

**Developing a Diagonal 2D SDS-PAGE to Identifying the Subproteome  
of Kinetically Stable Proteins**

by

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## **ABSTRACT**

Most proteins are in equilibrium with partially and globally unfolded conformations. In contrast, kinetically stable proteins (KSPs) are trapped by an energy barrier in a specific state, unable to transiently sample other conformations. Among many potential roles, it appears that kinetic stability (KS) is a feature used by nature to allow proteins to maintain activity under harsh conditions and to preserve the structure of proteins that are prone to misfolding. The biological and pathological significance of KS remain very poorly understood due to the lack of simple experimental methods to identify this property, and its infrequent occurrence in proteins. Based on the previous correlation between KS and a protein resistance to the denaturing detergent sodium dodecyl sulfate (SDS), we show here the development of a diagonal two-dimensional (D2D) SDS-polyacrylamide gel electrophoresis (PAGE) assay to identify KSPs in complex mixtures. This simple D2D SDS-PAGE assay will allow the widespread investigation of KS, including the proteomics-level identification of KSPs in different systems, potentially leading to a better understanding of the biological and pathological significance of this intriguing property of proteins.