

## **Comparison of a molecular map and haemoglobin diagram referenced as "Fingerprints. Haemoglobin A + A2"**

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analysis shows only four prolines in this type of myoglobin (137), whereas there are seven "corners." Two more prolines have been identified in the electron-density map in longer non-helical sections.

Several features of the heme group and its connection to the protein are also apparent. The orientation of the heme plane relative to the crystal axes agrees closely with measurements made by means of the anisotropy in electron-spin resonance for the iron atom (138), and the distribution of electron

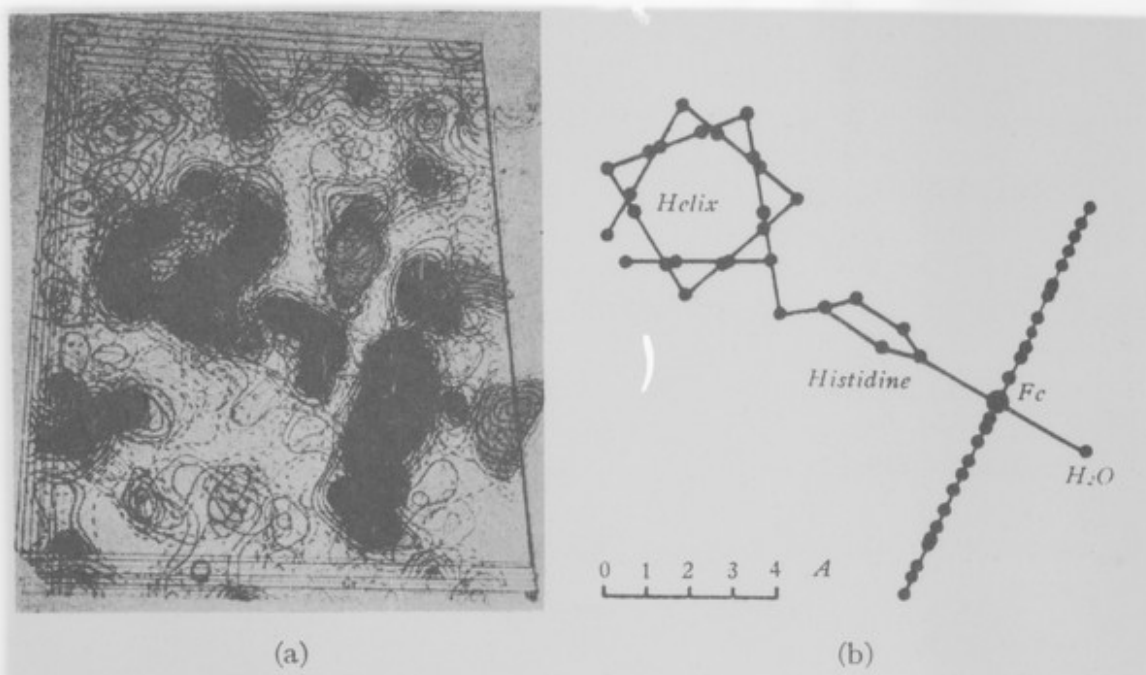


FIG. 6. (a) Photograph of a set of sections normal to the plane of the heme group which shows, from left to right, a helix in cross-section, the histidine residue nearly edge-on, the heme group edge-on, and a presumed water molecule. (b) Sketch showing the atomic arrangement in (a). [Reproduced from Kendrew *et al.* (108).]

density within this plane is very similar to that calculated from the known atomic arrangement seen at 2 Å resolution. As had long been believed on chemical grounds, the iron atom appears to be linked to the protein by coordination with a nitrogen atom of a histidine side chain, whereas the sixth coordination position, presumably occupied by the oxygen molecule in oxy-myoglobin, is filled, in metmyoglobin, by a water molecule (Figure 6). Further, the protein appears to be made through hydrogen bonds from