

# PLENARY LECTURE 3

Dr. Jiro Nakayama

Features and Signature in Asian Microbiome: Crisis or Adaptation?

**Synopsis:**

In Asian microbiome project phase III, we specified cohort to more carefully looked into the impact of food urbanization on gut microbiota. In Leyte Island, Philippines, school age children living in urban and rural had distinct microbiota type, each classified to Bacteroides-enterotype and Prevotella-enterotype. The Bacteroides-enterotype was associated with high-fat diet recruited in the city with Western culture. In Bangkok, children consumed much less vegetables compared to children in Buriram. The stool metabolome data indicated that Buriram children have higher level short chain fatty acids compared to Bangkok children, suggesting considerable influence of urbanized diets on metabolic activity of gut microbiota in Thai children. In Japan, gut microbiota is also depend on the daily dietary habits. Gut microbiota is really sensitive to diets. Changing of microbiota of Asians may link to our health.

PROF. DR. ENDANG S RAHAYU, MS

Gut Microbiota and Probiotics, Indonesian Perspective

**Synopsis:**

Fermented foods as source of microorganisms, in Indonesia as we know we have many fermented food such as dadih, asinan, tempoyak, etc. LAB isolated from 21 kinds Indonesian Fermented foods and the most found in the foods are Lactobacillus plantarum , Streptococcus thermophilus, Pediococcus pentosaceus. L.plantarum are potential as probiotic candidate. The selection of this probiotic because this LAB could potentially lower cholesterol, antioxidant properties, folic acid producer and many good characteristics. Lactobacillus plantarum Dad-13 is safe and have so many effect and this probiotic could survive in intestine, able to increase SCFA, able to increase bodyweight for malnutrition children, able to increase IgA.



### Synopsis:

This research is to understanding of human microbiome for therapeutics. *Collinsella aerofaciens* is the most abundant bacterium in the human intestine and found in more than 90% of human intestines. Also, we want to see the gut microbiome of the healthy Indians living in Ballabgharh (Sea level) and Leh (High Altitude Areas). Leh observed has least diverse of bacteria (55 genera) if we compare to urban (61 genera) and rural (62 genera). The dominant microbiota in the Indian subjects living in two distinct geographical localities is Firmicutes. Minimal representation of Proteobacteria was seen in the population living in Leh. Although all three groups had healthy individuals, yet rural community from low altitude areas had unique microbiome characterized not only by higher diversity but also a higher degree of homogeneity within the same cohort.

### Synopsis:

Bifidobacterium can maintaining health and protecting from infection for infants. Bifidobacterium have more than 60 species/subspecies. HRB (*B. longum*, *B. infantis*, *B. breve*, *B. bifidum*) showed high compatibility with human milk. These strains possessed the tolerance to lysozyme, and grew or kept the cells number in human breast milk. Japanese have higher abundance of Bifidobacterium because of so many factors that associated with gut microbiota composition. The most common gut microbiota in Japanese subjects is *B. longum*. Usually, family members found to have a same strain, this is because of Japanese people usually have to take a bath and don't change the water before all the family member bathe in the hot water. The variety of genes enriched in specific ages may enhance their adaptation and increase competitiveness in the gut.

### Synopsis:

Infants inherit microbiome from their mother. The predominant fecal microbiota of mothers in Indonesia was *Prevotella* with low abundance of Bifidobacteria, whereas that of the infants at birth until weaning (12 months) was *Bacteroides*-Bifidobacteria. The microbiota profile of infants and mothers converged after weaning to become *Prevotella*-type. *Bacteroides*-Bifidobacteria predominance was established rapidly (within one week) in the GI of infants after birth. *Bacteroides* and Bifidobacteria may be the favored GI-bacteria among pre-weaned infants of all mothers, both the *Prevotella*- and *Bacteroides*-Bifidobacteria type. This study shows that it is the intrinsic GI environment rather than abundance of entering microbes that determines the infant microbiota profile. Before weaning, the abundance of the commensal bacteria was inversely correlated with potential pathogens in GI. The abundance of commercial bacteria in infants after weaning was largely positively correlated with opportunistic pathogen up to 24 months age. Immunity again infection built up at around the time of weaning, may protect infant from then on.

