# Sertifikat

PERHIMPUNAN MIKROBIOLOGI INDONESIA

INDONESIAN SOCIETY FOR MICROBIOLOGY

Certificate

This certifies that

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As

Oral Presenter

at 9th International Seminar of Indonesian Society for Microbiology (ISISM 9)
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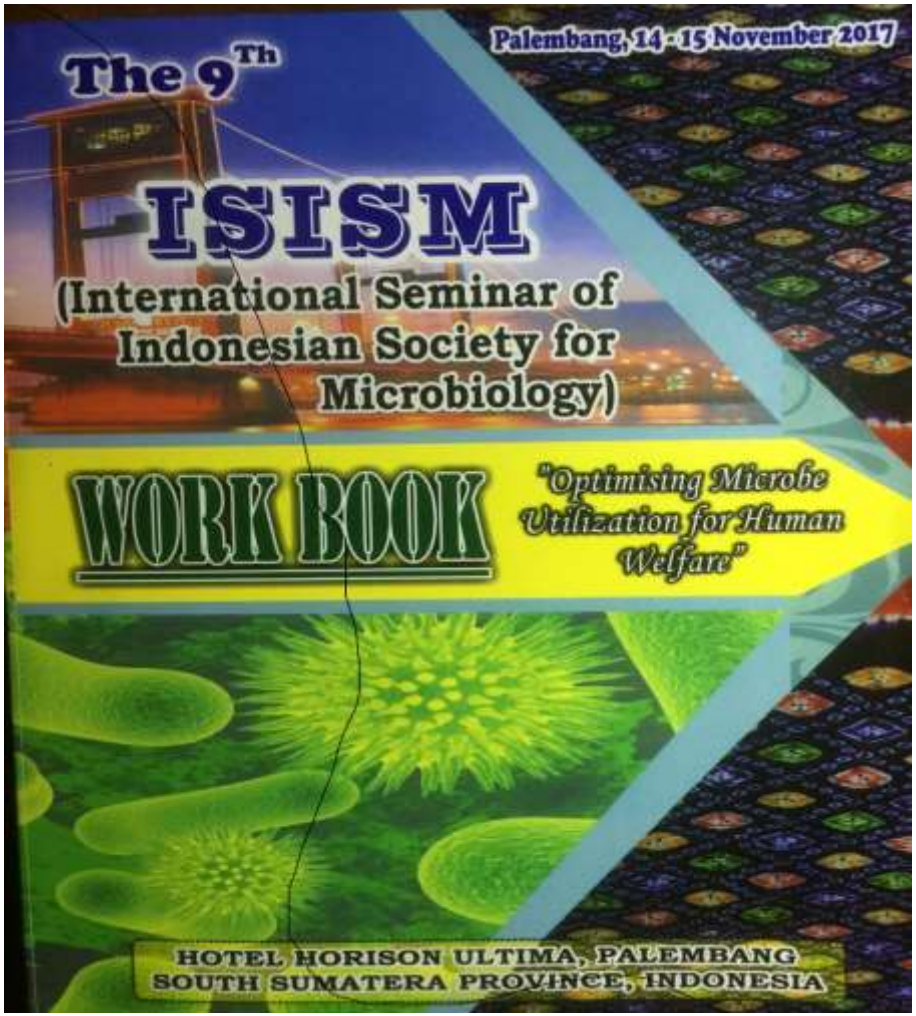
South Sumatera Province, Indonesia

Dr. Ir. Mulawarman, M.Sc

# Buku Panduan seminar



# Probiotic *lactobacillus* Sp. F213 Stimulated The Gowth Of Gut Microbiota In Healthy Human Subjects

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**Abstract**

The aimed of this research was to elaborate the effect of administration of *Lactobacillus* sp. F213 on gut microbiota of healthy human subjects. The subjects were adminitrated with 100 ml formulated milk containing $10^8$ cfu/g dry cells probiotic LbF213 for 28 days followed by 14 days washed out period. Fecal microbiomic DNA was isolated and analysed using Next Generation Sequncing (NFS), targeted on the variable region V4 of the 16S rDNA. The results showed that admnistration of LbF213 altered the GM, which indicated by chaned in main bacterial phylum that were increased of *Bacteroidetes*and*Proteobacteria*, while there was not significant changed observed on *Firmicutes*. Administration of LbF213 increased population of *Lactobacillus* spp, but on the other hand did not altered significantly the population of the *Bifidobacterium* spp. The detectable *Lactobacillus* in fecal microbiomic DNA were *L. agilis*, *L. mucoseae*, *L. reuteri*, *L. salivarius*, and*L. zeae*, while the group of *Bifidobacteium* were *B. adolescentis*, *B. longum*and*B. pseudolongum*. This study also revealed that LbF213 stimulated the growth of GM and hence increased the GM diversity. The composition of GM turned close to its condition as before admnistration of LbF213after 14 days washed out period. Nevertherless the presence of LbF213 could not detected in fecal microbiomic DNA using the amplication primers targeted to the variable region V4 of the 16S rDNA.

