Full wwPDB X-ray Structure Validation Report ⓘ

Oct 29, 2024 – 09:06 AM EDT

PDB ID	:	3S9M
Title	:	Complex between transferrin receptor 1 and transferrin with iron in the N-Lobe, cryocooled 1
Authors	:	Eckenroth, B.E.; Steere, A.N.; Mason, A.B.; Everse, S.J.
Deposited on	:	2011-06-01
Resolution	:	3.32 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*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

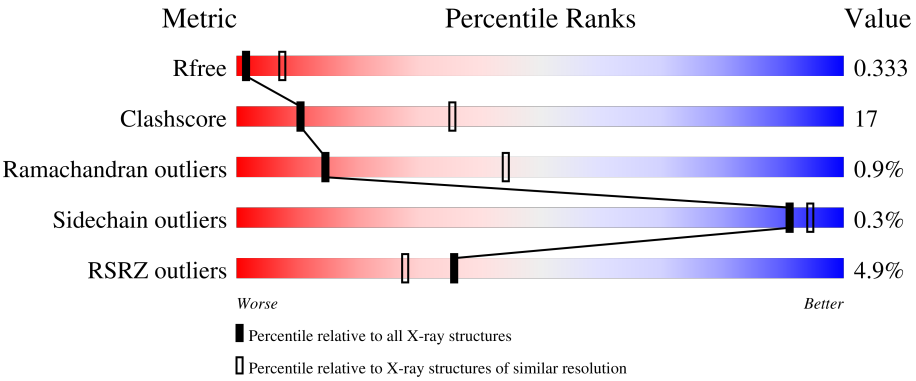
MolProbity	:	4.02b-467
Mogul	:	2022.3.0, CSD as543be (2022)
Xtriage (Phenix)	:	1.20.1
EDS	:	3.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.003 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 3.32 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}	164625	1066 (3.34-3.30)
Clashscore	180529	1111 (3.34-3.30)
Ramachandran outliers	177936	1109 (3.34-3.30)
Sidechain outliers	177891	1108 (3.34-3.30)
RSRZ outliers	164620	1066 (3.34-3.30)

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 of the lower bar indicate the fraction of residues that contain outliers for >=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 <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	654	4% 68% 29%
1	B	654	5% 69% 28%
2	C	693	5% 56% 18% 25%
2	D	693	3% 58% 12% 30%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard

residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
5	CO3	D	905	-	-	X	-

2 Entry composition (i)

There are 6 unique types of molecules in this entry. The entry contains 16658 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 Transferrin receptor protein 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	638	Total	C	N	O	S	0	0	0
			4917	3149	820	934	14			
1	B	639	Total	C	N	O	S	0	0	0
			4773	3056	790	913	14			

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	107	VAL	-	expression tag	UNP P02786
A	108	PRO	-	expression tag	UNP P02786
A	109	ASP	-	expression tag	UNP P02786
A	110	LYS	-	expression tag	UNP P02786
A	111	HIS	-	expression tag	UNP P02786
A	112	HIS	-	expression tag	UNP P02786
A	113	HIS	-	expression tag	UNP P02786
A	114	HIS	-	expression tag	UNP P02786
A	115	HIS	-	expression tag	UNP P02786
A	116	HIS	-	expression tag	UNP P02786
A	117	ILE	-	expression tag	UNP P02786
A	118	GLU	-	expression tag	UNP P02786
A	119	GLY	-	expression tag	UNP P02786
A	142	SER	GLY	SEE REMARK 999	UNP P02786
B	107	VAL	-	expression tag	UNP P02786
B	108	PRO	-	expression tag	UNP P02786
B	109	ASP	-	expression tag	UNP P02786
B	110	LYS	-	expression tag	UNP P02786
B	111	HIS	-	expression tag	UNP P02786
B	112	HIS	-	expression tag	UNP P02786
B	113	HIS	-	expression tag	UNP P02786
B	114	HIS	-	expression tag	UNP P02786
B	115	HIS	-	expression tag	UNP P02786
B	116	HIS	-	expression tag	UNP P02786
B	117	ILE	-	expression tag	UNP P02786

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Chain	Residue	Modelled	Actual	Comment	Reference
B	118	GLU	-	expression tag	UNP P02786
B	119	GLY	-	expression tag	UNP P02786
B	142	SER	GLY	SEE REMARK 999	UNP P02786

- Molecule 2 is a protein called Serotransferrin.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	517	Total	C	N	O	S	0	0	0
			3682	2305	623	718	36			
2	D	488	Total	C	N	O	S	0	0	0
			3246	1988	565	662	31			

There are 38 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-13	VAL	-	expression tag	UNP P02787
C	-12	PRO	-	expression tag	UNP P02787
C	-11	ASP	-	expression tag	UNP P02787
C	-10	LYS	-	expression tag	UNP P02787
C	-9	HIS	-	expression tag	UNP P02787
C	-8	HIS	-	expression tag	UNP P02787
C	-7	HIS	-	expression tag	UNP P02787
C	-6	HIS	-	expression tag	UNP P02787
C	-5	HIS	-	expression tag	UNP P02787
C	-4	HIS	-	expression tag	UNP P02787
C	-3	ILE	-	expression tag	UNP P02787
C	-2	GLU	-	expression tag	UNP P02787
C	-1	GLY	-	expression tag	UNP P02787
C	0	ARG	-	expression tag	UNP P02787
C	413	ASP	ASN	engineered mutation	UNP P02787
C	426	PHE	TYR	engineered mutation	UNP P02787
C	429	VAL	ILE	SEE REMARK 999	UNP P02787
C	517	PHE	TYR	engineered mutation	UNP P02787
C	611	ASP	ASN	engineered mutation	UNP P02787
D	-13	VAL	-	expression tag	UNP P02787
D	-12	PRO	-	expression tag	UNP P02787
D	-11	ASP	-	expression tag	UNP P02787
D	-10	LYS	-	expression tag	UNP P02787
D	-9	HIS	-	expression tag	UNP P02787
D	-8	HIS	-	expression tag	UNP P02787
D	-7	HIS	-	expression tag	UNP P02787
D	-6	HIS	-	expression tag	UNP P02787

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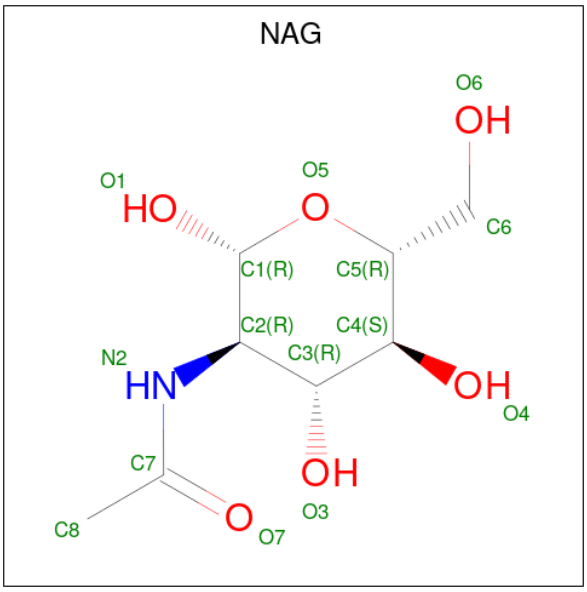
Chain	Residue	Modelled	Actual	Comment	Reference
D	-5	HIS	-	expression tag	UNP P02787
D	-4	HIS	-	expression tag	UNP P02787
D	-3	ILE	-	expression tag	UNP P02787
D	-2	GLU	-	expression tag	UNP P02787
D	-1	GLY	-	expression tag	UNP P02787
D	0	ARG	-	expression tag	UNP P02787
D	413	ASP	ASN	engineered mutation	UNP P02787
D	426	PHE	TYR	engineered mutation	UNP P02787
D	429	VAL	ILE	SEE REMARK 999	UNP P02787
D	517	PHE	TYR	engineered mutation	UNP P02787
D	611	ASP	ASN	engineered mutation	UNP P02787

- 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
3	A	1	Total C N O 14 8 1 5	0	0
3	B	1	Total C N O 14 8 1 5	0	0

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

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	1	Total Ca 1 1	0	0

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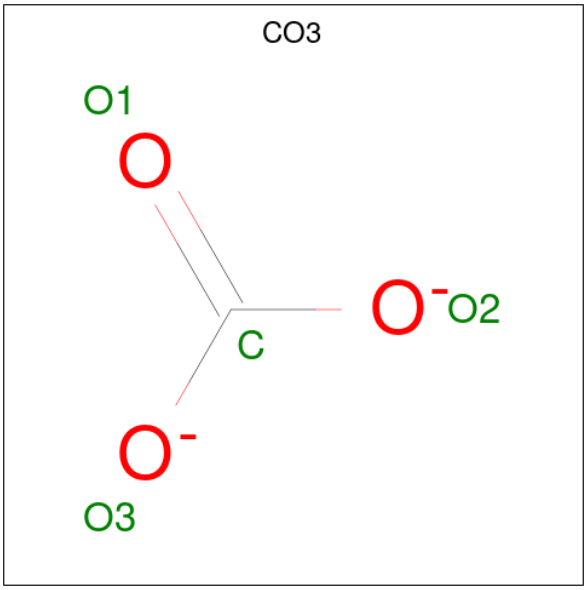
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total Ca 1 1	0	0

- Molecule 5 is CARBONATE ION (three-letter code: CO3) (formula: CO_3).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	C	1	Total C O 4 1 3	0	0
5	D	1	Total C O 4 1 3	0	0

- Molecule 6 is FE (III) ION (three-letter code: FE) (formula: Fe).

