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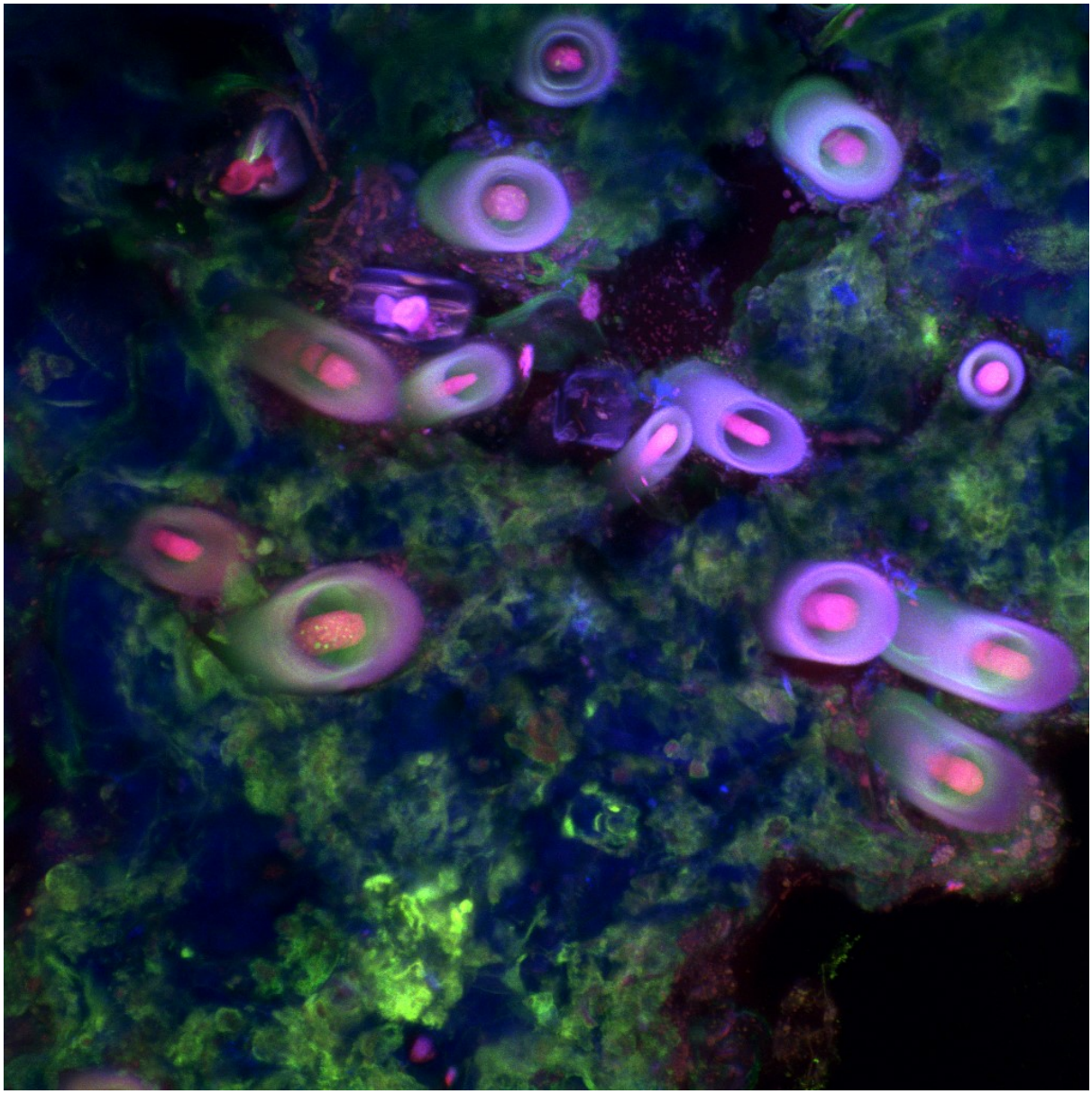
# *LVI SAIB Meeting – XV SAMIGE Meeting*



# SAIB-SAMIGE Joint Meeting 2020 – *Online*

***Cover image:***

Mineral–microorganisms interactions

Mlewski EC[1], Gérard E[2]
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A Confocal Laser Scanning Microscopy image of a resin-embedded microbialite from Laguna Negra (Puna-Catamarca), stained with calcein (a fluorescent dye that produces a stable complex in the presence of calcium and fluoresces in the green region of visible light). Mineral aggregates are observed in blue. Their surfaces are partially stained with calcein, indicate the presence of free $Ca^{2+}$ ions. Diatoms and *Rivularia halophila* filaments are visible in red thanks to their photosynthetic pigments.

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# *LVI Annual Meeting*
# *Argentine Society for Biochemistry and Molecular Biology*
# *(SAIB)*

# *XV Annual Meeting*
# *Argentinean Society for General Microbiology*
# *(SAMIGE)*

# *SAIB-SAMIGE – Online*
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*diazoefficiens*, and its relationship with soybean symbiosis will be a valuable tool for the improvement of the quality of the inoculants in order to get better agronomical yields.

