Full wwPDB X-ray Structure Validation Report ⓘ

Aug 24, 2025 – 11:36 pm BST

PDB ID	:	8RZZ / pdb_00008rzz
Title	:	Crystal structure of Renilla luciferase RLuc8-GFP BRET complex at pH 9.0 (space group P32)
Authors	:	Marek, M.; Smrckova, A.
Deposited on	:	2024-02-13
Resolution	:	2.30 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:

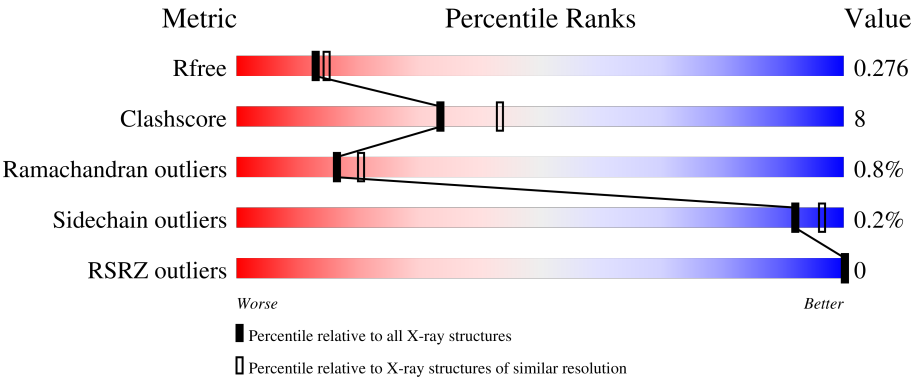
MolProbity	:	4-5-2 with Phenix2.0rc1
Mogul	:	1.8.4, CSD as541be (2020)
Xtriage (Phenix)	:	2.0rc1
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.006 (Gargrove)
Density-Fitness	:	1.0.12
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.45.1

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.30 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	5963 (2.30-2.30)
Clashscore	180529	6698 (2.30-2.30)
Ramachandran outliers	177936	6640 (2.30-2.30)
Sidechain outliers	177891	6640 (2.30-2.30)
RSRZ outliers	164620	5963 (2.30-2.30)

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	231	75% 24% .
1	B	231	75% 24% .
1	E	231	84% 16%
1	F	231	82% 17%
1	I	231	79% 20% .

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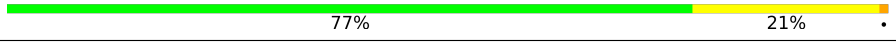
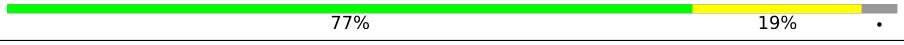
Mol	Chain	Length	Quality of chain
1	J	231	
2	C	319	
2	D	319	
2	G	319	
2	H	319	
2	K	319	
2	L	319	

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 26927 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 Green fluorescent protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	229	Total	C	N	O	S	0	0	0
			1812	1162	299	342	9			
1	B	230	Total	C	N	O	S	0	1	0
			1829	1171	301	348	9			
1	E	231	Total	C	N	O	S	0	1	0
			1839	1177	305	347	10			
1	F	230	Total	C	N	O	S	0	0	0
			1820	1166	300	345	9			
1	I	229	Total	C	N	O	S	0	1	0
			1821	1167	300	345	9			
1	J	231	Total	C	N	O	S	0	1	0
			1834	1174	302	347	11			

There are 18 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	66	CRO	SER	chromophore	UNP Q963I9
A	66	CRO	TYR	chromophore	UNP Q963I9
A	66	CRO	GLY	chromophore	UNP Q963I9
B	66	CRO	SER	chromophore	UNP Q963I9
B	66	CRO	TYR	chromophore	UNP Q963I9
B	66	CRO	GLY	chromophore	UNP Q963I9
E	66	CRO	SER	chromophore	UNP Q963I9
E	66	CRO	TYR	chromophore	UNP Q963I9
E	66	CRO	GLY	chromophore	UNP Q963I9
F	66	CRO	SER	chromophore	UNP Q963I9
F	66	CRO	TYR	chromophore	UNP Q963I9
F	66	CRO	GLY	chromophore	UNP Q963I9
I	66	CRO	SER	chromophore	UNP Q963I9
I	66	CRO	TYR	chromophore	UNP Q963I9
I	66	CRO	GLY	chromophore	UNP Q963I9
J	66	CRO	SER	chromophore	UNP Q963I9
J	66	CRO	TYR	chromophore	UNP Q963I9

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Chain	Residue	Modelled	Actual	Comment	Reference
J	66	CRO	GLY	chromophore	UNP Q963I9

- Molecule 2 is a protein called Coelenterazine h 2-monooxygenase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	C	307	Total	C	N	O	S	0	0	0
			2515	1631	421	454	9			
2	D	310	Total	C	N	O	S	0	0	0
			2541	1645	426	461	9			
2	G	307	Total	C	N	O	S	0	0	0
			2515	1631	421	454	9			
2	H	308	Total	C	N	O	S	0	0	0
			2523	1635	423	456	9			
2	K	307	Total	C	N	O	S	0	1	0
			2526	1637	425	455	9			
2	L	311	Total	C	N	O	S	0	0	0
			2549	1650	427	462	10			

There are 96 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	55	THR	ALA	engineered mutation	UNP P27652
C	124	ALA	CYS	engineered mutation	UNP P27652
C	130	ALA	SER	engineered mutation	UNP P27652
C	136	ARG	LYS	engineered mutation	UNP P27652
C	143	MET	ALA	engineered mutation	UNP P27652
C	185	VAL	MET	engineered mutation	UNP P27652
C	253	LEU	MET	engineered mutation	UNP P27652
C	287	LEU	SER	engineered mutation	UNP P27652
C	312	SER	-	expression tag	UNP P27652
C	313	GLY	-	expression tag	UNP P27652
C	314	LEU	-	expression tag	UNP P27652
C	315	GLU	-	expression tag	UNP P27652
C	316	VAL	-	expression tag	UNP P27652
C	317	LEU	-	expression tag	UNP P27652
C	318	PHE	-	expression tag	UNP P27652
C	319	GLN	-	expression tag	UNP P27652
D	55	THR	ALA	engineered mutation	UNP P27652
D	124	ALA	CYS	engineered mutation	UNP P27652
D	130	ALA	SER	engineered mutation	UNP P27652
D	136	ARG	LYS	engineered mutation	UNP P27652
D	143	MET	ALA	engineered mutation	UNP P27652

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Chain	Residue	Modelled	Actual	Comment	Reference
D	185	VAL	MET	engineered mutation	UNP P27652
D	253	LEU	MET	engineered mutation	UNP P27652
D	287	LEU	SER	engineered mutation	UNP P27652
D	322	SER	-	expression tag	UNP P27652
D	323	GLY	-	expression tag	UNP P27652
D	324	LEU	-	expression tag	UNP P27652
D	325	GLU	-	expression tag	UNP P27652
D	326	VAL	-	expression tag	UNP P27652
D	327	LEU	-	expression tag	UNP P27652
D	328	PHE	-	expression tag	UNP P27652
D	329	GLN	-	expression tag	UNP P27652
G	55	THR	ALA	engineered mutation	UNP P27652
G	124	ALA	CYS	engineered mutation	UNP P27652
G	130	ALA	SER	engineered mutation	UNP P27652
G	136	ARG	LYS	engineered mutation	UNP P27652
G	143	MET	ALA	engineered mutation	UNP P27652
G	185	VAL	MET	engineered mutation	UNP P27652
G	253	LEU	MET	engineered mutation	UNP P27652
G	287	LEU	SER	engineered mutation	UNP P27652
G	312	SER	-	expression tag	UNP P27652
G	313	GLY	-	expression tag	UNP P27652
G	314	LEU	-	expression tag	UNP P27652
G	315	GLU	-	expression tag	UNP P27652
G	316	VAL	-	expression tag	UNP P27652
G	317	LEU	-	expression tag	UNP P27652
G	318	PHE	-	expression tag	UNP P27652
G	319	GLN	-	expression tag	UNP P27652
H	55	THR	ALA	engineered mutation	UNP P27652
H	124	ALA	CYS	engineered mutation	UNP P27652
H	130	ALA	SER	engineered mutation	UNP P27652
H	136	ARG	LYS	engineered mutation	UNP P27652
H	143	MET	ALA	engineered mutation	UNP P27652
H	185	VAL	MET	engineered mutation	UNP P27652
H	253	LEU	MET	engineered mutation	UNP P27652
H	287	LEU	SER	engineered mutation	UNP P27652
H	312	SER	-	expression tag	UNP P27652
H	313	GLY	-	expression tag	UNP P27652
H	314	LEU	-	expression tag	UNP P27652
H	315	GLU	-	expression tag	UNP P27652
H	316	VAL	-	expression tag	UNP P27652
H	317	LEU	-	expression tag	UNP P27652
H	318	PHE	-	expression tag	UNP P27652

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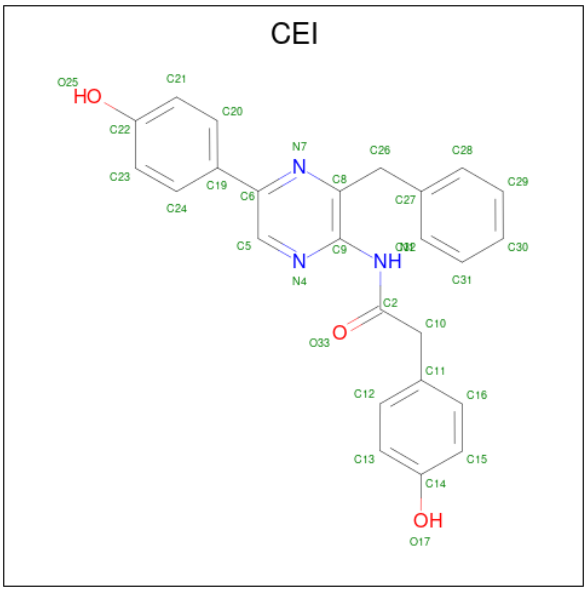
Chain	Residue	Modelled	Actual	Comment	Reference
H	319	GLN	-	expression tag	UNP P27652
K	55	THR	ALA	engineered mutation	UNP P27652
K	124	ALA	CYS	engineered mutation	UNP P27652
K	130	ALA	SER	engineered mutation	UNP P27652
K	136	ARG	LYS	engineered mutation	UNP P27652
K	143	MET	ALA	engineered mutation	UNP P27652
K	185	VAL	MET	engineered mutation	UNP P27652
K	253	LEU	MET	engineered mutation	UNP P27652
K	287	LEU	SER	engineered mutation	UNP P27652
K	312	SER	-	expression tag	UNP P27652
K	313	GLY	-	expression tag	UNP P27652
K	314	LEU	-	expression tag	UNP P27652
K	315	GLU	-	expression tag	UNP P27652
K	316	VAL	-	expression tag	UNP P27652
K	317	LEU	-	expression tag	UNP P27652
K	318	PHE	-	expression tag	UNP P27652
K	319	GLN	-	expression tag	UNP P27652
L	55	THR	ALA	engineered mutation	UNP P27652
L	124	ALA	CYS	engineered mutation	UNP P27652
L	130	ALA	SER	engineered mutation	UNP P27652
L	136	ARG	LYS	engineered mutation	UNP P27652
L	143	MET	ALA	engineered mutation	UNP P27652
L	185	VAL	MET	engineered mutation	UNP P27652
L	253	LEU	MET	engineered mutation	UNP P27652
L	287	LEU	SER	engineered mutation	UNP P27652
L	322	SER	-	expression tag	UNP P27652
L	323	GLY	-	expression tag	UNP P27652
L	324	LEU	-	expression tag	UNP P27652
L	325	GLU	-	expression tag	UNP P27652
L	326	VAL	-	expression tag	UNP P27652
L	327	LEU	-	expression tag	UNP P27652
L	328	PHE	-	expression tag	UNP P27652
L	329	GLN	-	expression tag	UNP P27652

- Molecule 3 is N-[3-BENZYL-5-(4-HYDROXYPHENYL)PYRAZIN-2-YL]-2-(4-HYDROXYPHENYL)ACETAMIDE (CCD ID: CEI) (formula: $C_{25}H_{21}N_3O_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	D	1	Total C N O 31 25 3 3	0	0
3	G	1	Total C N O 31 25 3 3	0	0
3	H	1	Total C N O 31 25 3 3	0	0
3	K	1	Total C N O 31 25 3 3	0	0
3	L	1	Total C N O 31 25 3 3	0	0

- Molecule 4 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	53	Total O 54 54	0	1
4	B	49	Total O 49 49	0	0
4	C	45	Total O 45 45	0	0
4	D	74	Total O 74 74	0	0
4	E	37	Total O 37 37	0	0
4	F	43	Total O 43 43	0	0
4	G	40	Total O 40 40	0	0

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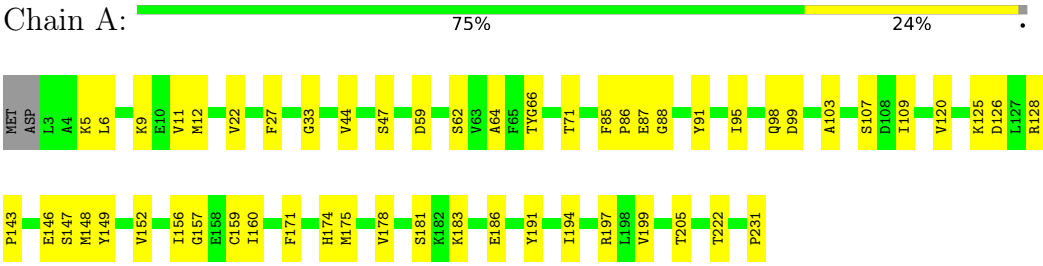
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	H	56	Total O 56 56	0	0
4	I	46	Total O 46 46	0	0
4	J	72	Total O 72 72	0	0
4	K	57	Total O 57 57	0	0
4	L	75	Total O 75 75	0	0

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.

