



# wwPDB X-ray Structure Validation Summary Report

Mar 5, 2026 – 03:25 PM UTC

PDB ID : 2RHS / pdb\_00002rhs  
Title : PheRS from Staphylococcus haemolyticus- rational protein engineering and inhibitor studies  
Authors : Evdokimov, A.G.; Mekel, M.  
Deposited on : 2007-10-09  
Resolution : 2.20 Å (reported)

This is a wwPDB X-ray Structure Validation Summary 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.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4-5-2 with Phenix2.0  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtrriage (Phenix) : 2.0  
EDS : 3.0  
Buster-report : wwPDB partial adaption of 1.1.7 (2018)  
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)  
CCP4 : 9.0.010 (Gargrove)  
Density-Fitness : 1.0.12  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.49

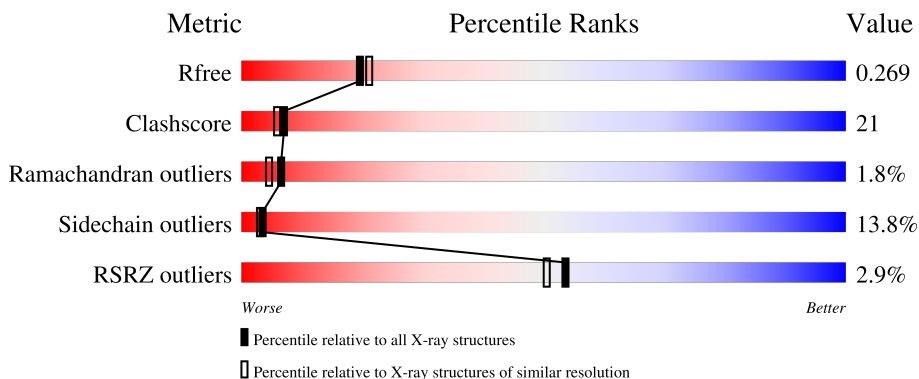
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.20 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))
$R_{free}$	180053	6164 (2.20-2.20)
Clashscore	190562	6851 (2.20-2.20)
Ramachandran outliers	187476	6768 (2.20-2.20)
Sidechain outliers	187428	6769 (2.20-2.20)
RSRZ outliers	180081	6166 (2.20-2.20)

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  $\geq 3$ , 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  $\leq 5\%$ . 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	294	 52% 27% 5% 15%
1	C	294	 57% 27% 7% 8%
2	B	800	 7% 63% 29% 6%
2	D	800	 7% 52% 33% 11%

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 17461 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 Phenylalanyl-tRNA synthetase alpha chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	249	2006	1270	337	389	10	0	3	0
1	C	271	2181	1381	367	418	15	0	4	0

There are 52 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	58	MET	-	expression tag	UNP Q4L5E3
A	59	GLY	-	expression tag	UNP Q4L5E3
A	60	SER	-	expression tag	UNP Q4L5E3
A	61	SER	-	expression tag	UNP Q4L5E3
A	62	HIS	-	expression tag	UNP Q4L5E3
A	63	HIS	-	expression tag	UNP Q4L5E3
A	64	HIS	-	expression tag	UNP Q4L5E3
A	65	HIS	-	expression tag	UNP Q4L5E3
A	66	HIS	-	expression tag	UNP Q4L5E3
A	67	HIS	-	expression tag	UNP Q4L5E3
A	68	SER	-	expression tag	UNP Q4L5E3
A	69	SER	-	expression tag	UNP Q4L5E3
A	70	GLY	-	expression tag	UNP Q4L5E3
A	71	LEU	-	expression tag	UNP Q4L5E3
A	72	VAL	-	expression tag	UNP Q4L5E3
A	73	PRO	-	expression tag	UNP Q4L5E3
A	74	ARG	-	expression tag	UNP Q4L5E3
A	75	GLY	-	expression tag	UNP Q4L5E3
A	76	SER	-	expression tag	UNP Q4L5E3
A	77	HIS	-	expression tag	UNP Q4L5E3
A	78	MET	-	expression tag	UNP Q4L5E3
A	79	GLY	-	expression tag	UNP Q4L5E3
A	80	THR	-	expression tag	UNP Q4L5E3
A	81	GLU	-	expression tag	UNP Q4L5E3
A	82	LEU	-	expression tag	UNP Q4L5E3

