



# Full wwPDB X-ray Structure Validation Report ⓘ

Aug 7, 2020 – 03:23 PM BST

PDB ID : 3V64  
Title : Crystal Structure of agrin and LRP4  
Authors : Zong, Y.; Zhang, B.; Gu, S.; Lee, K.; Zhou, J.; Yao, G.; Figueiedo, D.; Perry, K.; Mei, L.; Jin, R.  
Deposited on : 2011-12-18  
Resolution : 2.85 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.13.1  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.13.1

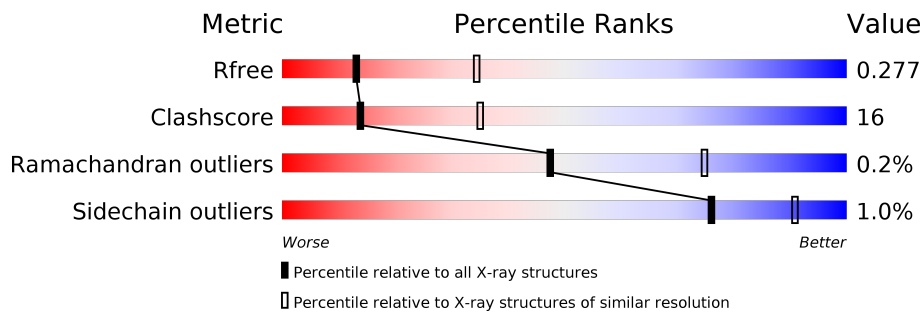
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.85 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	3168 (2.90-2.82)
Clashscore	141614	3438 (2.90-2.82)
Ramachandran outliers	138981	3348 (2.90-2.82)
Sidechain outliers	138945	3351 (2.90-2.82)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	C	349	
1	D	349	
2	A	191	
2	B	191	

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 8471 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Low-density lipoprotein receptor-related protein 4.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	C	338	2700	1697	498	490	15	0	0	0
1	D	334	2673	1683	492	483	15	0	0	0

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	738	LEU	-	expression tag	UNP Q9QYP1
C	739	GLU	-	expression tag	UNP Q9QYP1
C	740	VAL	-	expression tag	UNP Q9QYP1
C	741	LEU	-	expression tag	UNP Q9QYP1
C	742	PHE	-	expression tag	UNP Q9QYP1
C	743	GLN	-	expression tag	UNP Q9QYP1
C	744	GLY	-	expression tag	UNP Q9QYP1
D	738	LEU	-	expression tag	UNP Q9QYP1
D	739	GLU	-	expression tag	UNP Q9QYP1
D	740	VAL	-	expression tag	UNP Q9QYP1
D	741	LEU	-	expression tag	UNP Q9QYP1
D	742	PHE	-	expression tag	UNP Q9QYP1
D	743	GLN	-	expression tag	UNP Q9QYP1
D	744	GLY	-	expression tag	UNP Q9QYP1

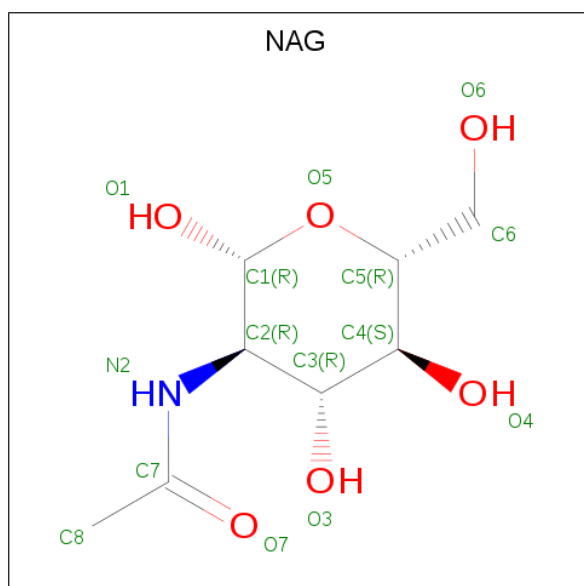
- Molecule 2 is a protein called agrin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	A	191	1470	927	263	277	3	0	0	0
2	B	190	1465	924	262	276	3	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1758	ALA	-	expression tag	UNP P25304
B	1758	ALA	-	expression tag	UNP P25304

- Molecule 3 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula:  $C_8H_{15}NO_6$ ).

