



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 22, 2018 – 04:54 PM EST

PDB ID : 6B9E  
Title : Human ATL1 mutant - R77A / F151S bound to GDP  
Authors : O'Donnell, J.P.; Sondermann, H.  
Deposited on : 2017-10-10  
Resolution : 1.99 Å(reported)

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

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

A user guide is available at

<http://wwpdb.org/validation/2016/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Mogul : 1.7.2 (RC1), CSD as538be (2017)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20030736  
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : rb-20030736

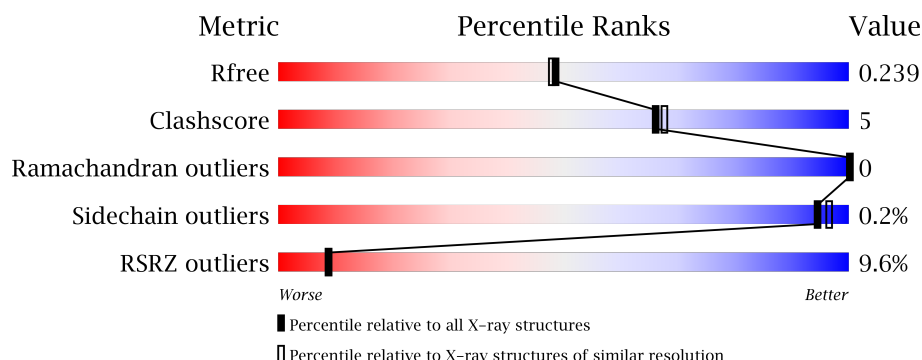
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 1.99 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))
$R_{free}$	100719	6609 (2.00-2.00)
Clashscore	112137	7775 (2.00-2.00)
Ramachandran outliers	110173	7679 (2.00-2.00)
Sidechain outliers	110143	7678 (2.00-2.00)
RSRZ outliers	101464	6696 (2.00-2.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. 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	458	<div> <div>9%</div> <div>73%</div> <div>12%</div> <div>14%</div> </div>
1	B	458	<div> <div>7%</div> <div>77%</div> <div>7%</div> <div>16%</div> </div>

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 6349 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 Atlastin-1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	392	Total	C	N	O	S	0	2	0
			3083	1990	507	573	13			
1	B	387	Total	C	N	O	S	0	0	0
			3005	1933	501	558	13			

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	SER	-	expression tag	UNP Q8WXF7
A	77	ALA	ARG	engineered mutation	UNP Q8WXF7
A	151	SER	PHE	engineered mutation	UNP Q8WXF7
A	447	ALA	-	expression tag	UNP Q8WXF7
A	448	ALA	-	expression tag	UNP Q8WXF7
A	449	ALA	-	expression tag	UNP Q8WXF7
A	450	LEU	-	expression tag	UNP Q8WXF7
A	451	GLU	-	expression tag	UNP Q8WXF7
A	452	HIS	-	expression tag	UNP Q8WXF7
A	453	HIS	-	expression tag	UNP Q8WXF7
A	454	HIS	-	expression tag	UNP Q8WXF7
A	455	HIS	-	expression tag	UNP Q8WXF7
A	456	HIS	-	expression tag	UNP Q8WXF7
A	457	HIS	-	expression tag	UNP Q8WXF7
B	0	SER	-	expression tag	UNP Q8WXF7
B	77	ALA	ARG	engineered mutation	UNP Q8WXF7
B	151	SER	PHE	engineered mutation	UNP Q8WXF7
B	447	ALA	-	expression tag	UNP Q8WXF7
B	448	ALA	-	expression tag	UNP Q8WXF7
B	449	ALA	-	expression tag	UNP Q8WXF7
B	450	LEU	-	expression tag	UNP Q8WXF7
B	451	GLU	-	expression tag	UNP Q8WXF7
B	452	HIS	-	expression tag	UNP Q8WXF7
B	453	HIS	-	expression tag	UNP Q8WXF7
B	454	HIS	-	expression tag	UNP Q8WXF7

*Continued on next page...*

Chain	Residue	Modelled	Actual	Comment	Reference
B	455	HIS	-	expression tag	UNP Q8WXF7
B	456	HIS	-	expression tag	UNP Q8WXF7
B	457	HIS	-	expression tag	UNP Q8WXF7