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Chain	Residue	Modelled	Actual	Comment	Reference
A	83	MET	-	expression tag	UNP Q4L5E3
C	58	MET	-	expression tag	UNP Q4L5E3
C	59	GLY	-	expression tag	UNP Q4L5E3
C	60	SER	-	expression tag	UNP Q4L5E3
C	61	SER	-	expression tag	UNP Q4L5E3
C	62	HIS	-	expression tag	UNP Q4L5E3
C	63	HIS	-	expression tag	UNP Q4L5E3
C	64	HIS	-	expression tag	UNP Q4L5E3
C	65	HIS	-	expression tag	UNP Q4L5E3
C	66	HIS	-	expression tag	UNP Q4L5E3
C	67	HIS	-	expression tag	UNP Q4L5E3
C	68	SER	-	expression tag	UNP Q4L5E3
C	69	SER	-	expression tag	UNP Q4L5E3
C	70	GLY	-	expression tag	UNP Q4L5E3
C	71	LEU	-	expression tag	UNP Q4L5E3
C	72	VAL	-	expression tag	UNP Q4L5E3
C	73	PRO	-	expression tag	UNP Q4L5E3
C	74	ARG	-	expression tag	UNP Q4L5E3
C	75	GLY	-	expression tag	UNP Q4L5E3
C	76	SER	-	expression tag	UNP Q4L5E3
C	77	HIS	-	expression tag	UNP Q4L5E3
C	78	MET	-	expression tag	UNP Q4L5E3
C	79	GLY	-	expression tag	UNP Q4L5E3
C	80	THR	-	expression tag	UNP Q4L5E3
C	81	GLU	-	expression tag	UNP Q4L5E3
C	82	LEU	-	expression tag	UNP Q4L5E3
C	83	MET	-	expression tag	UNP Q4L5E3

- Molecule 2 is a protein called Phenylalanyl-tRNA synthetase beta chain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	B	786	6141	3864	1037	1223	17	0	3	0
2	D	785	6116	3846	1031	1222	17	0	2	0

There are 10 discrepancies between the modelled and reference sequences:

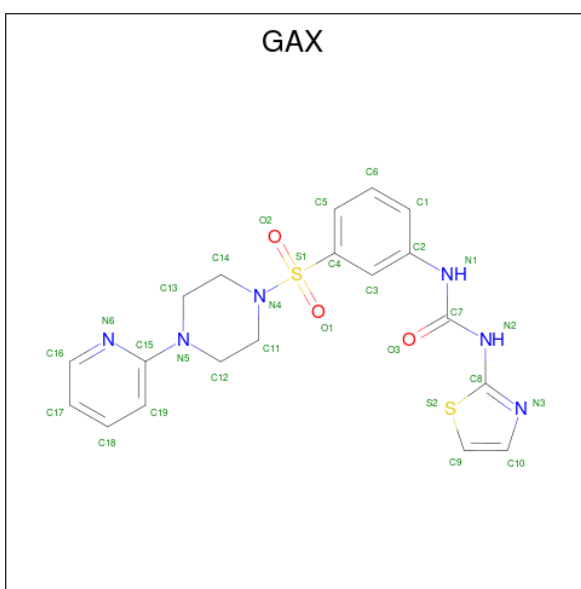
Chain	Residue	Modelled	Actual	Comment	Reference
B	34	ASN	ASP	engineered mutation	UNP Q4L5E4
B	144	PRO	GLN	engineered mutation	UNP Q4L5E4
B	661	GLY	GLU	engineered mutation	UNP Q4L5E4

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Chain	Residue	Modelled	Actual	Comment	Reference
B	663	ALA	GLN	engineered mutation	UNP Q4L5E4
B	664	GLY	ASP	engineered mutation	UNP Q4L5E4
D	34	ASN	ASP	engineered mutation	UNP Q4L5E4
D	144	PRO	GLN	engineered mutation	UNP Q4L5E4
D	661	GLY	GLU	engineered mutation	UNP Q4L5E4
D	663	ALA	GLN	engineered mutation	UNP Q4L5E4
D	664	GLY	ASP	engineered mutation	UNP Q4L5E4

- Molecule 3 is 1-{3-[(4-pyridin-2-yl)piperazin-1-yl)sulfonyl]phenyl}-3-(1,3-thiazol-2-yl)urea (CCD ID: GAX) (formula: C<sub>19</sub>H<sub>20</sub>N<sub>6</sub>O<sub>3</sub>S<sub>2</sub>).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
3	A	1	Total	C	N	O	S	0	0
			30	19	6	3	2		
3	C	1	Total	C	N	O	S	0	0
			30	19	6	3	2		

- Molecule 4 is SULFATE ION (CCD ID: SO4) (formula: O<sub>4</sub>S).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	B	1	Total O S 5 4 1	0	0
4	D	1	Total O S 5 4 1	0	0

- Molecule 5 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	C	1	Total Zn 1 1	0	0