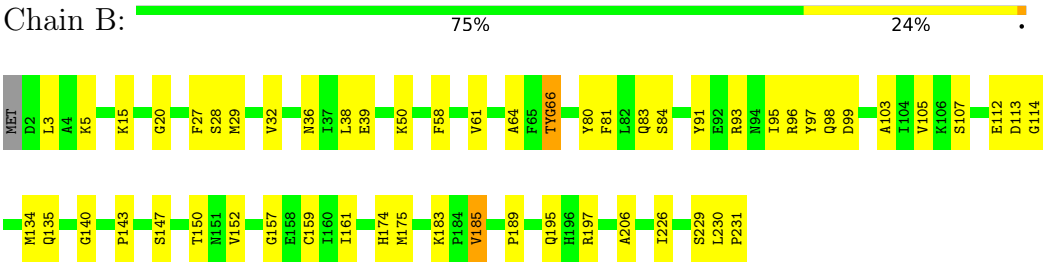
• Molecule 1: Green fluorescent protein

Chain A:



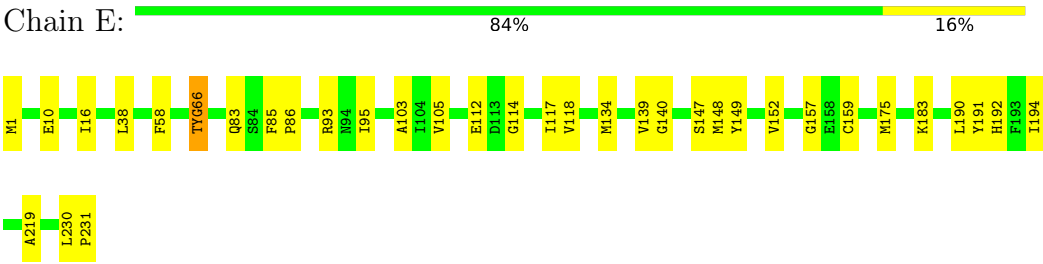
• Molecule 1: Green fluorescent protein

Chain B:



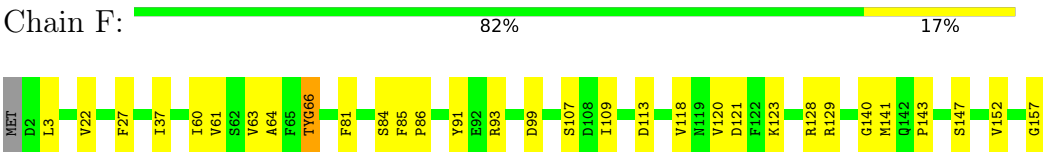
• Molecule 1: Green fluorescent protein

Chain E:



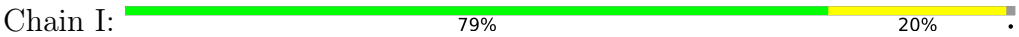
• Molecule 1: Green fluorescent protein

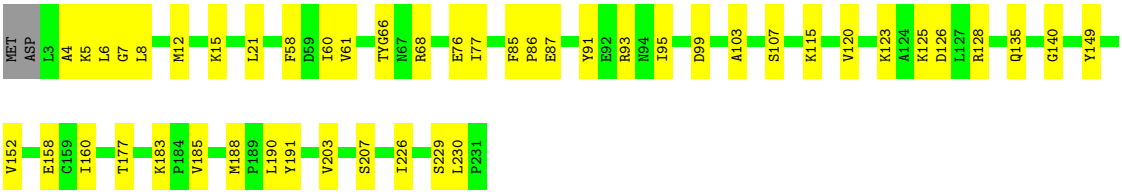
Chain F:



• Molecule 1: Green fluorescent protein

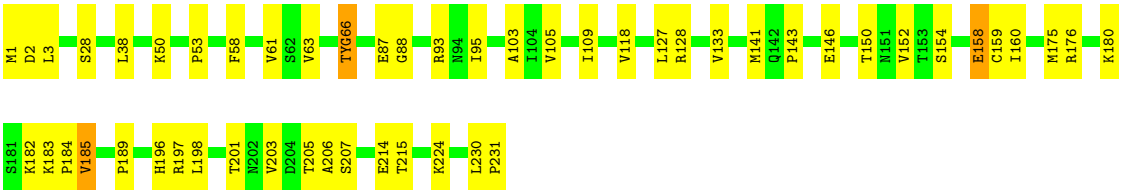
Chain I:





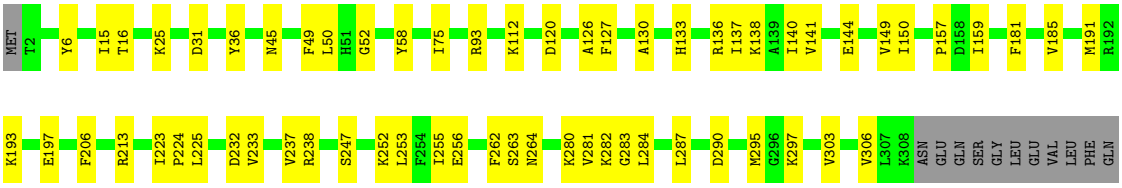
• Molecule 1: Green fluorescent protein

Chain J:



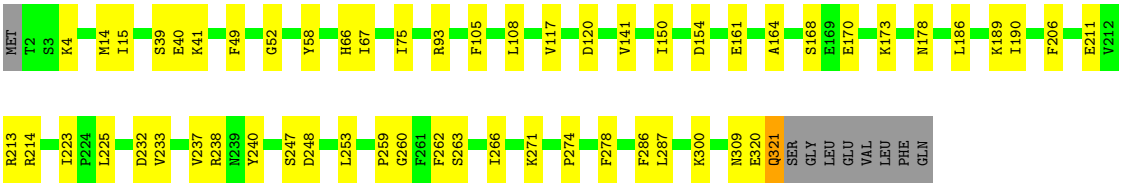
• Molecule 2: Coelenterazine h 2-monooxygenase

Chain C:



• Molecule 2: Coelenterazine h 2-monooxygenase

Chain D:



• Molecule 2: Coelenterazine h 2-monooxygenase

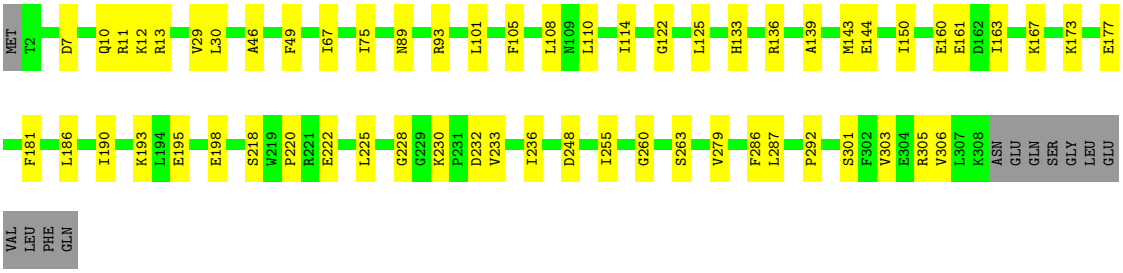
Chain G:

• Molecule 2: Coelenterazine h 2-monooxygenase

Chain H:

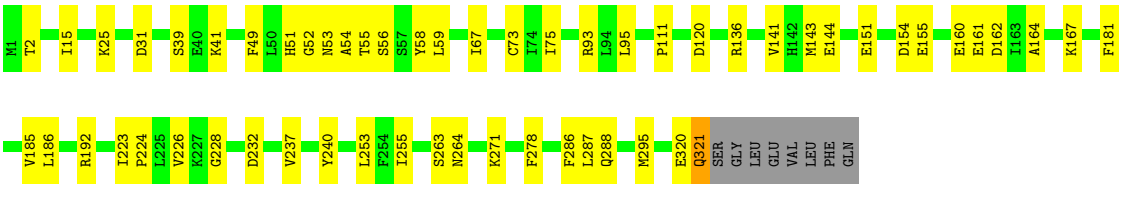
• Molecule 2: Coelenterazine h 2-monooxygenase

Chain K:



• Molecule 2: Coelenterazine h 2-monooxygenase

Chain L:



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 32	Depositor
Cell constants a, b, c, α, β, γ	97.99Å 97.99Å 362.00Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	49.17 – 2.30 49.17 – 2.30	Depositor EDS
% Data completeness (in resolution range)	100.0 (49.17-2.30) 99.9 (49.17-2.30)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	132.40 (at 2.29Å)	Xtriage
Refinement program	PHENIX (1.14_3260	Depositor
R, R_{free}	0.227 , 0.257 0.245 , 0.276	Depositor DCC
R_{free} test set	8476 reflections (4.90%)	wwPDB-VP
Wilson B-factor (Å^2)	43.4	Xtriage
Anisotropy	0.470	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 28.9	EDS
L-test for twinning[2]	$< \|L\| > = 0.40$, $< L^2 > = 0.22$	Xtriage
Estimated twinning fraction	0.056 for -h,-k,l 0.149 for h,-h-k,-l 0.057 for -k,-h,-l	Xtriage
F_o,F_c correlation	0.96	EDS
Total number of atoms	26927	wwPDB-VP
Average B, all atoms (Å^2)	45.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.59% 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: CRO, CEI

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	0.21	0/1829	0.33	0/2468
1	B	0.18	0/1846	0.37	0/2491
1	E	0.17	0/1856	0.36	0/2503
1	F	0.19	0/1837	0.35	0/2479
1	I	0.20	0/1838	0.36	0/2480
1	J	0.20	0/1851	0.36	0/2497
2	C	0.12	0/2587	0.34	0/3503
2	D	0.28	0/2613	0.53	5/3538 (0.1%)
2	G	0.10	0/2587	0.30	0/3503
2	H	0.13	0/2595	0.33	0/3514
2	K	0.15	0/2598	0.33	0/3517
2	L	0.14	0/2621	0.39	1/3548 (0.0%)
All	All	0.18	0/26658	0.37	6/36041 (0.0%)

There are no bond length outliers.

All (6) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	D	309	ASN	CA-C-N	9.68	140.02	121.54
2	D	309	ASN	C-N-CA	9.68	140.02	121.54
2	D	309	ASN	N-CA-CB	7.44	121.03	110.24
2	D	320	GLU	N-CA-C	-7.04	95.81	110.80
2	D	309	ASN	CA-CB-CG	-6.15	106.45	112.60
2	L	321	GLN	CB-CA-C	5.92	121.36	110.10

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	A	1812	0	1799	34	0
1	B	1829	0	1808	35	0
1	E	1839	0	1827	25	0
1	F	1820	0	1803	29	0
1	I	1821	0	1804	33	0
1	J	1834	0	1819	40	0
2	C	2515	0	2482	37	0
2	D	2541	0	2502	37	0
2	G	2515	0	2482	40	0
2	H	2523	0	2488	45	0
2	K	2526	0	2494	40	0
2	L	2549	0	2514	37	0
3	D	31	0	21	3	0
3	G	31	0	21	1	0
3	H	31	0	21	2	0
3	K	31	0	21	1	0
3	L	31	0	21	1	0
4	A	54	0	0	0	0
4	B	49	0	0	1	0
4	C	45	0	0	1	0
4	D	74	0	0	0	0
4	E	37	0	0	0	0
4	F	43	0	0	0	0
4	G	40	0	0	0	0
4	H	56	0	0	1	0
4	I	46	0	0	0	0
4	J	72	0	0	2	0
4	K	57	0	0	0	0
4	L	75	0	0	1	0
All	All	26927	0	25927	398	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 8.