Key words: *Probiotic*LbF213, Gut Microbiota

PPT

# PROBIOTIC *Lactobacillus* sp. F213 STIMULATED THE GROWTH OF GUT MICROBIOTA IN HEALTHY HUMAN SUBJECTS

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# GUT MICROBIOTA

- **Diverse ecosystems**
  - **300-400 dominant species**
  - **$10^{12-14}$ cells/g**
- **Powerful machine (total GM genes are 100-200 times of human genome)**
- **Play roles in human health and diseases**
  - **Dysbiosis of GM causing several diseases**
  - **Good balance (Certain composition) promoting health**
- **Dinamic influenced by diet, lifetyle, antibiotic abuse, genetic**

**Modulation of GM to improve human health is becoming a hot issue**

# A long way to screen Probiotic strains from Indonesian fermented foods and infant feces

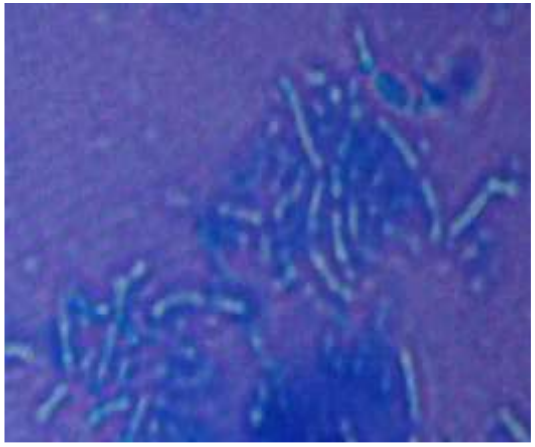
Criterias:

- Origin
- Well identified (16S rDNA seq.)
- Resistant to GI environment (pH, bile, enzymes)
- Safety
- Functionality (deconjugate bile salt)
- Applied preparation technology (plant based foods)

*Lactobacillus* sp. F213

Identified as *Weissella confusa* F213 (WCF213)

*Lactobacillus confusus* (former name)



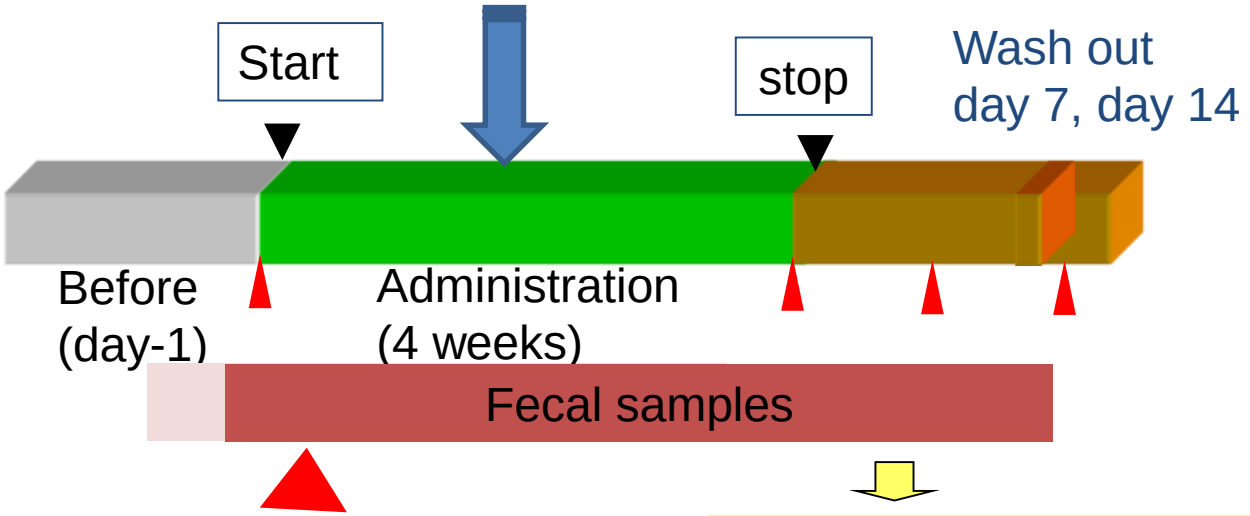
# ADMINISTRATION METHODS

**Etics**

- **Informed concern**,
- **Etical clearance**

9 adult healthy subjects (inclusion and exclusion )

