

# **Spectroscopic Methods in Bioinorganic Chemistry: Blue to Green to Red Copper Sites**

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A wide variety of spectroscopic methods are now available which provide complimentary insights into the electronic structures of transition metal complexes. Combined with calculations these define key bonding interactions, enable evaluation of reaction coordinates, and determine the origins of unique spectroscopic features/electronic structures that can activate metal centers for catalysis. This presentation will summarize the contributions of a range of spectroscopic methods combined with calculations in elucidating the electronic structure of an active site using the blue copper site as an example. The contribution of electronic structure to electron transfer reactivity will be considered in terms of anisotropic covalency, electron transfer pathways and protein contributions to the geometric and electronic structure of blue copper related active sites.