All (398) 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:E:230:LEU:HD12	1:F:203:VAL:HG11	1.35	1.03
1:E:140:GLY:HA3	1:F:231:PRO:HD3	1.50	0.94
2:D:321:GLN:HE21	2:D:321:GLN:HA	1.30	0.93
2:D:321:GLN:HA	2:D:321:GLN:NE2	2.00	0.76
2:G:163:ILE:HD11	3:G:401:CEI:H5	1.67	0.76
1:I:230:LEU:HD12	1:J:203:VAL:HG11	1.70	0.74
1:I:99:ASP:HB2	1:I:128:ARG:HD3	1.71	0.72
1:J:158:GLU:HG3	1:J:176:ARG:HG3	1.71	0.71
1:A:140:GLY:HA3	1:B:231:PRO:HG3	1.72	0.71
2:C:206:PHE:HB3	2:C:213:ARG:HG2	1.73	0.71
2:K:29:VAL:HG12	2:K:30:LEU:HD12	1.72	0.70
1:F:143:PRO:HG3	1:F:197:ARG:HG3	1.73	0.70
2:G:288:GLN:HA	2:G:295:MET:HE1	1.73	0.70
2:C:256:GLU:HB3	2:C:280:LYS:HG3	1.75	0.68
2:C:49:PHE:HB2	2:C:75:ILE:HG12	1.73	0.68
1:B:230:LEU:HB3	1:B:231:PRO:HD3	1.74	0.68
1:B:143:PRO:HG3	1:B:197:ARG:HG3	1.74	0.68
2:H:113:LYS:HB3	2:H:138:LYS:HB2	1.76	0.67
2:L:320:GLU:O	2:L:320:GLU:HG2	1.93	0.67
2:C:16:THR:HG23	2:C:197:GLU:HB3	1.76	0.66
1:I:93:ARG:HB2	1:I:177:THR:HG23	1.76	0.66
1:I:140:GLY:HA3	1:J:231:PRO:HD3	1.76	0.66
2:L:52:GLY:HA3	2:L:120:ASP:HB3	1.77	0.66
1:I:76:GLU:HG2	1:I:77:ILE:HD12	1.77	0.66
2:L:288:GLN:HG3	2:L:295:MET:HE1	1.78	0.66
2:K:133:HIS:HB3	2:K:136[B]:ARG:HG3	1.78	0.66
1:I:226:ILE:O	1:I:229:SER:OG	2.11	0.66
2:D:168:SER:O	2:D:170:GLU:N	2.24	0.66
2:D:206:PHE:HB3	2:D:213:ARG:HG2	1.78	0.66
1:B:226:ILE:HB	1:B:229:SER:HB3	1.78	0.65
2:D:66:HIS:O	2:D:300:LYS:HD2	1.97	0.65
2:L:143:MET:HE2	2:L:255:ILE:HD12	1.79	0.65
1:I:203:VAL:HG21	1:J:230:LEU:HD12	1.79	0.64
2:D:49:PHE:HB2	2:D:75:ILE:HG12	1.77	0.64
2:L:39:SER:HB3	2:L:73:CYS:H	1.63	0.64
2:K:105:PHE:HA	2:K:108:LEU:HD12	1.80	0.64
2:C:303:VAL:HA	2:C:306:VAL:HG12	1.80	0.63
1:E:230:LEU:CD1	1:F:203:VAL:HG11	2.20	0.63
1:A:5:LYS:HG3	1:A:6:LEU:HD22	1.81	0.63
1:A:147:SER:O	1:A:157:GLY:HA2	1.99	0.62
2:L:141:VAL:HG22	2:L:253:LEU:HB3	1.82	0.62
1:F:147:SER:O	1:F:157:GLY:HA2	1.99	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:230:LEU:HD12	1:J:203:VAL:CG1	2.30	0.61
2:D:52:GLY:HA3	2:D:120:ASP:HB3	1.83	0.61
2:H:117:VAL:HG22	2:H:141:VAL:HB	1.81	0.61
1:J:205:THR:HG23	4:J:444:HOH:O	2.00	0.61
1:J:143:PRO:HG3	1:J:197:ARG:HG3	1.82	0.60
2:H:130:ALA:O	2:H:134:GLN:HA	2.01	0.60
2:G:287:LEU:HD23	2:G:287:LEU:H	1.67	0.60
2:H:141:VAL:HG22	2:H:253:LEU:HB3	1.83	0.60
2:C:281:VAL:HG22	2:C:282:LYS:H	1.67	0.60
2:H:131:TYR:O	2:H:134:GLN:HG3	2.03	0.59
1:F:129:ARG:NH2	2:H:256:GLU:OE2	2.35	0.59
1:F:99:ASP:HB3	1:F:128:ARG:HG3	1.84	0.59
1:J:28:SER:HB2	1:J:50:LYS:HB2	1.84	0.59
2:G:111:PRO:O	2:G:136:ARG:NH1	2.35	0.59
1:I:125:LYS:HD3	1:I:126:ASP:OD1	2.03	0.59
1:B:29:MET:HE1	1:B:61:VAL:HG21	1.85	0.58
2:D:39:SER:O	2:D:41:LYS:N	2.36	0.58
2:C:50:LEU:HD12	2:C:126:ALA:HB2	1.85	0.58
2:D:189:LYS:HG3	3:D:401:CEI:H31	1.85	0.58
1:I:5:LYS:O	1:I:5:LYS:HG3	2.04	0.58
1:E:10:GLU:HG3	1:E:38:LEU:HD22	1.84	0.58
2:L:93:ARG:NH2	2:L:232:ASP:OD2	2.34	0.57
2:G:255:ILE:HD13	2:G:295:MET:HG2	1.87	0.57
1:B:107:SER:HB2	1:B:120:VAL:HG13	1.85	0.57
2:H:52:GLY:HA3	2:H:120:ASP:HB3	1.87	0.57
1:J:53:PRO:HG3	2:L:192:ARG:HB3	1.87	0.57
1:I:87:GLU:HG3	1:I:183:LYS:HB3	1.87	0.57
2:G:173:LYS:HD3	2:G:178:ASN:HD21	1.69	0.57
2:G:91:SER:OG	2:G:96:ASP:OD2	2.22	0.56
1:J:154:SER:OG	1:J:180:LYS:HD3	2.06	0.56
1:B:147:SER:O	1:B:157:GLY:HA2	2.05	0.56
1:J:128:ARG:NH1	4:J:402:HOH:O	2.37	0.56
2:G:173:LYS:O	2:G:178:ASN:ND2	2.36	0.56
2:C:191:MET:HG3	2:C:284:LEU:HG	1.86	0.56
2:H:303:VAL:O	2:H:307:LEU:HG	2.06	0.55
1:F:107:SER:HB2	1:F:120:VAL:HG13	1.88	0.55
2:G:141:VAL:HG22	2:G:253:LEU:HB3	1.88	0.55
2:K:49:PHE:HB2	2:K:75:ILE:HG12	1.87	0.55
1:B:96:ARG:NH1	4:B:403:HOH:O	2.39	0.55
1:A:87:GLU:OE1	1:A:183:LYS:HE3	2.07	0.55
2:C:141:VAL:HG22	2:C:253:LEU:HB3	1.87	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:277:GLU:OE2	2:G:305:ARG:NH2	2.38	0.55
2:K:93:ARG:NH2	2:K:232:ASP:OD2	2.40	0.55
2:D:93:ARG:NH2	2:D:232:ASP:OD1	2.40	0.55
1:J:150:THR:OG1	1:J:189:PRO:O	2.24	0.55
2:K:163:ILE:HD11	3:K:401:CEI:H5	1.88	0.55
1:I:207:SER:O	2:K:193:LYS:NZ	2.39	0.55
2:K:287:LEU:HD23	2:K:287:LEU:H	1.72	0.55
2:G:49:PHE:HB2	2:G:75:ILE:HG23	1.89	0.54
2:C:52:GLY:HA3	2:C:120:ASP:HB3	1.90	0.54
2:D:117:VAL:HG22	2:D:141:VAL:HB	1.89	0.54
2:C:45:ASN:OD1	2:C:138:LYS:NZ	2.40	0.54
2:K:46:ALA:HB3	2:K:114:ILE:HG23	1.90	0.54
1:B:93:ARG:HB3	1:B:105:VAL:HB	1.89	0.54
2:K:7:ASP:HB3	2:K:10:GLN:HB3	1.88	0.54
2:D:211:GLU:OE2	2:D:214:ARG:NE	2.40	0.54
1:E:230:LEU:CD1	1:F:203:VAL:HG21	2.38	0.54
2:G:179:ASN:HB3	2:G:183:GLU:HG3	1.88	0.54
1:A:231:PRO:HD3	1:B:140:GLY:HA3	1.90	0.54
2:D:141:VAL:HG22	2:D:253:LEU:HB3	1.91	0.53
2:C:133:HIS:HB3	2:C:136:ARG:HG3	1.90	0.53
1:J:109:ILE:HG13	1:J:118:VAL:HG13	1.90	0.53
2:H:49:PHE:HB2	2:H:75:ILE:HG12	1.89	0.53
2:L:55:THR:OG1	2:L:56:SER:N	2.39	0.53
1:A:181:SER:OG	1:A:183:LYS:O	2.26	0.53
2:K:10:GLN:NE2	2:K:198:GLU:OE2	2.40	0.53
2:G:50:LEU:HD12	2:G:126:ALA:HB2	1.91	0.53
2:G:223:ILE:HG13	2:G:224:PRO:HD2	1.91	0.53
1:B:97:TYR:C	1:B:99:ASP:H	2.17	0.53
1:I:15:LYS:HB3	1:I:115:LYS:NZ	2.23	0.53
1:J:3:LEU:HD11	1:J:38:LEU:HD21	1.91	0.53
1:B:129:ARG:HG3	2:D:259:PRO:HB3	1.91	0.53
1:B:36:ASN:ND2	1:B:39:GLU:OE1	2.42	0.53
1:E:230:LEU:HD11	1:F:203:VAL:HG21	1.90	0.53
2:G:93:ARG:NH2	2:G:232:ASP:OD2	2.41	0.53
1:I:4:ALA:HA	1:I:6:LEU:HD12	1.91	0.53
1:F:109:ILE:HG13	1:F:118:VAL:HG13	1.90	0.53
1:I:107:SER:HB2	1:I:120:VAL:HG13	1.91	0.52
1:F:129:ARG:NH1	2:H:259:PRO:O	2.42	0.52
1:E:1:MET:HE1	1:E:83:GLN:HG3	1.91	0.52
1:A:33:GLY:HA3	1:A:44:VAL:HG22	1.90	0.52
2:G:189:LYS:HE2	2:G:261:PHE:CE1	2.45	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:136:ARG:H	2:H:137:ILE:HD12	1.75	0.52
1:F:3:LEU:HD13	1:F:37:ILE:HD11	1.91	0.52
1:A:88:GLY:HA3	1:A:109:ILE:O	2.10	0.52
2:H:145:SER:HB2	2:H:147:VAL:HG23	1.91	0.52
2:H:271:LYS:HB3	2:L:41:LYS:HE2	1.92	0.52
1:E:134:MET:HB3	2:G:259:PRO:HG2	1.91	0.52
2:H:143:MET:HG3	2:H:287:LEU:HD21	1.92	0.51
2:C:15:ILE:O	2:C:58:TYR:OH	2.18	0.51
2:D:173:LYS:O	2:D:178:ASN:ND2	2.43	0.51
1:J:87:GLU:HG2	1:J:183:LYS:HG3	1.92	0.51
1:J:146:GLU:HG3	1:J:159[B]:CYS:HB3	1.93	0.51
1:I:95:ILE:HB	1:I:103:ALA:HB3	1.92	0.51
2:L:31:ASP:OD1	2:L:31:ASP:N	2.42	0.51
1:J:63:VAL:HG13	1:J:141:MET:HE1	1.92	0.51
2:L:49:PHE:HB2	2:L:75:ILE:HG12	1.93	0.51
1:B:64:ALA:HB1	1:B:120:VAL:HG11	1.93	0.50
2:H:287:LEU:HD23	2:H:287:LEU:H	1.75	0.50
1:F:93:ARG:HB2	1:F:177:THR:HG23	1.93	0.50
2:K:89:ASN:OD1	2:K:89:ASN:N	2.41	0.50
2:D:15:ILE:O	2:D:58:TYR:OH	2.27	0.50
2:K:301:SER:O	2:K:305:ARG:HG3	2.11	0.50
2:L:151:GLU:HG3	2:L:226:VAL:HG21	1.92	0.50
2:G:130:ALA:HA	2:G:137:ILE:HD11	1.93	0.50
1:J:230:LEU:HA	1:J:231:PRO:OXT	2.11	0.50
1:B:95:ILE:HB	1:B:103:ALA:HB3	1.93	0.50
1:J:158:GLU:CG	1:J:176:ARG:HG3	2.42	0.50
1:F:63:VAL:HG13	1:F:141:MET:HE1	1.93	0.49
2:H:170:GLU:OE1	2:H:173:LYS:NZ	2.44	0.49
2:C:256:GLU:HG3	2:C:263:SER:HB3	1.94	0.49
1:F:81:PHE:O	1:F:84:SER:OG	2.25	0.49
2:G:190:ILE:HG12	2:G:286:PHE:HB2	1.93	0.49
2:H:237:VAL:HA	2:H:240:TYR:CE2	2.48	0.49
1:J:146:GLU:HG3	1:J:159[A]:CYS:HB2	1.94	0.49
2:K:144:GLU:OE2	2:K:263:SER:OG	2.30	0.49
2:G:237:VAL:HA	2:G:240:TYR:CE2	2.48	0.49
1:J:88:GLY:C	1:J:182:LYS:HD2	2.37	0.49
2:K:186:LEU:HA	2:K:286:PHE:HE2	1.78	0.49
1:B:28:SER:HB2	1:B:50:LYS:HB2	1.95	0.48
2:H:130:ALA:HA	2:H:137:ILE:HD11	1.95	0.48
2:C:150:ILE:HB	2:C:225:LEU:HD23	1.95	0.48
2:D:247:SER:O	2:D:247:SER:OG	2.30	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:250:LEU:O	2:G:252:LYS:NZ	2.37	0.48
1:B:15:LYS:HD3	1:B:32:VAL:HG22	1.95	0.48
1:I:4:ALA:HB1	1:I:8:LEU:HB2	1.95	0.48
1:I:21:LEU:HB3	1:I:123:LYS:HG2	1.94	0.48
2:L:49:PHE:HZ	2:L:67:ILE:HD13	1.78	0.48
2:D:150:ILE:HB	2:D:225:LEU:HD23	1.95	0.48
2:L:223:ILE:HG13	2:L:224:PRO:HD2	1.94	0.48
2:L:49:PHE:HB2	2:L:75:ILE:HG23	1.95	0.48
2:C:93:ARG:NH2	2:C:232:ASP:OD1	2.46	0.48
2:D:287:LEU:HD23	2:D:287:LEU:H	1.79	0.48
2:K:303:VAL:HA	2:K:306:VAL:HG12	1.96	0.48
1:A:22:VAL:HG23	1:A:27:PHE:HE1	1.78	0.48
1:A:146:GLU:HA	1:A:159:CYS:HB3	1.95	0.48
2:C:130:ALA:HA	2:C:137:ILE:HD11	1.95	0.48
2:D:186:LEU:HA	2:D:286:PHE:HE2	1.79	0.48
2:C:247:SER:HB2	2:C:252:LYS:HZ1	1.79	0.48
1:A:199:VAL:HB	1:B:229:SER:HB2	1.95	0.48
1:A:9:LYS:HZ2	1:A:11:VAL:H	1.62	0.47
1:B:134:MET:HB3	2:D:259:PRO:HG2	1.96	0.47
2:C:127:PHE:HE1	2:C:140:ILE:HG21	1.79	0.47
1:F:64:ALA:HB1	1:F:120:VAL:HG11	1.96	0.47
1:I:135:GLN:NE2	2:K:260:GLY:O	2.42	0.47
1:A:148:MET:HG3	1:A:194:ILE:HG13	1.95	0.47
1:B:83:GLN:HB3	1:B:185:VAL:HG23	1.95	0.47
2:K:143:MET:HG3	2:K:287:LEU:HD21	1.96	0.47
1:A:95:ILE:HB	1:A:103:ALA:HB3	1.96	0.47
2:D:271:LYS:HA	2:D:278:PHE:HZ	1.78	0.47
2:H:250:LEU:O	2:H:252:LYS:NZ	2.47	0.47
1:I:149:TYR:HB3	1:I:191:TYR:HD1	1.78	0.47
2:K:67:ILE:HG23	2:K:303:VAL:HG21	1.97	0.47
1:E:66:CRO:N2	1:E:66:CRO:HD2	2.30	0.47
2:G:117:VAL:HG22	2:G:141:VAL:HB	1.96	0.47
2:H:104:TRP:CH2	2:H:108:LEU:HD11	2.49	0.47
2:L:161:GLU:HA	2:L:164:ALA:HB3	1.97	0.47
1:A:6:LEU:HD12	1:A:85:PHE:O	2.15	0.47
2:D:248:ASP:HA	2:D:274:PRO:HB2	1.97	0.47
1:E:192:HIS:HB2	1:E:219:ALA:O	2.15	0.47
1:J:93:ARG:HB3	1:J:105:VAL:HB	1.97	0.47
2:C:280:LYS:HB2	2:C:280:LYS:HE2	1.65	0.47
2:K:13:ARG:HH22	2:K:292:PRO:HG2	1.78	0.47
