# Separation of benzophenanthridine alkaloids production-related proteins using two-dimensional electrophoresis

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Benzophenanthridine alkaloids, a subclass of the benzylisoquinolines, are produced in *Eschscholtzia californica* (California poppy, used as a sedative by Native Americans) and most of them are derived from dihydrosanguinarine. Our cell line produces dihydrosanguinarine rather than sanguinarine as a major portion of benzophenanthridine alkaloids. We need to understand the biosynthetic mechanism from dihydrosanguinarine to sanguinarine for sanguinarine overproduction. To investigate expression profiling of sanguinarine production-related enzymes, such as dihydrobenzophenanthridine oxidase, with elicitation, the whole cell protein was extracted and separated by ammonium sulfate precipitation. With these fractions, two dimensional electrophoresis was conducted and we found some spots that were expected to relate to benzophenanthridine alkaloids production. This study describes the fractionated proteins profiling of *E. californica* cell culture.