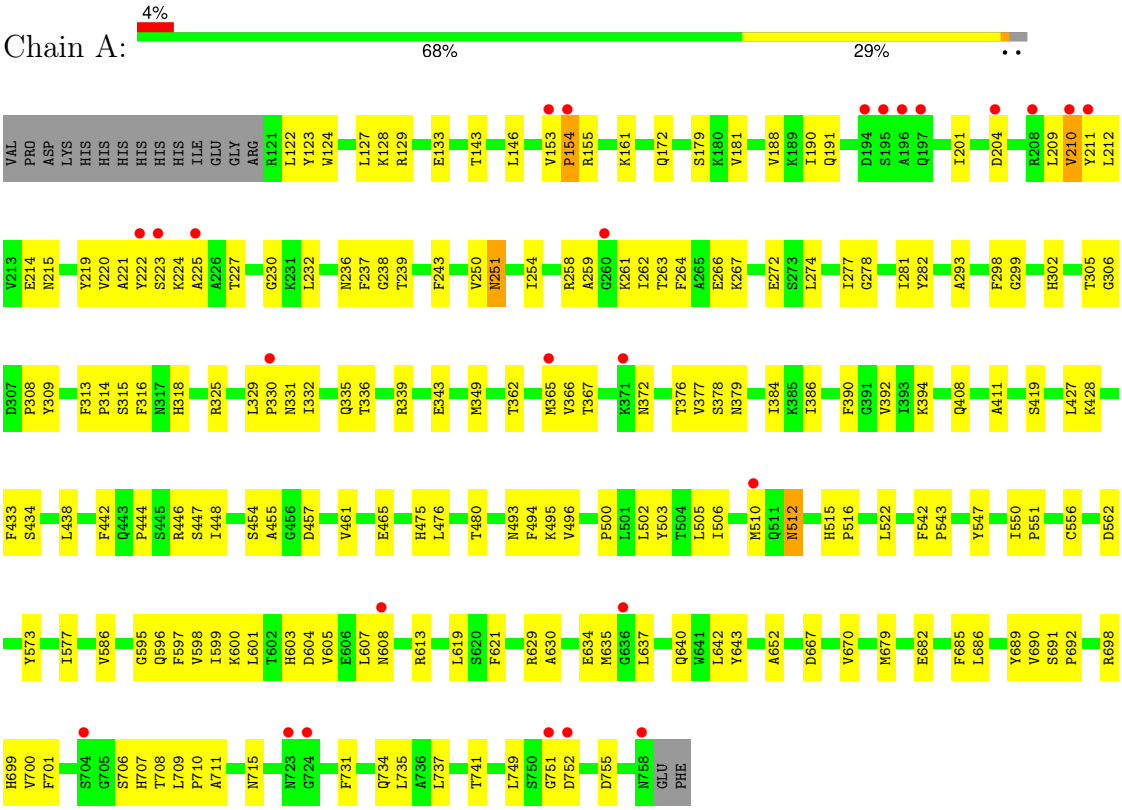
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	C	1	Total Fe 1 1	0	0
6	D	1	Total Fe 1 1	0	0

3 Residue-property plots (i)

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 and electron density. 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. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). 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.

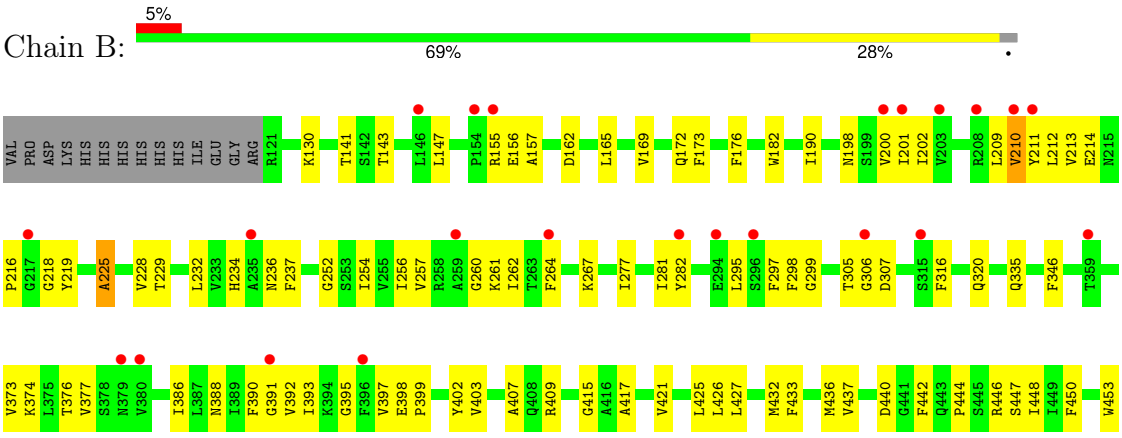
• Molecule 1: Transferrin receptor protein 1

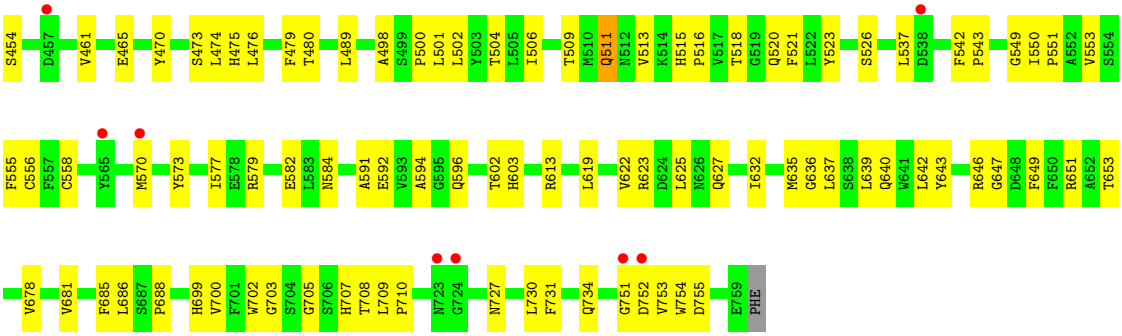
Chain A:



• Molecule 1: Transferrin receptor protein 1

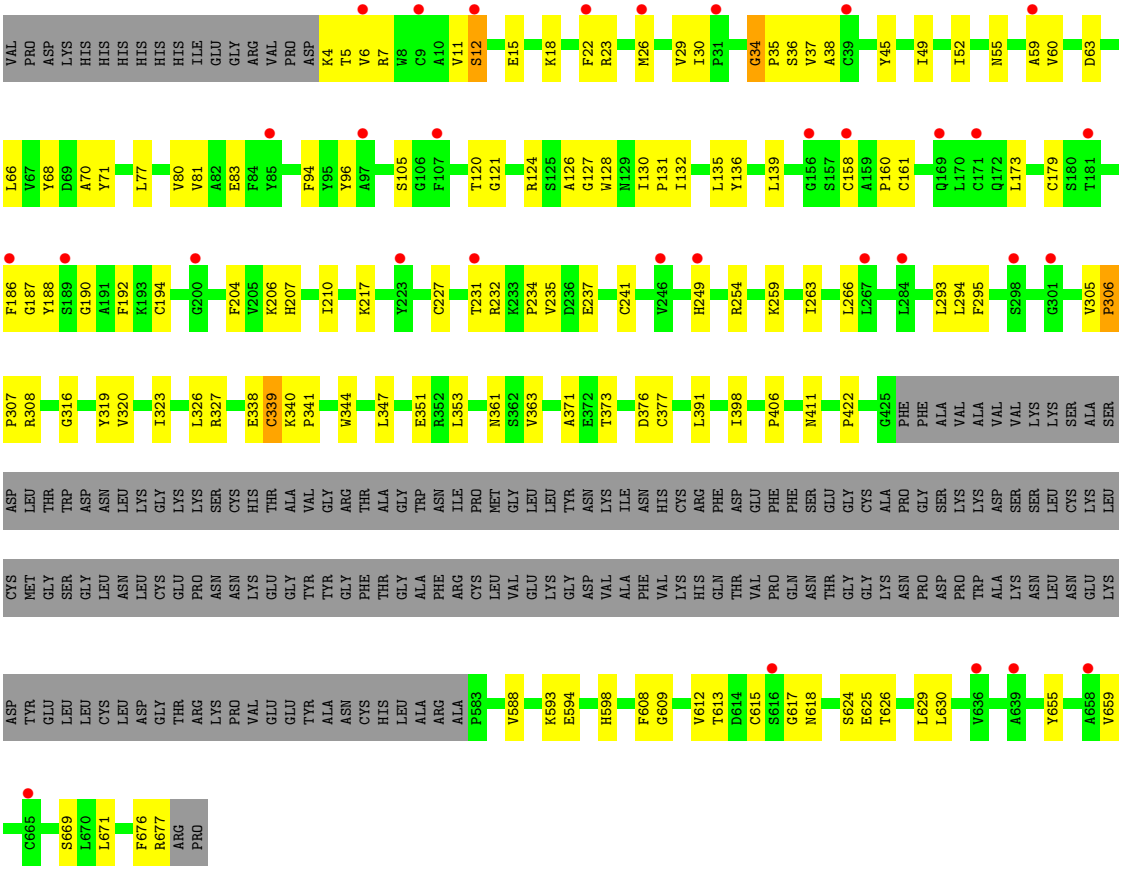
Chain B:





