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washed with 1 volume of pure water. The peptide fraction was eluted with 2 volumes of 25% acetonitrile, freeze-dried, and dissolved in pure water and further separated on C18 column. The Antibacterial activity was tested by spot-on-lawn method, 10  $\mu$ L of the sample were loaded onto Petri dish with LA medium and overnight culture of *S. aureus* and *P. aeruginosa* as test-strains. After 24 hours inhibition zones were measured. The MRS-broth SPE extract was used as a negative control

**Results:** To optimize the yield of the antibacterial compound from culture liquid, we test the impact of various conditions on the antibacterial activity of the total pool of extracted compounds. 48 hours of cultivation, and pH adjustment to 2.0 before centrifugation showed the best antibacterial activity. The antibacterial compound is thermostable, and the activity retains after 30 minutes of heating. The activity against both test-strains was on the same level.

**Conclusions:** The *L. fermentum* HFD1 strain produces thermostable antibacterial compounds active against G+ and G- bacteria. Since low pH value increases the yield of the antibacterial compound, the main antibacterial compound consists of antibacterial peptides that adsorb to the cell wall of the producer strain at a higher pH, and dissolve in the culture broth at a lower pH. Further experiments, including HPLC purification, will help to identify the antibacterial compound. This research was supported by grant from the President of the Russian Federation for state support to young Russian scientists - doctors of sciences (MD-572.2020.4)

### 55ASM-0096 FT | Molecular basis of nitrogen metabolism regulation in *Lactobacillus hilgardii*, the lactic acid bacterium from dairy products and wine

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**Background:** Lactic acid bacteria (LAB) are widespread in nature and can be found in niches with the excess of nutrients, including plants surfaces, gastro-enteric tract of animals and Human, fermented milk and plant substrates. Despite extensive use in food industry, production of probiotics, lactic acid and silage, etc., many aspects of the nitrogen metabolism of *Lactobacilli* remain unexplored. Among more than 300 *Lactobacilli* species known to the date, only five, including *Lactobacillus hilgardii*, widely present in dairy products and wine, carry in their genome the gene encoding for PII-like protein PotN, one of the central regulators

of cellular metabolism generally responding to energy- and carbon-nitrogen status in many free-living Bacteria, Archea and plant chloroplasts. The *potN* gene from *L. hilgardii* has unique genetic background and is located in the *potABCD* operon encoding spermidine/putrescine polyamine ABC transporter.

**Materials and Methods:** The whole genome of *L. hilgardii* was sequenced using Illumina MySeq and Oxford nanopore platform with the overall coverage of 201x. Interaction between PotN and its partner proteins was evaluated *in vitro* using Microscale Thermophoresis (MST) and *in vivo* in Bacterial two hybrid system.

**Results:** The co-immunoprecipitation has revealed that PotN interacts with transcriptional factor GlnR and beta subunit of Pyruvate/2-oxoglutarate/acetoacetyl dehydrogenase AcoB. *In vitro* co-elution confirmed these interaction and revealed the third binding partner – the ATPase subunit PotA. The MST measurements have shown that ADP-Mg<sup>2+</sup> reduces the PotN-GlnR interaction, while ATP-Mg<sup>2+</sup> reduced the efficiency of the interaction of PotN with PotA. No effect of effectors on the PotN-AcoB interaction was found. The data obtained *in vitro* were confirmed *in vivo* using Bacterial two hybrid system.

**Conclusions:** Depending on nutrients availability, PotN protein competitively binds ATP and ADP, and subsequently interacts mainly with either the GlnR or PotA. Interacting with GlnR, the PotN affects its DNA-binding activity and apparently controls the GlnR-regulon. Binding with PotA, the PotN affects its ATPase activity and affects the entry of polyamines into the cell. The possible physiological role of interaction with AcoB remains still speculative and requires further investigations.

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### 55ASM-0100 FT | Effects of «Enoant» and «Resveratrol» on anxiety and depression in rats

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**Background:** According to the WHO, more than 25% of the population of the planet Earth suffers from one or another negative psycho-emotional manifestation. The most common of these are anxiety and depressive disorders. The most important role in the prevention of the development of these