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- The image displays the chemical structure of Guanosine Diphosphate (GDP). It consists of a guanine base (a purine ring system with an amino group at C2 and a carbonyl group at C6) linked to a ribose sugar via a glycosidic bond at the C1' position. The ribose sugar is further linked to two phosphate groups (P1 and P2) via phosphodiester bonds. The first phosphate group (P1) is linked to the 3' carbon of the ribose (C3'), and the second phosphate group (P2) is linked to the 5' carbon of the ribose (C5'). The structure is labeled with atom names and numbers, including N1, C2, N3, C4, N5, C6, N7, C8, N9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C96, C97, C98, C99, C100, C101, C102, C103, C104, C105, C106, C107, C108, C109, C110, C111, C112, C113, C114, C115, C116, C117, C118, C119, C120, C121, C122, C123, C124, C125, C126, C127, C128, C129, C130, C131, C132, C133, C134, C135, C136, C137, C138, C139, C140, C141, C142, C143, C144, C145, C146, C147, C148, C149, C150, C151, C152, C153, C154, C155, C156, C157, C158, C159, C160, C161, C162, C163, C164, C165, C166, C167, C168, C169, C170, C171, C172, C173, C174, C175, C176, C177, C178, C179, C180, C181, C182, C183, C184, C185, C186, C187, C188, C189, C190, C191, C192, C193, C194, C195, C196, C197, C198, C199, C200, C201, C202, C203, C204, C205, C206, C207, C208, C209, C210, C211, C212, C213, C214, C215, C216, C217, C218, C219, C220, C221, C222, C223, C224, C225, C226, C227, C228, C229, C230, C231, C232, C233, C234, C235, C236, C237, C238, C239, C240, C241, C242, C243, C244, C245, C246, C247, C248, C249, C250, C251, C252, C253, C254, C255, C256, C257, C258, C259, C260, C261, C262, C263, C264, C265, C266, C267, C268, C269, C270, C271, C272, C273, C274, C275, C276, C277, C278, C279, C280, C281, C282, C283, C284, C285, C286, C287, C288, C289, C290, C291, C292, C293, C294, C295, C296, C297, C298, C299, C300, C301, C302, C303, C304, C305, C306, C307, C308, C309, C310, C311, C312, C313, C314, C315, C316, C317, C318, C319, C320, C321, C322, C323, C324, C325, C326, C327, C328, C329, C330, C331, C332, C333, C334, C335, C336, C337, C338, C339, C340, C341, C342, C343, C344, C345, C346, C347, C348, C349, C350, C351, C352, C353, C354, C355, C356, C357, C358, C359, C360, C361, C362, C363, C364, C365, C366, C367, C368, C369, C370, C371, C372, C373, C374, C375, C376, C377, C378, C379, C380, C381, C382, C383, C384, C385, C386, C387, C388, C389, C390, C391, C392, C393, C394, C395, C396, C397, C398, C399, C400, C401, C402, C403, C404, C405, C406, C407, C408, C409, C410, C411, C412, C413, C414, C415, C416, C417, C418, C419, C420, C421, C422, C423, C424, C425, C426, C427, C428, C429, C430, C431, C432, C433, C434, C435, C436, C437, C438, C439, C440, C441, C442, C443, C444, C445, C446, C447, C448, C449, C450, C451, C452, C453, C454, C455, C456, C457, C458, C459, C460, C461, C462, C463, C464, C465, C466, C467, C468, C469, C470, C471, C472, C473, C474, C475, C476, C477, C478, C479, C480, C481, C482, C483, C484, C485, C486, C487, C488, C489, C490, C491, C492, C493, C494, C495, C496, C497, C498, C499, C500, C501, C502, C503, C504, C505, C506, C507, C508, C509, C510, C511, C512, C513, C514, C515, C516, C517, C518, C519, C520, C521, C522, C523, C524, C525, C526, C527, C528, C529, C530, C531, C532, C533, C534, C535, C536, C537, C538, C539, C540, C541, C542, C543, C544, C545, C546, C547, C548, C549, C550, C551, C552, C553, C554, C555, C556, C557, C558, C559, C560, C561, C562, C563, C564, C565, C566, C567, C568, C569, C570, C571, C572, C573, C574, C575, C576, C577, C578, C579, C580, C581, C582, C583, C584, C585, C586, C587, C588, C589, C590, C591, C592, C593, C594, C595, C596, C597, C598, C599, C600, C601, C602, C603, C604, C605, C606, C607, C608, C609, C610, C611, C612, C613, C614, C615, C616, C617, C618, C619, C620, C621, C622, C623, C624, C625, C626, C627, C628, C629, C630, C631, C632, C633, C634, C635, C636, C637, C638, C639, C640, C641, C642, C643, C644, C645, C646, C647, C648, C649, C650, C651, C652, C653, C654, C655, C656, C657, C658, C659, C660, C661, C662, C663, C664, C665, C666, C667, C668, C669, C670, C671, C672, C673, C674, C675, C676, C677, C678, C679, C680, C681, C682, C683, C684, C685, C686, C687, C688, C689, C690, C691, C692, C693, C694, C695, C696, C697, C698, C699, C700, C701, C702, C703, C704, C705, C706, C707, C708, C709, C710, C711, C712, C713, C714, C715, C716, C717, C718, C719, C720, C721, C722, C723, C724, C725, C726, C727, C728, C729, C730, C731, C732, C733, C734, C735, C736, C737, C738, C739, C740, C741, C742, C743, C744, C745, C746, C747, C748, C749, C750, C751, C752, C753, C754, C755, C756, C757, C758, C759, C760, C761, C762, C763, C764, C765, C766, C767, C768, C769, C770, C771, C772, C773, C774, C775, C776, C777, C778, C779, C780, C781, C782, C783, C784, C785, C786, C787, C788, C789, C790, C791, C792, C793, C794, C795, C796, C797, C798, C799, C800, C801, C802, C803, C80





