

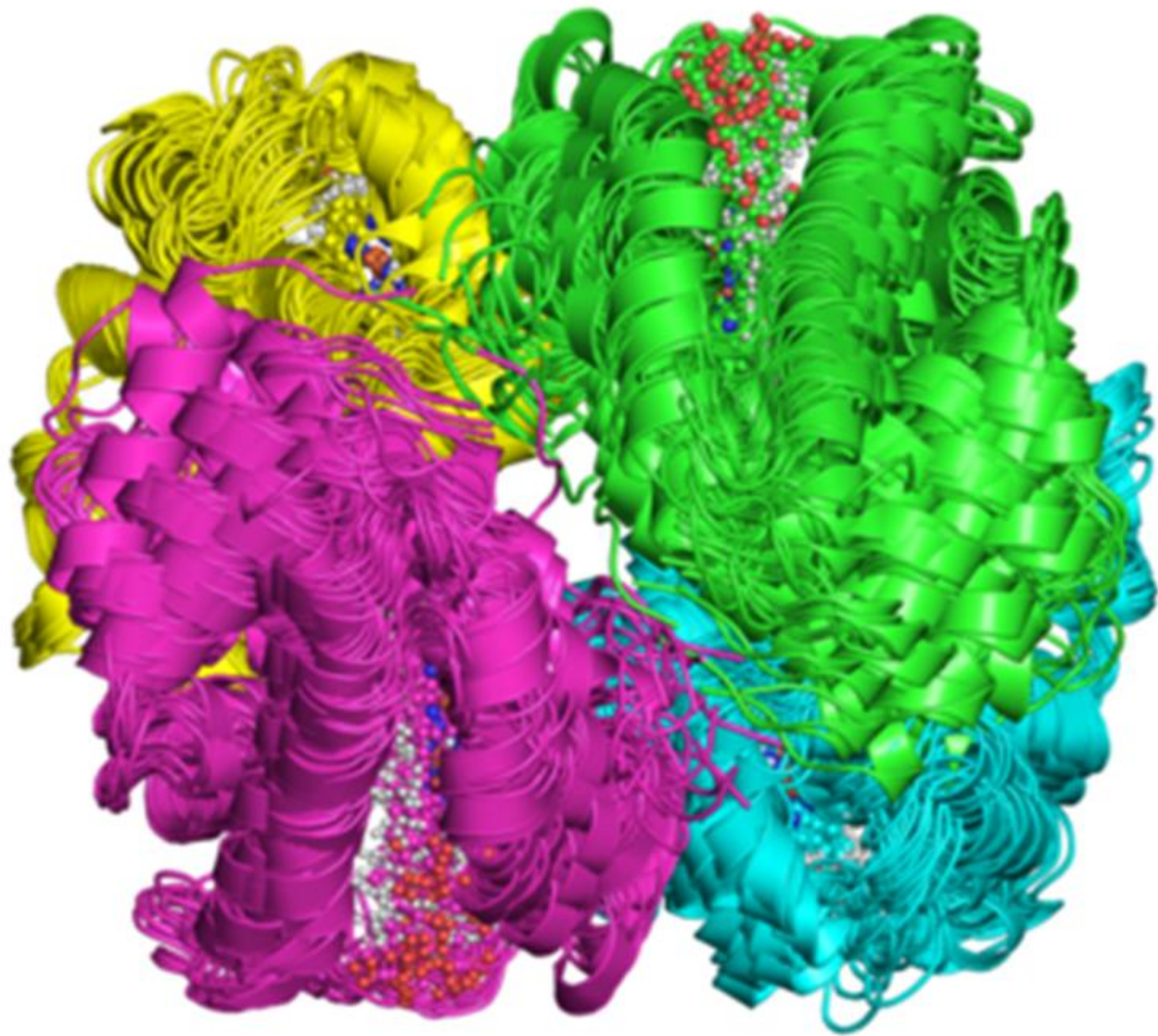
An Encyclopaedia of Protein Complexes

EMBL-EBI

www.ebi.ac.uk/intact/complex

Whilst most of the molecular building blocks of biology are served by high-quality reference databases, such as UniProtKB, Ensembl and ChEBI, no such central resource exists for macromolecular complexes, although there have been various fragmented attempts over the years to catalogue these. The IntAct molecular interaction database (www.ebi.ac.uk/intact) now includes a new resource, the Complex Portal, through which an encyclopaedia of major model organism protein complexes is made available for search, viewing and download. Details of complex content, topology and stoichiometry are given, along with details of function, physical properties and structural assembly. Consistent nomenclature is used throughout the resource, using the Reactome complex naming rules as a guideline, and the entries are extensively cross-referenced, for example to the Gene Ontology and PDB. Each entry is directly linked to the experimental data from which the information is derived or tagged, using ECO evidence codes, in cases when the complex has been inferred rather than experimentally identified. This reference resource will be maintained and grow to encompass an increasing number of organisms – input from the representative model organism communities is welcomed. The data is available in the community standard interaction format (PSI-MI XML) and additional download formats can be made available, on request.