**$10^{8-9}$ cfu freeze dried F213 in 100 ml powder-milk**




**Lipid profile**

- Cholesterol
- LDL, HDL, TG, TG

**Imunology**

**Metagenomic analysis (NGS)**

# Number of TAGs and OTUs

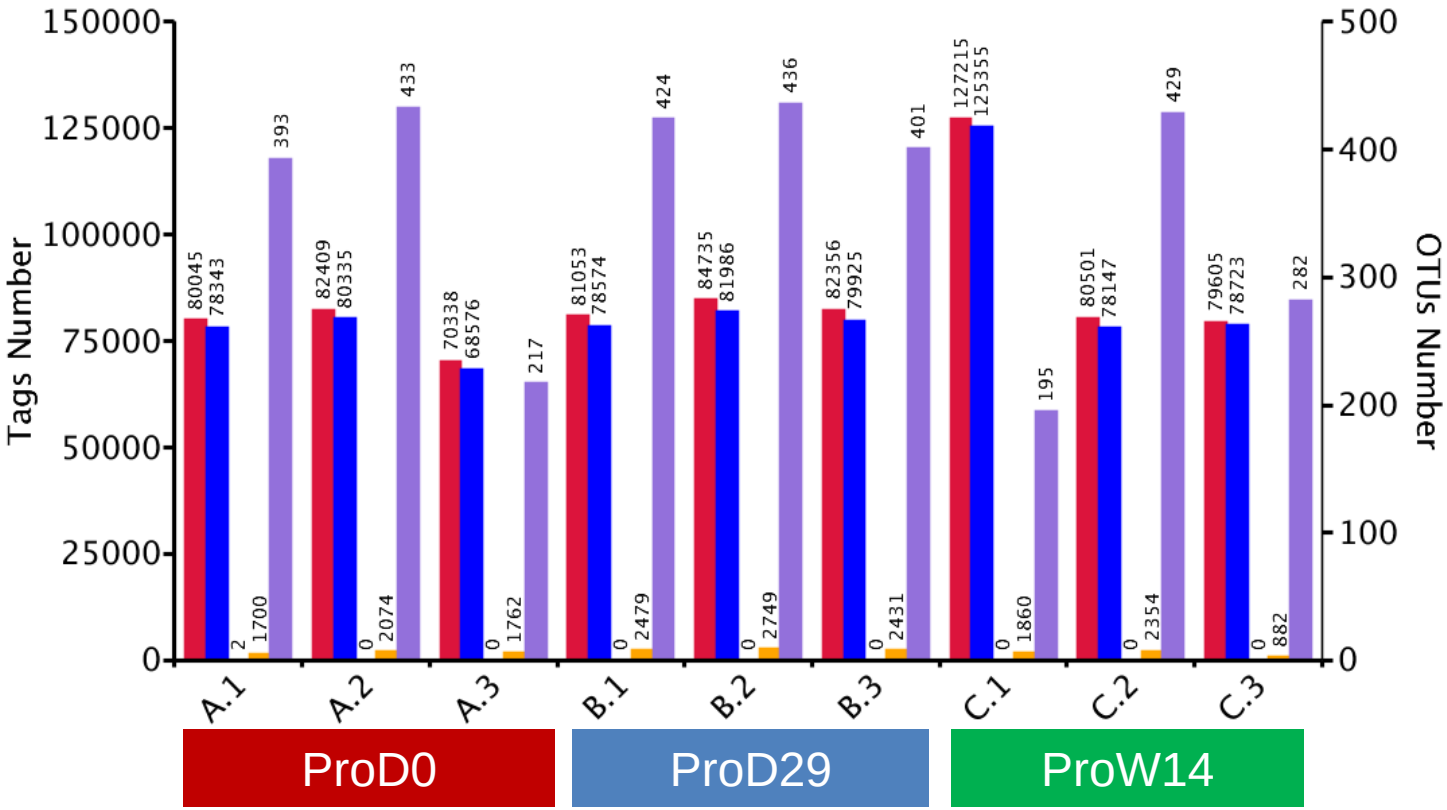
