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Analyzing biphasic surface plasmon resonance data PURUSHOTTAM TIWARI, XUEWEN WANG, JIN HE, YESIM DARICI, Florida International University — Surface plasmon resonance (SPR) is a widely used label-free biophysical technique to quantitatively study biochemical processes. Analysis of monophasic SPR profiles by fitting using a single exponential function is straightforward. However, there is no simple procedure for SPR data fitting with double exponential functions. An existing approach is to fit the biphasic SPR profiles with numerical solutions of the rate equations. This procedure requires some prior knowledge of the underlying interaction mechanism, and the extracted rate constants often have large uncertainties. We propose a new method of analyzing the biphasic SPR data using the three commonly employed biphasic models. Our method is based on a general analytical solution of the biphasic rate equations. Our method can be used to determine the underlying biphasic interaction mechanism from the analysis of the SPR data, and to extract the rate constants with high confidence levels.

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