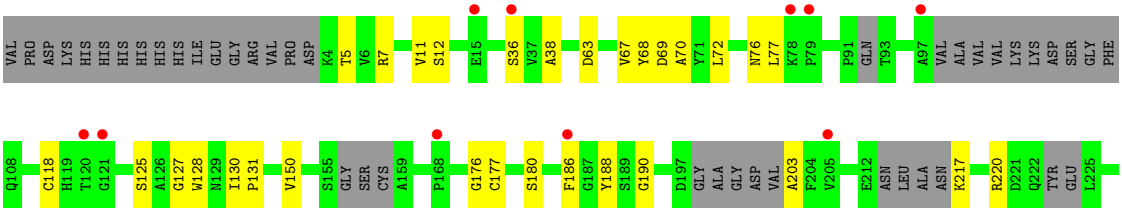
• Molecule 2: Serotransferrin

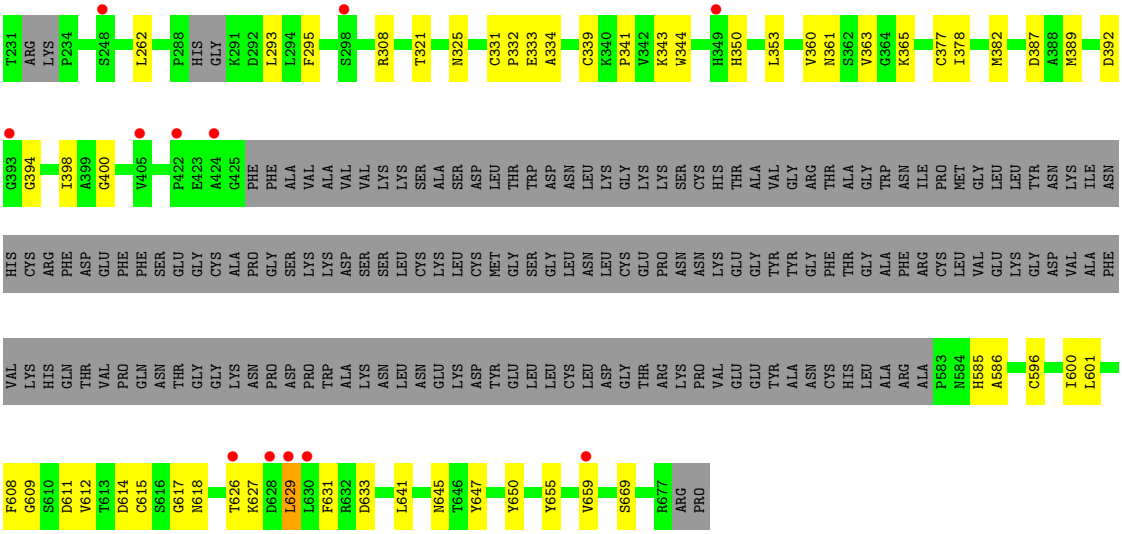
Chain C:



• Molecule 2: Serotransferrin

Chain D:




T231 ARG LYS P234 S248 L262 P288 HIS GLY K291 D292 L293 L294 F295 S298 R308 T321 N325 C331 P332 E333 A334 C339 K340 P341 V342 K343 W344 H349 H350 L353 V360 N361 S362 V363 G364 K365 C377 I378 M382 D387 A388 M389 D392
G393 G394 I398 A399 G400 V405 P422 E423 A424 G425 PHE PHE ALA VAL ALA VAL VAL LYS LYS SER ALA SER ASP LEU THR TRP ASP ASN LEU LYS GLY LYS LYS SER CYS HIS THR ALA VAL GLY ARG THR ALA GLY TRP ASN ILE PRO MET GLY LEU LEU TYR ASN LYS ILE ASN
HIS CYS ARG PHE ASP GLU PHE PHE SER GLU GLY CYS ALA PRO GLY SER LYS LYS ASP SER SER LEU CYS LYS LEU CYS MET GLY SER GLY LEU ASN LEU CYS GLU PRO ASN ASN LYS GLU GLY TYR TYR GLY PHE THR GLY ALA PHE ARG CYS LEU VAL GLU LYS GLY ASP VAL ALA PHE
VAL LYS HIS GLN THR VAL PRO GLN ASN THR GLY GLY LYS ASN PRO ASP PRO TRP ALA LYS ASN LEU ASN GLU LYS ASP TYR GLU LEU LEU CYS LEU ASP GLY THR ARG LYS PRO VAL GLU GLU TYR ALA ASN CYS HIS LEU ALA ARG ALA P583 N584 H585 A586 C596 I600 L601
F608 G609 S610 D611 V612 T613 D614 C615 S616 G617 N618 T626 K627 D628 L629 L630 F631 R632 D633 L641 N645 T646 Y647 Y650 Y655 V659 S669 R677 ARG PRO

4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 43 2 2	Depositor
Cell constants a, b, c, α, β, γ	232.19Å 232.19Å 168.31Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	17.00 – 3.32 17.00 – 3.32	Depositor EDS
% Data completeness (in resolution range)	96.6 (17.00-3.32) 95.9 (17.00-3.32)	Depositor EDS
R_{merge}	0.17	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.92 (at 3.34Å)	Xtriage
Refinement program	CNS	Depositor
R, R_{free}	0.282 , 0.332 0.284 , 0.333	Depositor DCC
R_{free} test set	6560 reflections (10.04%)	wwPDB-VP
Wilson B-factor (Å^2)	77.1	Xtriage
Anisotropy	0.458	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.24 , 59.8	EDS
L-test for twinning[2]	$< \|L\| > = 0.47$, $< L^2 > = 0.30$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.89	EDS
Total number of atoms	16658	wwPDB-VP
Average B, all atoms (Å^2)	105.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.46% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAG, FE, CA, CO3

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	A	0.43	0/5036	0.63	0/6862
1	B	0.42	0/4891	0.60	2/6688 (0.0%)
2	C	0.38	0/3760	0.58	0/5134
2	D	0.32	0/3296	0.53	0/4507
All	All	0.39	0/16983	0.59	2/23191 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	B	316	PHE	O-C-N	-7.63	110.49	122.70
1	B	316	PHE	CA-C-N	5.83	130.03	117.20

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	309	TYR	Sidechain

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	A	4917	0	4680	193	0
1	B	4773	0	4386	158	0
2	C	3682	0	3265	117	0
2	D	3246	0	2625	63	0
3	A	14	0	13	0	0
3	B	14	0	13	0	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
5	C	4	0	0	0	0
5	D	4	0	0	4	0
6	C	1	0	0	0	0
6	D	1	0	0	0	0
All	All	16658	0	14982	525	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 17.

All (525) 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)
1:A:751:GLY:O	1:A:755:ASP:HB2	1.33	1.29
1:B:489:LEU:HD12	1:B:558:CYS:SG	1.75	1.26
1:A:155:ARG:O	1:A:411:ALA:O	1.57	1.19
1:B:210:VAL:HG12	1:B:211:TYR:N	1.58	1.17
1:A:210:VAL:HG12	1:A:211:TYR:H	1.01	1.10
1:A:210:VAL:HG12	1:A:211:TYR:N	1.67	1.09
1:B:210:VAL:HG12	1:B:211:TYR:H	0.92	1.08
1:A:223:SER:HB3	1:A:379:ASN:HD22	1.21	1.06
1:A:629:ARG:NH2	2:C:618:ASN:OD1	1.96	0.98
1:B:210:VAL:CG1	1:B:211:TYR:H	1.72	0.97
1:B:727:ASN:HD22	1:B:730:LEU:HB2	1.29	0.97
2:C:5:THR:HG22	2:C:36:SER:HB3	1.44	0.94
2:D:188:TYR:OH	5:D:905:CO3:O2	1.85	0.94
1:A:123:TYR:O	1:A:127:LEU:HD13	1.69	0.93
2:C:351:GLU:HG2	2:C:629:LEU:O	1.68	0.93