Tags : 85.326

Unique tags (avrg) : 2.032

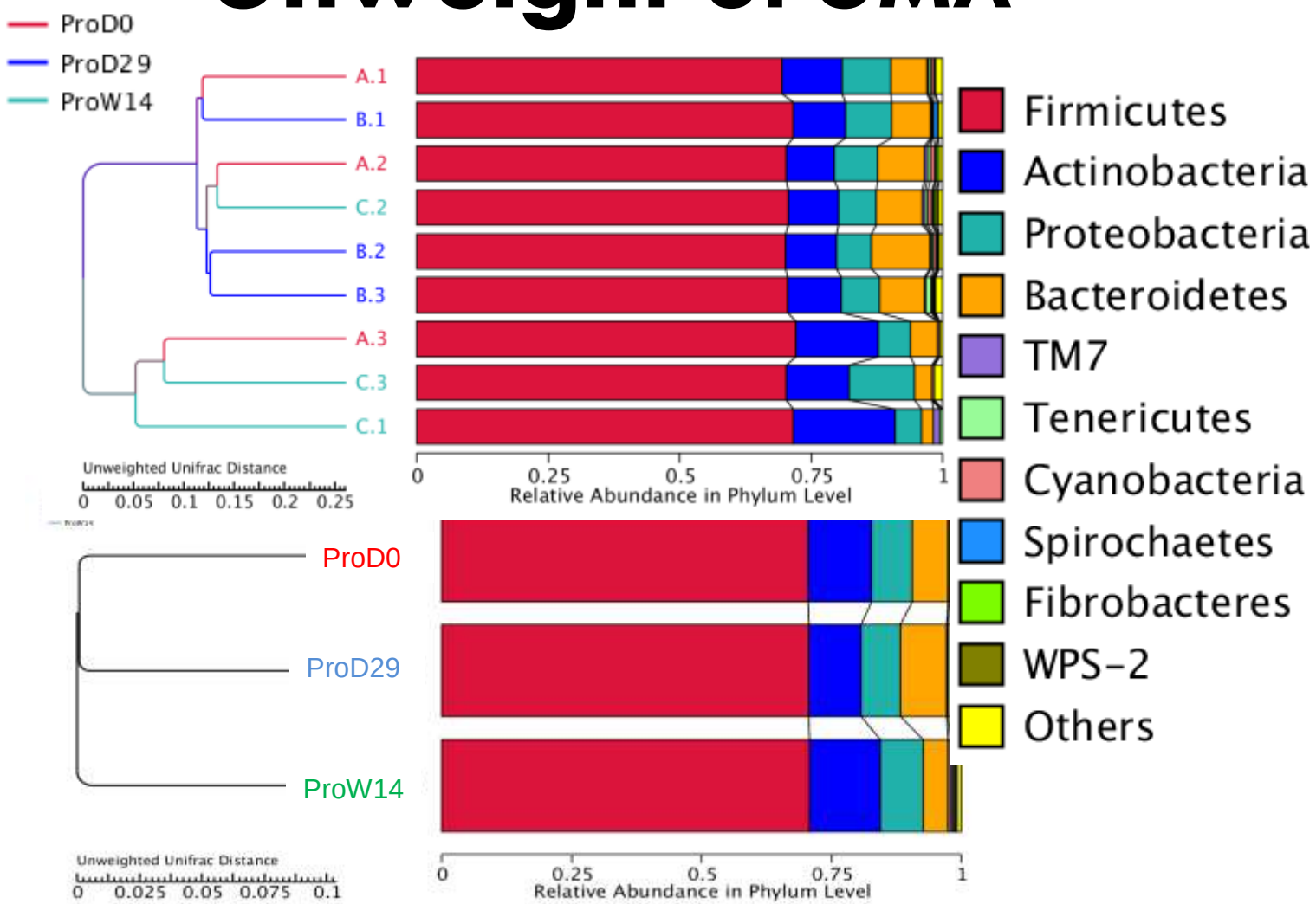
Taxon tags (avrg) : 83.329

Unclassified tags (avrg) : 0

OTUs (avrg) : 357



# Unweight UPGMA

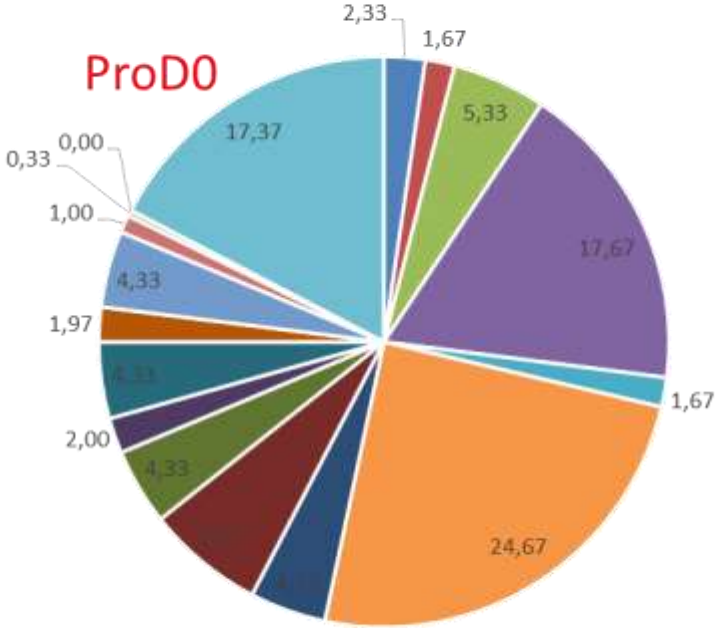


