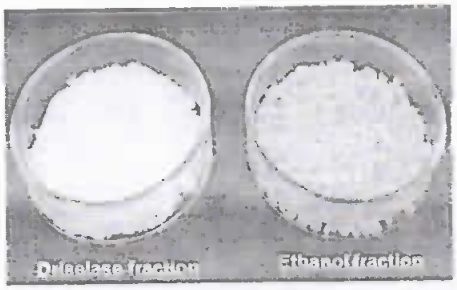


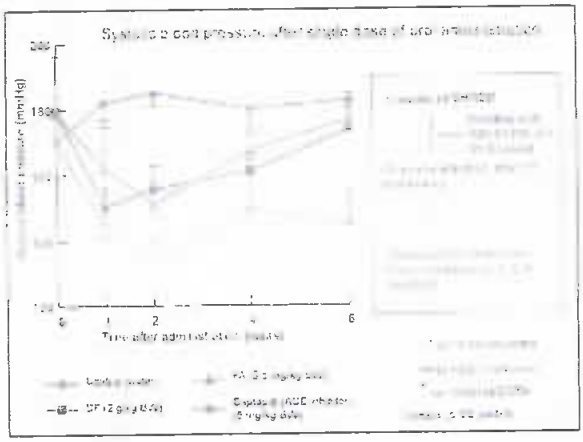
Systolic blood pressure



Plasma lipid and glucose levels







2. Identification of bioactive substances in the Driselase-treated fraction of rice bran to improve life-style related diseases in SHRSP

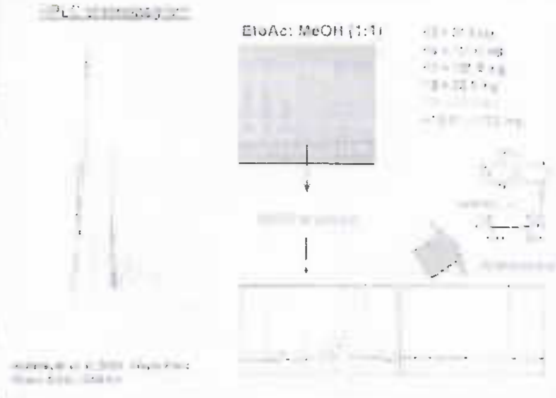
Driselase fraction

20~70% MeOH Eluates
F4 (3.68 g)

HPLC using ODS column
50mM Acetate buffer(pH4.0): acetonitrile (95:5) ,40min
50mM Acetate buffer(pH4.0): acetonitrile (65:35)
Flow rate: 1ml/min

F5 (213 mg) | F6 | F7 | F8 (75.1 mg) | F9 | F10

EtoAc: MeOH (1:1)



Adenosine has physiological functions.

1. Therapy neonatal refractory pulmonary hypertension
2. Attenuates proliferation in both human and rat glomerular mesangial cell
3. Decrease in blood glucose and insulin level after oral administration

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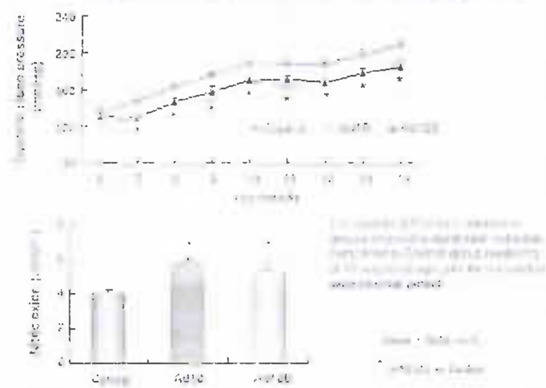
Experimental methods

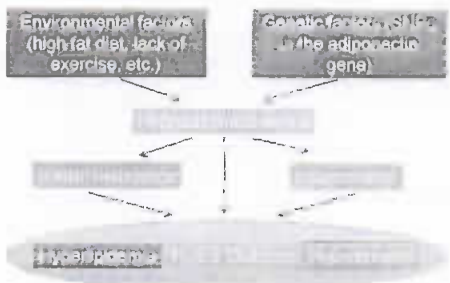
Ardiansyah et al. Br J Nutr 2010 104(1):48-55

- 6 weeks old male SHRSP/Izumo
- After 5 weeks feeding, all groups were used for oral glucose tolerance test (OGTT)

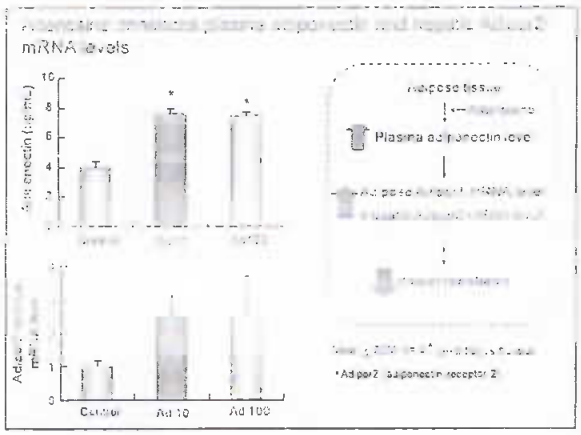
Antihypertensive effect of adenosine administration

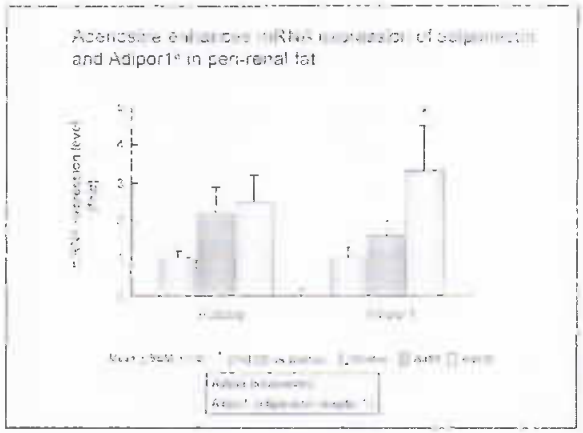


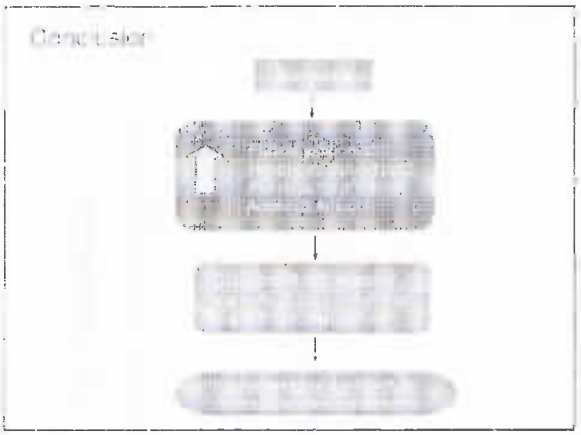
The Adiponectin Hypothesis



How does adenosine affect on adiponectin level in SHRSP?


mRNA levels
Plasma adiponectin level
Control
Ad 10
Ad 100
*Adipor2: adiponectin receptor 2


and Adipor1* in peri-renal fat


Conclusion


Terimakasih
Thank you