## Dr. G. Balakrish Nair, PhD

### The Human Gut Microbiome in Healthy Indians



## Dr. Jin-zhong Xiao

### New Findings For The Reason of Being of Bifidobacterium in Human Gut



## Prof. Yuan Kun Lee

### Asian Microbiome Project Phase III: Infant Microbiome





## Dinner and Ramayana Ballet Show at Prambanan Temple



# SECOND DAY CONFERENCE

Friday, August 30th, 2019



REGISTRATION DAY 2

## Parallel Session

### ROOM 1



**Dr. Yantyati  
Widyastuti**



**Dr. Massalin Nakphaichit**



**Prof. Seyed  
Shojaosadati**



**Dr. Prakaash M Halami**

## 1. Dr. Yantiyati Widyastuti

### Role of Lactic Acid Bacteria as Probiotics in The Rumen Fermentation

#### Synopsis:

Rumen productivity depends on milk production, feed efficiency and body weight gain. Manipulation of rumen microbial ecosystem is a way to improve ruminant productivity. LAB in rumen is naturally rumen inhabitant and because of consumption of silage or probiotics. *Lactobacillus plantarum* were isolated from the rumen of Ongole cross cattle and grass silage. The effect to beef cattle can increase acetic acid, propionic acid etc. Effect to increase propionate concentration in beef cattle can be obtained by feeding high concentrate diet+probiotics. For future research we need to manage rumen microbial balance that gave health effect.

## 2. Prof. Seyed Shojaosadati

#### Synopsis:

The hypothesis of this research are intestinal bacteria can adsorbs glucose and cholesterol as well as bile salt, both bacteria with fermented materials could show the synergistic adsorption of glucose, cholesterol and bile salt, bacteria could ferment natural edible material for their growth. Zucchini-ginger-*Chlorella vulgaris* microparticles regulated intestinal bacteria. ZuGiCh fermentation increased *L. plantarum* to pathogens. *L. plantarum* and pathogens efficiently adsorbed glucose, cholesterol & bile salt. Incorporation of bacteria with fermented ZuGiCh showed the synergetic adsorption. ZuGiCh can be used as a functional food ingredient for intestinal regulation.

## 3. Dr. Massalin Nakphaichit

#### Synopsis:

Allergic diseases are considered as a global health problem. Actually, atopic dermatitis and food allergy related with the maturation of the immune development and the establishing a stable colonization pattern of gut microbiome. There are many factor that contribute to allergic manifestation, one of them is gut microbiome. In dysbiosis condition, bacteria not in a balance composition and can cause many non-infectious human diseases. Different microbial pattern was found in distinct allergic phenotypes. Less diversity of the microbiota related to FA. *Erysipelotrichaceae* group contributed to AD. *Enterobacteraceae* might be related to FA.

## 4. Dr. Prakash M. Halami

#### Synopsis:

*Lactobacillus plantarum* detected in environment such as food. This certain strain reduce carriage of faecal *Enterobacteriaceae* decrease certain coronary artery disease, cholesterol reducing ability, etc. The aim is to evaluate strain level diversity and determine probiotic genetic loci; immunomodulatory properties and study its expression. Among all the cultures studied, *Lactobacillus paraplantarum* MTCC 9483 and *L. plantarum* subsp. *plantarum* CFR MFT1 was found to be a potent immune stimulant during oxidative stress, LPS-induced and pathogen invasion conditions with more adherence ability. These cultures have shown more adhesion and down-regulated some of the inflammatory cytokines such as tumour necrosis factor, range of interleukins as well as transforming growth factors. These indigenous LPG strains were found to have good functional attributes like anti-oxidant, anti-cholesterol, and anti-microbial activity. Because of the presence of these properties, the LPG strains can be a good probiotic starter culture protecting the intestinal mucosal layer from the invading pathogenic microbes.