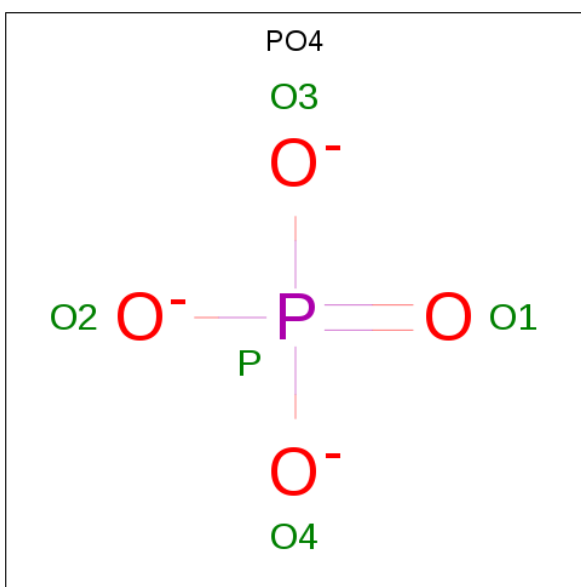


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
			Total	C	N	O		
3	C	1	Total	C	N	O	0	0
			14	8	1	5		
3	C	1	Total	C	N	O	0	0
			14	8	1	5		

- Molecule 4 is CALCIUM ION (three-letter code: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Ca		
4	B	1	Total	Ca	0	0
			1	1		
4	A	1	Total	Ca	0	0
			1	1		
4	D	2	Total	Ca	0	0
			2	2		
4	C	1	Total	Ca	0	0
			1	1		

- Molecule 5 is PHOSPHATE ION (three-letter code: PO4) (formula:  $O_4P$ ).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	C	1	Total O P 5 4 1	0	0
5	C	1	Total O P 5 4 1	0	0
5	A	1	Total O P 5 4 1	0	0
5	B	1	Total O P 5 4 1	0	0

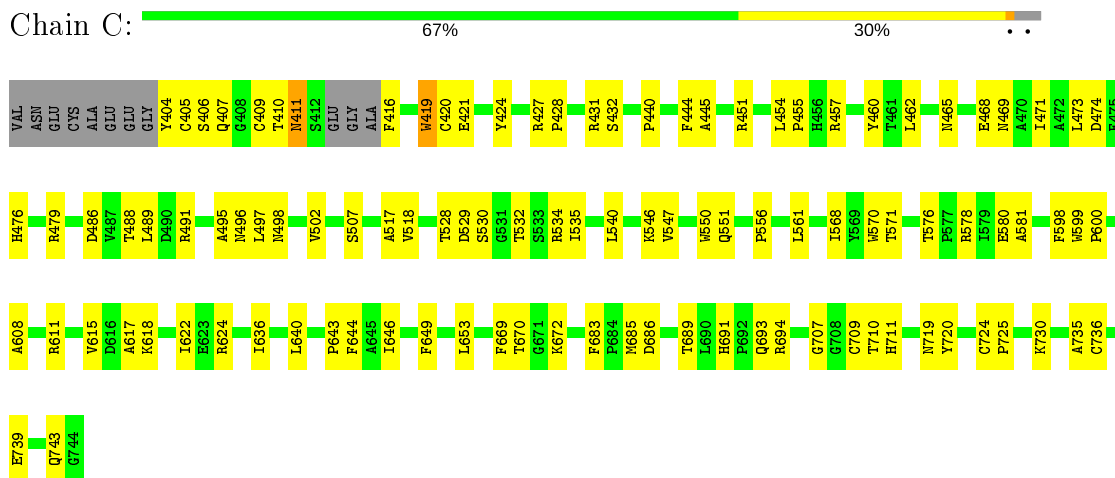
- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	C	39	Total O 39 39	0	0
6	A	25	Total O 25 25	0	0
6	B	18	Total O 18 18	0	0
6	D	28	Total O 28 28	0	0

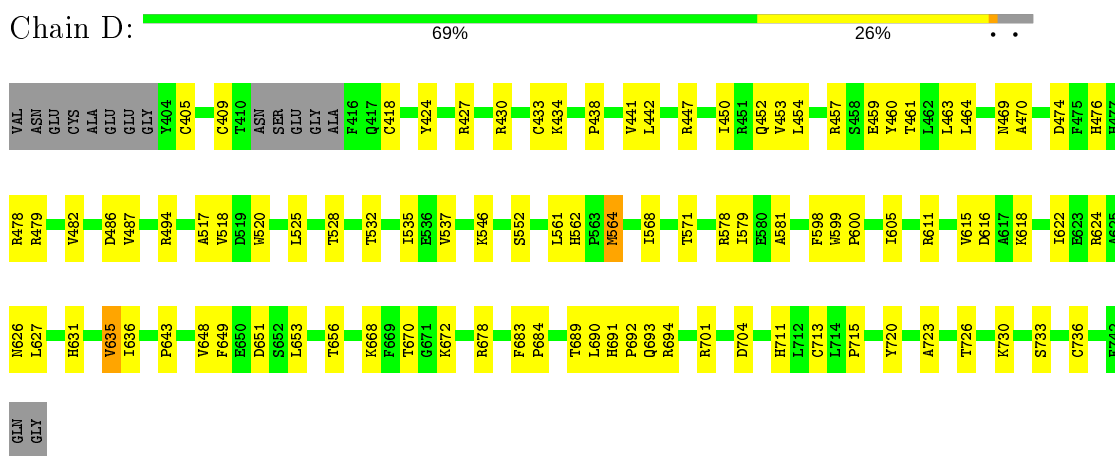
### 3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