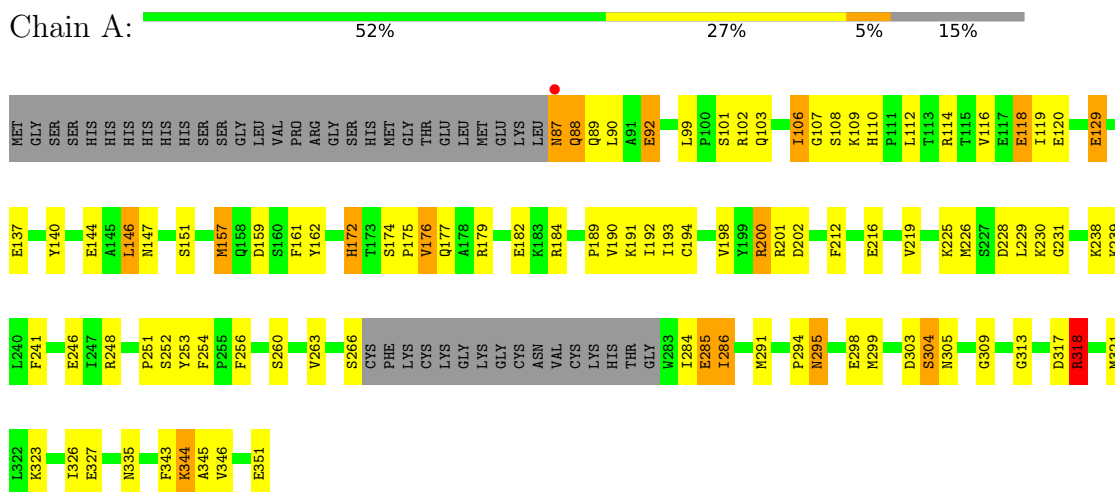
- Molecule 6 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	A	110	Total O 110 110	0	0
6	B	403	Total O 403 403	0	0
6	C	119	Total O 119 119	0	0
6	D	314	Total O 314 314	0	0

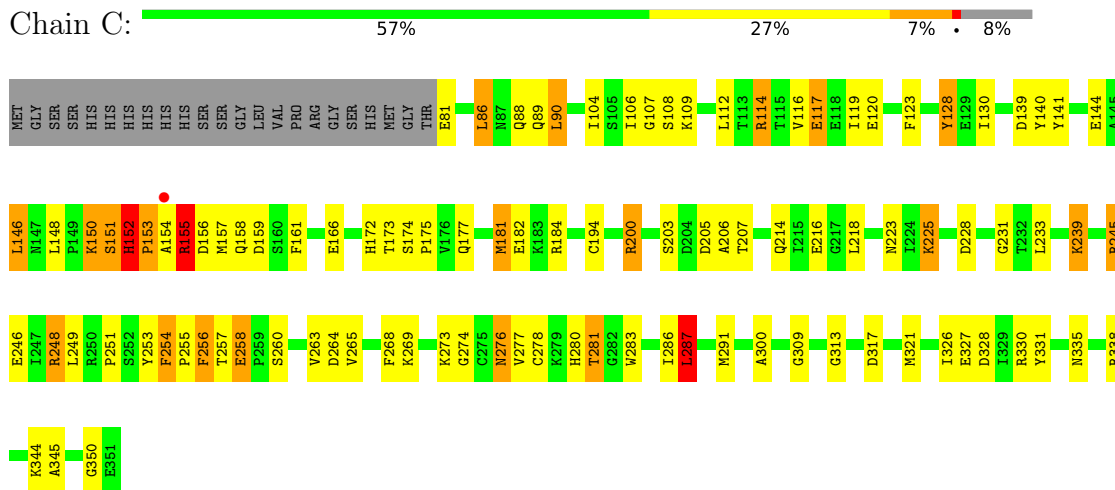
### 3 Residue-property plots [i](#)

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: Phenylalanyl-tRNA synthetase alpha chain