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

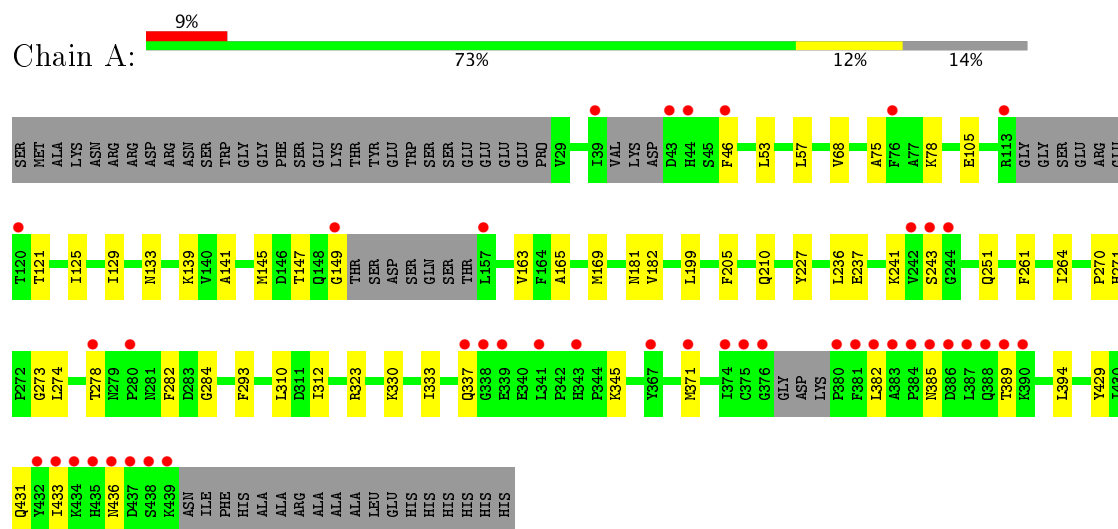
- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	95	Total	O	0	0
			95	95		
5	B	103	Total	O	0	0
			103	103		

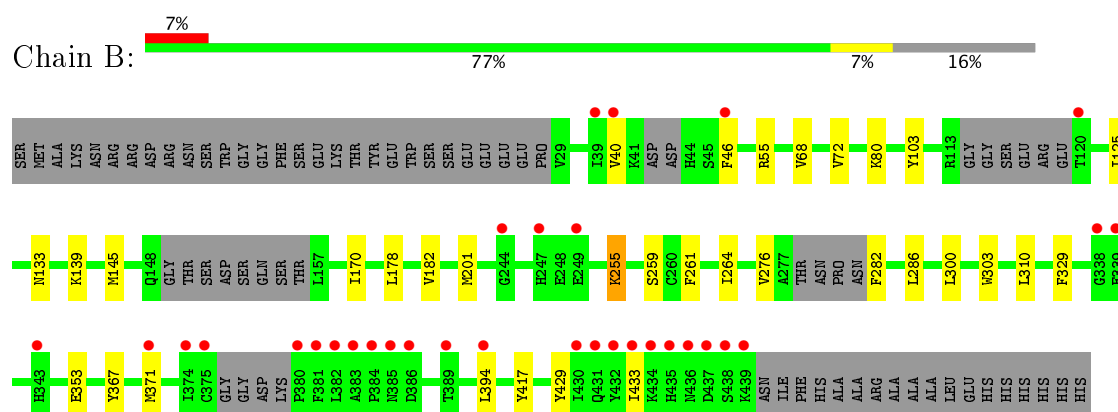
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA 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: Atlantin-1