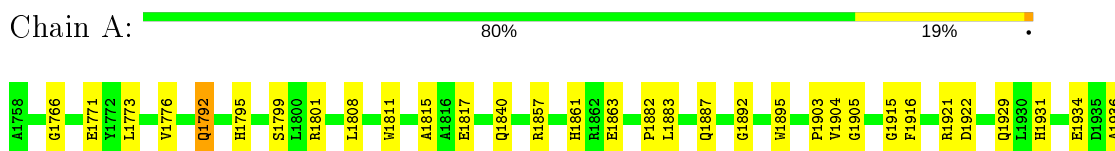
- Molecule 1: Low-density lipoprotein receptor-related protein 4



- Molecule 1: Low-density lipoprotein receptor-related protein 4



- Molecule 2: agrin



V1937  
T1938  
K1939

P1946  
T1947  
P1948

- Molecule 2: agrin

Chain B:  63% 36%

ALA  
L1759  
E1760  
T1761  
L1762  
G1766  
Y1769  
L1773  
Y1776  
I1777  
M1783  
A1787  
H1795  
F1796  
E1797  
L1798  
S1799  
I1800  
R1801  
Q1806  
G1807  
L1808  
Y1809  
L1810  
M1811  
I1812  
G1813  
K1814  
A1815  
A1819  
D1820  
Y1821  
M1822  
I1826  
Y1827  
D1828  
Q1832  
L1833  
S1834  
Y1835  
D1836  
L1837  
Q1840  
P1841  
V1842  
R1845

V1850  
H1861  
R1862  
E1863  
H1864  
R1865  
E1866  
G1867  
S1881  
P1882  
L1883  
T1886  
Q1887  
L1888  
D1891  
L1894  
G1898  
L1899  
Q1900  
K1901  
L1902  
P1903  
V1904  
G1905  
Q1906  
Y1912  
G1915  
R1921  
D1922  
V1923  
V1924  
L1930  
H1931  
L1932  
V1937  
P1944  
C1945  
P1946  
T1947  
P1948

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	99.46 Å 106.07 Å 112.06 Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	50.00 – 2.85 77.03 – 2.51	Depositor EDS
% Data completeness (in resolution range)	98.5 (50.00-2.85) 97.9 (77.03-2.51)	Depositor EDS
$R_{merge}$	0.12	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.48 (at 2.51 Å)	Xtrriage
Refinement program	PHENIX (phenix.refine: 1.7.1_743)	Depositor
R, $R_{free}$	0.203 , 0.273 0.235 , 0.277	Depositor DCC
$R_{free}$ test set	2034 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	44.5	Xtrriage
Anisotropy	0.382	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 61.0	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.91	EDS
Total number of atoms	8471	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	54.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.78% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.



## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: PO4, CA, NAG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	C	0.50	0/2773	0.50	0/3768
1	D	0.49	0/2746	0.51	0/3732
2	A	0.40	0/1499	0.51	0/2041
2	B	0.41	0/1494	0.57	0/2034
All	All	0.46	0/8512	0.52	0/11575

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	C	2700	0	2595	87	0
1	D	2673	0	2574	70	0
2	A	1470	0	1474	34	0
2	B	1465	0	1469	73	0
3	C	28	0	26	8	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	C	1	0	0	0	0
4	D	2	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	A	5	0	0	1	0
5	B	5	0	0	0	0
5	C	10	0	0	0	0
6	A	25	0	0	0	0
6	B	18	0	0	2	0
6	C	39	0	0	0	0
6	D	28	0	0	0	0
All	All	8471	0	8138	260	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 16.

All (260) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:A:1817:GLU:HG2	2:A:1904:VAL:HB	1.29	1.09
1:C:498:ASN:HB3	3:C:801:NAG:HN2	1.24	1.00
1:D:711:HIS:CD2	1:D:736:CYS:HB2	1.97	1.00
1:D:454:LEU:HD12	1:D:457:ARG:HH21	1.29	0.96
1:D:611:ARG:HD3	1:D:624:ARG:HD2	1.50	0.93
1:C:719:ASN:HD21	3:C:802:NAG:C1	1.83	0.92
2:B:1777:ILE:HG23	6:B:2101:HOH:O	1.70	0.91
2:B:1812:ILE:HD11	2:B:1894:LEU:HD13	1.53	0.91
1:C:719:ASN:ND2	3:C:802:NAG:C1	2.34	0.90
1:C:561:LEU:HD22	1:C:568:ILE:HD13	1.53	0.90
1:C:410:THR:O	1:C:411:ASN:HB2	1.69	0.90
1:C:498:ASN:CB	3:C:801:NAG:HN2	1.89	0.86
1:C:711:HIS:CD2	1:C:736:CYS:HB2	2.10	0.86
1:C:561:LEU:HD22	1:C:568:ILE:CD1	2.09	0.82
2:A:1946:PRO:O	2:A:1948:PRO:HD3	1.79	0.81
2:A:1773:LEU:HG	2:A:1937:VAL:HG21	1.62	0.80
1:C:498:ASN:HB3	3:C:801:NAG:N2	1.95	0.80
1:D:405:CYS:SG	1:D:409:CYS:HB3	2.23	0.78
2:B:1861:HIS:HE1	2:B:1863:GLU:HG3	1.48	0.78
1:C:404:TYR:O	1:C:431:ARG:HB3	1.85	0.76
1:C:615:VAL:HG11	1:C:643:PRO:HB2	1.66	0.76
2:B:1812:ILE:CD1	2:B:1894:LEU:HD13	2.15	0.75
2:B:1761:THR:O	2:B:1944:PRO:HA	1.88	0.74
1:C:622:ILE:HD12	1:C:640:LEU:HD11	1.68	0.74
1:D:450:ILE:O	1:D:463:LEU:HB2	1.91	0.71
2:B:1797:GLU:HB2	2:B:1924:VAL:HB	1.73	0.71