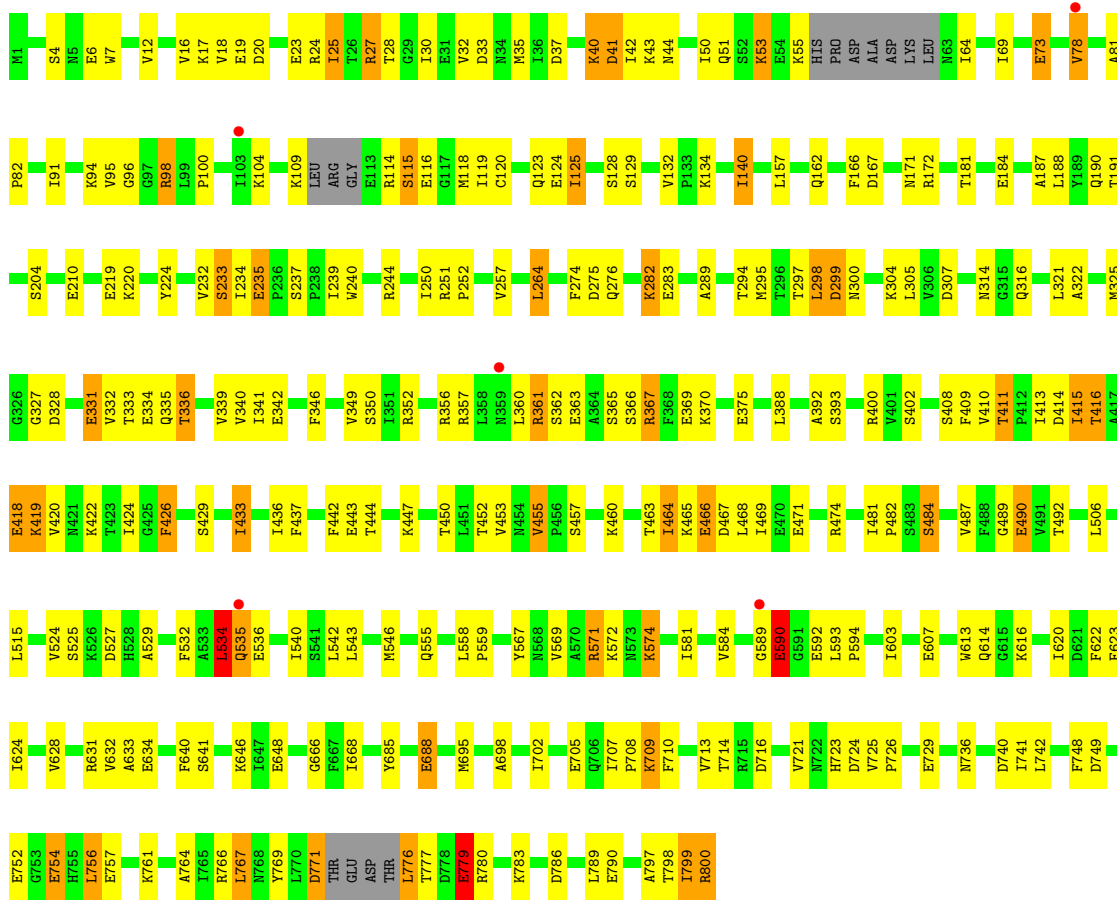


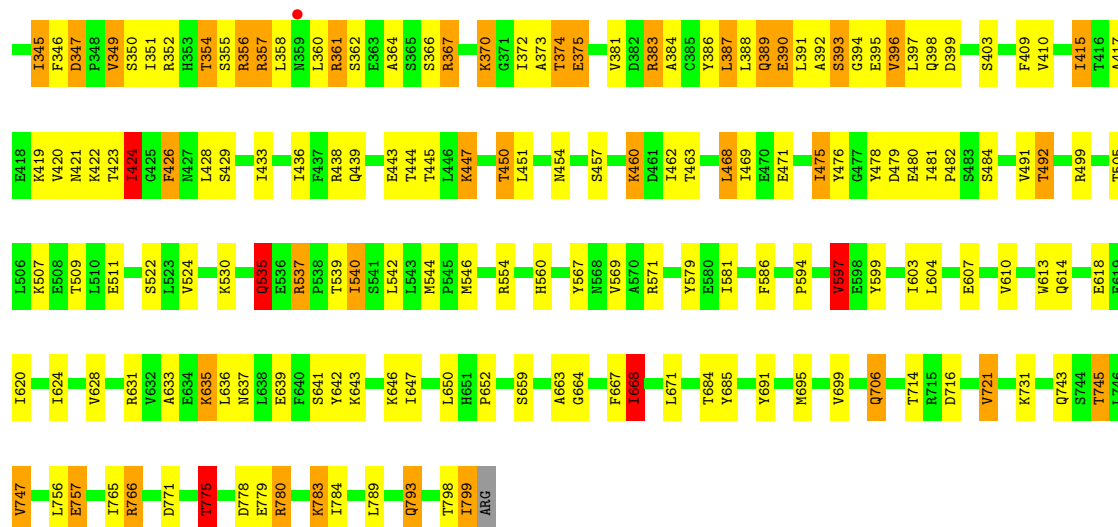
- Molecule 1: Phenylalanyl-tRNA synthetase alpha chain



- Molecule 2: Phenylalanyl-tRNA synthetase beta chain







## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	60.71Å 87.86Å 234.04Å 90.00° 90.59° 90.00°	Depositor
Resolution (Å)	57.30 – 2.20 57.30 – 2.20	Depositor EDS
% Data completeness (in resolution range)	89.3 (57.30-2.20) 89.3 (57.30-2.20)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.02 (at 2.20Å)	Xtrriage
Refinement program	REFMAC	Depositor
R, $R_{free}$	0.193 , 0.271 0.192 , 0.269	Depositor DCC
$R_{free}$ test set	5602 reflections (4.48%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	32.8	Xtrriage
Anisotropy	0.127	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 42.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.44$ , $\langle L^2 \rangle = 0.27$	Xtrriage
Estimated twinning fraction	0.047 for h,-k,-l	Xtrriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	17461	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	39.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.14% 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: SO4, GAX, ZN

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	0.58	0/2051	1.22	8/2771 (0.3%)
1	C	0.52	0/2233	1.20	10/3012 (0.3%)
2	B	0.54	0/6241	1.21	30/8452 (0.4%)
2	D	0.49	0/6212	1.12	30/8415 (0.4%)
All	All	0.52	0/16737	1.18	78/22650 (0.3%)

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	C	0	3
2	B	0	4
2	D	0	7
All	All	0	14

There are no bond length outliers.

