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Rapid and direct analysis of small molecular weight extra polysaccharides of Bacteria by Hi-Speed centrifugation coupled with nanoparticle-assisted laser desorption/ionization (HC-Np-ALDI-MS) mass spectrometry

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The analysis of extracellular polymeric substances (EPS) from bacteria traditional methods requires chemical treatments and complicated separation procedures. Analysis of Low molecular weight compounds on Convention MALDI-MS is very difficult due to conventional organic matrixes like DHB or CHCA matrix background peaks are interfere with samples peaks at low molecular range .For avoiding those problems we developed a method, combining Hi-Speed centrifugation or physical extraction method with Nano-particle assisted laser desorption/ionization (HC-Np-ALDI-MS) mass spectrometry (MS) without any chemical treatment or extraction methods, separation and purification of EPS. The objective of this study is to demonstrate the use of Hi-Speed centrifugation coupled with Nanoparticle-assisted laser desorption/ionization (NALDI) mass spectrometry (MS) as a powerful technique for rapid, simple and direct analysis of low molecular weight EPS secreted by bacteria. For this we prepared manganese oxide nanoparticles and developed a nano-PALDI MS method to analyze EPS extract from different bacteria's by using Hi-Speed centrifugation. Our studies showed that nano-PALDI MS was selective for analysis of low molecular weight EPS. This study is a preliminary study reporting for the first time the feasibility of nano-PALDI MS techniques for the analysis of bacterial EPS without prior complicated purification and separation methodologies. The MnO_2 Nano-particles working as matrix during MALDI-MS analysis and help to ionize the EPS Samples. The mass spectra did not show any background interference in the low-m/z range. The results reporting the successful use of the manganese dioxide particles as matrices for analysis of bacterial EPS has been outlined.

Biography

Gangaraju Gedda has a Masters in Analytical chemistry from JNTUH, India. He is currently a Ph.D student in Marine Biotechnology at National Sun-Yat Sen University, Taiwan. He has published articles on the use of electrospray ionization (ESI) and on the use of matrix-assisted laser desorption/ionization (MALDI) for mass-spectrometry-based measurement of the molecular weights of EPS molecules within bacteria. His current research focuses on synthesizing nanomaterials, including nanowires and Nano wire based bio-chip, for use as bio-chip-based Mass Sensors. He is using these sensors to analyze pathogenic bacteria, to perform matrix-assisted laser desorption/ionization time of flight mass spectrometry (MALDI-TOF-MS).

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Meta analysis of eugenol synthase-I in Ocimum basilicum

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Eugenol is one of the important chemical constituent of the essential oils of many aromatic plants, such as Eugenia caryophyllus, Dicipelium cariophyllatum, Pimenta dioica, Croton zehntneri, and Ocimum species. Recent studies suggest that Ocimum (tulsi) may be a COX-2 inhibitor, like many modern painkillers, due to its high concentration of eugenol (1-hydroxy-2-methoxy-4-allylbenzene). Ocimum is proven to be an effective treatment for diabetes by reducing blood glucose levels. Previous study showed that high glucose level in blood results in the increase transcription of Cyclooxgenase-2 (Ref:Narkunraja Shanmagum,Irene T. Gaw Ganzalo and Rama Natarajan). The basic idea behind the work is to reverse this process and for that Eugenol synthase comes in picture. Eugenol synthase suppresses COX 2 expression that has already been proved by Sun Suk Kim et al. There are around 410 experimentally proven medicinal plants having Anti-diabetic properties but the complete mechanism of action is available only for about 109. There are several medicinal plants whose extract modulate glycolysis, Krebs cycle, gluconeogenesis, HMP shunt pathway, glycogen synthesis and their degradation, cholesterol synthesis, metabolism and absorption of carbohydrates, and synthesis and release of insulin. This work provides a comprehensive overview of Meta Analysis of Eugenol Synthase-I in Ocimum basilicum.

Keywords: Eugenol synthase, COX-2, Ocimum basilicum, Meta analysis.

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