#### • Molecule 1: Atlantin-1



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	52.06 Å 68.11 Å 76.02 Å 116.85° 90.77° 98.50°	Depositor
Resolution (Å)	13.85 – 1.99 42.75 – 1.99	Depositor EDS
% Data completeness (in resolution range)	95.6 (13.85-1.99) 72.6 (42.75-1.99)	Depositor EDS
$R_{merge}$	0.06	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	0.77 (at 1.98 Å)	Xtriage
Refinement program	PHENIX (1.12_2829)	Depositor
R, $R_{free}$	0.203 , 0.244 0.199 , 0.239	Depositor DCC
$R_{free}$ test set	1752 reflections (3.31%)	DCC
Wilson B-factor (Å <sup>2</sup> )	26.1	Xtriage
Anisotropy	0.458	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.38 , 56.9	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	6349	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	44.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.44% 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

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: GDP, MG, SO4

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	0.44	0/3144	0.57	0/4247
1	B	0.43	0/3063	0.56	0/4142
All	All	0.43	0/6207	0.57	0/8389

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts

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	3083	0	3019	36	0
1	B	3005	0	2918	21	0
2	A	28	0	12	0	0
2	B	28	0	12	0	0
3	A	1	0	0	0	0
3	B	1	0	0	0	0
4	B	5	0	0	0	0
5	A	95	0	0	3	0
5	B	103	0	0	0	0
All	All	6349	0	5961	56	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 5.

All (56) 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:210[B]:GLN:NE2	1:A:312:ILE:O	2.25	0.67
1:A:46:PHE:O	1:A:337:GLN:NE2	2.23	0.66
1:A:121:THR:HG23	1:A:149:GLY:HA2	1.79	0.65
1:A:429:TYR:CZ	1:A:433:ILE:HD11	2.33	0.64
1:A:382:LEU:H	1:A:436:ASN:HD21	1.44	0.63
1:A:271:HIS:HD2	1:A:273:GLY:H	1.47	0.63
1:B:261:PHE:HB2	1:B:264:ILE:HD11	1.81	0.62
1:A:243:SER:O	1:A:251:GLN:NE2	2.31	0.62
1:B:429:TYR:CZ	1:B:433:ILE:HD11	2.36	0.61
1:A:68:VAL:HG21	1:A:310:LEU:HB3	1.83	0.60
1:B:125:ILE:HG22	1:B:145:MET:HG2	1.82	0.60
1:A:147:THR:HG23	1:A:163:VAL:HG12	1.84	0.59
1:B:68:VAL:HG21	1:B:310:LEU:HB3	1.84	0.59
1:B:40:VAL:HA	1:B:46:PHE:HA	1.86	0.58
1:A:125:ILE:HG22	1:A:145:MET:HG2	1.87	0.57
1:B:255:LYS:HE3	1:B:259:SER:OG	2.07	0.55
1:A:271:HIS:CD2	1:A:273:GLY:H	2.25	0.55
1:A:205:PHE:HD2	1:B:201:MET:HE3	1.74	0.52
1:A:237:GLU:O	1:A:241:LYS:HG2	2.10	0.52
1:B:429:TYR:CE2	1:B:433:ILE:HD11	2.44	0.51
1:A:274:LEU:O	1:A:278:THR:HG22	2.09	0.51
1:B:133:ASN:HD22	1:B:139:LYS:HD3	1.76	0.51
1:B:72:VAL:HG12	1:B:80:LYS:HD2	1.94	0.50
1:A:181:ASN:OD1	1:A:182:VAL:N	2.46	0.48
1:A:165:ALA:O	1:A:169:MET:HG2	2.15	0.47
1:A:236:LEU:HD21	1:A:264:ILE:HG22	1.96	0.47
1:A:323:ARG:NH1	5:A:605:HOH:O	2.47	0.46
1:A:210[A]:GLN:NE2	5:A:604:HOH:O	2.44	0.46
1:B:103:TYR:HA	1:B:286:LEU:HB2	1.97	0.46
1:A:105:GLU:OE2	5:A:601:HOH:O	2.21	0.46
1:B:353:GLU:HG3	1:B:417:TYR:OH	2.14	0.46
1:A:270:PRO:HG2	1:A:293:PHE:HA	1.96	0.46
1:A:282:PHE:CZ	1:A:284:GLY:HA2	2.51	0.46
1:A:385:ASN:O	1:A:389:THR:HG23	2.15	0.45
1:A:429:TYR:CE2	1:A:433:ILE:HD11	2.50	0.45
1:A:75:ALA:HB3	1:A:78:LYS:HD2	1.99	0.45
1:B:371:MET:CE	1:B:394:LEU:HD12	2.48	0.44
1:A:53:LEU:HD22	1:A:57:LEU:HD12	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:261:PHE:HB2	1:A:264:ILE:HD11	1.99	0.44
1:A:147:THR:CG2	1:A:163:VAL:HG12	2.47	0.43
1:A:227:TYR:CZ	1:A:270:PRO:HB3	2.54	0.43
1:B:178:LEU:HD13	1:B:182:VAL:HG22	1.99	0.43
1:B:55:ARG:HB2	1:B:55:ARG:HE	1.58	0.42
1:A:133:ASN:HD22	1:A:139:LYS:HD3	1.84	0.42
1:B:276:VAL:HG22	1:B:282:PHE:CZ	2.54	0.42
1:A:199:LEU:HD21	1:A:345:LYS:HG2	2.01	0.42
1:A:330:LYS:O	1:A:333:ILE:HG22	2.20	0.42
1:A:431:GLN:HA	1:A:431:GLN:OE1	2.20	0.42
1:B:371:MET:HE2	1:B:394:LEU:HD12	2.02	0.41
1:B:170:ILE:HD13	1:B:329:PHE:CE1	2.54	0.41
1:B:201:MET:HE1	1:B:259:SER:O	2.20	0.41
1:B:367:TYR:CZ	1:B:371:MET:HG3	2.55	0.41
1:B:300:LEU:O	1:B:303:TRP:HB3	2.21	0.41
1:A:371:MET:HE1	1:A:394:LEU:HD12	2.02	0.41
1:A:129:ILE:CG2	1:A:141:ALA:HB1	2.51	0.40
1:A:371:MET:CE	1:A:394:LEU:HD12	2.51	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	384/458 (84%)	375 (98%)	9 (2%)	0	100	100
1	B	375/458 (82%)	368 (98%)	7 (2%)	0	100	100
All	All	759/916 (83%)	743 (98%)	16 (2%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains ⓘ