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:153:VAL:CB	1:A:154:PRO:HD3	1.99	0.93
2:C:5:THR:HG22	2:C:36:SER:CB	2.00	0.92
1:A:751:GLY:O	1:A:755:ASP:CB	2.18	0.91
1:A:210:VAL:CG1	1:A:211:TYR:H	1.82	0.91
1:B:511:GLN:O	1:B:521:PHE:CD1	2.23	0.91
1:A:599:ILE:O	1:A:603:HIS:HB2	1.72	0.90
1:B:751:GLY:O	1:B:755:ASP:HB2	1.71	0.89
2:C:26:MET:O	2:C:30:ILE:HB	1.72	0.89
2:C:227:CYS:HB2	2:C:231:THR:HG22	1.53	0.89
1:A:259:ALA:HA	1:A:267:LYS:HE3	1.53	0.89
1:A:225:ALA:HB1	1:A:378:SER:HA	1.56	0.88
1:A:222:TYR:CD2	1:A:302:HIS:HB2	2.09	0.87
1:B:256:ILE:HD11	1:B:282:TYR:CD2	2.11	0.85
1:B:264:PHE:CD2	1:B:299:GLY:HA3	2.11	0.85
2:C:340:LYS:HD2	2:C:341:PRO:HD2	1.60	0.83
1:A:204:ASP:HB2	1:A:209:LEU:CB	2.08	0.83
1:B:201:ILE:HG22	1:B:212:LEU:HA	1.62	0.82
1:B:489:LEU:CD1	1:B:558:CYS:SG	2.64	0.81
1:A:442:PHE:CE2	1:A:444:PRO:HG3	2.15	0.81
2:C:105:SER:HB2	2:C:232:ARG:HH22	1.45	0.80
1:A:277:ILE:O	1:A:332:ILE:HG23	1.81	0.79
1:A:599:ILE:O	1:A:603:HIS:CB	2.31	0.79
1:A:446:ARG:NE	1:A:607:LEU:HD21	1.98	0.79
1:B:182:TRP:HZ3	1:B:392:VAL:HG12	1.48	0.78
1:B:264:PHE:HD2	1:B:299:GLY:HA3	1.48	0.78
1:A:223:SER:HB3	1:A:379:ASN:ND2	1.97	0.78
1:A:263:THR:OG1	1:A:266:GLU:HG3	1.85	0.78
1:B:500:PRO:HB3	1:B:613:ARG:HG3	1.66	0.77
1:B:407:ALA:HB3	1:B:426:LEU:HD22	1.64	0.77
1:A:225:ALA:CA	1:A:377:VAL:O	2.33	0.77
1:A:278:GLY:HA2	1:A:332:ILE:CG2	2.15	0.76
1:B:256:ILE:HD11	1:B:282:TYR:HD2	1.48	0.76
1:A:640:GLN:HA	1:A:643:TYR:HD1	1.50	0.76
1:A:494:PHE:CE2	1:A:510:MET:SD	2.79	0.76
2:C:49:ILE:HG23	2:C:77:LEU:HD12	1.68	0.76
1:B:257:VAL:HG23	1:B:281:ILE:HG12	1.66	0.76
1:B:509:THR:HG23	1:B:596:GLN:HE21	1.51	0.75
1:B:474:LEU:HD13	1:B:550:ILE:HD11	1.66	0.75
1:A:225:ALA:HA	1:A:377:VAL:O	1.86	0.75
1:B:210:VAL:CG1	1:B:211:TYR:N	2.34	0.74
1:A:224:LYS:CB	1:A:331:ASN:O	2.35	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:222:TYR:CE1	1:A:308:PRO:HG3	2.22	0.74
2:C:227:CYS:HB2	2:C:231:THR:CG2	2.17	0.74
1:A:751:GLY:C	1:A:755:ASP:HB2	2.07	0.74
1:B:397:VAL:HG12	1:B:398:GLU:HG3	1.70	0.73
1:B:632:ILE:HG13	1:B:639:LEU:HD13	1.71	0.73
1:B:306:GLY:HA2	1:B:461:VAL:HA	1.69	0.73
1:A:201:ILE:HG22	1:A:212:LEU:HA	1.70	0.73
2:C:29:VAL:HG23	2:C:30:ILE:HD12	1.71	0.72
1:A:225:ALA:C	1:A:377:VAL:O	2.27	0.72
1:A:494:PHE:CD2	1:A:510:MET:HE1	2.25	0.71
1:B:172:GLN:HG3	1:B:176:PHE:CE2	2.26	0.71
1:B:518:THR:OG1	1:B:520:GLN:HG2	1.89	0.70
1:B:727:ASN:ND2	1:B:730:LEU:HB2	2.04	0.70
2:D:69:ASP:HA	2:D:72:LEU:HD12	1.74	0.69
2:C:34:GLY:H	2:C:35:PRO:CD	2.04	0.69
2:D:188:TYR:OH	5:D:905:CO3:C	2.40	0.69
1:B:549:GLY:HA3	1:B:686:LEU:HD11	1.74	0.69
2:D:353:LEU:HD23	2:D:353:LEU:O	1.93	0.69
1:A:494:PHE:CD2	1:A:510:MET:CE	2.76	0.69
2:C:59:ALA:HB2	2:C:263:ILE:HD13	1.74	0.69
1:A:123:TYR:O	1:A:127:LEU:CD1	2.40	0.68
2:C:45:TYR:CE2	2:C:66:LEU:HD22	2.29	0.68
1:A:223:SER:CB	1:A:379:ASN:HD22	2.03	0.68
1:A:542:PHE:HB3	1:A:543:PRO:HD3	1.75	0.68
1:A:237:PHE:CD2	1:A:261:LYS:CB	2.77	0.68
2:D:626:THR:OG1	2:D:629:LEU:HG	1.94	0.68
1:B:442:PHE:CE2	1:B:444:PRO:HG3	2.29	0.67
1:A:512:ASN:C	1:A:512:ASN:HD22	1.95	0.67
1:A:433:PHE:HE1	1:A:599:ILE:HD11	1.60	0.67
1:A:551:PRO:CD	1:A:682:GLU:HG2	2.23	0.67
1:A:179:SER:OG	1:A:392:VAL:O	2.14	0.66
1:B:500:PRO:HB3	1:B:613:ARG:CG	2.25	0.66
2:C:319:TYR:O	2:C:323:ILE:HG13	1.96	0.66
1:B:444:PRO:HB3	1:B:602:THR:HG21	1.78	0.66
1:A:293:ALA:HB2	1:A:339:ARG:NH2	2.11	0.65
1:B:172:GLN:HG3	1:B:176:PHE:CZ	2.31	0.65
1:A:298:PHE:HE2	1:A:457:ASP:HB3	1.62	0.65
2:C:340:LYS:HD2	2:C:341:PRO:CD	2.25	0.65
2:D:641:LEU:HD13	2:D:645:ASN:HB2	1.78	0.65
1:B:257:VAL:CG2	1:B:281:ILE:HG12	2.26	0.65
2:C:340:LYS:HB3	2:C:593:LYS:HZ2	1.62	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:188:TYR:CZ	5:D:905:CO3:O2	2.50	0.64
2:C:217:LYS:O	2:C:217:LYS:HD3	1.97	0.64
1:A:500:PRO:HB3	1:A:613:ARG:HG3	1.80	0.64
1:B:200:VAL:HG13	1:B:213:VAL:HB	1.80	0.64
2:C:615:CYS:O	2:C:618:ASN:O	2.15	0.64
2:C:52:ILE:O	2:C:254:ARG:HD3	1.97	0.64
1:A:366:VAL:HG12	1:A:367:THR:N	2.13	0.63
2:C:45:TYR:CZ	2:C:66:LEU:HD22	2.33	0.63
2:D:615:CYS:HA	2:D:618:ASN:O	1.98	0.63
1:B:395:GLY:O	1:B:399:PRO:HG3	1.98	0.62
1:A:210:VAL:CG1	1:A:211:TYR:N	2.43	0.62
1:A:597:PHE:O	1:A:601:LEU:HG	2.00	0.62
2:C:391:LEU:HD12	2:C:588:VAL:HG21	1.81	0.62
2:C:26:MET:SD	2:C:30:ILE:HD13	2.39	0.62
2:C:340:LYS:CG	2:C:593:LYS:HZ2	2.13	0.62
2:C:49:ILE:HG23	2:C:77:LEU:CD1	2.28	0.62
2:D:344:TRP:HZ3	2:D:601:LEU:HD21	1.65	0.62
1:B:386:ILE:HG23	1:B:454:SER:HB3	1.81	0.61
1:A:129:ARG:O	1:A:133:GLU:HG3	2.00	0.61
1:A:272:GLU:HG3	1:A:332:ILE:CD1	2.30	0.61
2:C:340:LYS:HG2	2:C:593:LYS:NZ	2.15	0.61
1:B:157:ALA:HA	1:B:162:ASP:OD1	1.99	0.61
2:D:614:ASP:O	2:D:617:GLY:N	2.33	0.61
1:A:123:TYR:C	1:A:127:LEU:HD13	2.21	0.61
1:A:146:LEU:O	1:A:146:LEU:HD23	2.00	0.61
1:A:700:VAL:HG11	1:A:741:THR:HG21	1.81	0.61
1:B:256:ILE:CD1	1:B:282:TYR:CD2	2.83	0.61
1:B:475:HIS:ND1	1:B:476:LEU:HG	2.16	0.61
2:C:130:ILE:N	2:C:131:PRO:HD2	2.16	0.61
1:A:172:GLN:HG2	1:A:427:LEU:HD22	1.83	0.60
1:A:221:ALA:O	1:A:222:TYR:HB2	2.00	0.60
2:C:120:THR:OG1	2:C:127:GLY:HA3	2.01	0.60
2:D:118:CYS:HB2	2:D:203:ALA:N	2.16	0.60
1:B:165:LEU:O	1:B:169:VAL:HG23	2.02	0.60
1:A:446:ARG:CZ	1:A:607:LEU:HD21	2.31	0.60
2:C:5:THR:CG2	2:C:36:SER:HB3	2.27	0.60
1:A:127:LEU:HD23	1:A:599:ILE:HG23	1.83	0.60
1:A:220:VAL:O	1:A:223:SER:HB2	2.02	0.60
1:B:256:ILE:CD1	1:B:282:TYR:HD2	2.15	0.59
2:C:338:GLU:O	2:C:339:CYS:HB2	2.02	0.59
2:C:340:LYS:CB	2:C:593:LYS:HZ2	2.14	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:624:SER:HB3	2:C:629:LEU:HD13	1.84	0.59
1:B:474:LEU:CD1	1:B:550:ILE:HD11	2.31	0.59
1:B:705:GLY:HA3	1:B:707:HIS:CE1	2.37	0.59
2:C:7:ARG:HA	2:C:38:ALA:HB3	1.82	0.59
2:C:615:CYS:HA	2:C:618:ASN:O	2.02	0.59
