

Two-dimensional electrophoresis – parasite proteome in focus

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Two-dimensional electrophoresis (2DE) is a basic method for the visualization and comparison of protein patterns. It is particularly useful to identify the differences in proteomes of closely related organisms. Additionally, the effects of different treatments on the sample can be characterized.

Several kinds of soluble proteins can be evaluated with this method. However, there are demands for the purity of the sample. Fractionating the samples helps focusing on certain group of proteins, and frequently, provides a better and easier view to compare the sample than a complex total protein extraction.

Differential gel electrophoresis (DIGE) is a fluorescence staining method which improves the efficiency of 2DE. It enables multiple sample electrophoresis in the same gel. Gel-to-gel differences can thereby be ignored.

Further analysis of the sample after 2DE is relatively easy to perform. For example, the antigenic properties of the protein spots can be detected by constructing Western blot from the 2DE gel. If there is a need to identify a certain protein, the spot can simply be excised from the gel and, after purification and digestion, analyzed with MALDI-TOF mass spectrometry.

The protein patterns of *T. spiralis* and *T. britovi,* which are used here as examples, differed remarkably in silver stained 2DE gels and in 2D Western blot. However, strong cross-reactions were seen in Western blot between the species when they were analyzed with homological and heterological sera. The obvious proteomic differences between the two *Trichinella* species and their antigenic differences provide a solid basis for future examination of the possibilities for the serological differentiation of *Trichinella* species.