1:B:135:GLN:NE2	2:D:260:GLY:O	2.46	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:203:VAL:CG2	1:J:230:LEU:HD12	2.44	0.47
2:L:167:LYS:NZ	2:L:228:GLY:O	2.42	0.47
1:A:85:PHE:HB3	1:A:86:PRO:HA	1.96	0.46
2:K:101:LEU:HD22	2:K:125:LEU:HD13	1.98	0.46
1:A:149:TYR:HB3	1:A:191:TYR:HD2	1.81	0.46
1:B:150:THR:OG1	1:B:189:PRO:O	2.30	0.46
2:C:112:LYS:O	2:C:136:ARG:NH1	2.44	0.46
1:E:231:PRO:HG3	1:F:140:GLY:HA3	1.95	0.46
2:K:230:LYS:HB2	2:K:233:VAL:HG23	1.97	0.46
2:C:233:VAL:O	2:C:237:VAL:HG23	2.14	0.46
1:F:60:ILE:HG13	1:F:61:VAL:HG13	1.97	0.46
1:J:198:LEU:HD12	1:J:214:GLU:HG3	1.97	0.46
1:B:112:GLU:O	1:B:114:GLY:N	2.48	0.46
2:D:161:GLU:HA	2:D:164:ALA:HB3	1.96	0.46
1:F:204:ASP:OD1	1:F:204:ASP:N	2.48	0.46
2:G:234:VAL:O	2:G:238:ARG:HG3	2.16	0.46
2:K:255:ILE:HA	2:K:279:VAL:HG23	1.98	0.46
2:G:247:SER:HB2	2:G:252:LYS:HZ1	1.81	0.46
1:A:143:PRO:HB3	1:A:197:ARG:HG3	1.98	0.46
2:G:25:LYS:NZ	2:G:40:GLU:OE1	2.37	0.46
2:K:11:ARG:HB2	2:K:195:GLU:CD	2.41	0.46
2:L:51:HIS:HD1	2:L:55:THR:HG23	1.80	0.46
1:E:93:ARG:HB3	1:E:105:VAL:HB	1.98	0.45
2:L:186:LEU:HA	2:L:286:PHE:HE2	1.82	0.45
2:H:35:ASN:ND2	2:H:83:LYS:HB2	2.31	0.45
2:H:136:ARG:HD2	2:H:136:ARG:HA	1.74	0.45
1:E:147:SER:O	1:E:157:GLY:HA2	2.15	0.45
2:G:206:PHE:HB3	2:G:213:ARG:HG2	1.97	0.45
1:J:66:CRO:N2	1:J:66:CRO:HD2	2.32	0.45
1:B:3:LEU:HD11	1:B:38:LEU:HD21	1.99	0.45
2:C:25:LYS:N	2:C:36:TYR:O	2.46	0.45
2:C:282:LYS:HB2	2:C:282:LYS:HE2	1.70	0.45
1:E:148:MET:HG3	1:E:194:ILE:HG13	1.98	0.45
1:A:126:ASP:O	1:A:128:ARG:NH1	2.49	0.45
2:D:4:LYS:NZ	2:D:190:ILE:O	2.34	0.45
2:D:223:ILE:HD12	3:D:401:CEI:H12	1.99	0.45
1:E:139:VAL:HG23	1:F:231:PRO:HB3	1.98	0.45
1:F:66:CRO:HD2	1:F:66:CRO:N2	2.32	0.45
2:D:237:VAL:HA	2:D:240:TYR:CE2	2.52	0.45
2:H:168:SER:O	2:H:170:GLU:N	2.48	0.45
1:A:125:LYS:HD3	1:A:126:ASP:N	2.32	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:G:32:SER:OG	2:G:33:PHE:N	2.49	0.45
2:G:218:SER:O	2:G:222:GLU:HG2	2.17	0.45
1:A:160:ILE:HD11	1:B:174:HIS:CD2	2.51	0.45
2:D:186:LEU:HD12	2:D:286:PHE:CE2	2.52	0.44
2:C:6:TYR:CZ	2:C:193:LYS:HD3	2.52	0.44
2:L:25:LYS:NZ	4:L:502:HOH:O	2.42	0.44
1:E:85:PHE:HB3	1:E:86:PRO:HA	2.00	0.44
2:L:49:PHE:CZ	2:L:67:ILE:HD13	2.53	0.44
2:H:53:ASN:HB3	3:H:401:CEI:H29	1.99	0.44
2:D:263:SER:HA	2:D:266:ILE:HG12	2.00	0.44
2:C:287:LEU:H	2:C:287:LEU:HD23	1.82	0.44
2:G:152:SER:C	2:G:154:ASP:H	2.26	0.44
1:A:71:THR:HG21	1:A:194:ILE:HD13	2.00	0.44
2:L:155:GLU:HB3	2:L:264:ASN:ND2	2.33	0.44
2:L:181:PHE:HA	2:L:185:VAL:HB	1.99	0.44
1:A:59:ASP:O	1:A:62:SER:OG	2.34	0.44
2:C:31:ASP:OD1	2:C:31:ASP:N	2.44	0.44
1:A:99:ASP:HB2	1:A:128:ARG:HD3	2.00	0.43
2:D:49:PHE:HZ	2:D:67:ILE:HD13	1.83	0.43
1:E:16:ILE:HG23	1:E:118:VAL:HB	2.00	0.43
2:C:223:ILE:HG13	2:C:224:PRO:HD2	1.99	0.43
1:I:12:MET:HE2	1:I:12:MET:HB2	1.78	0.43
1:B:81:PHE:O	1:B:84:SER:OG	2.23	0.43
1:I:15:LYS:HB3	1:I:115:LYS:HZ3	1.82	0.43
1:F:85:PHE:HB3	1:F:86:PRO:HA	2.00	0.43
1:J:1:MET:HA	1:J:2:ASP:HA	1.61	0.43
2:L:287:LEU:H	2:L:287:LEU:HD23	1.83	0.43
2:L:321:GLN:OE1	2:L:321:GLN:HA	2.17	0.43
2:C:181:PHE:HA	2:C:185:VAL:HB	2.01	0.43
2:G:173:LYS:HA	2:G:177:GLU:HB2	2.00	0.43
1:J:1:MET:HG3	1:J:2:ASP:HB2	2.01	0.43
1:J:95:ILE:HB	1:J:103:ALA:HB3	2.00	0.43
2:D:262:PHE:HE2	3:D:401:CEI:H262	1.83	0.43
2:G:49:PHE:HZ	2:G:67:ILE:HD13	1.84	0.43
2:K:232:ASP:O	2:K:236:ILE:HG13	2.19	0.43
2:G:10:GLN:NE2	2:G:198:GLU:OE2	2.48	0.43
2:H:190:ILE:HG12	2:H:286:PHE:HB2	2.01	0.43
2:H:303:VAL:HA	2:H:306:VAL:HG22	2.01	0.43
1:I:60:ILE:HG13	1:I:61:VAL:HG13	2.01	0.43
2:L:237:VAL:HA	2:L:240:TYR:CE2	2.53	0.43
2:H:271:LYS:HA	2:H:278:PHE:HZ	1.84	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:I:91:TYR:CZ	1:I:107:SER:HB3	2.53	0.43
2:L:232:ASP:OD1	2:L:232:ASP:N	2.38	0.43
2:L:271:LYS:HG2	2:L:278:PHE:CZ	2.54	0.43
1:A:129:ARG:HD3	2:C:264:ASN:HB2	2.01	0.42
1:F:129:ARG:HD3	2:H:264:ASN:HB2	2.01	0.42
2:G:49:PHE:CZ	2:G:67:ILE:HD13	2.53	0.42
2:G:308:LYS:HE3	2:G:308:LYS:HB3	1.88	0.42
2:H:255:ILE:HG21	2:H:295:MET:HG3	2.01	0.42
2:L:55:THR:OG1	2:L:59:LEU:HB2	2.18	0.42
2:L:185:VAL:HG12	3:L:401:CEI:C30	2.49	0.42
2:C:149:VAL:HG12	2:C:224:PRO:HB2	2.01	0.42
2:C:238:ARG:NH2	4:C:407:HOH:O	2.49	0.42
1:E:183:LYS:HB2	1:E:183:LYS:HE2	1.77	0.42
2:H:39:SER:O	2:H:41:LYS:N	2.52	0.42
1:I:160:ILE:HG21	1:J:158:GLU:HB3	2.00	0.42
2:K:248:ASP:OD1	2:K:248:ASP:N	2.52	0.42
1:A:156:ILE:HD12	1:A:178:VAL:HG22	2.02	0.42
2:H:49:PHE:O	2:H:76:PRO:HD2	2.19	0.42
1:B:58:PHE:O	1:B:61:VAL:HG22	2.18	0.42
2:G:267:VAL:O	2:G:271:LYS:HG3	2.19	0.42
2:H:53:ASN:OD1	2:H:54:ALA:N	2.52	0.42
1:A:64:ALA:HB1	1:A:120:VAL:HG11	2.01	0.42
1:B:80:TYR:CE1	1:B:185:VAL:HG11	2.54	0.42
1:B:183:LYS:HD2	1:B:183:LYS:HA	1.79	0.42
2:D:105:PHE:HA	2:D:108:LEU:HD12	2.01	0.42
2:K:167:LYS:NZ	2:K:228:GLY:O	2.32	0.42
1:A:12:MET:HB2	1:A:12:MET:HE2	1.76	0.42
1:I:185:VAL:HG11	1:I:188:MET:HE2	2.00	0.42
2:K:190:ILE:HG12	2:K:286:PHE:HB2	2.02	0.42
1:E:149:TYR:HB3	1:E:191:TYR:HD1	1.85	0.42
1:F:91:TYR:CE2	1:F:107:SER:HB3	2.55	0.42
1:J:159[B]:CYS:SG	1:J:175:MET:HE2	2.60	0.42
2:L:95:LEU:HD23	2:L:95:LEU:HA	1.92	0.42
1:A:222:THR:OG1	1:B:195:GLN:NE2	2.38	0.42
2:C:297:LYS:HE3	2:C:297:LYS:HB3	1.89	0.42
2:H:309:ASN:OD1	2:H:309:ASN:N	2.52	0.42
1:J:230:LEU:C	1:J:231:PRO:OXT	2.61	0.42
2:K:49:PHE:HZ	2:K:67:ILE:HD13	1.84	0.42
2:K:122:GLY:O	2:K:125:LEU:HB2	2.19	0.42
2:L:144:GLU:OE2	2:L:263:SER:OG	2.28	0.42
2:H:29:VAL:HG22	2:H:107:LEU:HD12	2.02	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:206:PHE:HB3	2:H:213:ARG:HG2	2.02	0.42
2:C:144:GLU:CD	2:C:262:PHE:H	2.28	0.41
1:E:159:CYS:SG	1:E:175:MET:HE2	2.60	0.41
2:H:144:GLU:OE2	2:H:263:SER:OG	2.31	0.41
2:K:139:ALA:HB2	2:K:306:VAL:HG21	2.00	0.41
1:E:66:CRO:CB1	1:E:214:GLU:OE2	2.68	0.41
1:E:95:ILE:HB	1:E:103:ALA:HB3	2.01	0.41
1:I:158:GLU:HB3	1:J:160:ILE:HG21	2.02	0.41
1:A:98:GLN:HG2	1:A:171:PHE:CE1	2.56	0.41
1:I:68:ARG:HA	1:I:68:ARG:NE	2.35	0.41
2:K:181:PHE:CZ	2:K:220:PRO:HG3	2.56	0.41
1:E:112:GLU:HG3	1:E:117:ILE:HG13	2.01	0.41
2:H:273:PHE:O	2:H:276:THR:OG1	2.30	0.41
2:K:10:GLN:C	2:K:12:LYS:H	2.28	0.41
1:F:121:ASP:OD1	1:F:123:LYS:NZ	2.45	0.41
1:F:206:ALA:O	2:H:6:TYR:OH	2.31	0.41
1:I:85:PHE:HA	1:I:87:GLU:H	1.86	0.41
1:I:85:PHE:HB3	1:I:86:PRO:HA	2.03	0.41
1:J:196:HIS:HA	1:J:215:THR:O	2.21	0.41
1:J:224:LYS:HA	1:J:224:LYS:HD3	1.82	0.41
2:K:10:GLN:C	2:K:12:LYS:N	2.78	0.41
1:B:20:GLY:HA3	1:B:27:PHE:CZ	2.56	0.41
1:E:58:PHE:CE2	1:E:210:VAL:HG11	2.55	0.41
1:J:127:LEU:HD22	1:J:133:VAL:HG11	2.01	0.41
2:K:173:LYS:HA	2:K:177:GLU:HB2	2.02	0.41
2:H:15:ILE:O	2:H:58:TYR:OH	2.23	0.41
1:A:159:CYS:SG	1:A:175:MET:HE2	2.61	0.41
1:J:58:PHE:O	1:J:61:VAL:HG22	2.21	0.41
1:J:128:ARG:HG2	1:J:128:ARG:HH11	1.86	0.41
1:J:201:THR:O	1:J:203:VAL:N	2.54	0.41
2:K:110:LEU:HD13	2:K:114:ILE:HD13	2.02	0.41
2:L:15:ILE:O	2:L:58:TYR:OH	2.29	0.41
1:A:91:TYR:CE2	1:A:107:SER:HB3	2.56	0.41
1:B:91:TYR:CZ	1:B:107:SER:HB3	2.56	0.41
2:C:255:ILE:HD13	2:C:295:MET:HG2	2.03	0.41
2:H:4:LYS:HG2	2:H:191:MET:O	2.21	0.41
2:H:28:ASN:ND2	4:H:502:HOH:O	2.44	0.41
1:I:5:LYS:C	1:I:7:GLY:H	2.28	0.41
2:K:143:MET:HB3	2:K:255:ILE:HB	2.03	0.41
2:L:160:GLU:C	2:L:162:ASP:H	2.29	0.41
1:A:85:PHE:HA	1:A:88:GLY:H	1.86	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:K:150:ILE:HB	2:K:225:LEU:HD23	2.03	0.41
2:D:232:ASP:OD1	2:D:233:VAL:HG23	2.21	0.40
2:H:54:ALA:HB3	3:H:401:CEI:H30	2.03	0.40
2:K:160:GLU:O	2:K:161:GLU:HB3	2.21	0.40
2:L:53:ASN:OD1	2:L:54:ALA:N	2.54	0.40
1:B:66:CRO:HE1	1:B:161:ILE:HD11	2.03	0.40
1:B:97:TYR:C	1:B:99:ASP:N	2.80	0.40
2:C:157:PRO:O	2:C:159:ILE:N	2.51	0.40
2:C:283:GLY:HA2	2:C:290:ASP:OD2	2.21	0.40
2:D:238:ARG:HH12	2:G:245:ARG:NH1	2.19	0.40
2:H:78:LEU:HB3	2:H:97:HIS:ND1	2.36	0.40
2:H:104:TRP:CZ2	2:H:108:LEU:HD11	2.56	0.40
1:E:149:TYR:CD1	1:F:170:HIS:HB2	2.57	0.40
2:G:2:THR:OG1	2:G:4:LYS:HE2	2.22	0.40
2:G:49:PHE:O	2:G:76:PRO:HD2	2.21	0.40
2:G:176:LEU:HG	2:G:210:GLY:O	2.21	0.40
1:I:58:PHE:O	1:I:61:VAL:HG22	2.21	0.40
1:J:184:PRO:O	1:J:185:VAL:HB	2.20	0.40
2:L:111:PRO:O	2:L:136:ARG:NH1	2.54	0.40
2:D:14:MET:HE2	2:D:14:MET:HB3	1.90	0.40
2:G:52:GLY:HA3	2:G:120:ASP:HB3	2.04	0.40
1:A:160:ILE:HD13	1:A:174:HIS:HA	2.04	0.40
1:B:159:CYS:SG	1:B:175:MET:HE2	2.61	0.40
2:D:271:LYS:HA	2:D:278:PHE:CZ	2.55	0.40
1:F:22:VAL:HG23	1:F:27:PHE:HE1	1.86	0.40
2:H:148:ASP:OD2	2:H:245:ARG:NH2	2.52	0.40
1:J:205:THR:O	1:J:207:SER:N	2.55	0.40
2:K:218:SER:O	2:K:222:GLU:HG2	2.21	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	224/231 (97%)	214 (96%)	7 (3%)	3 (1%)	10 11
1	B	226/231 (98%)	213 (94%)	8 (4%)	5 (2%)	5 4
1	E	227/231 (98%)	218 (96%)	6 (3%)	3 (1%)	10 11
1	F	225/231 (97%)	213 (95%)	8 (4%)	4 (2%)	7 6
1	I	225/231 (97%)	212 (94%)	11 (5%)	2 (1%)	14 17
1	J	227/231 (98%)	214 (94%)	10 (4%)	3 (1%)	10 11
2	C	305/319 (96%)	275 (90%)	30 (10%)	0	100 100
2	D	308/319 (97%)	285 (92%)	21 (7%)	2 (1%)	22 27
2	G	305/319 (96%)	284 (93%)	21 (7%)	0	100 100
2	H	306/319 (96%)	280 (92%)	23 (8%)	3 (1%)	13 15
2	K	306/319 (96%)	284 (93%)	22 (7%)	0	100 100
2	L	309/319 (97%)	282 (91%)	25 (8%)	2 (1%)	22 27
All	All	3193/3300 (97%)	2974 (93%)	192 (6%)	27 (1%)	16 20