2:D:5:THR:HA	2:D:36:SER:HB3	1.84	0.59
1:A:306:GLY:HA2	1:A:461:VAL:HA	1.85	0.59
1:A:685:PHE:O	1:A:700:VAL:HG22	2.02	0.59
1:A:225:ALA:HA	1:A:377:VAL:C	2.22	0.59
1:A:446:ARG:CZ	1:A:607:LEU:CD2	2.81	0.59
1:A:551:PRO:HD3	1:A:682:GLU:HG2	1.83	0.59
2:C:351:GLU:CG	2:C:629:LEU:O	2.45	0.58
2:C:398:ILE:HG23	2:C:671:LEU:HD23	1.85	0.58
1:A:689:TYR:CD2	1:A:737:LEU:HD22	2.39	0.58
1:A:313:PHE:HB2	1:A:314:PRO:HD2	1.86	0.58
1:B:282:TYR:HH	1:B:346:PHE:HZ	1.50	0.58
1:B:635:MET:O	1:B:637:LEU:N	2.34	0.58
2:C:135:LEU:O	2:C:139:LEU:HG	2.03	0.58
1:A:264:PHE:HD1	1:A:281:ILE:HD13	1.69	0.58
2:D:70:ALA:HB1	2:D:77:LEU:HB2	1.86	0.58
1:A:506:ILE:O	1:A:510:MET:HG2	2.03	0.57
2:C:136:TYR:HA	2:C:139:LEU:HD12	1.85	0.57
1:A:237:PHE:CG	1:A:261:LYS:CB	2.87	0.57
2:C:34:GLY:H	2:C:35:PRO:HD2	1.69	0.57
2:C:23:ARG:HD3	2:C:37:VAL:O	2.03	0.57
1:A:629:ARG:NE	2:C:617:GLY:O	2.26	0.57
1:A:682:GLU:OE1	1:A:682:GLU:HA	2.03	0.57
2:C:234:PRO:HD2	2:C:237:GLU:OE1	2.04	0.57
1:B:225:ALA:HA	1:B:377:VAL:HB	1.87	0.57
1:B:172:GLN:HG2	1:B:427:LEU:HD22	1.85	0.57
2:D:615:CYS:O	2:D:618:ASN:O	2.22	0.57
1:A:433:PHE:HE1	1:A:599:ILE:CD1	2.18	0.57
2:D:130:ILE:N	2:D:131:PRO:HD2	2.19	0.57
1:A:343:GLU:HG2	1:A:362:THR:HG21	1.86	0.56
1:A:454:SER:O	1:A:455:ALA:HB3	2.05	0.56
1:B:228:VAL:HB	1:B:277:ILE:HG22	1.86	0.56
2:C:340:LYS:HG2	2:C:593:LYS:HZ2	1.69	0.56
1:A:153:VAL:CB	1:A:154:PRO:CD	2.80	0.56
1:A:222:TYR:CD2	1:A:302:HIS:CB	2.86	0.56
1:A:210:VAL:HG22	1:B:627:GLN:HG2	1.88	0.56
1:B:147:LEU:HB3	1:B:155:ARG:HH22	1.69	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:201:ILE:HG22	1:B:212:LEU:CA	2.34	0.56
1:B:640:GLN:HA	1:B:643:TYR:HD1	1.70	0.56
1:A:600:LYS:O	1:A:608:ASN:ND2	2.37	0.56
2:D:626:THR:OG1	2:D:629:LEU:CG	2.53	0.56
1:A:305:THR:HG21	1:A:543:PRO:HG3	1.88	0.56
1:B:700:VAL:HB	1:B:709:LEU:HD13	1.87	0.56
2:C:340:LYS:CD	2:C:341:PRO:HD2	2.35	0.56
1:A:191:GLN:OE1	1:A:223:SER:N	2.39	0.56
1:A:690:VAL:HG11	1:A:707:HIS:ND1	2.21	0.56
1:B:210:VAL:HG13	1:B:211:TYR:CD2	2.40	0.56
2:D:626:THR:OG1	2:D:629:LEU:CD1	2.53	0.56
1:A:640:GLN:HA	1:A:643:TYR:CD1	2.37	0.55
2:C:158:CYS:HB2	2:C:173:LEU:HB2	1.88	0.55
2:C:188:TYR:CE1	2:C:206:LYS:HB2	2.41	0.55
2:C:347:LEU:HD23	2:C:377:CYS:SG	2.47	0.55
2:C:128:TRP:O	2:C:132:ILE:HB	2.06	0.55
2:C:371:ALA:HB3	2:C:377:CYS:SG	2.46	0.55
2:D:68:TYR:O	2:D:72:LEU:HG	2.05	0.55
1:B:210:VAL:CG1	1:B:211:TYR:CD2	2.89	0.55
1:B:305:THR:HG21	1:B:543:PRO:HG3	1.88	0.55
2:C:121:GLY:HA2	2:C:160:PRO:HD2	1.89	0.55
2:D:7:ARG:HA	2:D:38:ALA:HB3	1.89	0.55
2:C:626:THR:OG1	2:C:629:LEU:HD11	2.06	0.55
1:B:685:PHE:O	1:B:700:VAL:HG22	2.07	0.55
1:A:635:MET:O	1:A:637:LEU:N	2.38	0.55
1:A:689:TYR:CG	1:A:737:LEU:HD22	2.41	0.55
1:B:479:PHE:O	1:B:551:PRO:HD2	2.06	0.54
2:C:29:VAL:HG23	2:C:30:ILE:CD1	2.37	0.54
2:D:392:ASP:HB3	2:D:585:HIS:CE1	2.42	0.54
1:B:498:ALA:HB2	1:B:553:VAL:HA	1.90	0.54
2:D:321:THR:HG22	2:D:325:ASN:ND2	2.23	0.54
1:A:225:ALA:HA	1:A:377:VAL:HB	1.89	0.54
1:B:141:THR:HG22	1:B:584:ASN:HD22	1.71	0.54
1:B:417:ALA:HA	1:B:421:VAL:HG23	1.88	0.54
2:D:596:CYS:O	2:D:600:ILE:HG12	2.08	0.54
2:D:626:THR:OG1	2:D:629:LEU:HD11	2.08	0.54
2:C:124:ARG:HH12	2:C:187:GLY:HA2	1.72	0.53
1:A:210:VAL:HG12	1:A:211:TYR:CD2	2.43	0.53
1:A:223:SER:CB	1:A:379:ASN:ND2	2.68	0.53
1:B:130:LYS:HD2	1:B:440:ASP:OD2	2.09	0.53
1:A:210:VAL:CG1	1:A:211:TYR:CD2	2.91	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:489:LEU:HD12	1:B:556:CYS:SG	2.49	0.53
1:A:408:GLN:O	1:A:419:SER:HB2	2.09	0.53
1:B:200:VAL:HG13	1:B:200:VAL:O	2.08	0.53
1:B:523:TYR:OH	1:B:526:SER:HA	2.08	0.53
2:D:217:LYS:HA	2:D:220:ARG:HE	1.71	0.53
1:B:232:LEU:HA	1:B:254:ILE:O	2.08	0.53
1:B:264:PHE:CE2	1:B:299:GLY:HA3	2.44	0.53
1:B:307:ASP:N	1:B:461:VAL:HG13	2.24	0.53
1:A:503:TYR:HD2	1:A:613:ARG:HD2	1.73	0.53
1:A:562:ASP:N	1:A:562:ASP:OD2	2.41	0.53
1:A:597:PHE:O	1:A:601:LEU:CG	2.56	0.53
2:C:671:LEU:HD13	2:C:671:LEU:O	2.08	0.53
2:C:293:LEU:O	2:C:295:PHE:N	2.42	0.53
2:D:627:LYS:HA	2:D:633:ASP:OD2	2.09	0.53
1:B:214:GLU:O	1:B:216:PRO:HD3	2.09	0.52
2:C:83:GLU:HG2	2:C:249:HIS:O	2.09	0.52
1:A:476:LEU:O	1:A:679:MET:HE1	2.10	0.52
1:A:512:ASN:O	1:A:512:ASN:ND2	2.28	0.52
1:B:515:HIS:ND1	1:B:516:PRO:HD2	2.25	0.52
2:C:34:GLY:N	2:C:35:PRO:CD	2.67	0.52
1:A:316:PHE:C	1:A:318:HIS:N	2.62	0.52
1:A:692:PRO:HG3	1:A:698:ARG:HD3	1.90	0.52
1:B:573:TYR:O	1:B:577:ILE:HG22	2.09	0.52
2:C:353:LEU:O	2:C:353:LEU:HD23	2.09	0.52
2:D:611:ASP:OD1	2:D:612:VAL:N	2.42	0.52
1:A:515:HIS:ND1	1:A:516:PRO:HD2	2.25	0.52
1:B:392:VAL:HG22	1:B:393:ILE:N	2.24	0.52
1:B:623:ARG:HD3	2:D:363:VAL:HG22	1.91	0.52
1:B:254:ILE:HD12	1:B:373:VAL:HG23	1.91	0.52
1:A:543:PRO:O	1:A:547:TYR:HB3	2.09	0.52
1:B:252:GLY:HA2	1:B:277:ILE:HD11	1.91	0.51
1:A:700:VAL:HG23	1:A:701:PHE:CD1	2.45	0.51
1:A:516:PRO:HG3	1:A:586:VAL:HG22	1.93	0.51
2:C:105:SER:H	2:C:232:ARG:HH12	1.57	0.51
1:A:232:LEU:HA	1:A:254:ILE:O	2.10	0.51
1:B:489:LEU:HB2	1:B:558:CYS:HA	1.91	0.51
2:C:173:LEU:HD23	2:C:194:CYS:SG	2.51	0.51
1:A:642:LEU:HD11	1:A:735:LEU:HD11	1.92	0.51
2:C:26:MET:SD	2:C:30:ILE:CD1	2.99	0.51
1:A:239:THR:HA	1:A:262:ILE:HD13	1.93	0.51
1:A:386:ILE:HG23	1:A:454:SER:HB3	1.93	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:128:TRP:CE2	2:C:132:ILE:HG13	2.46	0.51
1:A:143:THR:OG1	1:A:428:LYS:HE3	2.10	0.50
1:B:393:ILE:CD1	1:B:450:PHE:HE1	2.24	0.50
1:B:647:GLY:O	1:B:651:ARG:HG3	2.10	0.50
2:D:333:GLU:HG2	2:D:334:ALA:N	2.26	0.50
1:A:621:PHE:CG	1:A:709:LEU:HD23	2.46	0.50
1:B:402:TYR:HA	1:B:447:SER:O	2.11	0.50
2:C:210:ILE:HG12	2:C:235:VAL:HG11	1.94	0.50
1:A:219:TYR:HA	1:A:335:GLN:HE22	1.76	0.50
1:B:295:LEU:HD22	1:B:570:MET:CE	2.42	0.50
1:A:480:THR:HA	1:A:551:PRO:O	2.12	0.50
2:C:11:VAL:O	2:C:12:SER:CB	2.60	0.50