## MI-P48-249
## INTESTINAL METABOLIC ACTIVITY OF MICE FED A HIGH-FAT DIET SUPPLEMENTED WITH WHEAT BRAN AND *Lactobacillus fermentum* CRL1446

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In recent years there has been an increase of people diagnosed metabolic syndrome (MS), due to a greater consumption of high-fat diets and a sedentary lifestyle, among other factors. Incorporation of bran fibers and probiotics in diet modifies intestinal microbiota (IM) and exerts beneficial effects on the health of individuals. *Lactobacillus fermentum* CRL1446 (Lf) is a strain with feruloyl esterase (FE) activity, which increases the bioavailability of ferulic acid (FA) at the intestinal level. FA is a phenolic compound present in vegetable fibers (esterified) with proven antioxidant, hypoglycemic and lipid-lowering activity, which can be used in different metabolic diseases. This work aimed to evaluate the effect of oral administration of Lf on IM and intestinal metabolic activity of mice with MS induced by a high-fat diet and supplemented with wheat bran (HFD+WB). Male Swiss albino mice 6 weeks old (N=24) were separated into 3 groups and fed for 14 weeks. Groups were as follows: (1) Control group, mice receiving water and normal diet; (2) MS group, mice receiving water and HFD+WB; (3) MS+Lf group, mice receiving Lf suspension (dose: $10^8$ cells/day) and HFD+WB. Stools from all groups were stored for metagenomics analysis. Animals were sacrificed and intestines were removed. Microbial metabolic activity was evaluated in colon contents by determining: (1) Intestinal FE activity: methylferulate was used as substrate and the FA released was quantified by HPLC; (2) Presence of metabolites derived from FA: detection was carried out by HPLC-MS; (3) Short-chain fatty acids (SCFA): acetic, propionic and butyric acids were quantified by HPLC. Relative abundance of Bacteroidetes was lower in MS group (31.2%) with respect to control group (85.8%), while in MS+Lf group Bacteroidetes increased (59.05%) compared to MS group. On the other hand, the proportion of Firmicutes was 12.75% in control group and it increased in MS group (55.05%); however, in MS+Lf group it was observed a decreased abundance of Firmicutes (36.05%). Intestinal FE activity was reduced (42%) in MS group compared to control group. Supplementation with Lf increased intestinal FE activity in MS+Lf group by 46%, compared to MS group. In all groups, dihydroferulic acid, 3,4-dihydroxyphenylpropionic acid and 3-hydroxyphenylpropionic acid (HPPA) were detected. A lower abundance of HPPA was observed in MS group compared to control, and an increase was found in MS+Lf group. Results showed a reduction in levels of all SCFA in MS group with respect to control. MS+Lf group showed no differences in acetic and propionic acid concentrations with respect to MS group, but an increase in concentration of butyric acid was observed. Results obtained suggest that supplementation with Lf enhanced the beneficial effects of a diet rich in bran, increasing the microbial metabolic activity at intestinal level in individuals suffering MS.

## MI-P49-251
## EFFECTS OF A FERMENTED GOAT MILK WITH *Lactobacillus* IN A DIET-INDUCED OBESITY MURINE MODEL

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The use of nutritional therapies with functional foods has a promising application for metabolic disorders, such as diet-induced obesity (DIO). The objective of this work was to evaluate in mice with DIO, the administration of fermented goat milk (FGM) with *Lactobacillus (L.) delbrueckii subsp. bulgaricus* CRL1447 and supplemented with different mixes of *Lactobacillus* strains, on metabolic and immunologic parameters. The strain mixtures (Mix) were formed as follow: Mix 1: *L. fermentum* CRL1446, *L. plantarum* CRL1449 and CRL1472 strains, Mix 2: CRL1446 and CRL1449, Mix 3: CRL1446 and CRL1472 and Mix 4: CRL1449 and CRL1472. Seven groups (n = 6) of male C57BL/6 mice were used: Control groups: 1) Standard diet (SD) group: SD + water, 2) FGM group: SD + FGM; 3) Obese (Ob)+FGM group: high fat diet (HFD) + FGM; Obese groups with treatments: 4) Ob+FGM+Mix1 group: HFD + FGM + Mix1, 5) Ob+FGM+Mix2 group: HFD + FGM + Mix2, 6) Ob+FGM+Mix3 group: HFD + FGM + Mix3, 7) Ob+FGM+Mix4 group: HFD + FGM + Mix4. After 10 weeks of feeding, following determinations were made in plasma: glucose and lipid profile by enzymatic methods, leptin by ELISA and cytokines by CBA. Body weight gain (BWG) was evaluated weekly. The results were compared with Ob+FMG group. BWG decreased 34% and 22% in Ob+FGM+Mix2 and Ob+FGM+Mix3 group (respectively). Triglyceride and leptin levels in Ob+FGM+Mix2 group were significantly reduced (35% and 22%, respectively). Regarding total and LDL cholesterol, no significant differences were observed in the different treatment groups. HDL-cholesterol values increased 22% in FGM+Mix 2 and 19% in FGM+Mix3. Levels of glucose values decreased in groups fed with FGM+Mix2 (48%) and FGM+Mix3 (43%). The administration of supplementated FGM with Mix2 reduce levels of pro-inflammatory cytokines (MCP-1 and IL-6), while no significant differences were observed in levels of anti-inflammatory cytokine IL-10. In conclusion, we suggest the use of FGM supplemented with Mix2 as a supplement to nutritional therapies due to its hypotriglyceridemic, hypoglycemic and immunomodulatory properties.