All (27) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	185	VAL
1	F	201	THR
1	B	113	ASP
1	B	206	ALA
2	D	154	ASP
1	E	152	VAL
1	E	190	LEU
1	F	185	VAL
1	I	152	VAL
1	I	190	LEU
1	J	185	VAL
1	J	206	ALA
1	A	152	VAL
1	B	152	VAL
2	D	40	GLU
1	F	113	ASP
1	F	152	VAL
2	H	3	SER
1	J	152	VAL
2	L	2	THR
2	H	154	ASP
2	L	154	ASP

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Mol	Chain	Res	Type
1	A	205	THR
1	B	98	GLN
1	E	114	GLY
2	H	4	LYS
1	A	186	GLU

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	196/198 (99%)	195 (100%)	1 (0%)	86 93
1	B	198/198 (100%)	197 (100%)	1 (0%)	86 93
1	E	199/198 (100%)	199 (100%)	0	100 100
1	F	197/198 (100%)	197 (100%)	0	100 100
1	I	197/198 (100%)	197 (100%)	0	100 100
1	J	199/198 (100%)	198 (100%)	1 (0%)	86 93
2	C	271/282 (96%)	271 (100%)	0	100 100
2	D	274/282 (97%)	273 (100%)	1 (0%)	89 95
2	G	271/282 (96%)	270 (100%)	1 (0%)	89 95
2	H	272/282 (96%)	271 (100%)	1 (0%)	89 95
2	K	272/282 (96%)	272 (100%)	0	100 100
2	L	275/282 (98%)	275 (100%)	0	100 100
All	All	2821/2880 (98%)	2815 (100%)	6 (0%)	92 96

All (6) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	47	SER
1	B	5	LYS
2	D	321	GLN
2	G	74	ILE
2	H	114	ILE

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Mol	Chain	Res	Type
1	J	158	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (32) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	220	HIS
1	B	17	ASN
1	B	42	GLN
1	B	151	ASN
1	B	212	GLN
2	C	178	ASN
2	C	235	GLN
2	D	10	GLN
2	D	19	GLN
2	D	62	HIS
2	D	321	GLN
1	E	135	GLN
1	F	42	GLN
1	F	195	GLN
2	G	42	HIS
2	G	128	HIS
2	G	134	GLN
2	G	178	ASN
2	H	26	GLN
2	H	45	ASN
2	H	178	ASN
2	H	264	ASN
2	H	275	ASN
1	J	119	ASN
2	K	45	ASN
2	K	119	HIS
2	K	178	ASN
2	K	235	GLN
2	K	239	ASN
2	K	264	ASN
2	L	128	HIS
2	L	178	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

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

6 non-standard protein/DNA/RNA residues are modelled in this entry.