1:B:515:HIS:CG	1:B:516:PRO:HD2	2.47	0.50
2:C:80:VAL:HG23	2:C:81:VAL:N	2.26	0.50
1:A:258:ARG:HG2	1:A:282:TYR:CZ	2.47	0.50
1:A:597:PHE:O	1:A:601:LEU:HD12	2.12	0.49
1:A:214:GLU:HG2	1:A:215:ASN:N	2.27	0.49
1:A:512:ASN:C	1:A:512:ASN:ND2	2.65	0.49
2:C:96:TYR:HB2	2:C:207:HIS:CD2	2.46	0.49
2:C:131:PRO:HB3	2:C:204:PHE:CD1	2.47	0.49
2:D:361:ASN:HB3	2:D:608:PHE:CZ	2.47	0.49
1:A:222:TYR:CE2	1:A:302:HIS:HB2	2.47	0.49
1:B:202:ILE:O	1:B:209:LEU:O	2.30	0.49
2:D:321:THR:HG22	2:D:325:ASN:HD21	1.77	0.49
1:A:262:ILE:O	1:A:267:LYS:HE2	2.12	0.49
1:A:154:PRO:O	1:A:161:LYS:CB	2.60	0.48
1:A:272:GLU:HG3	1:A:332:ILE:HD11	1.94	0.48
1:A:298:PHE:CG	1:A:299:GLY:N	2.82	0.48
1:B:699:HIS:O	1:B:708:THR:HG22	2.14	0.48
1:B:446:ARG:HD2	1:B:479:PHE:CZ	2.49	0.48
1:A:366:VAL:CG1	1:A:367:THR:N	2.76	0.48
2:C:127:GLY:O	2:C:131:PRO:HG3	2.13	0.48
1:A:685:PHE:CD2	1:A:701:PHE:HE1	2.31	0.48
2:C:124:ARG:NH1	2:C:187:GLY:HA2	2.29	0.48
2:D:188:TYR:CZ	5:D:905:CO3:C	2.97	0.48
1:B:579:ARG:HB3	1:B:579:ARG:HH11	1.78	0.48
2:C:161:CYS:N	2:C:179:CYS:SG	2.78	0.48
1:B:470:TYR:HB3	1:B:473:SER:HB3	1.95	0.48
1:B:625:LEU:HD23	1:B:642:LEU:HD13	1.95	0.48
1:A:685:PHE:CE2	1:A:701:PHE:HE1	2.32	0.47
2:C:130:ILE:N	2:C:131:PRO:CD	2.77	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:510:MET:HE1	1:A:522:LEU:HB3	1.96	0.47
2:D:308:ARG:HB2	2:D:669:SER:HB2	1.96	0.47
1:B:236:ASN:O	1:B:257:VAL:HA	2.14	0.47
1:B:475:HIS:CE1	1:B:476:LEU:HG	2.49	0.47
1:B:256:ILE:CG1	1:B:282:TYR:HD2	2.28	0.47
2:C:126:ALA:O	2:C:131:PRO:HD3	2.13	0.47
1:A:259:ALA:HA	1:A:267:LYS:CE	2.33	0.47
1:B:390:PHE:HE2	1:B:453:TRP:CH2	2.32	0.47
1:B:753:VAL:HG12	1:B:754:TRP:CE3	2.48	0.47
1:A:259:ALA:HB2	1:A:281:ILE:CG2	2.44	0.47
1:A:731:PHE:HA	1:A:734:GLN:HE21	1.80	0.47
1:B:388:ASN:HB3	1:B:390:PHE:CZ	2.49	0.47
1:B:444:PRO:HB3	1:B:602:THR:CG2	2.43	0.47
2:C:18:LYS:CG	2:C:294:LEU:HD13	2.45	0.47
2:C:594:GLU:O	2:C:598:HIS:HB2	2.13	0.47
1:A:751:GLY:O	1:A:755:ASP:CA	2.63	0.47
1:B:446:ARG:H	1:B:602:THR:HG23	1.79	0.47
2:D:400:GLY:HA3	2:D:647:TYR:HB3	1.96	0.47
1:A:494:PHE:HE2	1:A:510:MET:SD	2.37	0.47
1:A:272:GLU:HG3	1:A:332:ILE:HD12	1.97	0.47
1:B:201:ILE:HG22	1:B:212:LEU:CB	2.44	0.47
1:B:433:PHE:O	1:B:437:VAL:HG23	2.14	0.47
2:D:69:ASP:HA	2:D:72:LEU:CD1	2.45	0.47
1:B:542:PHE:N	1:B:543:PRO:CD	2.78	0.46
1:B:582:GLU:CD	1:B:582:GLU:H	2.19	0.46
1:A:434:SER:O	1:A:438:LEU:HD23	2.15	0.46
1:B:182:TRP:CZ3	1:B:392:VAL:HG12	2.39	0.46
1:B:513:VAL:HG22	1:B:592:GLU:HG2	1.96	0.46
1:B:619:LEU:HD12	1:B:646:ARG:HH21	1.81	0.46
1:B:703:GLY:O	1:B:708:THR:HG21	2.15	0.46
1:B:234:HIS:CE1	1:B:236:ASN:HA	2.50	0.46
2:C:192:PHE:CZ	2:C:210:ILE:HD12	2.50	0.46
1:A:155:ARG:C	1:A:411:ALA:O	2.46	0.46
1:A:220:VAL:HG23	1:A:336:THR:HG23	1.96	0.46
1:A:652:ALA:HB1	1:A:749:LEU:HB3	1.97	0.46
2:D:341:PRO:HA	2:D:365:LYS:O	2.15	0.46
1:B:260:GLY:O	1:B:261:LYS:HB3	2.15	0.46
2:C:406:PRO:HA	2:C:588:VAL:HA	1.96	0.46
1:A:225:ALA:HB2	1:A:379:ASN:H	1.81	0.46
1:A:708:THR:HB	1:A:710:PRO:HD2	1.98	0.46
2:C:308:ARG:HB2	2:C:669:SER:HB2	1.97	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:502:LEU:O	1:B:506:ILE:HG13	2.16	0.46
2:C:5:THR:HA	2:C:36:SER:HB3	1.97	0.46
2:C:15:GLU:HG3	2:C:294:LEU:HD12	1.97	0.46
2:C:186:PHE:H	2:C:190:GLY:HA3	1.81	0.46
1:A:502:LEU:HD22	1:A:505:LEU:HD23	1.98	0.46
1:A:751:GLY:O	1:A:752:ASP:HB2	2.15	0.46
1:A:225:ALA:HA	1:A:377:VAL:CB	2.46	0.46
2:C:625:GLU:CG	2:C:629:LEU:HD21	2.46	0.46
1:A:220:VAL:CG2	1:A:336:THR:HG23	2.45	0.45
2:D:343:LYS:H	2:D:387:ASP:HB2	1.80	0.45
1:A:446:ARG:CZ	1:A:607:LEU:HD23	2.46	0.45
1:B:446:ARG:CD	1:B:479:PHE:CZ	2.99	0.45
1:B:678:VAL:O	1:B:681:VAL:HG23	2.17	0.45
1:A:190:ILE:HD13	1:A:384:ILE:HD13	1.98	0.45
1:A:448:ILE:HD13	1:A:598:VAL:HG11	1.98	0.45
1:B:501:LEU:HD12	1:B:551:PRO:HG3	1.98	0.45
2:D:655:TYR:O	2:D:659:VAL:HG22	2.15	0.45
1:A:227:THR:HG23	1:A:376:THR:HB	1.98	0.45
1:A:394:LYS:HA	1:A:447:SER:OG	2.15	0.45
1:A:510:MET:CE	1:A:522:LEU:HB3	2.46	0.45
2:D:176:GLY:O	2:D:177:CYS:HB2	2.15	0.45
2:D:363:VAL:HG12	2:D:363:VAL:O	2.16	0.45
1:A:496:VAL:HG13	1:A:496:VAL:O	2.15	0.45
1:A:392:VAL:HG23	1:A:448:ILE:O	2.16	0.45
1:B:391:GLY:O	1:B:450:PHE:N	2.32	0.45
2:C:227:CYS:SG	2:C:231:THR:HG23	2.57	0.45
2:C:612:VAL:HG12	2:C:613:THR:N	2.31	0.45
1:A:243:PHE:HB3	1:A:274:LEU:HD12	1.99	0.45
2:D:293:LEU:C	2:D:295:PHE:H	2.20	0.45
1:B:320:GLN:HA	1:B:320:GLN:HE21	1.82	0.45
2:C:68:TYR:HD2	2:C:327:ARG:NH1	2.14	0.45
1:A:181:VAL:HG13	1:A:390:PHE:O	2.18	0.44
1:B:432:MET:O	1:B:436:MET:HG2	2.17	0.44
2:D:130:ILE:N	2:D:131:PRO:CD	2.79	0.44
2:D:350:HIS:HB2	2:D:629:LEU:HD21	1.97	0.44
1:A:597:PHE:O	1:A:601:LEU:CD1	2.65	0.44
1:B:446:ARG:HD3	1:B:479:PHE:CE2	2.52	0.44
2:C:340:LYS:HB3	2:C:593:LYS:NZ	2.30	0.44
1:B:731:PHE:HA	1:B:734:GLN:HE21	1.81	0.44
1:B:392:VAL:CG2	1:B:393:ILE:N	2.79	0.44
1:A:599:ILE:O	1:A:603:HIS:HB3	2.14	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:331:CYS:HA	2:D:332:PRO:HD3	1.81	0.44
1:B:555:PHE:CZ	1:B:594:ALA:HB2	2.52	0.44
2:C:34:GLY:N	2:C:35:PRO:HD3	2.33	0.44
1:A:365:MET:C	1:A:366:VAL:HG23	2.38	0.44
1:B:282:TYR:CD1	1:B:282:TYR:C	2.91	0.44
2:D:344:TRP:CZ3	2:D:601:LEU:HD21	2.50	0.44
1:B:403:VAL:HG23	1:B:480:THR:O	2.17	0.44
1:B:542:PHE:HB3	1:B:543:PRO:HD3	2.00	0.44
1:B:619:LEU:HD12	1:B:646:ARG:NH2	2.33	0.44
2:D:377:CYS:HB3	2:D:389:MET:SD	2.57	0.44
1:A:706:SER:O	1:A:711:ALA:HB3	2.17	0.43
1:A:493:ASN:HD21	1:A:495:LYS:HE3	1.83	0.43
1:A:573:TYR:O	1:A:577:ILE:HG22	2.19	0.43
1:B:232:LEU:HD22	1:B:373:VAL:HG11	1.99	0.43
1:B:504:THR:OG1	1:B:613:ARG:NH2	2.49	0.43
2:D:128:TRP:C	2:D:131:PRO:HD2	2.38	0.43
2:D:186:PHE:H	2:D:190:GLY:HA3	1.83	0.43
1:A:278:GLY:HA2	1:A:332:ILE:HG23	1.99	0.43
1:A:551:PRO:HG3	1:A:682:GLU:HG2	2.00	0.43