The worst 5 of 78 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	535	GLN	N-CA-C	11.12	123.92	110.91
1	C	152	HIS	CA-C-N	10.65	133.16	119.84
1	C	152	HIS	C-N-CA	10.65	133.16	119.84
2	D	42	ILE	N-CA-C	9.58	121.69	107.80
2	B	237	SER	CA-C-N	-9.22	111.36	120.21

There are no chirality outliers.

5 of 14 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	B	298	LEU	Peptide
2	B	534	LEU	Peptide
2	B	740	ASP	Peptide
2	B	752	GLU	Peptide
1	C	273	LYS	Peptide

## 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	2006	0	1949	73	0
1	C	2181	0	2130	98	0
2	B	6141	0	6121	195	0
2	D	6116	0	6088	359	0
3	A	30	0	20	2	0
3	C	30	0	20	2	0
4	B	5	0	0	0	0
4	D	5	0	0	1	0
5	C	1	0	0	0	0
6	A	110	0	0	3	0
6	B	403	0	0	17	0
6	C	119	0	0	5	0
6	D	314	0	0	9	0
All	All	17461	0	16328	688	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 21.

The worst 5 of 688 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:D:91:ILE:CD1	2:D:153:ALA:HB1	1.74	1.17
2:B:424:ILE:HD11	2:B:469:ILE:HG23	1.26	1.15
1:A:87:ASN:N	1:A:87:ASN:HD22	1.44	1.14
2:D:53:LYS:NZ	2:D:53:LYS:HB3	1.65	1.11
2:B:464:ILE:HG13	2:B:466:GLU:HG2	1.22	1.10

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	246/294 (84%)	226 (92%)	20 (8%)	0	100	100
1	C	271/294 (92%)	252 (93%)	13 (5%)	6 (2%)	5	3
2	B	780/800 (98%)	726 (93%)	47 (6%)	7 (1%)	14	14
2	D	778/800 (97%)	674 (87%)	79 (10%)	25 (3%)	3	1
All	All	2075/2188 (95%)	1878 (90%)	159 (8%)	38 (2%)	6	4

5 of 38 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	151	SER
1	C	152	HIS
1	C	155	ARG
2	D	39	SER
2	D	114	ARG

### 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	220/257 (86%)	198 (90%)	22 (10%)	7	7
1	C	240/257 (93%)	214 (89%)	26 (11%)	6	6
2	B	678/688 (98%)	593 (88%)	85 (12%)	4	4

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	D	676/688 (98%)	557 (82%)	119 (18%)	2	1
All	All	1814/1890 (96%)	1562 (86%)	252 (14%)	3	3

5 of 252 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	151	SER
2	D	450	THR
2	D	53	LYS
2	D	445	THR
2	D	641	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 16 such sidechains are listed below:

Mol	Chain	Res	Type
2	D	398	GLN
2	D	338	ASN
2	D	89	HIS
2	D	288	GLN
2	D	63	ASN

### 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 5 ligands modelled in this entry, 1 is 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	GAX	A	1	-	33,33,33	2.28	7 (21%)	46,46,46	2.25	17 (36%)
3	GAX	C	2	-	33,33,33	2.42	6 (18%)	46,46,46	2.66	15 (32%)
4	SO4	B	801	-	4,4,4	0.24	0	6,6,6	0.26	0
4	SO4	D	801	-	4,4,4	0.25	0	6,6,6	0.22	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	GAX	A	1	-	-	11/24/34/34	0/4/4/4
3	GAX	C	2	-	-	6/24/34/34	0/4/4/4

The worst 5 of 13 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	2	GAX	C4-S1	-12.16	1.60	1.76
3	A	1	GAX	C4-S1	-10.90	1.61	1.76
3	A	1	GAX	C2-N1	-3.75	1.34	1.41
3	C	2	GAX	C7-N2	-3.00	1.32	1.39
3	C	2	GAX	C8-N3	2.75	1.35	1.31

The worst 5 of 32 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	C	2	GAX	O1-S1-N4	8.11	114.33	106.69
3	C	2	GAX	O2-S1-O1	-6.42	109.57	119.59
3	A	1	GAX	O2-S1-O1	-6.07	110.11	119.59
3	C	2	GAX	C4-S1-N4	-4.90	101.36	107.28
3	C	2	GAX	C13-N5-C15	-4.75	107.75	120.41

There are no chirality outliers.

