

Abstract Submitted
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Exploring the Electrical Conductivity of Myoglobin¹ DEBIN LI, DAVID LEDERMAN, Dept of Physics, West Virginia University, PETER M GANNETT, Basic Pharmaceutical Sciences, West Virginia University — The electrical conductance of single myoglobin proteins was measured to study its electron transfer properties. We examined the electronic properties of myoglobin, using apomyoglobin (myoglobin without a heme group) as a reference. The differential conductivity of the proteins deposited on Pt nanometer-scale electrodes was measured using a lock-in technique as a function of bias and gate voltages. Nano- electrodes were fabricated by creating small Pt channels 100 nm - 300 nm wide via e-beam lithography and then creating a break junction by electromigration at low temperatures (4 K - 77 K). The conductance of apomyoglobin was very different from that of myoglobin, with a predominant peak at 50 meV. On the other hand, myoglobin had a rich structure that we surmise results from the presence of the heme group.

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