1:B:708:THR:HB	1:B:710:PRO:HD2	2.01	0.43
1:A:154:PRO:O	1:A:161:LYS:HB2	2.18	0.43
1:A:238:GLY:C	1:A:262:ILE:HD11	2.39	0.43
1:A:384:ILE:HD12	1:A:386:ILE:HD11	2.00	0.43
1:A:709:LEU:N	1:A:710:PRO:CD	2.82	0.43
1:B:515:HIS:ND1	1:B:516:PRO:CD	2.82	0.43
2:C:96:TYR:H	2:C:207:HIS:CD2	2.36	0.43
1:A:188:VAL:HG12	1:A:315:SER:OG	2.17	0.43
1:A:223:SER:OG	1:A:377:VAL:HG11	2.18	0.43
1:A:604:ASP:CG	1:A:605:VAL:H	2.21	0.43
1:B:256:ILE:CG1	1:B:282:TYR:CD2	3.02	0.43
2:C:411:ASN:HD21	2:C:422:PRO:HA	1.84	0.43
1:A:222:TYR:CE2	1:A:302:HIS:CB	3.02	0.43
1:A:250:VAL:HG12	1:A:250:VAL:O	2.19	0.43
1:B:537:LEU:HD12	1:B:537:LEU:H	1.83	0.43
2:C:338:GLU:HA	2:C:338:GLU:OE1	2.17	0.43
2:C:80:VAL:O	2:C:305:VAL:HB	2.19	0.43
1:A:604:ASP:CG	1:A:605:VAL:N	2.72	0.43
2:C:22:PHE:CE2	2:C:37:VAL:HG21	2.53	0.43
2:D:12:SER:HB2	2:D:180:SER:HB2	2.00	0.43
2:D:63:ASP:O	2:D:67:VAL:HG23	2.19	0.43
1:A:316:PHE:C	1:A:318:HIS:H	2.22	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:198:ASN:OD1	1:B:377:VAL:HA	2.19	0.43
1:B:298:PHE:CG	1:B:299:GLY:N	2.87	0.43
1:B:649:PHE:O	1:B:653:THR:HG23	2.19	0.43
2:C:94:PHE:O	2:C:94:PHE:CG	2.72	0.43
2:C:612:VAL:HG12	2:C:613:THR:H	1.83	0.43
2:D:262:LEU:O	2:D:262:LEU:HD23	2.19	0.43
2:D:343:LYS:HB2	2:D:387:ASP:OD2	2.19	0.43
1:A:122:LEU:N	1:A:122:LEU:HD12	2.34	0.43
1:B:282:TYR:CD1	1:B:282:TYR:O	2.72	0.43
2:C:391:LEU:HD12	2:C:588:VAL:CG2	2.48	0.43
1:B:281:ILE:O	1:B:297:PHE:HZ	2.03	0.42
1:B:461:VAL:O	1:B:465:GLU:HG2	2.19	0.42
2:C:676:PHE:HD1	2:C:677:ARG:HG3	1.85	0.42
2:D:615:CYS:CA	2:D:618:ASN:O	2.65	0.42
1:A:551:PRO:CG	1:A:682:GLU:HG2	2.49	0.42
1:A:595:GLY:O	1:A:599:ILE:HG12	2.19	0.42
1:A:603:HIS:CD2	1:A:603:HIS:C	2.93	0.42
1:B:155:ARG:HD3	1:B:409:ARG:O	2.18	0.42
1:B:214:GLU:C	1:B:216:PRO:HD3	2.40	0.42
1:B:752:ASP:HB3	1:B:753:VAL:H	1.65	0.42
2:C:22:PHE:HD2	2:C:37:VAL:HG11	1.84	0.42
2:C:37:VAL:HG22	2:C:266:LEU:HD21	2.00	0.42
1:A:225:ALA:O	1:A:377:VAL:O	2.38	0.42
1:A:667:ASP:HB3	1:A:670:VAL:HG12	2.00	0.42
1:B:511:GLN:H	1:B:511:GLN:HG2	1.52	0.42
2:D:127:GLY:C	2:D:131:PRO:HG3	2.40	0.42
1:B:169:VAL:HG12	1:B:173:PHE:CE1	2.54	0.42
2:C:160:PRO:O	2:C:161:CYS:HB2	2.20	0.42
1:A:314:PRO:HB2	1:A:316:PHE:CD2	2.54	0.42
1:B:232:LEU:HB2	1:B:373:VAL:CG2	2.50	0.42
2:C:306:PRO:HA	2:C:307:PRO:HD3	1.84	0.42
2:C:373:THR:OG1	2:C:376:ASP:OD2	2.26	0.42
1:A:251:ASN:OD1	1:A:251:ASN:C	2.58	0.42
1:A:495:LYS:O	1:A:556:CYS:N	2.50	0.42
1:B:425:LEU:CD2	1:B:591:ALA:HB2	2.50	0.42
2:C:128:TRP:O	2:C:132:ILE:HG12	2.19	0.42
1:A:715:ASN:HD22	1:A:734:GLN:HE22	1.68	0.42
1:B:182:TRP:HZ3	1:B:392:VAL:CG1	2.25	0.42
2:C:49:ILE:HD13	2:C:70:ALA:HB2	2.01	0.42
2:D:128:TRP:CH2	2:D:150:VAL:HG21	2.55	0.42
2:D:333:GLU:HG2	2:D:334:ALA:H	1.85	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:4:LYS:HB2	2:C:4:LYS:HE2	1.81	0.42
1:A:630:ALA:O	1:A:634:GLU:HG3	2.19	0.41
1:A:700:VAL:CG1	1:A:741:THR:HG21	2.50	0.41
1:B:156:GLU:O	1:B:162:ASP:HB2	2.20	0.41
1:B:182:TRP:CE2	1:B:390:PHE:HB2	2.55	0.41
2:C:132:ILE:HG22	2:C:326:LEU:HD11	2.02	0.41
2:C:676:PHE:CD1	2:C:677:ARG:HG3	2.54	0.41
1:A:686:LEU:HA	1:A:699:HIS:HA	2.01	0.41
1:B:376:THR:HG23	1:B:376:THR:O	2.20	0.41
2:D:586:ALA:HB2	2:D:650:TYR:CZ	2.55	0.41
1:A:596:GLN:HE21	1:A:596:GLN:HB3	1.63	0.41
1:A:706:SER:HA	1:A:711:ALA:HB1	2.03	0.41
1:B:229:THR:HB	1:B:374:LYS:HG3	2.01	0.41
1:B:392:VAL:HA	1:B:448:ILE:O	2.19	0.41
2:C:52:ILE:HD11	2:C:60:VAL:HG12	2.02	0.41
2:C:316:GLY:O	2:C:320:VAL:HG23	2.20	0.41
1:A:262:ILE:HG13	1:A:267:LYS:HG3	2.03	0.41
1:B:173:PHE:HA	1:B:176:PHE:CD2	2.55	0.41
1:B:433:PHE:HA	1:B:436:MET:HB2	2.02	0.41
2:C:340:LYS:CB	2:C:593:LYS:NZ	2.82	0.41
2:C:361:ASN:HB3	2:C:608:PHE:CZ	2.55	0.41
2:D:125:SER:O	2:D:130:ILE:HG12	2.21	0.41
1:A:325:ARG:CG	1:A:329:LEU:HD12	2.50	0.41
1:A:691:SER:HA	1:A:692:PRO:HD3	1.91	0.41
1:B:500:PRO:HD2	1:B:702:TRP:CH2	2.56	0.41
2:C:363:VAL:HG12	2:C:363:VAL:O	2.21	0.41
2:D:378:ILE:O	2:D:382:MET:HG3	2.19	0.41
1:A:640:GLN:HB2	2:C:353:LEU:HD21	2.03	0.41
1:B:143:THR:O	1:B:147:LEU:HG	2.20	0.41
2:C:655:TYR:O	2:C:659:VAL:HG22	2.21	0.41
2:D:11:VAL:O	2:D:12:SER:HB3	2.21	0.41
2:D:344:TRP:CH2	2:D:631:PHE:CZ	3.09	0.41
1:A:128:LYS:HE2	1:A:512:ASN:OD1	2.21	0.41
1:A:230:GLY:O	1:A:372:ASN:HB2	2.21	0.41
1:A:619:LEU:O	1:A:619:LEU:HD23	2.20	0.41
1:A:731:PHE:HA	1:A:734:GLN:NE2	2.36	0.41
1:B:219:TYR:HA	1:B:335:GLN:HE22	1.86	0.41
1:B:500:PRO:O	1:B:613:ARG:HG2	2.20	0.41
1:B:727:ASN:HB3	1:B:730:LEU:HB3	2.02	0.41
1:B:537:LEU:HD12	1:B:537:LEU:N	2.36	0.41
2:D:5:THR:HG22	2:D:36:SER:OG	2.20	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:262:ILE:CD1	1:B:267:LYS:HG2	2.51	0.40
1:B:442:PHE:CD2	1:B:444:PRO:HG3	2.55	0.40
2:C:63:ASP:HB2	2:C:249:HIS:CE1	2.56	0.40
2:C:128:TRP:O	2:C:132:ILE:CB	2.68	0.40
1:A:221:ALA:O	1:A:222:TYR:CB	2.68	0.40
1:A:314:PRO:HA	1:A:465:GLU:OE2	2.21	0.40
1:B:218:GLY:O	1:B:335:GLN:NE2	2.53	0.40
2:C:6:VAL:HG13	2:C:259:LYS:HZ1	1.86	0.40
1:A:236:ASN:CG	1:A:237:PHE:H	2.24	0.40
1:A:349:MET:HA	1:A:367:THR:HA	2.01	0.40
1:B:236:ASN:CG	1:B:237:PHE:H	2.23	0.40
2:C:5:THR:HG22	2:C:36:SER:OG	2.20	0.40
1:A:550:ILE:O	1:A:551:PRO:C	2.59	0.40
1:B:579:ARG:HB3	1:B:579:ARG:NH1	2.36	0.40
1:B:622:VAL:HG11	2:D:360:VAL:HG21	2.03	0.40
2:D:394:GLY:O	2:D:398:ILE:HG12	2.22	0.40
1:A:124:TRP:CE2	1:A:600:LYS:NZ	2.90	0.40
2:C:344:TRP:NE1	2:C:630:LEU:HD22	2.37	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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	A	636/654 (97%)	589 (93%)	42 (7%)	5 (1%)	16	47
1	B	637/654 (97%)	594 (93%)	37 (6%)	6 (1%)	14	44
2	C	513/693 (74%)	474 (92%)	33 (6%)	6 (1%)	11	39
2	D	468/693 (68%)	437 (93%)	27 (6%)	4 (1%)	14	44
All	All	2254/2694 (84%)	2094 (93%)	139 (6%)	21 (1%)	14	44

