Poster Sessions

PS15-5: PTR-ToF-MS and bioprocesses: Potential in monitoring VOCs release by eukaryotic microbes

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The release of volatile organic compounds (VOCs) by eukaryotic microbes is of interest for several fields, comprising food, environmental, biotechnological and medical applications. In addition, it represents an intriguingly opportunity to conceive and to confirm new hypotheses in fundamental biology and in breeding sciences. For example, VOCs studies in an -omics perspective are generally defined as volatome, indicating with this terms the organic volatile subset of metabolome. The various techniques for VOC analysis generally aim to combine either sample throughput or analytical insight. From this point of view, Proton Transfer Reaction Time of Flight Mass Spectrometry (PTR-ToF-MS) represents a valid compromise, with the advantages of on-line process monitoring and non-invasive analysis. In order to maximize the advantages of on-line bioprocess monitoring, we coupled PTR-ToF-MS with an auto-sampler, adding a tailored data analysis tools. We demonstrated the applicability of our comprehensive methodology (automatic sampling, PTR-ToF-MS analysis and tailored data handling and analysis) the study *Saccharomyces cerevisiae* volatile organic compounds released during alcoholic fermentations. In particular, considering bread-making bioprocess, we use this approach i) to differentiate bakery yeast starter cultures in reason of their release of VOCs and to analyze the effect on VOCs productivity as a function of ii) different bakery yeast starter cultures/flour combinations, ii) the interaction between *S. cerevisiae* and *Lactobacillus sanfranciscensis* as model microorganisms in the sourdough environment, iv) different commercial aromatic yeast starter cultures for bakery.

PS15-6: Systems level understanding of cell polarity regulation

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All cells - including those in our body - possess some degree of asymmetry or 'polarity', which is key to their healthy function and if disrupted can lead to serious cellular malfunctions like those found in cancer. We have reconstructed with unprecedented spatiotemporal resolution the molecular networks that regulate cell polarity using an interdisciplinary strategy - combining genetics, microscopy and computational approaches - and focusing on the polarity machinery of the archetypal model organism *Schizosaccharomyces pombe* (fission yeast). Using network analysis methods, we have identified the core set of genes/proteins that regulate cell polarity in fission yeast and obtained a basic interaction 'network' map connecting those genes/proteins, as well as discovered new molecular links between cell polarity, cell cycle and cytokinesis control. We determined the detailed network topology and the functional hierarchy among polarity regulators in this yeast species. Based on these and other earlier results we built a mathematical model that captures the polarity pattern changes throughout the cell cycle of fission yeast cells.