

Abstract Submitted
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Protein-ligand biosensing: dielectric spectroscopy and numerical simulation of molecular interactions BRETT MELLOR, NATHAN KELLIS, STEVEN BREWER, DAVID BUSATH, BRIAN MAZZEO, Brigham Young University — In this study we demonstrate the capability of dielectric spectroscopy, an impedance-based measurement technique, to probe molecular binding interactions in liquid. As a test system, the avidin-biotin binding reaction is used because it is well understood and has a high binding constant. Experiments are first performed on avidin and biotin-labeled bovine serum albumin, showing characteristics of aggregation. Next, experiments are performed on avidin and biotin, showing changes in dipole moment and molecule size after the binding occurs. Numerical methods based on Poisson-Boltzmann pKa shifts and molecular dynamics simulations confirm the measured changes.

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