

# STRUCTURE OF HUMAN DEOXYHAEMOGLOBIN

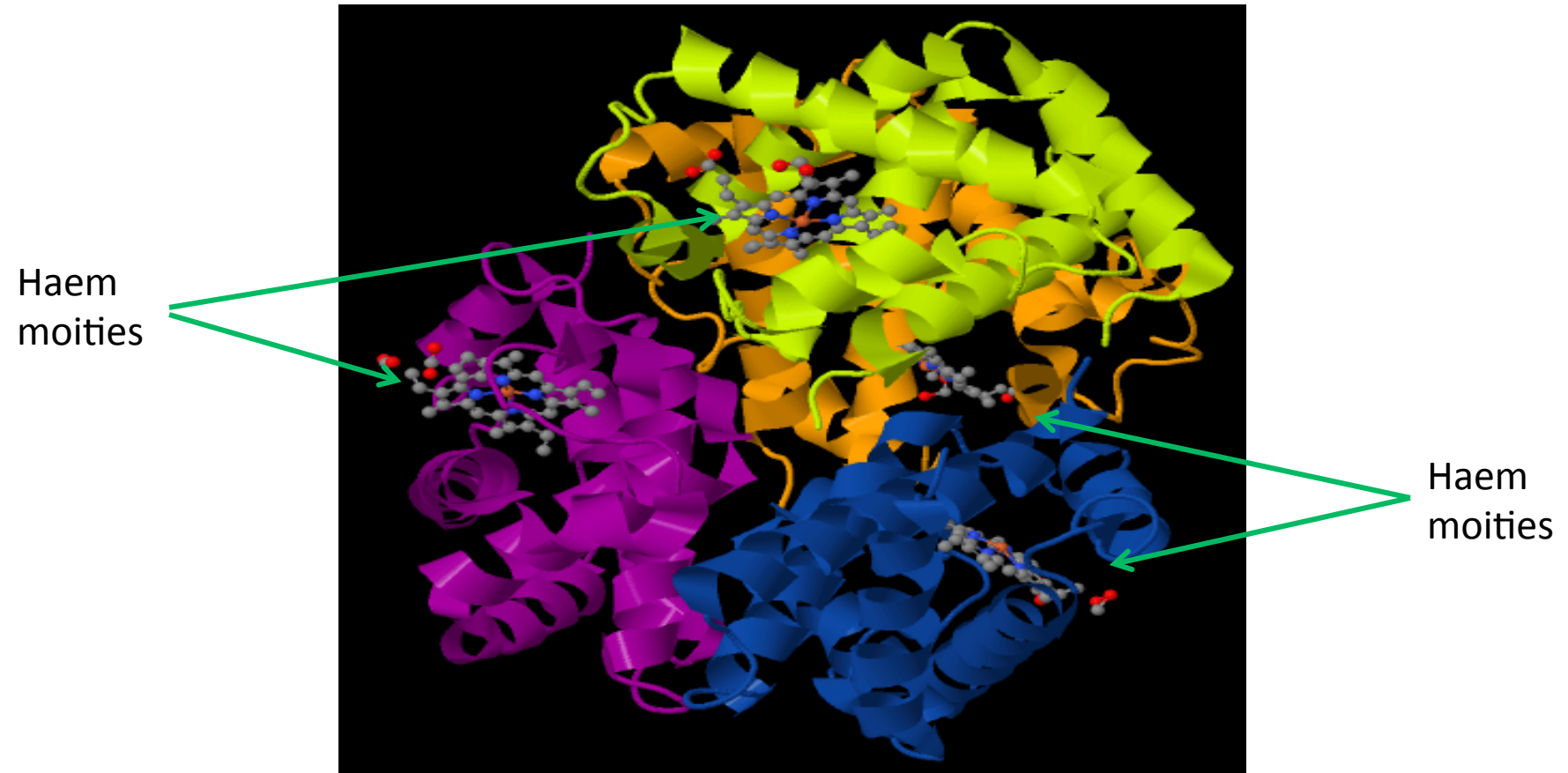
Created with Jmol; Jmol: an open-source Java  
viewer for chemical structures in 3D. [http://  
www.jmol.org/](http://www.jmol.org/)



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**SICKLE CELL ANAEMIA**  
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# STRUCTURE OF HUMAN DEOXYHAEMOGLOBIN



[http://www.pdb.org/pdb/explore/explore.do?  
structureId=2HHB](http://www.pdb.org/pdb/explore/explore.do?structureId=2HHB)

Image of 4HHB (The crystal structure of human deoxyhaemoglobin at 1.74 Å resolution. Fermi G, Perutz MF, Shaanan B, Fourme R. *J Mol Biol.* 1984 May 15;175(2):159-74.)