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## A1. Saowanit Tongpim

Prebiotic Effect of Plant Extracts on Growth of Probiotic Lactic Acid Bacteria and Fish

### Synopsis:

The purpose of this study was to evaluate the effects of some plant extracts as prebiotics on the growth of probiotic *Lactobacillus paraplantarum* strain L34b-2 and their synbiotic effects in hybrid catfish. The extracts from chayote and cucumber contained higher indigestible polysaccharides (IP) than those of the other plants. The extract from each plant was determined for its ability to enhance growth of a probiotic *Lactobacillus paraplantarum* L34b-2. The extract from cucumber and soybean meal was found most effectively in enhancing growth of *L. paraplantarum* L34b-2. In addition, the bacteriocin produced by strain L34b-2 against fish bacterial pathogens, *Aeromonas hydrophila* FW32 and *Streptococcus agalactiae* F3S was also enhanced by the plant extracts. Feed-trial experiments were conducted in hybrid catfish for 30 days. Growth performance of fish based on weight gain, specific growth rate and feed conversion ratio showed that fish fed bacterial probiotics and plant extract exhibited significantly highest growth.

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## A2. Rio Jati Kusuma

Divergent Effect of Rice Bran and Fermented Rice Bran on Cecal Short Chain Fatty Acid and Lactic Acid Bacteria of Colorectal Cancer Model of Mice

### Synopsis:

The aim of this study is to determine the effect of rice bran and fermented rice bran on cecal short chain fatty acid (SFCA) and lactic acid bacteria (LAB) of colorectal cancer model of mice. However, rice bran and fermented rice bran have impact on the gut microbiota and SFCA level. Colorectal cancer was induced in twenty five male mice aged 8 weeks by intraperitoneal injection of DMBA 20 mg/kg body weight twice a week for 3 weeks. Mice were randomly allocated into 5 groups: control, negative control, rice bran-10, rice bran-20, fermented rice bran-10, fermented rice bran-20. After 4 weeks, mice were sacrificed and cecum was collected for pH, lactic acid bacteria and SCFA analysis. Both rice bran and fermented rice bran reduced the acidity of the gut and increased the production of SCFA. Fermented rice bran-20 has lower log CFU of lactic acid bacteria and SCFA level compared with both rice bran groups and fermented rice bran-10 albeit no statistically difference. Rice bran and fermented rice bran have different effect on the gut microbiota of colorectal cancer.

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## A3. Chen, Ying-Chen

Investigation on The Responses of *Lactobacillus mali* APS1 to Environmental Stresses and Its Survival After Freeze-Drying

### Synopsis:

The aim of this study is to investigation the adaptive responses of *Lactobacillus mali* APS1 to various environmental stresses and its survival after freeze drying. The results showed that the sublethal and lethal levels of cold, heat, acid and bile salts for *L. mali* APS1 were 10°C and -20°C, 42°C and 52°C, pH 3.5 and 2.0, and 0.1% and 2%, respectively. Adaptation of *L. mali* APS1 to cold, heat and bile salts induced homologous tolerance. In the present study, we further evaluated the protein expression of *L. mali* APS1 influenced by stress adaptation by two dimensional gel electrophoresis (2-DE). The expression levels of 14, 13, 8, and 16 proteins in cells of *L. mali* APS1 were altered by cold, heat, acid and bile salt adaptations, respectively. After freeze drying, the survival rates between stress-adapted and non-adapted cells of *L. mali* APS1 were not significantly different. Stress-adapted *L. mali* APS1 maintained higher bacterial counts during subsequent storage at -20 and 4°C. Our study revealed that stress adaptation could be a possible strategy to improve the survival of *L. mali* APS1 under environmental stress conditions.

