QC IN PROTEOMICS: LESSONS FROM PROTEORED MULTICENTRIC EXPERIMENTS

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From the early days of Proteomics, the issue of reproducibility and robustness of proteomic analysis methods has been subject of controversy. The large diversity of techniques, instruments and software tools used in proteomic analysis makes this a complex question. For Proteomics to deliver meaningful and relevant biological information it is mandatory that proper quality control and assessment of reproducibility of the different methods are regularly performed at proteomic laboratories.

Since its establishment in 2005, ProteoRed, netwotk of proteomic facilities in Spain, has maintained a regular program of activities devoted to QC issues. Their main goals have been: i) benchmark and QC of the different techniques offered by ProteoRed laboratories. ii) optimize procedures in each laboratory. iii) standardization of protocols. iv) setting up new techniques. With this purpose, two different kinds of activities have been carried out by ProteoRed labs. On one hand, several multicentric experiments have been organized within ProteoRed, covering different techniques: 2D-electrophoresis and DIGE differential analysis, protein identification by mass spectrometry, both by peptide mass fingerprint and LC-MSMS, and relative quantification by different LC-MS based approaches. In each of those multicentric experiments, after defining a particular standardization need, suitable samples were prepared and distributed to all ProteoRed laboratories for analysis. After collection and centralized analysis of results when applicable, the results were exposed and discussed at ProteoRed meetings. In parallel, ProteoRed laboratories have participated regularly on the studies organized by the American Association of Biomolecular Resource Facilities (ABRF). The outcome of those studies has been also discussed at the ProteoRed meetings.

We will present an overview of all these QC activities that have allowed to reassess the general robustness of proteomic methods, and also shown their practical limitations. We will also emphasize their decisive contribution to the overall improvement of the analysis qualifications of the participant laboratories.