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	$\#\|Z\| > 2$
1	CRO	I	66	1	22,22,24	2.61	6 (27%)	27,30,34	2.95	7 (25%)
1	CRO	J	66	1	22,22,24	2.59	6 (27%)	27,30,34	2.99	7 (25%)
1	CRO	A	66	1	22,22,24	2.58	6 (27%)	27,30,34	3.01	8 (29%)
1	CRO	B	66	1	22,22,24	2.57	5 (22%)	27,30,34	3.00	8 (29%)
1	CRO	E	66	1	22,22,24	2.57	6 (27%)	27,30,34	3.00	7 (25%)
1	CRO	F	66	1	22,22,24	2.59	6 (27%)	27,30,34	3.00	8 (29%)

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
1	CRO	I	66	1	-	3/9/29/32	0/2/2/2
1	CRO	J	66	1	-	3/9/29/32	0/2/2/2
1	CRO	A	66	1	-	6/9/29/32	0/2/2/2
1	CRO	B	66	1	-	3/9/29/32	0/2/2/2
1	CRO	E	66	1	-	3/9/29/32	0/2/2/2
1	CRO	F	66	1	-	4/9/29/32	0/2/2/2

All (35) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	I	66	CRO	CA2-C2	-9.57	1.39	1.48
1	F	66	CRO	CA2-C2	-9.51	1.39	1.48
1	B	66	CRO	CA2-C2	-9.46	1.39	1.48
1	A	66	CRO	CA2-C2	-9.45	1.39	1.48
1	J	66	CRO	CA2-C2	-9.44	1.39	1.48

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	66	CRO	CA2-C2	-9.36	1.39	1.48
1	I	66	CRO	C1-N2	4.03	1.38	1.32
1	J	66	CRO	C1-N2	3.92	1.38	1.32
1	A	66	CRO	C1-N2	3.83	1.37	1.32
1	E	66	CRO	C1-N2	3.83	1.37	1.32
1	F	66	CRO	C1-N2	3.82	1.37	1.32
1	B	66	CRO	C1-N2	3.81	1.37	1.32
1	J	66	CRO	CE2-CZ	3.13	1.44	1.38
1	E	66	CRO	CE2-CZ	3.13	1.44	1.38
1	I	66	CRO	CE2-CZ	3.12	1.44	1.38
1	A	66	CRO	CE2-CZ	3.11	1.44	1.38
1	B	66	CRO	CE2-CZ	3.11	1.44	1.38
1	F	66	CRO	CE2-CZ	3.07	1.44	1.38
1	E	66	CRO	CG2-CB2	2.35	1.51	1.46
1	A	66	CRO	CG2-CB2	2.35	1.51	1.46
1	J	66	CRO	CG2-CB2	2.31	1.51	1.46
1	B	66	CRO	CD2-CG2	2.30	1.43	1.39
1	F	66	CRO	CG2-CB2	2.29	1.51	1.46
1	E	66	CRO	CD2-CG2	2.26	1.43	1.39
1	B	66	CRO	CG2-CB2	2.26	1.51	1.46
1	J	66	CRO	CD2-CG2	2.25	1.43	1.39
1	F	66	CRO	CD2-CG2	2.24	1.43	1.39
1	I	66	CRO	CG2-CB2	2.24	1.51	1.46
1	A	66	CRO	CD2-CG2	2.23	1.43	1.39
1	I	66	CRO	CD2-CG2	2.21	1.43	1.39
1	I	66	CRO	C1-N3	-2.14	1.33	1.37
1	J	66	CRO	C1-N3	-2.12	1.33	1.37
1	F	66	CRO	C1-N3	-2.10	1.33	1.37
1	E	66	CRO	C1-N3	-2.05	1.33	1.37
1	A	66	CRO	C1-N3	-2.02	1.33	1.37

All (45) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	E	66	CRO	O2-C2-CA2	-9.44	125.66	130.96
1	J	66	CRO	O2-C2-CA2	-9.44	125.66	130.96
1	F	66	CRO	O2-C2-CA2	-9.41	125.68	130.96
1	A	66	CRO	O2-C2-CA2	-9.39	125.69	130.96
1	J	66	CRO	CA2-C2-N3	9.38	107.81	103.37
1	E	66	CRO	CA2-C2-N3	9.38	107.81	103.37
1	I	66	CRO	CA2-C2-N3	9.38	107.81	103.37
1	I	66	CRO	O2-C2-CA2	-9.32	125.72	130.96

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	66	CRO	CA2-C2-N3	9.29	107.76	103.37
1	B	66	CRO	CA2-C2-N3	9.28	107.76	103.37
1	F	66	CRO	CA2-C2-N3	9.25	107.75	103.37
1	B	66	CRO	O2-C2-CA2	-9.06	125.87	130.96
1	B	66	CRO	CG2-CB2-CA2	-4.33	124.64	129.94
1	A	66	CRO	CG2-CB2-CA2	-4.04	124.99	129.94
1	B	66	CRO	N3-C1-N2	-4.00	108.69	111.45
1	F	66	CRO	CG2-CB2-CA2	-3.96	125.09	129.94
1	J	66	CRO	N3-C1-N2	-3.86	108.78	111.45
1	A	66	CRO	N3-C1-N2	-3.84	108.80	111.45
1	F	66	CRO	N3-C1-N2	-3.83	108.81	111.45
1	I	66	CRO	N3-C1-N2	-3.81	108.82	111.45
1	E	66	CRO	N3-C1-N2	-3.78	108.84	111.45
1	B	66	CRO	CA2-N2-C1	3.62	108.44	105.77
1	E	66	CRO	CA2-N2-C1	3.55	108.39	105.77
1	A	66	CRO	CA2-N2-C1	3.53	108.37	105.77
1	F	66	CRO	CA2-N2-C1	3.48	108.34	105.77
1	J	66	CRO	CA2-N2-C1	3.44	108.31	105.77
1	E	66	CRO	CG2-CB2-CA2	-3.43	125.73	129.94
1	J	66	CRO	CG2-CB2-CA2	-3.27	125.93	129.94
1	I	66	CRO	CG2-CB2-CA2	-3.24	125.97	129.94
1	I	66	CRO	CA2-N2-C1	3.20	108.13	105.77
1	E	66	CRO	C2-CA2-N2	-2.82	106.96	108.93
1	J	66	CRO	C2-CA2-N2	-2.78	106.98	108.93
1	B	66	CRO	C2-CA2-N2	-2.72	107.03	108.93
1	F	66	CRO	C2-CA2-N2	-2.70	107.04	108.93
1	A	66	CRO	C2-CA2-N2	-2.66	107.07	108.93
1	I	66	CRO	C2-CA2-N2	-2.61	107.10	108.93
1	B	66	CRO	CB2-CA2-C2	2.28	125.00	122.28
1	B	66	CRO	O3-C3-CA3	-2.27	119.53	126.39
1	A	66	CRO	CB2-CA2-C2	2.25	124.96	122.28
1	I	66	CRO	O3-C3-CA3	-2.25	119.61	126.39
1	J	66	CRO	O3-C3-CA3	-2.23	119.65	126.39
1	E	66	CRO	O3-C3-CA3	-2.22	119.68	126.39
1	F	66	CRO	O3-C3-CA3	-2.19	119.77	126.39
1	A	66	CRO	O3-C3-CA3	-2.18	119.82	126.39
1	F	66	CRO	CB2-CA2-C2	2.10	124.78	122.28

There are no chirality outliers.

All (22) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	66	CRO	N1-CA1-CB1-OG1
1	A	66	CRO	C1-CA1-CB1-OG1
1	A	66	CRO	C3-CA3-N3-C2
1	A	66	CRO	C2-CA2-CB2-CG2
1	B	66	CRO	C3-CA3-N3-C2
1	B	66	CRO	C2-CA2-CB2-CG2
1	E	66	CRO	C3-CA3-N3-C2
1	F	66	CRO	C3-CA3-N3-C2
1	F	66	CRO	C2-CA2-CB2-CG2
1	I	66	CRO	C3-CA3-N3-C2
1	I	66	CRO	C2-CA2-CB2-CG2
1	J	66	CRO	C3-CA3-N3-C2
1	A	66	CRO	N2-CA2-CB2-CG2
1	B	66	CRO	N2-CA2-CB2-CG2
1	F	66	CRO	N2-CA2-CB2-CG2
1	I	66	CRO	N2-CA2-CB2-CG2
1	F	66	CRO	C1-CA1-CB1-OG1
1	E	66	CRO	N2-CA2-CB2-CG2
1	J	66	CRO	N2-CA2-CB2-CG2
1	A	66	CRO	C3-CA3-N3-C1
1	E	66	CRO	C3-CA3-N3-C1
1	J	66	CRO	C3-CA3-N3-C1

There are no ring outliers.

4 monomers are involved in 5 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	J	66	CRO	1	0
1	B	66	CRO	1	0
1	E	66	CRO	2	0
1	F	66	CRO	1	0

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

5 ligands are modelled in this entry.

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	CEI	H	401	-	31,34,34	1.49	5 (16%)	38,46,46	0.92	0
3	CEI	L	401	-	31,34,34	1.48	5 (16%)	38,46,46	0.92	1 (2%)
3	CEI	K	401	-	31,34,34	1.48	5 (16%)	38,46,46	0.90	0
3	CEI	D	401	-	31,34,34	1.46	5 (16%)	38,46,46	0.89	1 (2%)
3	CEI	G	401	-	31,34,34	1.49	5 (16%)	38,46,46	0.90	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	CEI	H	401	-	-	1/12/16/16	0/4/4/4
3	CEI	L	401	-	-	2/12/16/16	0/4/4/4
3	CEI	K	401	-	-	4/12/16/16	0/4/4/4
3	CEI	D	401	-	-	3/12/16/16	0/4/4/4
3	CEI	G	401	-	-	3/12/16/16	0/4/4/4

All (25) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	H	401	CEI	C2-N1	4.83	1.46	1.35
3	G	401	CEI	C2-N1	4.79	1.46	1.35
3	L	401	CEI	C2-N1	4.71	1.46	1.35
3	K	401	CEI	C2-N1	4.69	1.46	1.35
3	D	401	CEI	C2-N1	4.64	1.45	1.35
3	L	401	CEI	C9-N1	3.41	1.46	1.39
3	K	401	CEI	C9-N1	3.37	1.46	1.39
3	G	401	CEI	C9-N1	3.36	1.46	1.39
3	H	401	CEI	C9-N1	3.34	1.46	1.39
3	D	401	CEI	C9-N1	3.26	1.46	1.39
3	K	401	CEI	C6-N7	-3.11	1.32	1.37
3	H	401	CEI	C6-N7	-3.05	1.32	1.37
3	L	401	CEI	C6-N7	-3.01	1.32	1.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	401	CEI	C6-N7	-3.00	1.32	1.37
3	G	401	CEI	C6-N7	-2.98	1.32	1.37
3	G	401	CEI	C26-C8	2.56	1.53	1.51
3	H	401	CEI	C26-C8	2.40	1.53	1.51
3	L	401	CEI	C26-C8	2.39	1.53	1.51
3	D	401	CEI	C26-C8	2.36	1.53	1.51
3	H	401	CEI	O33-C2	-2.20	1.18	1.23
3	D	401	CEI	O33-C2	-2.19	1.18	1.23
3	G	401	CEI	O33-C2	-2.19	1.18	1.23
3	K	401	CEI	C26-C8	2.19	1.53	1.51
3	K	401	CEI	O33-C2	-2.16	1.18	1.23
3	L	401	CEI	O33-C2	-2.15	1.18	1.23

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	D	401	CEI	C26-C8-N7	2.27	120.87	116.36
3	L	401	CEI	C26-C8-N7	2.19	120.71	116.36

There are no chirality outliers.

All (13) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	G	401	CEI	C27-C26-C8-C9
3	G	401	CEI	C27-C26-C8-N7
3	D	401	CEI	C11-C10-C2-O33
3	D	401	CEI	C11-C10-C2-N1
3	K	401	CEI	C27-C26-C8-C9
3	D	401	CEI	C8-C9-N1-C2
3	K	401	CEI	C11-C10-C2-N1
3	K	401	CEI	C11-C10-C2-O33
3	L	401	CEI	C11-C10-C2-O33
3	K	401	CEI	C27-C26-C8-N7
3	L	401	CEI	C11-C10-C2-N1
3	H	401	CEI	C11-C10-C2-O33
3	G	401	CEI	C11-C10-C2-O33

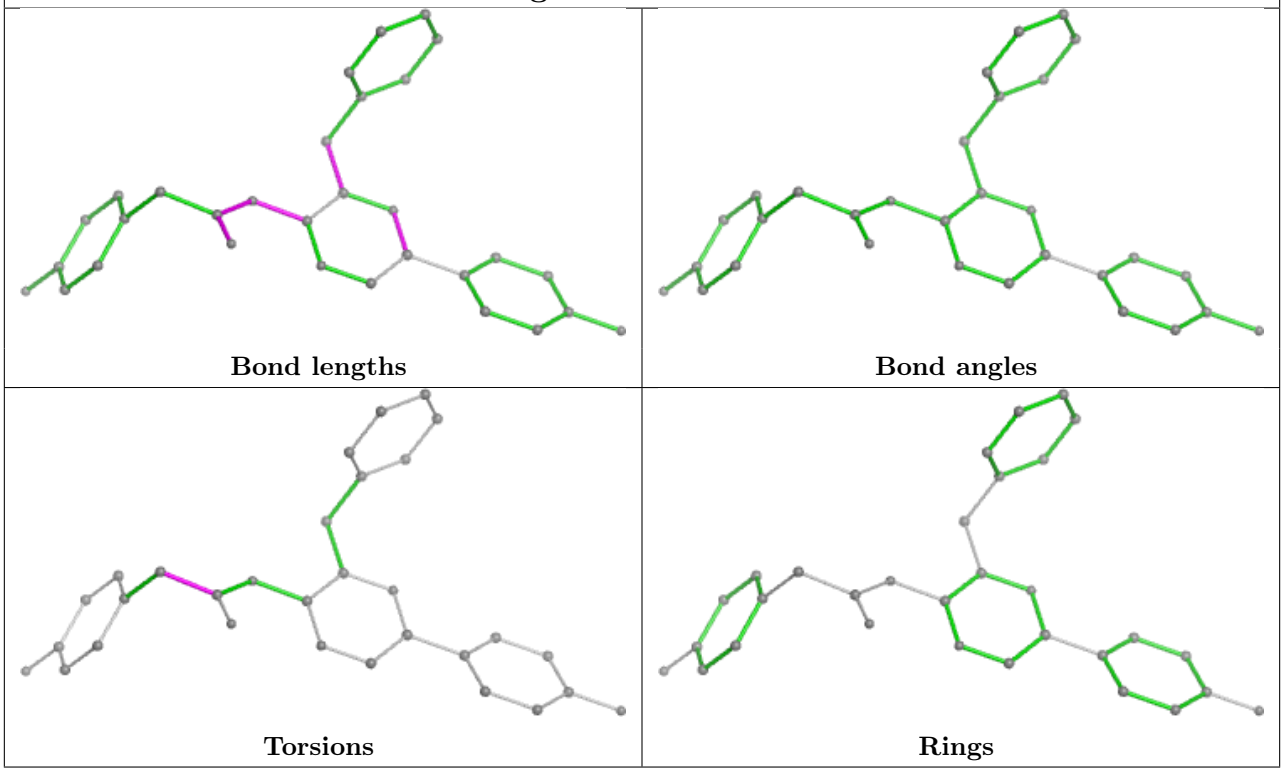
There are no ring outliers.