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:615:VAL:HG11	1:D:643:PRO:HB2	1.74	0.69
2:B:1773:LEU:HD12	2:B:1937:VAL:CG2	2.21	0.69
1:D:615:VAL:HG22	1:D:622:ILE:HG12	1.74	0.67
1:D:648:VAL:HG22	1:D:653:LEU:HD23	1.75	0.67
2:A:1922:ASP:HA	2:A:1929:GLN:HE22	1.58	0.67
2:B:1769:TYR:CD2	2:B:1900:GLN:HA	2.30	0.67
2:B:1904:VAL:HG23	2:B:1906:GLN:HG2	1.76	0.67
1:D:442:LEU:HB2	1:D:453:VAL:HG23	1.77	0.67
2:A:1795:HIS:N	5:A:2002:PO4:O4	2.22	0.67
2:B:1796:PHE:CZ	2:B:1812:ILE:HG13	2.30	0.67
1:D:528:THR:HG22	1:D:535:ILE:HG12	1.78	0.66
2:B:1901:LYS:C	2:B:1903:PRO:HD3	2.16	0.66
1:C:416:PHE:CD2	1:C:416:PHE:O	2.49	0.66
2:B:1776:VAL:HG12	2:B:1777:ILE:N	2.12	0.65
2:A:1936:ALA:HB3	2:A:1939:LYS:HD3	1.79	0.63
2:B:1822:MET:CE	2:B:1862:ARG:HD3	2.28	0.63
1:C:410:THR:O	1:C:411:ASN:CB	2.43	0.63
2:A:1817:GLU:CG	2:A:1904:VAL:HB	2.18	0.63
1:C:404:TYR:HB3	1:C:431:ARG:HD2	1.80	0.63
1:C:710:THR:OG1	1:C:735:ALA:HA	1.98	0.62
2:B:1932:LEU:HD12	2:B:1932:LEU:H	1.63	0.62
1:C:454:LEU:HD13	1:C:457:ARG:HH21	1.64	0.62
1:C:528:THR:HG22	1:C:535:ILE:HG12	1.81	0.62
2:B:1946:PRO:C	2:B:1948:PRO:HD3	2.19	0.62
1:D:626:ASN:OD1	1:D:631:HIS:HB2	1.99	0.61
1:C:576:THR:O	1:C:578:ARG:NE	2.33	0.61
2:B:1861:HIS:CE1	2:B:1863:GLU:HG3	2.33	0.61
1:C:534:ARG:HD2	1:C:547:VAL:HG11	1.83	0.61
1:D:424:TYR:HB3	1:D:433:CYS:HB3	1.83	0.61
2:B:1766:GLY:O	2:B:1915:GLY:HA3	2.01	0.60
1:D:711:HIS:HD2	1:D:736:CYS:HB2	1.62	0.60
1:C:407:GLN:OE1	1:C:608:ALA:HB1	2.02	0.60
1:C:689:THR:HB	1:C:694:ARG:HD3	1.82	0.60
1:D:454:LEU:CD1	1:D:457:ARG:HH21	2.09	0.60
1:C:404:TYR:CB	1:C:431:ARG:HD2	2.32	0.60
2:A:1931:HIS:HB3	2:A:1934:GLU:HG2	1.83	0.60
2:A:1776:VAL:HG12	2:A:1892:GLY:HA3	1.84	0.59
1:C:419:TRP:CD1	1:C:419:TRP:C	2.75	0.59
1:D:571:THR:HG22	1:D:579:ILE:HG12	1.84	0.59
2:A:1801:ARG:NH1	2:A:1947:THR:OG1	2.34	0.59
1:C:404:TYR:HB2	1:C:431:ARG:CZ	2.32	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:615:VAL:HG22	1:C:622:ILE:HG13	1.84	0.59
2:B:1832:GLN:HG2	2:B:1845:ARG:HG3	1.84	0.58
1:C:469:ASN:O	1:C:486:ASP:HA	2.03	0.58
1:C:530:SER:HA	1:C:556:PRO:HD2	1.84	0.58
2:B:1801:ARG:NH1	2:B:1948:PRO:HD2	2.19	0.58
1:D:452:GLN:HE21	1:D:463:LEU:HD21	1.68	0.58
2:B:1773:LEU:CD1	2:B:1937:VAL:CG2	2.82	0.57
1:D:635:VAL:HG23	1:D:636:ILE:HG13	1.85	0.57
2:A:1771:GLU:HB3	2:A:1938:THR:HB	1.88	0.56
2:B:1795:HIS:ND1	2:B:1861:HIS:HD2	2.03	0.56
1:C:462:LEU:HD21	1:C:465:ASN:HB2	1.87	0.56
2:B:1862:ARG:NH1	2:B:1864:HIS:O	2.38	0.56
2:B:1761:THR:HG22	2:B:1921:ARG:HB3	1.88	0.56
2:B:1795:HIS:ND1	2:B:1861:HIS:CD2	2.74	0.56
2:B:1808:LEU:HB2	2:B:1912:TYR:HA	1.87	0.56
2:A:1934:GLU:CD	2:A:1934:GLU:H	2.10	0.55
