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Metabolic profiles of complex fermentation matrices from cream and bakery industry

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and global analysis of the central and energetic metabolism.

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Material and methods Introduction **EXTRACTION** Microbial ecosystems are key factors in food production by fermentation. The Quenching metabolic potential of ecosystems is very important and varies depending on the ecosystem composition and the metabolic capacity of the different partners. The construction of the metabolic map of an ecosystem is an important tool to understand, develop and use these metabolic capacities. In this context the MetaPath Bpi France project aims to develop an integrated solution allowing this modeling. In this context, the MetaToul platform aims to develop methods adapted to different food matrices for study of the metabolism, the most accurate and global possible of these different cellular ecosystems. Our main action is first of all to develop, on these complex fermented cream and sourdoughs, the extraction Literature **DATA**

ANALYSIS Results and discussion **EXTRACTION OPTIMIZATION PATHWAYS COVERAGE Fermented cream** 118 metabolites screened (ID level 1) 90 metabolites identified in fermented matrices 76% Metatoul database detected and identified E Fresh material Dry material (D)Metatoul House Database B Polar Polar Polar + apolar Polar + apolar **AA Metabolism** metabolites metabolites metabolites metabolites extraction extraction TCA cycle **CoA Metabolism** extraction extraction ACN/MeOH/H₂O (2:2:1, ACN/MeOH/H₂O (2:2:1, 2.5e+09 v:v), 125mM Formic Acid v:v), 125mM Formic Acid **71%** metabolism **METABOLIC PROFILES PRE-SCREENING Cellular lysis** No Lysis Cellular lysis No Lysis No Lysis Pentose phosphate Time pathway Freezing 1h • T0 Tint **Nucleotides pathway** Methionine cycle • Tf No No No Mevalonate SPE SPE SPE SPE SPE SPE pathway **Oasis Prime HLB** E D B A **AA Metabolism** Dilution for IC-MS analysis compatibility **TCA** cycle **CoA Metabolism LESAFFRE** PC1 (56.3%) 64% Sugar metabolism **EXTRACTION OPTIMIZATION LESAFFRE** Pentose phosphate pathway Sourdoughs **Nucleotides pathway Methionine cycle** D Mevalonate pathway **Fresh material Dry material** CV% C WORK **WORK IN PROGRESS ... PROGRESS Polar metabolites extraction** ACN/MeOH/H₂O (2:2:1, v:v), 125mM Formic Acid **Validation with IDMS Cellular lysis** Cellular lysis No Lysis METABOLIC PROFILES PRE-SCREENING **Untargeted MS Workflow** Freezing 1h Time: Tint SPE No SPE No SPE No SPE **Oasis Prime HLB** B **Dilution for IC-MS analysis compatibility**

LESAFFRE Type 1 – Tf (7) Identification of discriminating features

Conclusions

Different sampling and sample extraction systems have been tested and remain to be validated. They allow the detection of central and energetic metabolism but also a wider detection. We currently cover the main pathways of the studied microorganisms and they will be used for the reconstruction of metabolic maps of the studied ecosystems. These systems will be used on different conditions of culture and ecosystems.





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Folate metabolism

Folate metabolism

Glycolysis

Glycolysis