#### A4. Yu-Ting, Hsu

Evaluating The Correlation Between Microbiome and Metabolome Associated with The Mastitis in Holstein Dairy Cows

##### **Synopsis:**

The purpose of this study was to determine the correlation between microbiota and metabolites associated with the mastitis in Holstein dairy cows. Thirty dairy cows were selected and separated into healthy and mastitis groups according to veterinary diagnosis, milk somatic cells, and milk enzyme results. The ruminal microbiota and metabolites were determined using next generation sequencing (NGS) and high performance liquid chromatography-tandem mass spectrometry (LC-MS/MS), respectively. NGS results indicated that the community richness and diversity indices were not different between groups. Further examination by the partial least squares discriminant analysis (PLS-DA) showed a clear differentiation of healthy and mastitis group. Results indicated that biomarkers including seventeen genus level and three species level were identified in the healthy and mastitis group. For ruminal metabolome, 1181 metabolites were significant difference between groups including 65 identified metabolites by LC-MS/MS and used Mann-Whitney U Test.

#### A5. Li, Kai-Yi

Development of Fermented Milk with *Lactobacillus paracasei* PS23 and Evaluation of Its Anti-Colitis Function

##### **Synopsis:**

Colitis refers to the phenomenon of inflammation of the inner of the lining colon. Probiotics, providing gastrointestinal care and immune-regulating function, might be an alternative solution for colitis. The aim of this study is to evaluate the anti-colitis effect of fermented milk with *Lactobacillus paracasei* PS23. For fermentation study, we found that PS23 grew slowly and did not produce acid in milk along. Co-cultured PS23 with *Lactobacillus bulgaricus* and *Streptococcus thermophilus* could significantly improve the stability of fermented samples, including syneresis. After 3-week storage, the survival rate of PS23 could maintain 90%. In vitro anti-colitis test indicated that the fermented product with PS23 could prevent the simulated intestinal epithelial injury with 3% dextran sulfate sodium salt reagent (DSS). Further animal study is necessary to confirm the in-vitro findings. The possible mechanisms will be also investigated through analysis of microbiome, metabolome and molecular pathway.

#### A6. Nurulfiza Mat Isa

Isolation, Characterisation and Anti-Breast Cancer Effects of Potential Probiotic Bacteria from Human Breast Milk

##### **Synopsis:**

In this study, potential probiotic bacteria from human breast milk was isolated, characterized and further screen as anti-breast cancer agents. The isolates were further characterized using Biolog Gen III and 16S rRNA to dwell down to species levels. The results obtained from the study revealed the presence of *Staphylococcus homini*, *Staphylococcus lugdunensis*, *Enterococcus faecalis* and *Enterobacter cloacae*. Live, heat-killed cells (HKC) and the cytoplasmic fractions (CF) of *Enterococcus faecalis* and *Staphylococcus hominis* were furthered investigated their potential as antibreast cancer agents. Non-malignant breast epithelial cell line, MCF-10A and MCF-7 cell line were treated with these components and cytotoxicity was evaluated for 24, 48 and 72 h using MTT assay. All the three forms of the bacteria caused a significant decrease in MCF-7 (up to 33.29%) cell proliferation in concentration- and time dependent manner. Flow cytometry analyses suggested that about 34.60% of treated MCF-7 was undergoing apoptosis while treated MCF-10A showed no significant difference with the untreated (>90% viability). These findings highlight the potential application of these bacteria as an alternative nutraceutical with significant therapeutic indexes for breast cancer because of their non-cytotoxic effects to non-malignant mammalian epithelial cells.