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A free web programme called Jmol is useful to visualise molecular structures of biological components. By searching for Haemoglobin, several models are available for view.

## **The Ribbon model**

The structure of human deoxyhaemoglobin. The four chains (2  $\alpha$ -chains and 2  $\beta$ -chains) are coloured as follows:

Green and blue =  $\alpha$ -chains

Purple and orange =  $\beta$ -chains

Each chain has a haem group associated with it, each of which consists of an iron-ion in the centre of a porphyrin ring. The four haem-moieties are indicated.

Jmol settings:

Display style: cartoon

Colour: by chain

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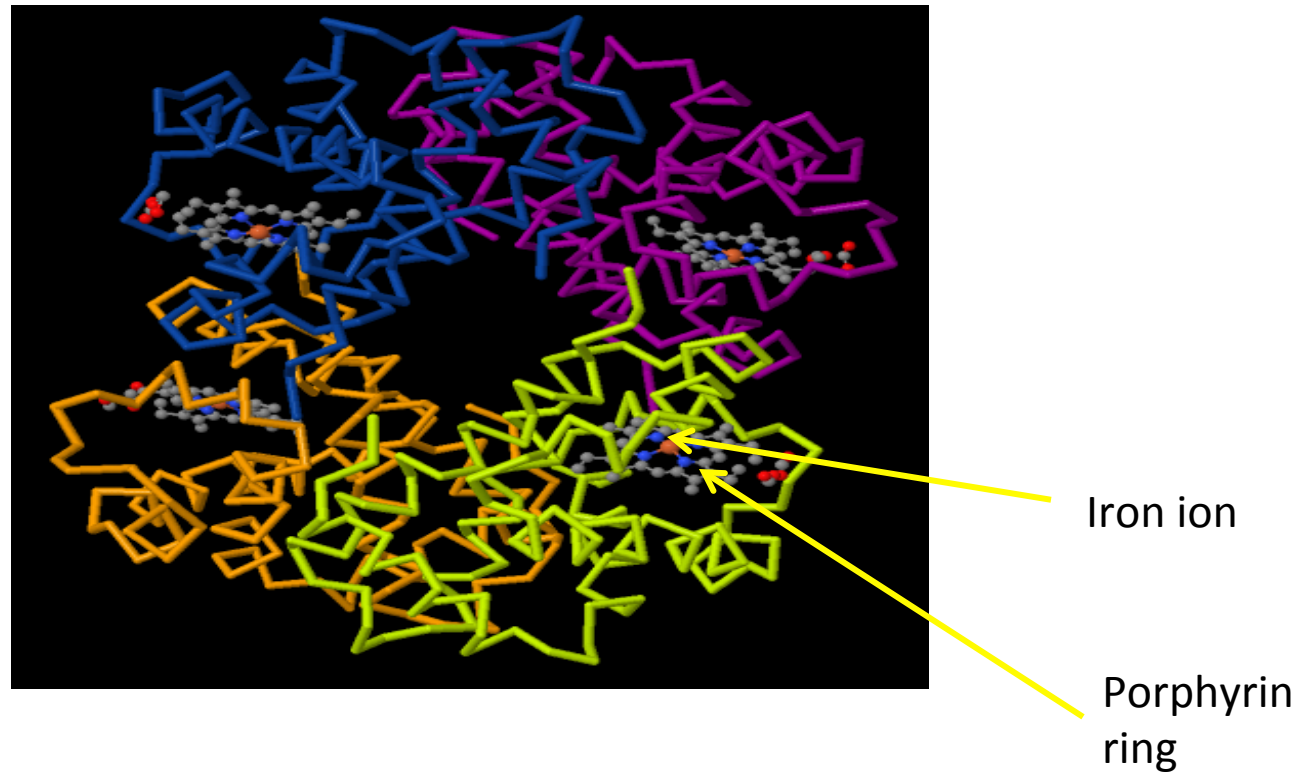
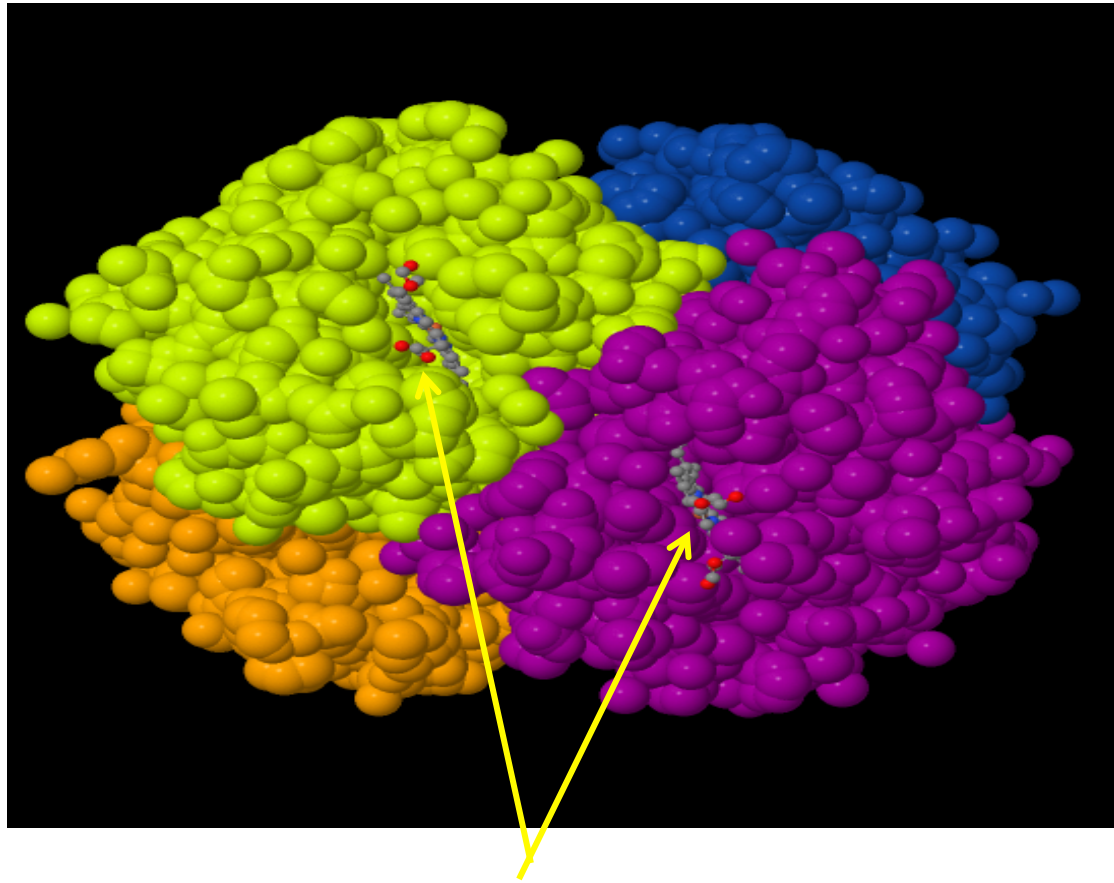


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**Alternative display** (Jmol “backbone”) of human deoxyhaemoglobin showing the positions of the four haem groups in the tetrameric structure and highlighted for one haem group the iron at the centre of the porphyrin ring.

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Haem groups

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## **Space fill (Jmol CPK) model of human deoxyhaemoglobin.**

The overall structure is approximately spherical and each globin chain is folded in such a way that each haem moiety is equidistant from each other and lies in a cleft in the surface of the haemoglobin, as illustrated here. The globin chains are coloured as follows:

Green and blue =  $\alpha$ -chains

Purple and orange =  $\beta$ -chains