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## Proteomic approach to determine the biological variation of oil palm fruit mesocarp

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A comparative protein expression study has been initiated to determine the metabolic factors controlling the production of high-value oleic acid in the oil palm. In order to ensure that any differences in protein expression occurred primarily due to the differential regulation during oleic acid production, the credibility of the examined biological replicates is crucial and need to be established before further exploration. The extend of biological variation among oil palm fruit mesocarps were accentuated using gel-based and gel free proteomic techniques. A comparative protein profile analysis performed on eleven major one-dimensional gel electrophoresis-separated protein bands revealed that the intensities were similar across each of the replicates for low and high oleic acid mesocarps. Subsequently, a two-dimensional gel protein profiles demonstrated minor variations (in the number of protein spots and intensities) between replicates for low and high oleic acid mesocarps. A more in-depth evaluation of the low and high oleic acid replicates was executed with nano-liquid chromatography-tandem mass spectrometry (nLC-MS/MS). The evaluation showed that the number of identified proteins for each of the low and high oleic acid replicates differed by 3-14% with low/high oleic acid (LO/HO)1 as the reference replicate. The difference in the number of identified peptides between LO2/LO1 and HO2/HO1 was 72 and 73 peptides, respectively. The number of identified peptides for LO3 varied by 69 peptides when compared to the LO1. Comparison between HO3 and HO1 exhibited a difference of 41 peptides. The biological variations of low and high oleic acid replicates were highlighted more effectively using a peptide centric approach but not with the relatively less sensitive gel-based proteomic techniques. These proteome differences also indicated the presence of biological variations.

### Biography

Benjamin Lau has completed his PhD in 2015 from Lincoln University, New Zealand. He is a Proteomics Research Scientist at the Advanced Biotechnology and Breeding Division, MPOB. His works focus on plant (oil palm) proteomics and currently investigating the metabolic factors controlling the yield and high-value fatty acids production in the oil palm.

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