5 of 17 torsion outliers are listed below:

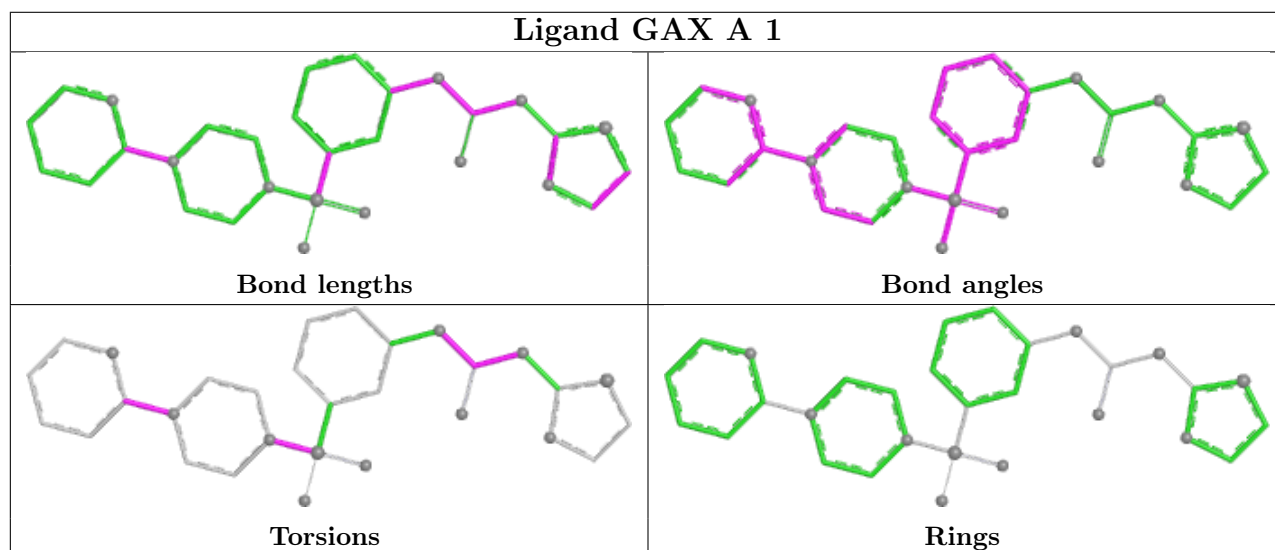
Mol	Chain	Res	Type	Atoms
3	A	1	GAX	C11-N4-S1-O2
3	C	2	GAX	C14-N4-S1-O1
3	C	2	GAX	C11-N4-S1-O2
3	A	1	GAX	C11-N4-S1-O1
3	A	1	GAX	C11-N4-S1-C4

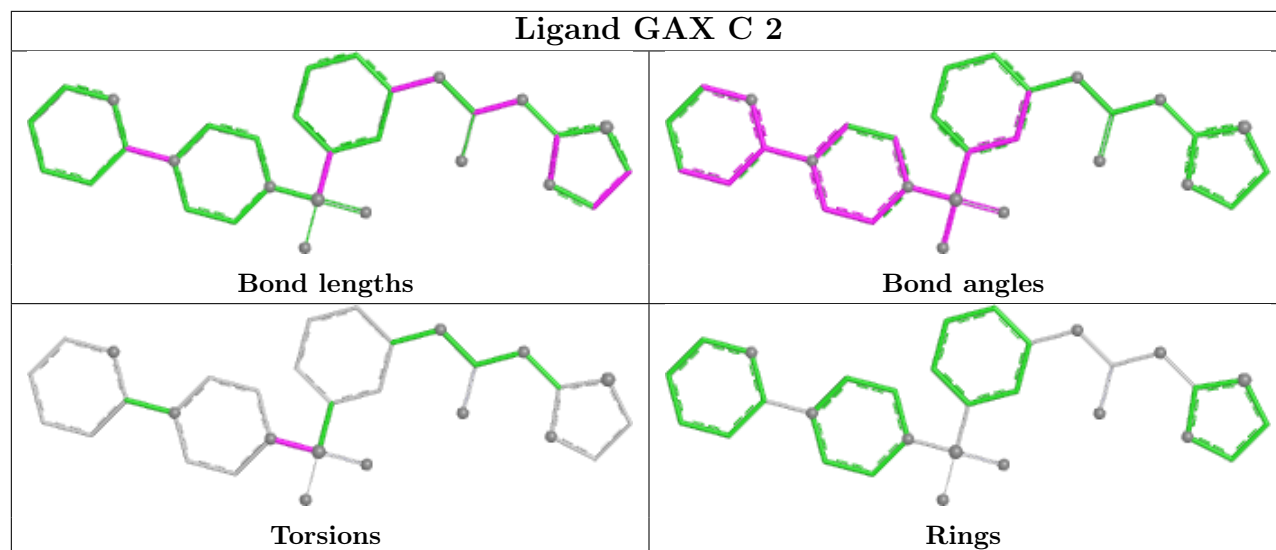
There are no ring outliers.