## A7. Marilen Parungao Balolong

Cytotoxic Activity of the Biofunctional Probiotic Strains *Lactobacillus plantarum* BS25 and *Pediococcus acidilactici* S3 Against Colorectal Cancer Cells (HCT 116)

### Synopsis:

This research focused on the evaluation of the cytotoxic and apoptotic potentials of cell free supernatants (CFS) from two lactic acid bacteria strains (*Lactobacillus plantarum* BS25 and *Pediococcus acidilactici* S3) against the human colorectal cancer cell line (HCT-116) via 3-(4,5-dimethylthiazolyl-2)-2,5-diphenyltetrazolium bromide (MTT) assay and Terminal deoxynucleotidyl transferase dUTP nick end labeling (TUNEL) staining. Results showed that BS25 and S3 CFS exhibited cytotoxicity on HCT-116 cells. HCT-116 cells characteristically showed membrane blebbing, granulation, and rounding up, which are typical morphological symptoms of cell death, when treated with the bacterial CFS from both strains. TUNEL staining confirmed DNA fragmentation in HCT-116 cells upon treatment with 100% v/v CFS from BS25 and S3 within 12 hours, which is an indicator of apoptosis. These results show that the CFS from *L. plantarum* BS25 and *P. acidilactici* S3 appear to be potentially promising anticancer agents for adjunct therapy, which can be further purified via bioassayguided fractionation methods.

## A8. Yoyok Budi Pramono

Utilization of Lesser Yam (*Dioscorea esculenta* L.) Flour as Prebiotic in Yogurt to Total Lactic Acid Bacteria (Lab), Sugar Reduction, and Organoleptic Properties

### Synopsis:

This study aims to determine the effect of the concentration the addition of lesser yam as prebiotic to total Lactic Acid Bacteria (LAB), reducing sugar content, crude fiber, viscosity, and organoleptic properties of yogurt with a combination of three bacteria (*Streptococcus thermophilus*, *Lactobacillus bulgaricus*, and *Lactobacillus acidophilus*). This study used a completely randomized design with variations in the addition of lesser yam tuber, with a concentration of 0%, 2%, 4% and 6%. The results showed that the addition of different lesser yam tuber flour had a significant effect on properties of yogurt. The ideal treatment for the addition of lesser yam tuber flour is the concentration of 2% lesser yam tuber, which produces a total LAB is  $9.2 \times 10^9$ , a sugar reduction is 0.653 mg/mL, crude fiber is 1.3%, 82.25 cPs, and organoleptic properties had sour taste and viscosity is rather thick which the most preferred.

# Parallel Session ROOM 2

## 1. Dr. Nanik Suhartatik

Microbial Contamination of Fresh Fruit Juice Sold in Surakarta

### Synopsis:

Fresh juice consumption was believed to reduce lipid profile or cholesterol, antioxidant source and cardiovascular disease. The concern from juice's stall is using artificial sweeteners, there isn't personal hygiene, poor water quality. So, the aim of this study to determine the microbial contamination in juice by counting: total aerobic count, total coliform, total Staphylococcal, total Salmonella-Shigella count. Avocado and guava juice sold in Solo has high microbial contamination and some of it probably hazardous. Using natural ingredient that have antimicrobial activity could be develop for the next research. Government should take a concern about public health about the safety of fresh fruit juice. The possible source of contamination are food material, handler, juice machine, sanitation and hygiene.



## 2. Prof. Dr. Teck Chwen Loh

### Effect of Postbiotic and Inulin Supplements on Broiler Chickens

#### Synopsis:

There is an ongoing trend to reducing and prohibiting the use of antibiotics in animal feed as a result of the contamination of meat products with antibiotic residues. So, natural food additives are advocated to substitute antibiotic in order to reduce food-borne illness. The antibiotic residue in meat products can make human resistance to some antibiotics, that's why antibiotics are prohibited in animal feed. The substitution of antibiotics are probiotics, prebiotics, synbiotics and postbiotics. The aim of this study is to study the effect of feeding postbiotic and inulin on broiler chickens. Postbiotic and inulin improved growth performance, reduced ETEC, and increased LAB count. The quality of meat improved if we compare with meat that uses antibiotic-feed. The expression of IGF-I and GHR in the liver is influenced by postbiotic and inulin addition on the diet.