- Molecule content – proteins (UniProtKB), small molecules (ChEBI), nucleic acids
- Stoichiometry
- Topology
- Consistent nomenclature – and synonyms
- Free text function and property comments
- Complex assembly – controlled vocabulary
- Ligands
- Disease
- Structured annotation using GO – parallel effort to update existing GO complex hierarchy
- Cross references to PDB, eMDB, Reactome (human), ChEMBL, PubMed.....
- Links to experimental data plus evidence code attribution to assess level of supporting evidence for the existence/components of a complex



Curation Priorities

- Human and mouse
- *Saccharomyces cerevisiae*
- *Escherichia coli*

Longer Term

- *Arabidopsis thaliana*
- *Drosophila melanogaster*
- *Caenorhabditis elegans*
- *Schizosaccharomyces pombe*

A collaborative effort

We need your expertise – if you would like to contribute to this work, we can offer access to the editorial tool, training, QC and long term data maintenance. Contact intact-help@ebi.ac.uk if interested

Complex Portal > Details

Hemoglobin HbA complex

Species: Homo sapiens; 9606

Accession number: EBI-9008420

Summary

Systematic Name:
HBA1:HBB

Synonyms:
HBA1:HBB
HBA2:HBB

Function:
Adult hemoglobin A (HbA) is expressed in erythrocytes in the bone marrow. Binds oxygen in the lungs and transports it to the various peripheral tissues. Transports CO2 from cells back to the lungs. It appears in late pregnancy and becomes the dominant hemoglobin type in adults, replacing fetal hemoglobin (EBI-9106045 & EBI-9106218).

Properties:
Two alpha chains and two beta chains. Each chain has a heme b group attached to it containing either an Fe2+ or Fe3+ ion. Oxygen only binds to Fe2+ ions, not Fe3+ ions. CO2 binds directly to the protein chains and therefore does not compete with oxygen binding. MW = 64 kD

Disease:
Mutations in hemoglobin alpha chain can result in a range of diseases, including alpha-thalassemia, Heinz body anemias and hemoglobin H (HbH) disease. Mutations in hemoglobin beta chain can result in a range of diseases, including sickle-cell anemia, beta-thalassemia and Heinz body anemias.

Complex Assembly:
Heterotetramer.

EMBL-EBI

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Complex Portal

hemoglobin Search

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Complex Portal > Search results

Complex Portal results for hemoglobin

Showing 10 results from a total of 15

Species:
☐ Homo sapiens (11)
☐ Mus musculus (4)

Interactor type:
☐ protein (15)
☐ small molecule (14)

Participant's biological role:
☐ unspecified role (15)
☐ cofactor (14)

File:

1. Hemoglobin E complex (Homo sapiens; 9606) EBI-9106687
Embryonic hemoglobin E (HbE) complex is the main embryonic hemoglobin type, expressed predominantly in fetal liver and embryonic erythrocytes...

2. Hemoglobin HbA Variant 1 complex (Mus musculus; 10090) EBI-9108241
Adult hemoglobin A (HbA) is expressed in erythrocytes in the bone marrow. Binds oxygen in the lungs and transports it to the various periph...

3. Hemoglobin HbA Variant 2 complex (Mus musculus; 10090) EBI-9105377
Adult hemoglobin A (HbA) is expressed in erythrocytes in the bone marrow. Binds oxygen in the lungs and transports it to the various periph...

4. Hemoglobin Portland-2 complex (Homo sapiens; 9606) EBI-9107700
Embryonic hemoglobin Portland-2 complex is found during early embryonic development, predominantly in the yolk sac. It is linked to severe ...

5. Hemoglobin Portland-1 Variant 1 complex (Homo sapiens; 9606) EBI-9107742
Embryonic hemoglobin Portland-1 complex is found during early embryonic development, predominantly in the yolk sac. It is linked to severe ...

6. Hemoglobin Portland-1 Variant 2 complex (Homo sapiens; 9606) EBI-9107795
Embryonic hemoglobin Portland-1 complex is found during early embryonic development, predominantly in the yolk sac. It is linked to severe ...

7. Hemoglobin HbF Variant 1 complex (Homo sapiens; 9606) EBI-9108045
Fetal hemoglobin (HbF) complex is expressed in the fetal liver from around 9 weeks gestation until 4-5 week after birth. It can be detected f...

8. Hemoglobin HbF Variant 2 complex (Homo sapiens; 9606) EBI-9108218
Fetal hemoglobin (HbF) complex is expressed in the fetal liver from around 9 weeks gestation until 4-5 week after birth. It can be detected f...

9. Hemoglobin HbA complex (Homo sapiens; 9606) EBI-9008420
Adult hemoglobin A (HbA) is expressed in erythrocytes in the bone marrow. Binds oxygen in the lungs and transports it to the various periph...

10. Hemoglobin HbA2 complex (Homo sapiens; 9606) EBI-9016042
Adult hemoglobin A2 (HbA2) is expressed in erythrocytes in the bone marrow. Binds oxygen in the lungs and transports it to the various periph...

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Database	Identifier	Description
chembi	ChEMBL2095168	
evidence code ontology	ECO:0000353	
gene ontology	GO:0005833	hemoglobin complex
gene ontology	GO:0005344	oxygen transporter activity
intact	EBI-1029796	
omim	140700	
omim	141749	
reactome	REACT_160621.1	
reactome	REACT_161051.1	
wwpdb	2dn1	
wwpdb	2dn2	

Coming soon

- Graphics – complex topological views auto-generated from XML files
- Structural views
- Links to tissue specific expression data
- Increased content