5 monomers are involved in 8 short contacts:

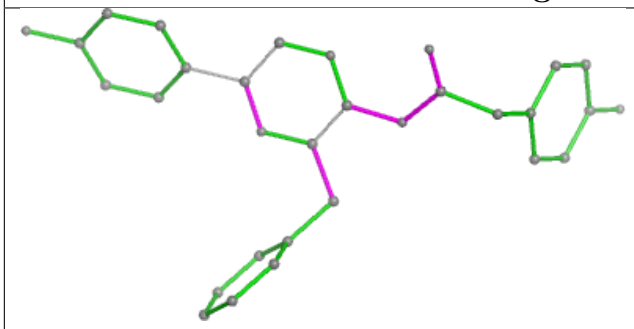
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	H	401	CEI	2	0
3	L	401	CEI	1	0
3	K	401	CEI	1	0
3	D	401	CEI	3	0
3	G	401	CEI	1	0

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 then 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.

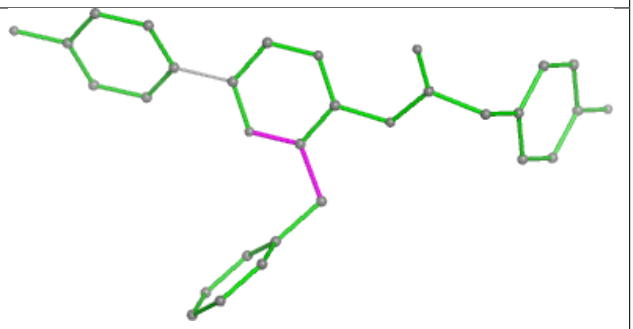
Ligand CEI H 401



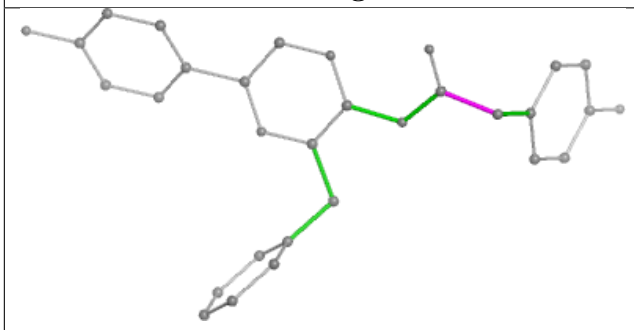
Ligand CEI L 401



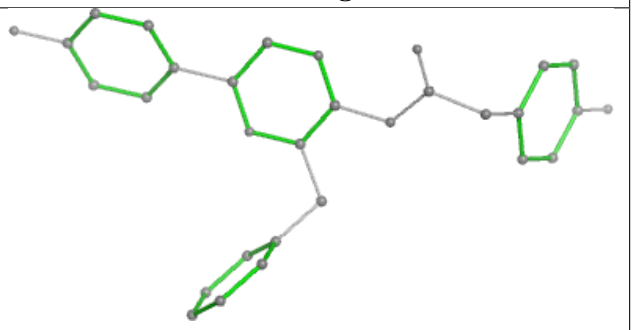
Bond lengths



Bond angles

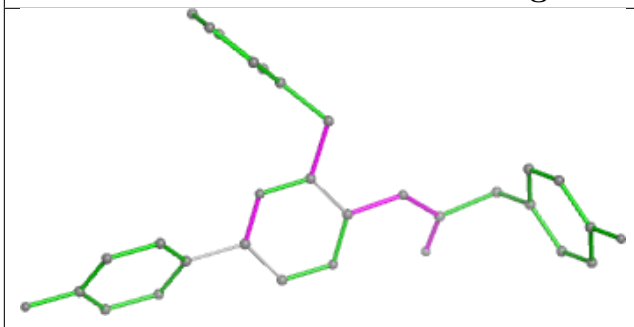


Torsions

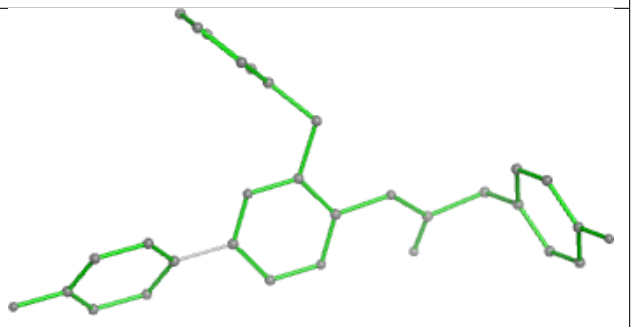


Rings

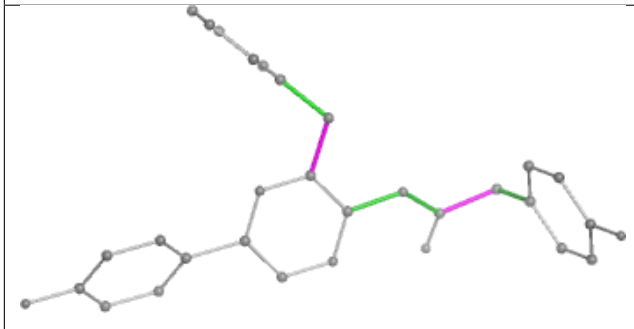
Ligand CEI K 401



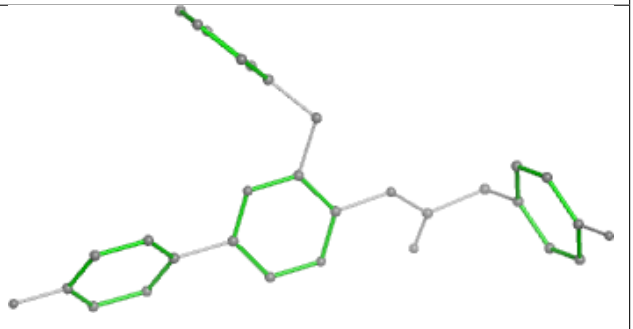
Bond lengths



Bond angles

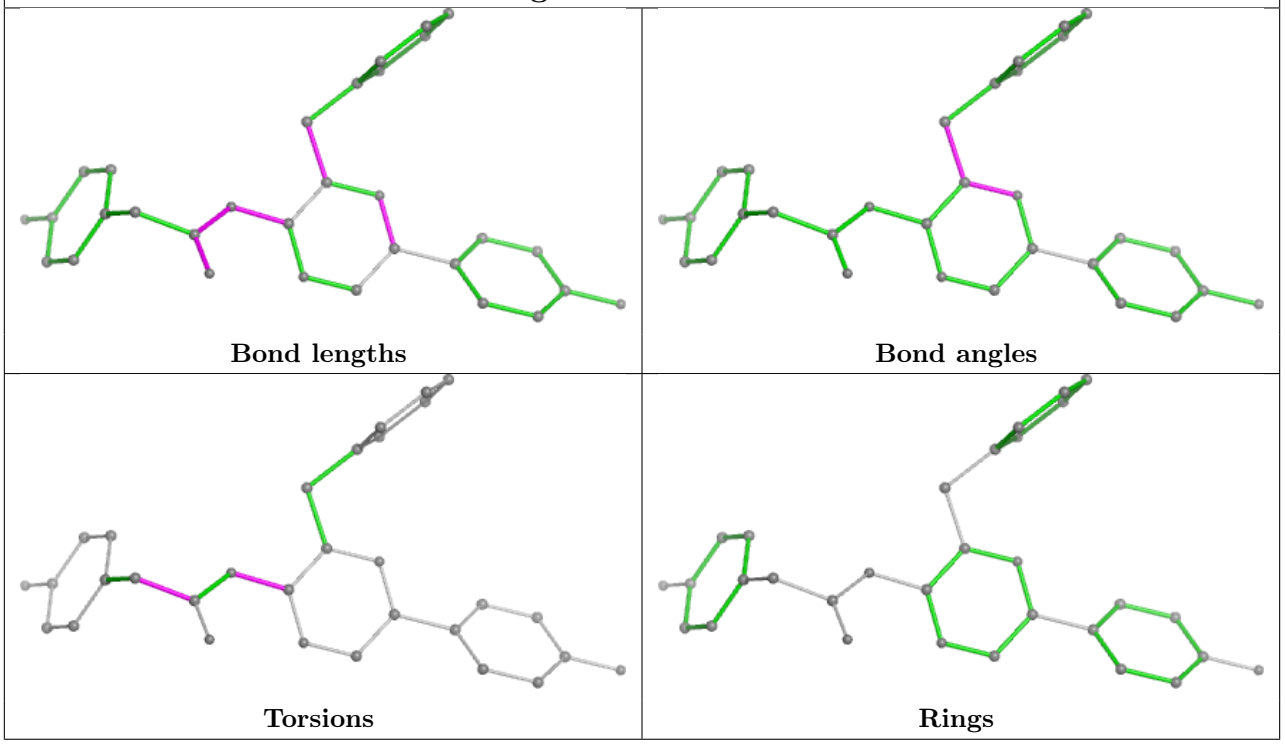


Torsions



Rings

Ligand CEI D 401



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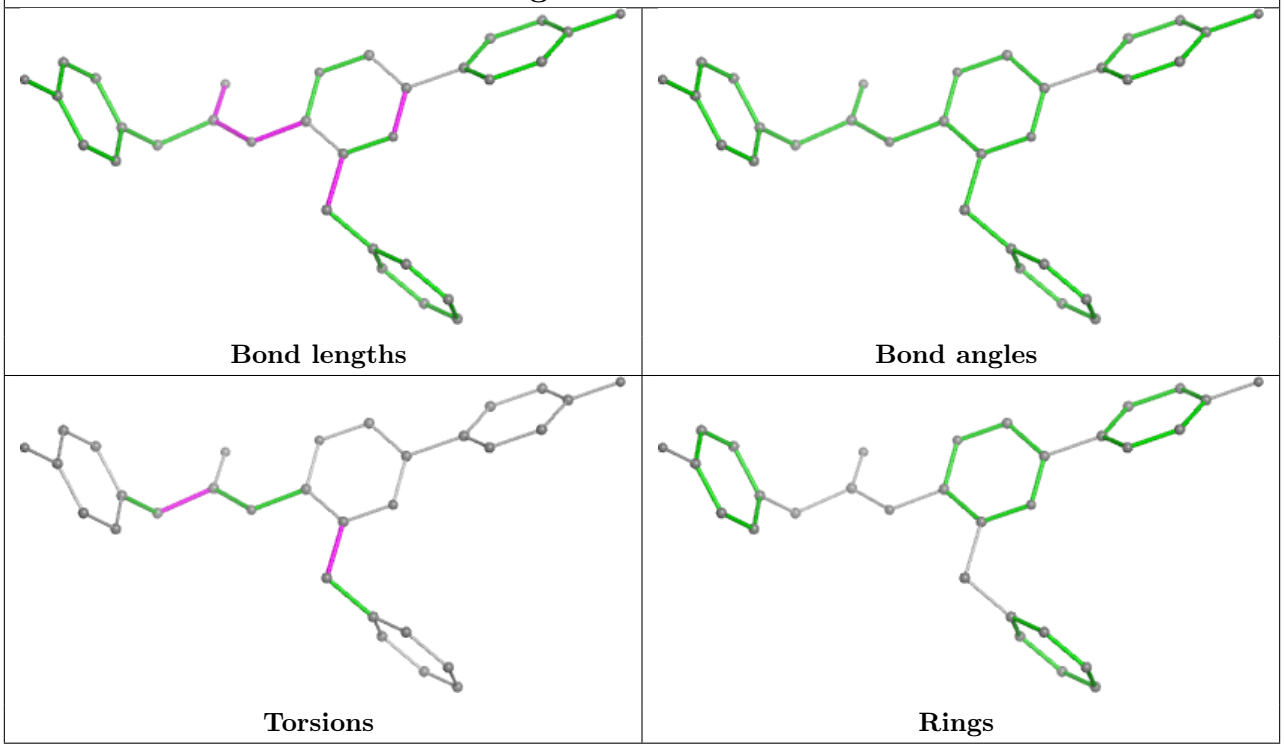

5.7 Other polymers (i)

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	228/231 (98%)	-1.35	0	100	100	25, 45, 71, 89	0
1	B	229/231 (99%)	-1.42	0	100	100	18, 40, 61, 87	1 (0%)
1	E	230/231 (99%)	-1.32	0	100	100	25, 45, 66, 107	1 (0%)
1	F	229/231 (99%)	-1.39	0	100	100	29, 43, 64, 114	0
1	I	228/231 (98%)	-1.31	0	100	100	22, 44, 67, 87	1 (0%)
1	J	230/231 (99%)	-1.40	0	100	100	19, 41, 60, 76	1 (0%)
2	C	307/319 (96%)	-1.26	0	100	100	27, 50, 67, 74	0
2	D	310/319 (97%)	-1.47	0	100	100	22, 36, 49, 75	0
2	G	307/319 (96%)	-1.33	0	100	100	34, 47, 61, 68	0
2	H	308/319 (96%)	-1.37	0	100	100	30, 46, 60, 78	0
2	K	307/319 (96%)	-1.30	0	100	100	27, 47, 65, 91	1 (0%)
2	L	311/319 (97%)	-1.46	0	100	100	20, 38, 51, 68	0
All	All	3224/3300 (97%)	-1.37	0	100	100	18, 44, 63, 114	5 (0%)

There are no RSRZ outliers to report.