3 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1	GAX	2	0
3	C	2	GAX	2	0
4	D	801	SO4	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





## 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 [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	249/294 (84%)	-0.39	1 (0%) 88 87	16, 29, 51, 83	1 (0%)
1	C	271/294 (92%)	-0.31	1 (0%) 88 87	13, 31, 59, 83	2 (0%)
2	B	786/800 (98%)	-0.24	5 (0%) 85 83	17, 34, 56, 83	3 (0%)
2	D	785/800 (98%)	0.32	54 (6%) 23 20	16, 46, 85, 105	2 (0%)
All	All	2091/2188 (95%)	-0.06	61 (2%) 53 50	13, 35, 75, 105	8 (0%)

The worst 5 of 61 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	D	105	ILE	5.4
2	D	103	ILE	4.9
2	D	127	ILE	4.3
2	D	124	GLU	4.2
2	D	151	THR	4.0

### 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](#)

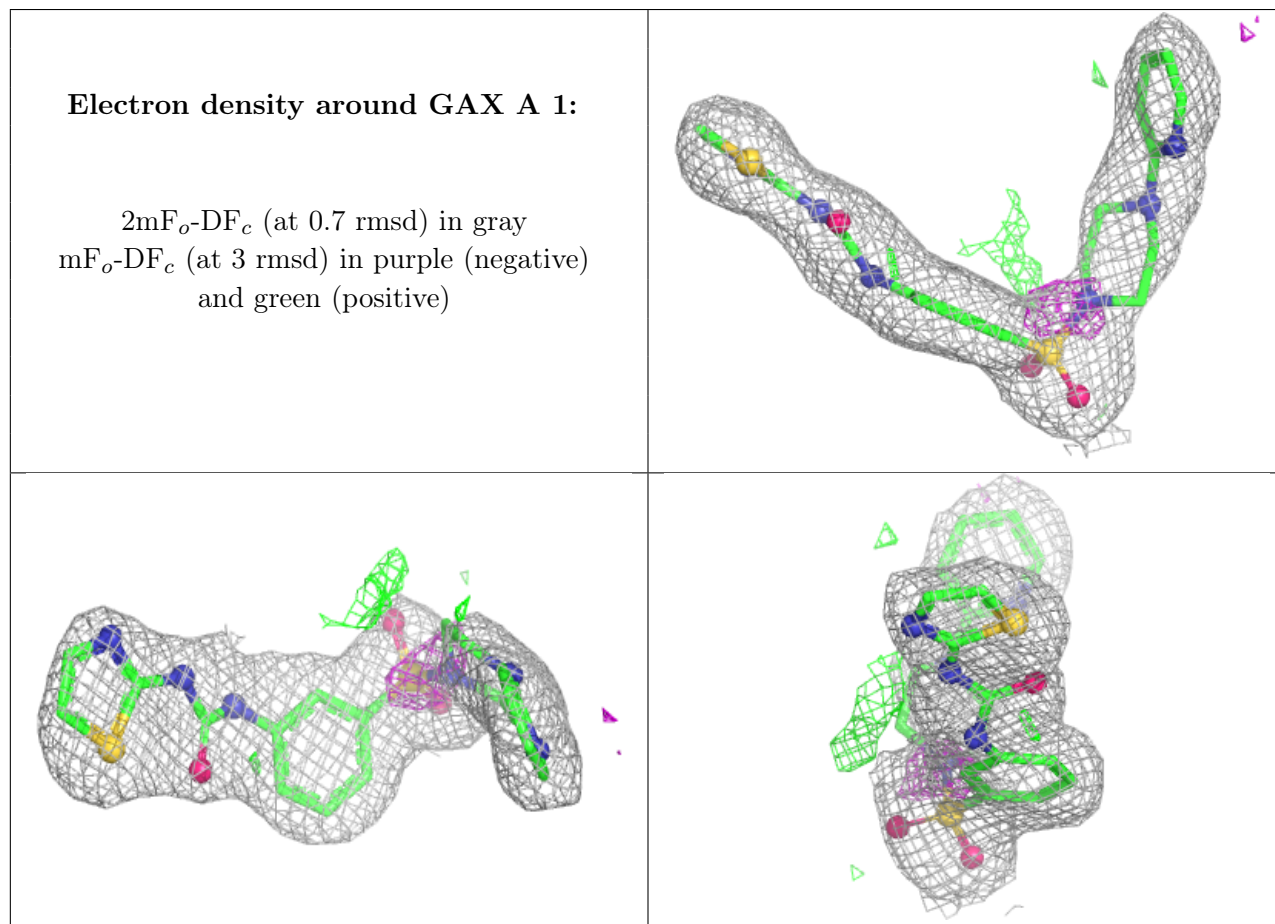
There are no oligosaccharides in this entry.