2:B:1822:MET:HE3	2:B:1862:ARG:HD3	1.88	0.55
2:B:1806:GLN:HG2	2:B:1828:ASP:H	1.72	0.55
2:B:1773:LEU:HD12	2:B:1937:VAL:HG22	1.87	0.55
2:B:1902:LEU:O	2:B:1902:LEU:HD12	2.06	0.55
2:B:1923:VAL:HB	2:B:1930:LEU:HB3	1.89	0.55
2:A:1857:ARG:HH12	2:A:1922:ASP:HB2	1.72	0.54
2:B:1812:ILE:HB	2:B:1822:MET:HB3	1.89	0.54
1:C:416:PHE:CG	1:C:416:PHE:O	2.59	0.54
1:C:469:ASN:HB2	1:C:488:THR:HG23	1.88	0.54
1:C:528:THR:HB	1:C:556:PRO:HB2	1.88	0.54
1:C:517:ALA:HB1	1:C:561:LEU:HG	1.90	0.54
1:C:405:CYS:SG	1:C:409:CYS:HB3	2.47	0.54
2:B:1822:MET:HE1	2:B:1862:ARG:HD3	1.90	0.53
2:B:1759:LEU:HD13	2:B:1760:GLU:N	2.23	0.53
2:B:1801:ARG:HH12	2:B:1948:PRO:HD2	1.74	0.53
1:C:622:ILE:HD13	1:C:636:ILE:HD13	1.90	0.53
1:D:447:ARG:HA	1:D:470:ALA:O	2.09	0.53
2:B:1795:HIS:HB2	2:B:1861:HIS:HD2	1.72	0.53
2:B:1899:LEU:C	2:B:1901:LYS:H	2.12	0.53
1:C:646:ILE:HD11	1:C:653:LEU:HD22	1.90	0.53
1:D:730:LYS:HE2	1:D:733:SER:HA	1.92	0.52
2:B:1811:TRP:NE1	2:B:1813:GLY:HA3	2.25	0.52
2:B:1799:SER:HB2	2:B:1921:ARG:HG2	1.91	0.52
1:D:476:HIS:ND1	1:D:478:ARG:O	2.24	0.52
1:D:546:LYS:HE3	1:D:723:ALA:HB1	1.92	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:568:ILE:O	1:D:581:ALA:HA	2.10	0.52
2:B:1862:ARG:NH2	2:B:1888:LEU:HB2	2.25	0.52
1:D:454:LEU:HD12	1:D:457:ARG:NH2	2.12	0.52
1:C:719:ASN:HD21	3:C:802:NAG:C2	2.22	0.52
1:C:561:LEU:CD2	1:C:568:ILE:HD13	2.35	0.51
2:B:1773:LEU:CD1	2:B:1937:VAL:HG21	2.40	0.51
1:C:529:ASP:HB3	1:C:532:THR:HB	1.91	0.51
1:C:404:TYR:HB3	1:C:431:ARG:CD	2.41	0.51
1:D:454:LEU:N	1:D:459:GLU:OE1	2.43	0.51
2:A:1771:GLU:HG2	2:A:1937:VAL:HB	1.91	0.51
1:C:495:ALA:HB2	1:C:502:VAL:HG12	1.93	0.51
1:C:724:CYS:SG	1:C:730:LYS:HD2	2.51	0.51
1:D:452:GLN:HB2	1:D:461:THR:HB	1.93	0.51
2:A:1808:LEU:O	2:A:1916:PHE:HB2	2.11	0.51
1:D:453:VAL:CG1	1:D:678:ARG:HH11	2.24	0.50
1:D:651:ASP:HA	1:D:668:LYS:HE2	1.93	0.50
1:D:450:ILE:HD12	1:D:464:LEU:HD12	1.94	0.50
1:D:598:PHE:HB3	1:D:618:LYS:HB3	1.92	0.50
2:B:1902:LEU:N	2:B:1903:PRO:HD3	2.27	0.50
2:B:1840:GLN:HB3	2:B:1841:PRO:HD2	1.93	0.50
1:C:498:ASN:CB	3:C:801:NAG:N2	2.65	0.50
2:B:1795:HIS:HB2	2:B:1861:HIS:CD2	2.46	0.50
2:B:1840:GLN:O	2:B:1882:PRO:HD2	2.11	0.50
2:B:1842:VAL:HB	2:B:1881:SER:HA	1.94	0.50
2:B:1862:ARG:HH21	2:B:1888:LEU:HB2	1.76	0.50
1:D:713:CYS:SG	1:D:720:TYR:CD1	3.05	0.50
2:A:1795:HIS:HB2	2:A:1861:HIS:CD2	2.47	0.49
1:D:474:ASP:HB3	1:D:518:VAL:HG23	1.94	0.49
1:C:615:VAL:HG13	1:C:643:PRO:HG2	1.93	0.49
1:C:550:TRP:CZ3	1:C:551:GLN:HG2	2.48	0.49
1:D:459:GLU:HG2	1:D:460:TYR:N	2.27	0.49
1:C:495:ALA:CB	1:C:502:VAL:HG12	2.42	0.49
1:D:469:ASN:O	1:D:486:ASP:HA	2.13	0.49
1:C:476:HIS:CE1	1:C:479:ARG:HG3	2.48	0.48