All (21) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	D	629	LEU
2	C	55	ASN
1	A	210	VAL
1	A	251	ASN
1	A	475	HIS
2	C	34	GLY
1	A	330	PRO
1	B	210	VAL
2	D	76	ASN
1	B	225	ALA
2	C	12	SER
2	D	339	CYS
1	A	154	PRO
2	C	339	CYS
1	B	415	GLY
1	B	636	GLY
2	C	609	GLY
1	B	190	ILE
2	C	306	PRO
2	D	609	GLY
1	B	688	PRO

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	A	512/562 (91%)	511 (100%)	1 (0%)	92 95
1	B	473/562 (84%)	471 (100%)	2 (0%)	89 93
2	C	357/585 (61%)	355 (99%)	2 (1%)	84 90
2	D	277/585 (47%)	277 (100%)	0	100 100
All	All	1619/2294 (71%)	1614 (100%)	5 (0%)	91 94

All (5) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	512	ASN

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Mol	Chain	Res	Type
1	B	511	GLN
1	B	603	HIS
2	C	71	TYR
2	C	241	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (34) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	148	ASN
1	A	160	GLN
1	A	164	ASN
1	A	186	HIS
1	A	285	GLN
1	A	318	HIS
1	A	335	GLN
1	A	348	ASN
1	A	475	HIS
1	A	483	ASN
1	A	511	GLN
1	A	596	GLN
1	A	603	HIS
1	A	626	ASN
1	A	684	HIS
1	A	734	GLN
1	A	747	ASN
1	B	320	GLN
1	B	483	ASN
1	B	511	GLN
1	B	512	ASN
1	B	584	ASN
1	B	596	GLN
1	B	626	ASN
1	B	727	ASN
1	B	734	GLN
2	C	207	HIS
2	C	584	ASN
2	C	585	HIS
2	C	604	GLN
2	D	325	ASN
2	D	584	ASN
2	D	585	HIS
2	D	604	GLN

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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 8 ligands modelled in this entry, 4 are monoatomic - leaving 4 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	$\#\|Z\| > 2$
3	NAG	A	903	1	14,14,15	0.43	0	17,19,21	1.15	2 (11%)
5	CO3	C	905	6	3,3,3	0.18	0	2,3,3	0.31	0
3	NAG	B	903	1	14,14,15	0.43	0	17,19,21	1.16	2 (11%)
5	CO3	D	905	6	3,3,3	0.15	0	2,3,3	0.18	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	A	903	1	-	0/6/23/26	0/1/1/1
3	NAG	B	903	1	-	0/6/23/26	0/1/1/1

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	B	903	NAG	C8-C7-N2	2.31	119.94	116.12
3	A	903	NAG	C8-C7-N2	2.30	119.94	116.12
3	B	903	NAG	C2-N2-C7	-2.18	119.98	122.90
3	A	903	NAG	C2-N2-C7	-2.18	119.98	122.90

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 4 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	D	905	CO3	4	0

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	638/654 (97%)	-0.15	26 (4%)	42	31	28, 75, 122, 200	0
1	B	639/654 (97%)	0.26	31 (4%)	36	28	42, 99, 173, 200	0
2	C	517/693 (74%)	0.52	32 (6%)	28	22	61, 116, 172, 200	0
2	D	488/693 (70%)	0.41	22 (4%)	39	29	66, 136, 182, 200	0
All	All	2282/2694 (84%)	0.24	111 (4%)	36	28	28, 103, 175, 200	0

All (111) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	154	PRO	5.6
2	C	6	VAL	5.4
1	A	222	TYR	5.1
1	A	758	ASN	4.6
1	A	751	GLY	4.6
1	B	210	VAL	4.5
1	B	379	ASN	4.5
1	A	223	SER	4.4
2	C	636	VAL	4.4
1	B	203	VAL	4.3
1	B	208	ARG	4.2
2	D	630	LEU	4.1
1	B	724	GLY	4.1
1	A	195	SER	4.1
2	D	186	PHE	3.8
1	B	751	GLY	3.8
2	D	97	ALA	3.7
2	C	59	ALA	3.6
1	A	225	ALA	3.6
1	A	154	PRO	3.6
2	D	659	VAL	3.5

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Mol	Chain	Res	Type	RSRZ
2	C	31	PRO	3.4
2	D	120	THR	3.4
1	A	194	ASP	3.4
1	A	330	PRO	3.3
1	B	359	THR	3.3
2	C	12	SER	3.3
2	C	169	GLN	3.3
2	C	223	TYR	3.3
2	C	156	GLY	3.2
2	C	298	SER	3.2
1	B	296	SER	3.1
2	D	424	ALA	3.1
2	C	107	PHE	3.1
2	C	616	SER	3.0
1	B	146	LEU	3.0
1	B	201	ILE	3.0
1	A	211	TYR	3.0
1	A	197	GLN	2.9
1	B	570	MET	2.9
2	D	629	LEU	2.9
2	C	658	ALA	2.9
1	A	210	VAL	2.9
1	B	380	VAL	2.9
1	B	723	ASN	2.9
1	A	153	VAL	2.8
1	A	704	SER	2.8
2	C	26	MET	2.8
1	B	396	PHE	2.8
2	D	168	PRO	2.7
1	A	752	ASP	2.7
1	B	235	ALA	2.7
1	A	510	MET	2.7
1	A	636	GLY	2.7
2	C	181	THR	2.7
1	B	217	GLY	2.6
1	B	391	GLY	2.6
1	B	294	GLU	2.6
2	D	393	GLY	2.5
1	A	204	ASP	2.5
2	C	158	CYS	2.5
1	B	282	TYR	2.5
2	C	301	GLY	2.5

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Mol	Chain	Res	Type	RSRZ
1	A	196	ALA	2.5
1	B	565	TYR	2.4
2	C	85	TYR	2.4
2	D	15	GLU	2.4
1	B	211	TYR	2.4
1	A	208	ARG	2.4
1	B	457	ASP	2.4
1	B	315	SER	2.4
2	C	639	ALA	2.4
2	D	626	THR	2.4
2	C	284	LEU	2.3
2	C	249	HIS	2.3
2	D	79	PRO	2.3
2	D	422	PRO	2.3
2	C	22	PHE	2.3
2	C	97	ALA	2.3
1	B	538	ASP	2.3
2	C	171	CYS	2.3
1	B	306	GLY	2.3
1	B	752	ASP	2.2
2	D	628	ASP	2.2
1	A	365	MET	2.2
2	D	349	HIS	2.2
2	D	78	LYS	2.2
2	D	205	VAL	2.2
2	D	405	VAL	2.2
1	B	155	ARG	2.2
2	C	231	THR	2.2
2	D	121	GLY	2.2
2	D	248	SER	2.2
2	C	200	GLY	2.1
2	C	267	LEU	2.1
2	D	298	SER	2.1
1	B	264	PHE	2.1
2	C	186	PHE	2.1
1	A	260	GLY	2.1
1	A	724	GLY	2.1
2	C	665	CYS	2.1
2	C	246	VAL	2.1
2	C	189	SER	2.1
2	D	36	SER	2.1
2	C	9	CYS	2.1

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Mol	Chain	Res	Type	RSRZ
1	A	608	ASN	2.0
1	A	723	ASN	2.0
2	C	39	CYS	2.0
1	B	200	VAL	2.0
1	A	371	LYS	2.0
1	B	259	ALA	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (i)

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

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	NAG	B	903	14/15	0.55	0.21	140,140,140,140	0
5	CO3	D	905	4/4	0.63	0.14	127,127,127,127	0
3	NAG	A	903	14/15	0.66	0.19	116,116,116,116	0
6	FE	C	901	1/1	0.86	0.09	118,118,118,118	0
6	FE	D	901	1/1	0.89	0.07	163,163,163,163	0
5	CO3	C	905	4/4	0.96	0.05	55,55,55,55	0
4	CA	B	900	1/1	0.97	0.03	80,80,80,80	0
4	CA	A	900	1/1	1.00	0.02	61,61,61,61	0

6.5 Other polymers (i)

There are no such residues in this entry.