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

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
1	CRO	A	66	21/23	0.99	0.03	40,45,49,50	0
1	CRO	B	66	21/23	0.99	0.03	32,39,42,45	0
1	CRO	E	66	21/23	0.99	0.04	34,40,45,46	0

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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
1	CRO	F	66	21/23	0.99	0.03	33,37,42,45	0
1	CRO	I	66	21/23	0.99	0.04	39,44,49,54	0
1	CRO	J	66	21/23	0.99	0.03	32,39,46,55	0

6.3 Carbohydrates (i)

There are no oligosaccharides in this entry.

6.4 Ligands (i)

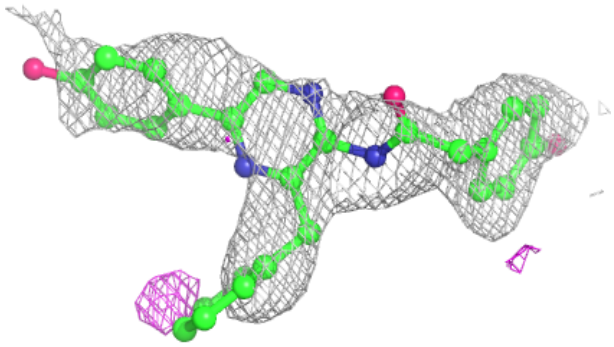
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9'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

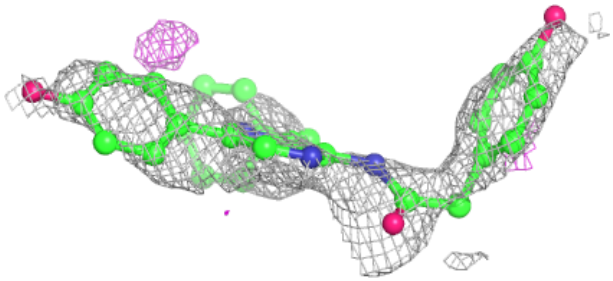
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
3	CEI	D	401	31/31	0.99	0.05	41,49,61,63	0
3	CEI	G	401	31/31	0.99	0.06	51,58,64,66	0
3	CEI	H	401	31/31	0.99	0.07	46,59,68,70	0
3	CEI	K	401	31/31	0.99	0.07	53,61,70,76	0
3	CEI	L	401	31/31	0.99	0.06	38,49,60,64	0

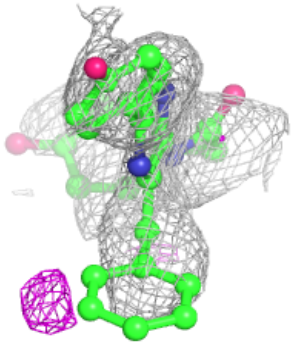
The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation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

Electron density around CEI D 401:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

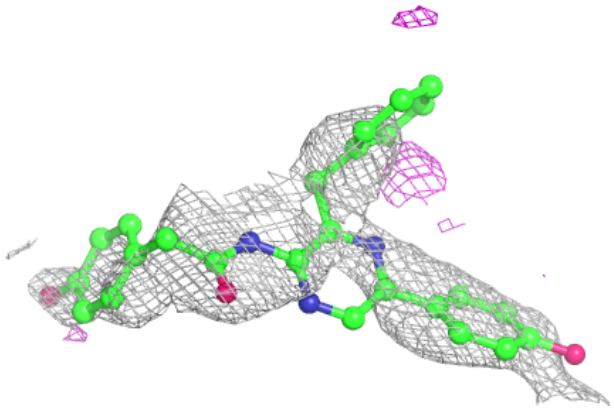


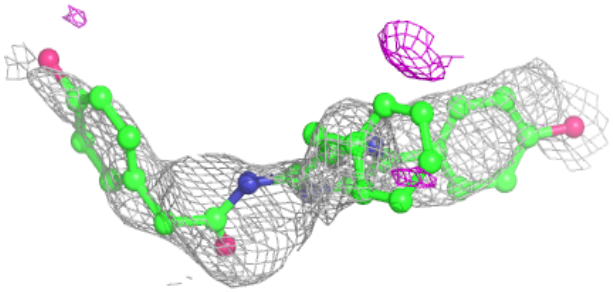


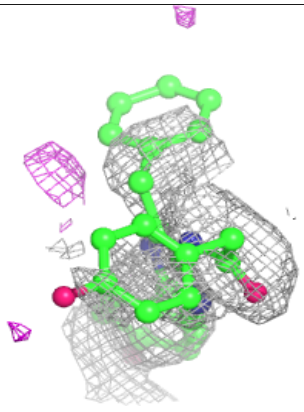


Electron density around CEI G 401:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

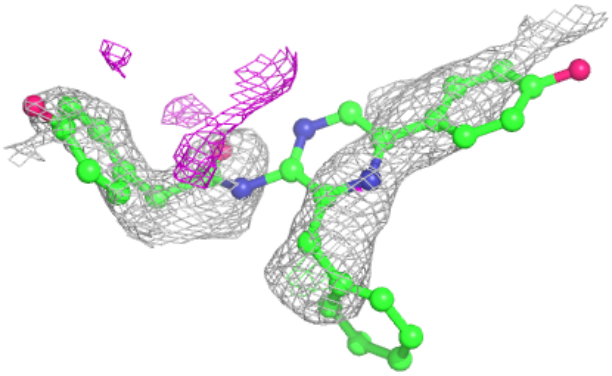


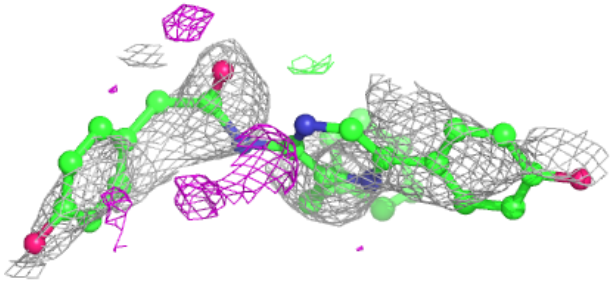


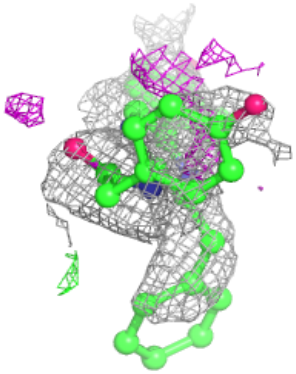


Electron density around CEI H 401:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

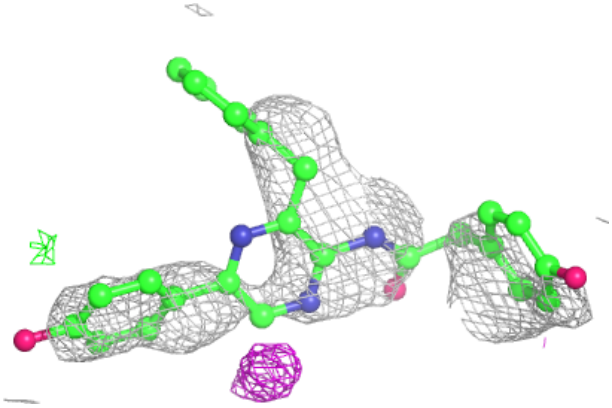


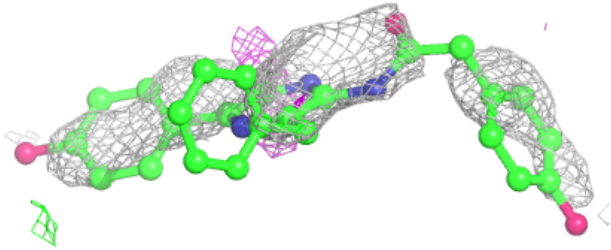


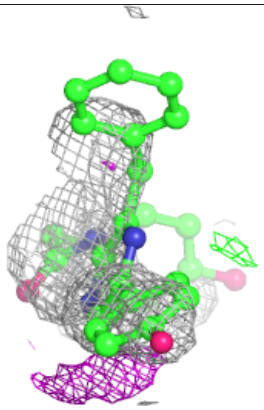


Electron density around CEI K 401:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)

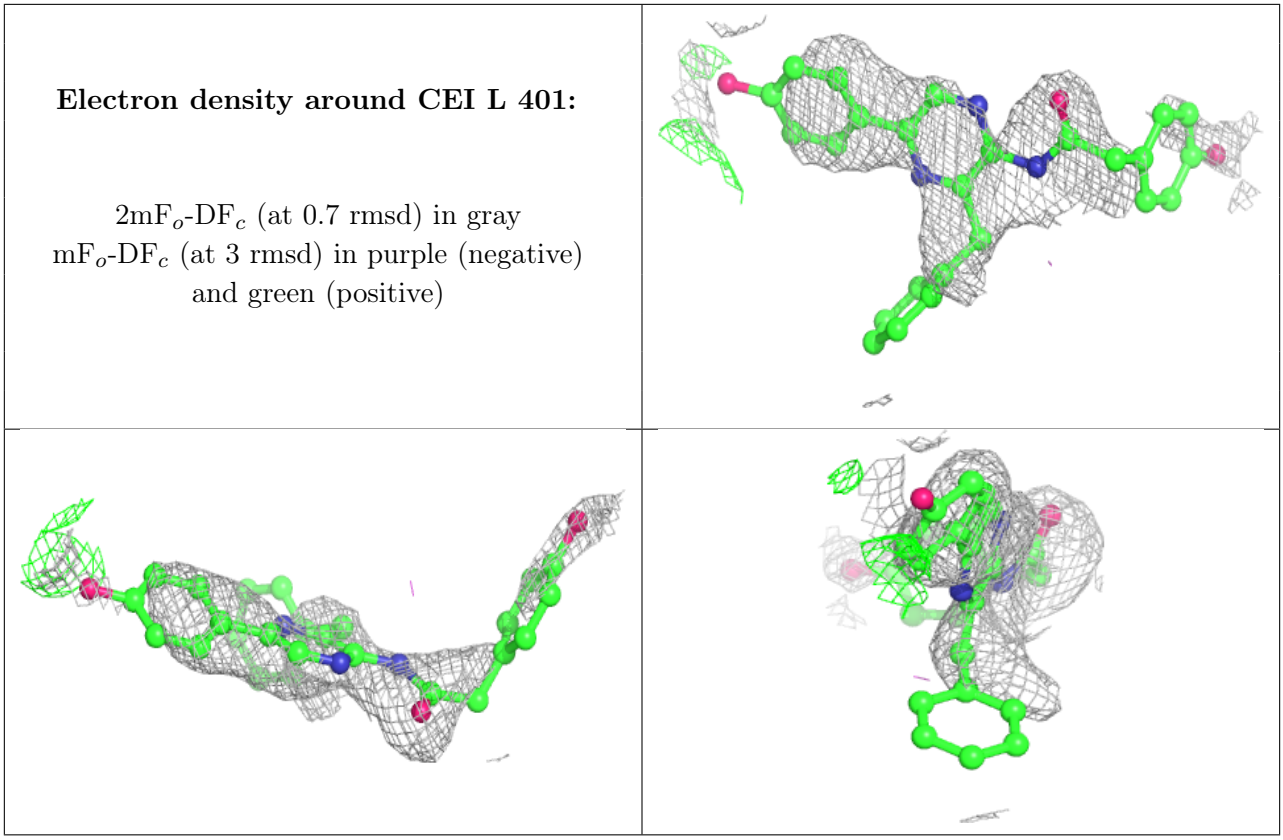






Electron density around CEI L 401:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



6.5 Other polymers (i)

There are no such residues in this entry.