1:D:691:HIS:HD2	1:D:693:GLN:HB2	1.77	0.48
2:B:1946:PRO:O	2:B:1948:PRO:HD3	2.14	0.48
1:D:615:VAL:CG1	1:D:643:PRO:HG2	2.43	0.48
2:A:1817:GLU:HA	2:A:1905:GLY:H	1.77	0.48
2:B:1821:TYR:CE2	2:B:1836:ASP:HB2	2.48	0.48
2:B:1865:ARG:HG3	2:B:1886:THR:HG22	1.95	0.48
1:C:571:THR:HB	1:C:600:PRO:HB2	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:615:VAL:CG1	1:C:643:PRO:HG2	2.43	0.48
1:C:468:GLU:HG3	1:C:489:LEU:HD21	1.95	0.48
2:A:1840:GLN:HB2	2:A:1882:PRO:HG2	1.95	0.48
2:A:1946:PRO:C	2:A:1948:PRO:HD3	2.32	0.48
1:C:406:SER:OG	1:C:432:SER:HA	2.14	0.48
1:D:520:TRP:HZ2	1:D:564:MET:HE1	1.79	0.48
2:B:1776:VAL:CG1	2:B:1777:ILE:N	2.76	0.47
2:B:1832:GLN:HG2	2:B:1845:ARG:CG	2.44	0.47
2:A:1801:ARG:HH12	2:A:1947:THR:HG1	1.57	0.47
2:B:1773:LEU:CD1	2:B:1937:VAL:HG22	2.45	0.47
2:B:1819:ALA:HB2	2:B:1906:GLN:CD	2.35	0.47
1:C:496:ASN:OD1	1:C:497:LEU:N	2.48	0.47
1:D:615:VAL:HG11	1:D:643:PRO:CB	2.43	0.47
2:B:1883:LEU:HD22	1:D:532:THR:HG23	1.96	0.47
1:C:534:ARG:HD2	1:C:547:VAL:CG1	2.44	0.47
1:C:546:LYS:HB2	1:C:725:PRO:HA	1.97	0.47
2:B:1796:PHE:HZ	2:B:1812:ILE:HG13	1.77	0.47
1:D:701:ARG:HD2	1:D:715:PRO:HB3	1.95	0.47
2:B:1777:ILE:CG2	6:B:2101:HOH:O	2.46	0.47
1:C:689:THR:HB	1:C:694:ARG:CD	2.44	0.47
1:C:719:ASN:CG	3:C:802:NAG:C1	2.83	0.47
2:B:1826:ILE:HG21	2:B:1850:VAL:HG21	1.96	0.47
2:B:1808:LEU:HD22	2:B:1912:TYR:O	2.16	0.46
1:D:711:HIS:NE2	1:D:736:CYS:HB2	2.26	0.46
1:D:520:TRP:HZ2	1:D:564:MET:CE	2.28	0.46
1:C:488:THR:HG22	2:B:1787:ALA:HB1	1.98	0.46
2:B:1834:SER:HA	2:B:1842:VAL:O	2.16	0.46
2:A:1811:TRP:HB3	2:A:1895:TRP:HB2	1.96	0.46
1:D:453:VAL:HG11	1:D:678:ARG:HH11	1.80	0.46
2:A:1840:GLN:O	2:A:1882:PRO:HD2	2.16	0.46
1:D:520:TRP:CZ2	1:D:564:MET:CE	2.99	0.46
1:C:469:ASN:ND2	1:C:471:ILE:HD11	2.31	0.45
1:D:552:SER:O	1:D:578:ARG:NH2	2.49	0.45
2:A:1861:HIS:HE1	2:A:1863:GLU:HG2	1.80	0.45
2:B:1810:LEU:HD11	2:B:1894:LEU:CD1	2.46	0.45
2:A:1766:GLY:O	2:A:1915:GLY:HA3	2.17	0.45
1:C:474:ASP:HB3	1:C:518:VAL:HG23	1.99	0.45
2:A:1861:HIS:CE1	2:A:1863:GLU:HG2	2.52	0.45
1:C:611:ARG:HD3	1:C:624:ARG:HD2	1.96	0.45
1:C:711:HIS:NE2	1:C:736:CYS:HB2	2.29	0.45
1:D:525:LEU:O	1:D:537:VAL:HA	2.16	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:571:THR:HB	1:D:600:PRO:HB2	1.98	0.45
1:D:605:ILE:HG23	1:D:627:LEU:HD11	1.98	0.45
2:B:1796:PHE:HE2	2:B:1822:MET:SD	2.39	0.45
1:C:570:TRP:CZ2	1:C:580:GLU:HB2	2.53	0.44
2:B:1761:THR:HB	2:B:1945:CYS:HB2	1.99	0.44
2:B:1862:ARG:HA	2:B:1867:GLY:HA2	1.99	0.44
1:C:617:ALA:HA	1:C:643:PRO:HD2	2.00	0.44
1:D:649:PHE:HB2	1:D:689:THR:HG21	2.00	0.44
1:D:562:HIS:CE1	1:D:564:MET:HG3	2.53	0.43
2:B:1837:LEU:HD21	2:B:1862:ARG:CZ	2.48	0.43