## B1. Adelene Song Al Lian

### *Lactococcus lactis* Producing Phage Lysins as Potential Enzybiotics Against Methicillin Resistant *Staphylococcus aureus*

#### Synopsis:

Phage therapy is a potential alternative solution to the global antimicrobial resistance problem currently plaguing mankind. Bacteriophages are specific viruses which only attack bacteria. In this study, lysins from Phage 88 against Methicillin-resistant *Staphylococcus aureus* (MRSA) were cloned and expressed in *Lactococcus lactis*. Methicillin-resistant *Staphylococcus aureus* (MRSA) are resistant to many types of antibiotics, causing complications in treatment. While usually associated with the skin, it also causes other diseases ranging from septic shock to food poisoning. *L. lactis*, generally regarded as safe (GRAS) bacteria, have been extensively used as a model for genetic engineering in lactic acid bacteria and is extensively researched as a gastrointestinal delivery vehicle. The recombinant lysins showed lysis activity on plate assays, observed by halozone formation. These lysins were further characterized for their antimicrobial activity. Additionally, the recombinant *L. lactis* expressing phage lysin is expected to function as an antimicrobial agent against MRSA when grown in co-culture.

## B2. Karseno

### The Effect of Dates Addition and Fermentation Time on Quality Characteristics of Coconut Water – Dates Probiotic Drink

#### Synopsis:

The aim of this research is to determine the effect of combination treatment between dates concentration and fermentation time that produce the best quality characteristics of coconut water-dates probiotic drink. This study used a completely randomized design with variations in the addition of dates (15%, 20%, 25% w/v), and fermentation time were 14, 16, and 18 hours. Physico-chemical characteristics (pH, viscosity, total acid, total soluble solid, and total sugar), microbiology characteristics (total of lactic acid bacteria), and sensory characteristics (color, aroma, taste, acidity, sweetness, and preference) were determined. The result showed that increasing dates concentration up to 25% tend to increase viscosity, total soluble solid and total sugar. In addition, increasing the fermentation times up to 18 hours tend to increase pH, viscosity and total acid, respectively. The combination treatment of 25% dates concentration and 14 hours of fermentation time resulted in the best quality characteristics of coconut water dates probiotic drink.

## B3. Gerry Michael Donad Harindah

### Isolation and Identification of Lactic Acid Bacteria from Gedi Leaves (*Albemoschus manihot L.*)

#### Synopsis:

Gedi plants, in addition to providing a savory effect on food, can also be used as alternative medication to treat various diseases such as kidney disease, stomach ulcers, lowering cholesterol in the blood and facilitate digestion. The purpose of this research was to obtain lactic acid bacteria (LAB) from Gedi leaves. This research was conducted according to the qualitative description of lactic acid bacteria from Gedi leaves covering microscopic characteristics, macroscopic characteristics, and identifying them based on bacterial morphology. The 32 isolates of acid-producing bacteria were successfully isolated from Gedi leaves using MRS-agar media. 32 isolates of lactic acid bacteria were based on Gram staining, catalase, motility, spore-forming and gas production from glucose. The results of research on the presence of lactic acid bacteria from Gedi leaves can be said that bacterial morphology from 32 isolates of LAB were shaped rods and classified in the genus *Lactobacillus*.

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## B4. Usman Pato

Antimicrobial Activity of Lactic Acid Bacteria Strains Isolated from Dadih against *Listeria monocytogenes*

### Synopsis:

The aims of this study were to evaluate the ability of LAB isolated from dadih in inhibiting the growth of *L. monocytogenes* and to obtain antimicrobial components that play a role in inhibiting the growth of *L. monocytogenes*. The results showed that supernatant from 12 LAB strains were able to inhibit the growth of *L. monocytogenes* with various inhibition zones. However, out of the 12 LAB, only 9 strains were found to have an inhibition zone of more than 4 mm. The antimicrobial compounds of 9 strains were tested and it was found that antimicrobial compounds of 3 strains derived from organic acids mainly lactic acid and 6 strains namely R-43, R-32, R-19, R-55, R-45 and R-41 derived from bacteriocin based on sensitivity to pH, heat and enzyme treatments. Crude bacteriocin derived from 6 LAB strains inhibited the growth of *L. monocytogenes*, and the highest antimicrobial activity was obtained in *Streptococcus faecalis* subsp. *liquefaciens* R-55 with an average inhibition zone of 13.87 mm.