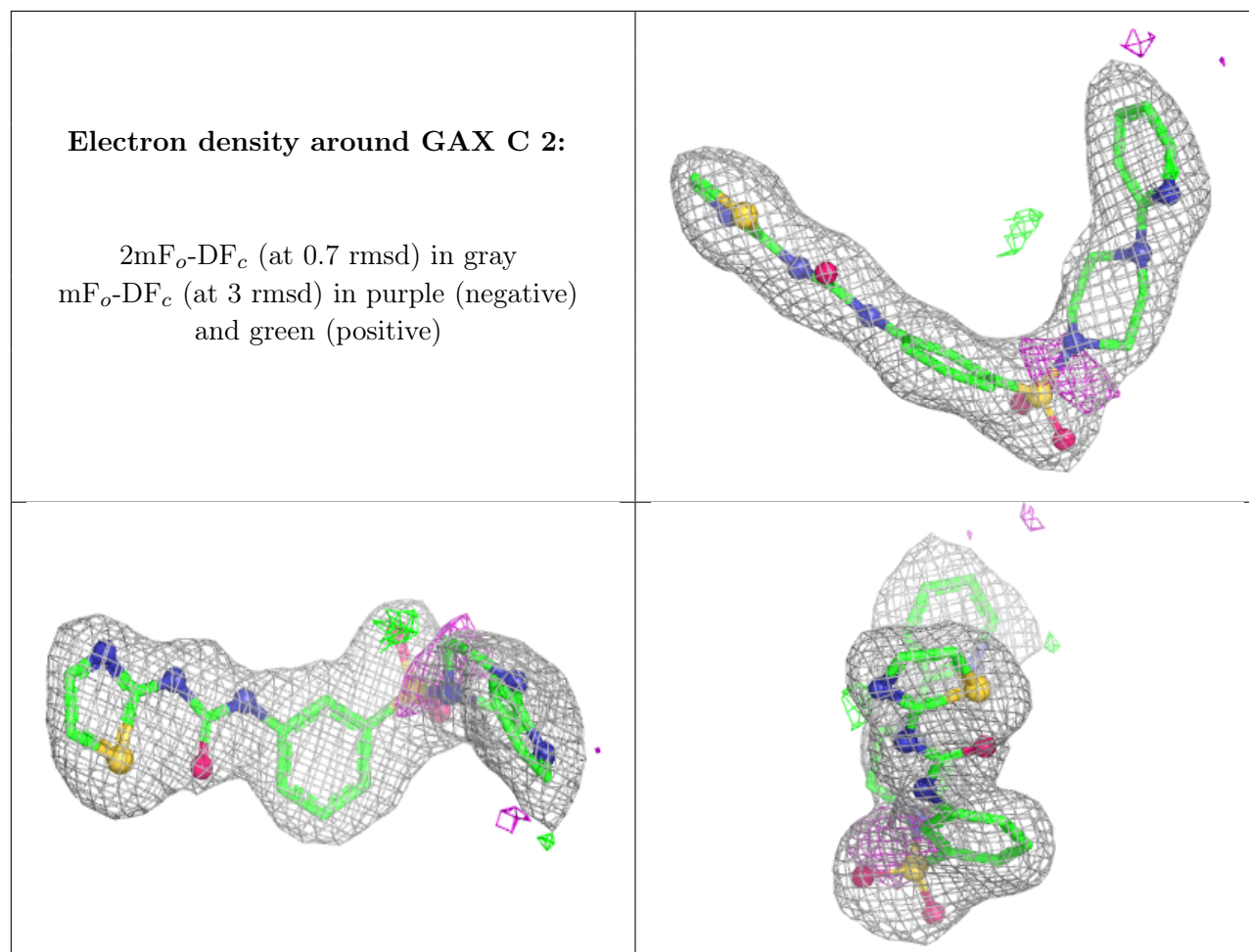
### 6.4 Ligands [i](#)

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<sup>th</sup> 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( $\text{\AA}^2$ )	Q<0.9
3	GAX	A	1	30/30	0.94	0.11	21,39,63,65	0
3	GAX	C	2	30/30	0.95	0.09	22,40,56,57	0
4	SO4	B	801	5/5	0.97	0.05	44,44,52,53	0
4	SO4	D	801	5/5	0.97	0.05	37,41,44,47	0
5	ZN	C	3	1/1	0.99	0.04	47,47,47,47	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.





## 6.5 Other polymers [i](#)

There are no such residues in this entry.