1:C:444:PHE:HA	1:C:686:ASP:O	2.18	0.43
1:D:520:TRP:CZ2	1:D:564:MET:HE2	2.53	0.43
2:A:1815:ALA:HA	2:A:1903:PRO:HG3	2.00	0.43
1:C:691:HIS:HE1	1:C:693:GLN:HG2	1.83	0.43
1:C:568:ILE:O	1:C:581:ALA:HA	2.18	0.43
2:A:1792:GLN:NE2	2:A:1887:GLN:HG2	2.33	0.43
1:C:451:ARG:NH1	1:C:460:TYR:OH	2.50	0.43
1:C:644:PHE:HD2	1:C:685:MET:O	2.01	0.43
1:D:418:CYS:HB2	1:D:430:ARG:O	2.18	0.43
2:A:1792:GLN:NE2	2:A:1887:GLN:HE21	2.17	0.43
1:C:427:ARG:HB3	1:C:428:PRO:HD2	2.00	0.43
2:B:1899:LEU:O	2:B:1901:LYS:N	2.48	0.43
2:B:1904:VAL:HG23	2:B:1906:GLN:CG	2.46	0.43
1:D:518:VAL:HG22	1:D:525:LEU:HD12	2.00	0.43
1:C:445:ALA:HB2	1:C:473:LEU:HD23	2.01	0.43
1:D:517:ALA:HB1	1:D:561:LEU:HG	2.00	0.43
1:C:561:LEU:CD2	1:C:568:ILE:CD1	2.90	0.42
1:D:469:ASN:HD22	1:D:487:VAL:HG22	1.85	0.42
1:D:649:PHE:CD1	1:D:694:ARG:HG2	2.55	0.42
2:A:1936:ALA:CB	2:A:1939:LYS:HD3	2.47	0.42
1:D:691:HIS:CG	1:D:692:PRO:HD2	2.54	0.42
1:C:534:ARG:NH1	2:A:1883:LEU:HD23	2.35	0.42
1:C:410:THR:HG1	1:C:419:TRP:HZ3	1.66	0.42
1:C:622:ILE:HD12	1:C:640:LEU:CD1	2.45	0.42
1:D:670:THR:HB	1:D:672:LYS:HD2	2.01	0.42
2:A:1811:TRP:CZ2	2:A:1903:PRO:HG2	2.54	0.42
1:D:478:ARG:O	1:D:479:ARG:HB3	2.19	0.42
1:D:720:TYR:CD1	1:D:720:TYR:C	2.93	0.42
2:A:1840:GLN:HA	2:A:1840:GLN:OE1	2.20	0.42
1:C:670:THR:HG22	1:C:672:LYS:H	1.84	0.42
1:D:441:VAL:HB	1:D:690:LEU:HB3	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:454:LEU:HA	1:C:455:PRO:HD2	1.93	0.41
1:D:564:MET:H	1:D:564:MET:HG2	1.52	0.41
2:B:1808:LEU:HG	2:B:1898:GLY:HA2	2.02	0.41
1:D:656:THR:HB	1:D:684:PRO:HB2	2.02	0.41
1:D:704:ASP:O	1:D:704:ASP:CG	2.58	0.41
1:D:599:TRP:O	1:D:616:ASP:HA	2.20	0.41
1:C:719:ASN:HB3	1:C:720:TYR:H	1.70	0.41
1:C:739:GLU:O	1:C:743:GLN:HG3	2.20	0.41
1:D:438:PRO:O	1:D:691:HIS:HE1	2.04	0.41
1:C:707:GLY:C	1:C:709:CYS:H	2.24	0.41
2:B:1762:LEU:CD1	2:B:1932:LEU:HB3	2.51	0.41
2:B:1815:ALA:HB3	2:B:1891:ASP:OD2	2.20	0.41
1:D:427:ARG:HD3	1:D:434:LYS:HD2	2.03	0.41
1:C:599:TRP:CE2	2:B:1783:ASN:HB2	2.56	0.41
1:C:598:PHE:HB3	1:C:618:LYS:HB3	2.02	0.41
1:C:411:ASN:O	1:C:411:ASN:OD1	2.39	0.41
1:C:421:GLU:O	1:C:424:TYR:HB2	2.21	0.41
1:D:546:LYS:HA	1:D:726:THR:HG23	2.01	0.41
2:A:1795:HIS:ND1	2:A:1861:HIS:HD2	2.18	0.40
1:D:482:VAL:O	1:D:494:ARG:HA	2.21	0.40
1:D:615:VAL:HG11	1:D:643:PRO:CG	2.51	0.40
1:C:491:ARG:HD3	1:C:507:SER:HA	2.03	0.40
1:C:462:LEU:CD2	1:C:465:ASN:HB2	2.52	0.40
1:D:711:HIS:HD2	1:D:736:CYS:CB	2.32	0.40
2:B:1806:GLN:NE2	2:B:1828:ASP:OD1	2.55	0.40
2:B:1769:TYR:CE2	2:B:1900:GLN:HA	2.56	0.40
2:A:1799:SER:HB2	2:A:1921:ARG:HG3	2.04	0.40
1:C:440:PRO:HG3	1:C:649:PHE:CE2	2.56	0.40
1:C:598:PHE:CD2	1:C:618:LYS:HG2	2.57	0.40