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## B5. Artitaya Buatong

Investigation of Antioxidant Activity and Cholesterol Reducing Ability from Lactic Acid Bacteria and *Bacillus sp.* Isolated from Foods and Fish Samples

### Synopsis:

This study aimed to investigate antioxidant activity and cholesterol reducing ability of lactic acid bacteria and *Bacillus* spp. isolated from fermented foods and fish intestines. Antioxidant activity and cholesterol reducing ability was determined. It was found that *Bacillus aerius* B81e, *B. polymyxa*, *Bacillus sp.* B85b, *Bacillus sp.* strain 24 together with *Lactobacillus plantarum* CR1T5 and *Lactobacillus* spp. strains L42d, L42c, L42u, L42i, L42j, L42p, L42q displayed high DPPH scavenging activities (>30 %). Meanwhile, *B. polymyxa*, *B. aerius* B81e, and *Bacillus* spp. strains 24, B79a, B51f, B83c, B39d, B78e could reduce more than 60% cholesterol whereas *Lactobacillus* strains L42d, L42u, L42q, LAB40 reduce more than 40% cholesterol. Interestingly, *B. polymyxa*, *B. aerius* B81e, *Bacillus sp.* strain 24 together with *Lactobacillus* strains L42d, L42u and L42q possessed both antioxidant activity and cholesterol reducing ability.

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## B6. Ryan Haryo Setyawan

Edible Mushroom Potency to Alleviate Stunting Through Gut Microbiota Modulation

### Synopsis:

Recent research has explored that microbes who cohabitate human intestinal can affect their host's health and nutritive status. The composition of gut microbiota is shown different between a healthy individual and stunted individual. Various kind of edible mushroom can be found and has been part of the diet for several Indonesian. Not only mushroom contains high dietary fiber, vitamin, and mineral, but also several mushrooms are known for its immunomodulating effect. With plentiful prebiotic potential carbohydrates, like chitin, hemicellulose,  $\beta$  and  $\alpha$ -glucans, mannans, xylans, and galactans in mushroom, Mushrooms can act as a prebiotic to modulate gut microbiota, and give health benefits to the host. This paper will present several shreds of evidence that edible mushroom has potency to become a source of prebiotic, affect gut microbiota composition, and prevent stunting. It also will show any obstacles in applying edible mushroom in an attempt of combating stunting.

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## B7. Leslie Michelle Dalmacio

Prebiotic Effects of Philippine Medicinal Plants on Mice Gut Microbiome Provide Support for Their Health Benefits

### Synopsis:

The aim of this study is to investigate prebiotic effects of Philippine medicinal plants on mice gut microbiome provide support for their health benefit. Six groups of BALB/c mice were each given 200 mg/kg body weight of *Cassia alata*, *Psidium guajava*, *Quisqualis indica* L., *Carmona retusa*, *Peperomia pellucida*, and *Mentha cordifolia* crude extracts through oral gavage for a month. Bacterial DNA was extracted from fecal samples collected before and on Day 16 and 32 of extract administration. Targeted 16S metagenomics next generation sequencing was done to determine effect of extract on gut bacteria. The result is anti-inflammatory activity of *P. pellucida* and *C. retusa* extracts are partly due to the promotion of growth of beneficial bacteria. *Q. indica* and *M. cordifolia* extracts both increased Firmicutes and decreased Proteobacteria in mice gut, with decrease in Actinobacteria also observed in *Q. indica*-fed mice.