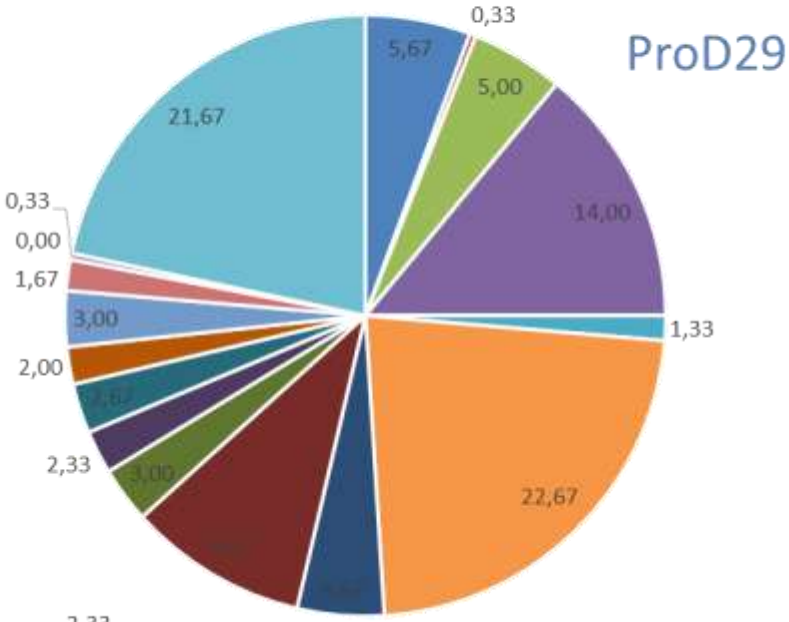

**LbF213 increased Bacteroidetes**
**LbF213 decreased Actinobacteria**

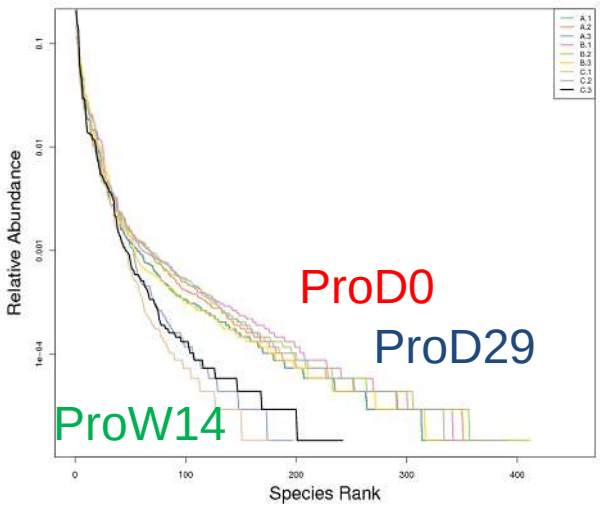
# Probiotic LbF213 Alters Human Gut Microbiota

