

2. Multidimensional Liquid Chromatography

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Multidimensional Liquid Chromatography is a technique that keeps growing and developing. The two-dimensional comprehensive version of this technique, which we will call 2DLC, is a very interesting technique where sample zones are fractionated over two different types of retention mechanisms, from two independent columns. For many bioseparations, one needs to have at least two different retention mechanisms to spread the separation over an area (two-dimensional), rather than along a one-dimensional separation axis, as is the normal way with HPLC. Often people talk about how 2DLC can increase peak capacity so that more peaks can be resolved. This is often true but not always.

In this course we will review the basic operation of 2DLC and discuss the key biochemistry applications where one needs to use this type of technology. The present state of instrumentation will be surveyed in separate groups:

- 1) Commercially available as complete turn-key systems
- 2) How to add 2DLC to an existing HPLC with an add-on kit

We will not discuss how to build a system from the ground up. The various methods development processes will be taught. A survey of the present state-of-the art work in 2DLC will be given with emphasis on the application. Students will be expected to be familiar with HPLC.