There are no symmetry-related clashes.

## 5.3 Torsion angles

### 5.3.1 Protein backbone

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.



Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	334/349 (96%)	308 (92%)	25 (8%)	1 (0%)	41	68
1	D	330/349 (95%)	300 (91%)	30 (9%)	0	100	100
2	A	189/191 (99%)	179 (95%)	10 (5%)	0	100	100
2	B	188/191 (98%)	179 (95%)	8 (4%)	1 (0%)	29	57
All	All	1041/1080 (96%)	966 (93%)	73 (7%)	2 (0%)	47	75

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	411	ASN
2	B	1900	GLN

### 5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	C	290/297 (98%)	285 (98%)	5 (2%)	60	83
1	D	287/297 (97%)	284 (99%)	3 (1%)	76	91
2	A	156/156 (100%)	155 (99%)	1 (1%)	86	95
2	B	156/156 (100%)	156 (100%)	0	100	100
All	All	889/906 (98%)	880 (99%)	9 (1%)	76	91

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	419	TRP
1	C	420	CYS
1	C	540	LEU
1	C	669	PHE
1	C	683	PHE
2	A	1792	GLN
1	D	564	MET
1	D	635	VAL
1	D	683	PHE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (16) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	682	HIS
1	C	719	ASN
2	A	1792	GLN
2	A	1861	HIS
2	A	1864	HIS
2	A	1887	GLN
2	A	1929	GLN
2	B	1832	GLN
2	B	1861	HIS
2	B	1864	HIS
2	B	1927	HIS
1	D	501	ASN
1	D	688	HIS
1	D	691	HIS
1	D	706	ASN
1	D	711	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

### 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

### 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

Of 11 ligands modelled in this entry, 5 are monoatomic - leaving 6 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the

expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
5	PO4	A	2002	-	4,4,4	1.03	0	6,6,6	0.42	0
5	PO4	C	805	-	4,4,4	0.89	0	6,6,6	0.45	0
3	NAG	C	801	1	14,14,15	0.61	0	17,19,21	0.86	0
5	PO4	B	2002	-	4,4,4	0.92	0	6,6,6	0.41	0
3	NAG	C	802	-	14,14,15	0.56	0	17,19,21	0.85	0
5	PO4	C	804	-	4,4,4	0.90	0	6,6,6	0.39	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	C	802	-	-	2/6/23/26	0/1/1/1
3	NAG	C	801	1	-	3/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	802	NAG	O5-C5-C6-O6
3	C	802	NAG	C4-C5-C6-O6
3	C	801	NAG	C4-C5-C6-O6
3	C	801	NAG	C1-C2-N2-C7
3	C	801	NAG	O5-C5-C6-O6

There are no ring outliers.

3 monomers are involved in 9 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	2002	PO4	1	0
3	C	801	NAG	4	0
3	C	802	NAG	4	0

## 5.7 Other polymers

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

## 6 Fit of model and data

### 6.1 Protein, DNA and RNA chains

Unable to reproduce the depositors R factor - this section is therefore empty.

### 6.2 Non-standard residues in protein, DNA, RNA chains

Unable to reproduce the depositors R factor - this section is therefore empty.

### 6.3 Carbohydrates

Unable to reproduce the depositors R factor - this section is therefore empty.

### 6.4 Ligands

Unable to reproduce the depositors R factor - this section is therefore empty.

### 6.5 Other polymers

Unable to reproduce the depositors R factor - this section is therefore empty.