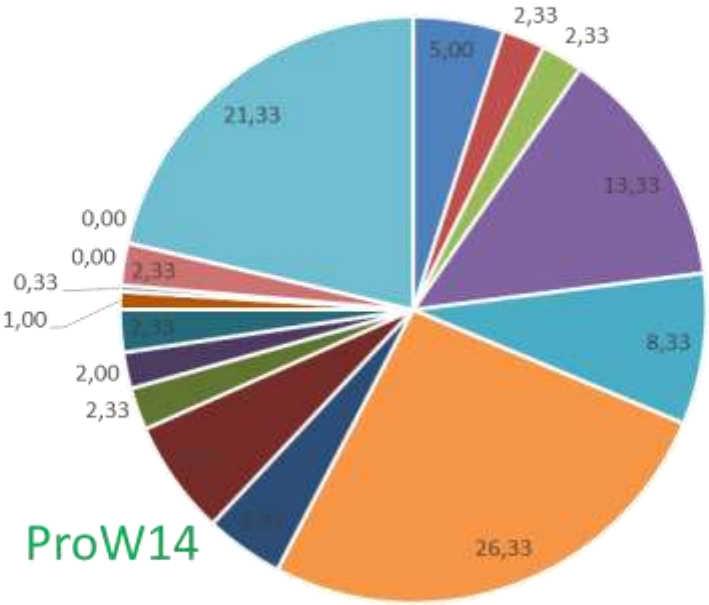
**ProD0** **ProD29** **ProW14**

# Probiotic LbF213 Alters Human Gut Microbiota

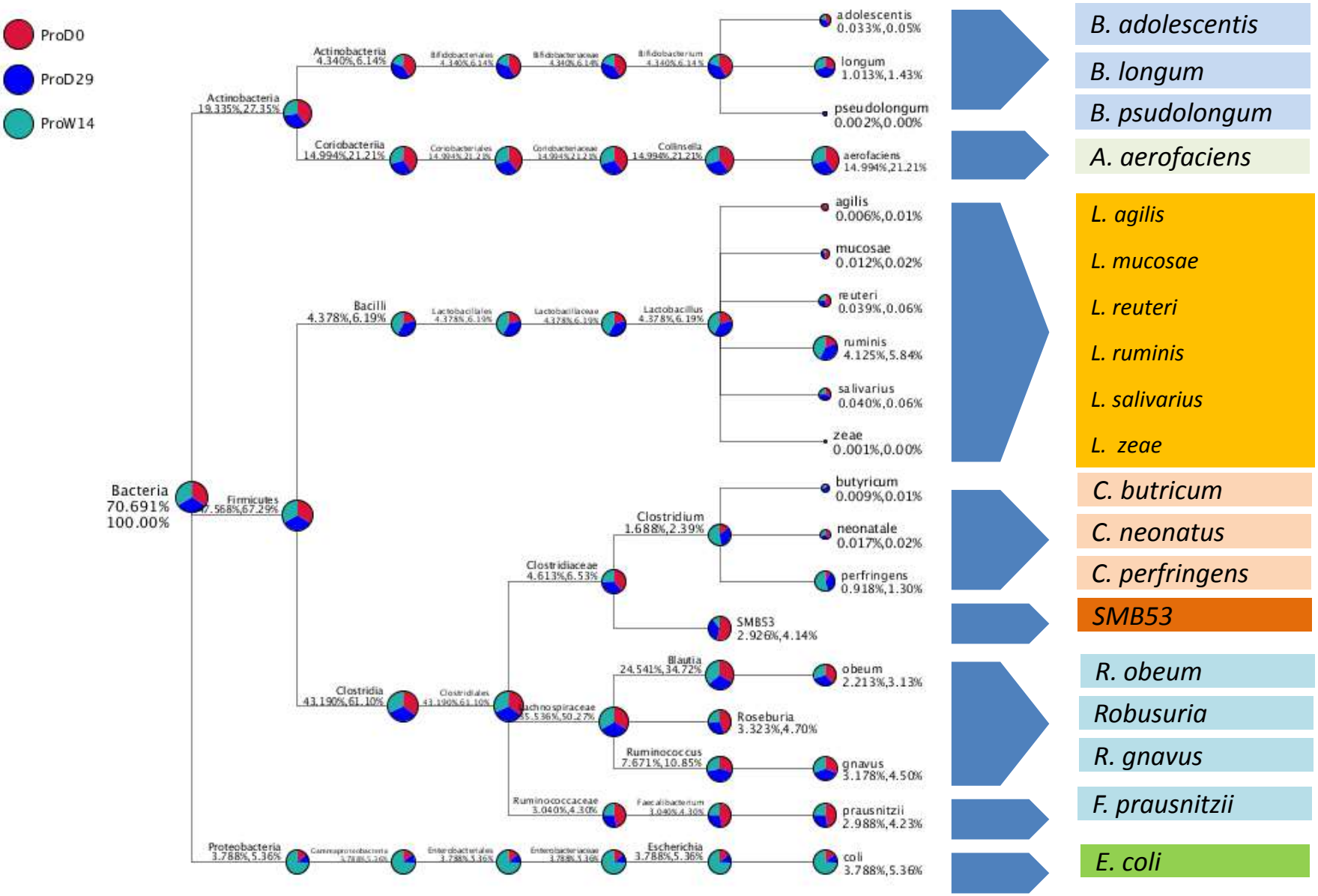



- Lactobacilus
- Streptococcus
- Bifidobacterium
- Collinsela
- Escherichia
- Blautia
- Caprococcus
- Ruminococcus
- Roseburia
- Dorea
- Faecalibacterium
- Ruminococcus
- SMB53
- Clostridium
- Butyricoccus/Oscillospora
- unclassified

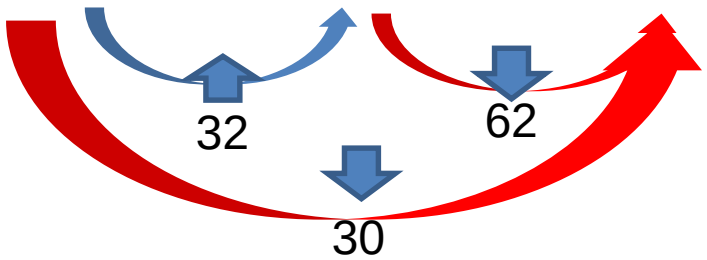


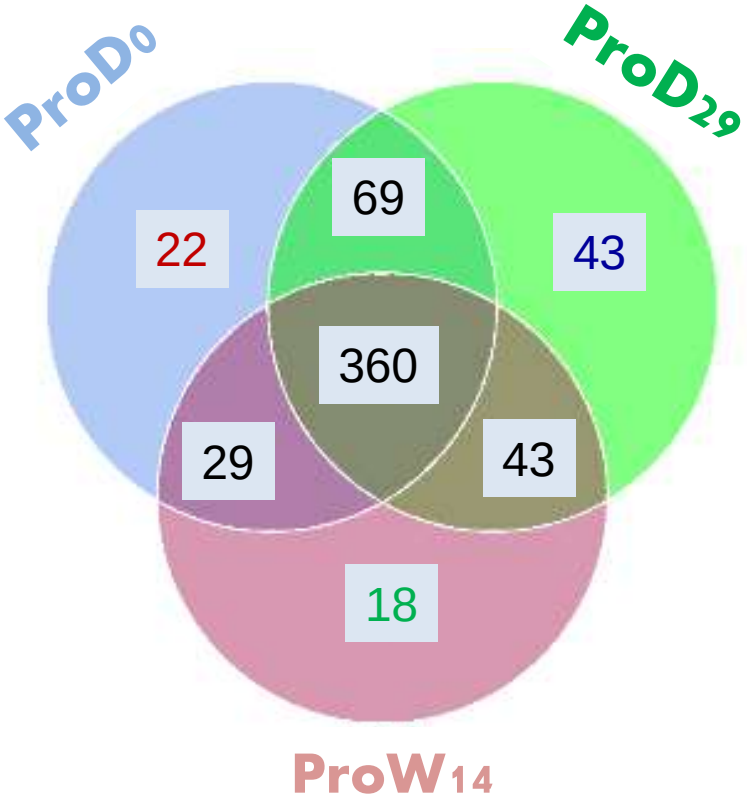

# Identified species of GM modulated by LbF213

**LbF213 was under the detection level**

# Changes in Diversity of GM after administration of LbF213

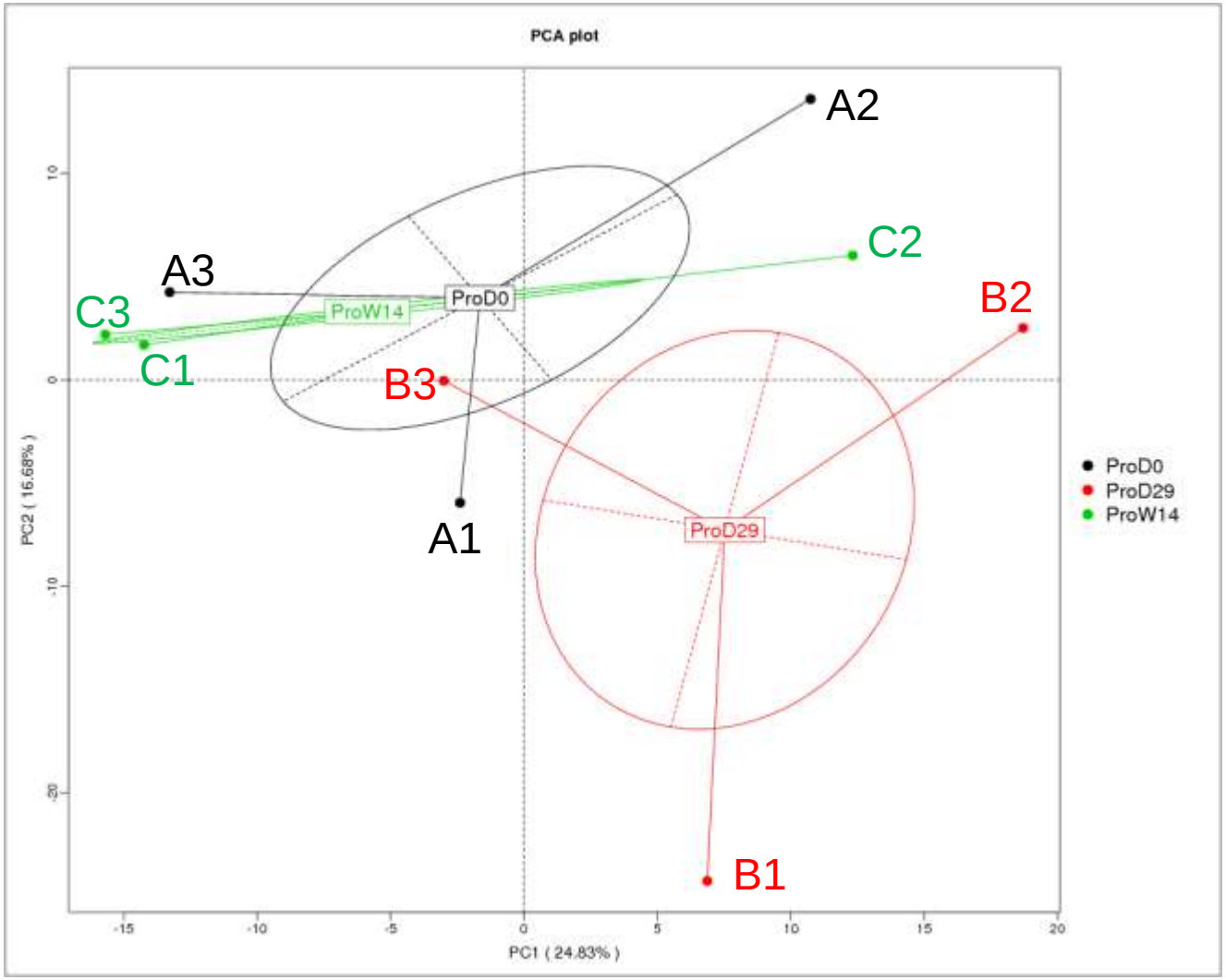
| ProD0 | ProD29 | ProW14 |
|---|---|---|
| 22 | 43 | 18 |
| 69 | 69 | 29 |
| 360 | 360 | 360 |
| 29 | 43 | 43 |
| Total : 480 | Total : 512 | Total : 450 |




**LbF213 stimulated the growth of GM (improve diversity)**

# Probiotic LbF213 shifts GM




**After washed out period profile of GM was gradually turned back closely similar to its original condition**

# Conclusion

- **$LbF_{213}$ improves diversity of human gut microbiota,**
- **Alteration of GM by probiotic $LbF_{213}$ was likely effective during the administration period, and the GM will gradually turned into the original composition when the administration was stop.**
- **The presence of $LbF_{213}$ in fecal microbiome was not able to demonstrate in this study.**

# Acknowledgement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# Thank you