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	324/402 (81%)	324 (100%)	0	100	100
1	B	313/402 (78%)	312 (100%)	1 (0%)	94	96
All	All	637/804 (79%)	636 (100%)	1 (0%)	94	96

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	255	LYS

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (13) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	94	GLN
1	A	133	ASN
1	A	174	GLN
1	A	271	HIS
1	A	385	ASN
1	A	419	GLN
1	A	436	ASN
1	B	44	HIS
1	B	94	GLN
1	B	124	GLN
1	B	133	ASN
1	B	349	GLN
1	B	391	HIS

### 5.3.3 RNA ⓘ

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 carbohydrates in this entry.

## 5.6 Ligand geometry [i](#)

Of 5 ligands modelled in this entry, 2 are monoatomic - leaving 3 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	$\# Z  > 2$
2	GDP	A	501	3	25,30,30	1.27	2 (8%)	26,47,47	2.14	6 (23%)
4	SO4	B	501	-	4,4,4	0.16	0	6,6,6	0.26	0
2	GDP	B	502	3	25,30,30	1.27	2 (8%)	26,47,47	2.09	6 (23%)

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
2	GDP	A	501	3	-	0/12/32/32	0/3/3/3
4	SO4	B	501	-	-	0/0/0/0	0/0/0/0
2	GDP	B	502	3	-	0/12/32/32	0/3/3/3

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	501	GDP	C5-C4	3.24	1.47	1.40
2	B	502	GDP	C5-C4	3.24	1.47	1.40
2	A	501	GDP	C6-C5	3.93	1.48	1.41
2	B	502	GDP	C6-C5	4.11	1.49	1.41

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	501	GDP	C6-C5-C4	-4.41	116.46	120.84
2	B	502	GDP	C6-C5-C4	-4.26	116.61	120.84
2	A	501	GDP	C5-C6-N1	-4.13	117.60	123.48
2	B	502	GDP	C5-C6-N1	-3.92	117.90	123.48
2	A	501	GDP	N3-C2-N1	-3.75	121.98	127.46
2	B	502	GDP	N3-C2-N1	-3.41	122.47	127.46
2	B	502	GDP	C4-C5-N7	-3.03	106.48	109.41
2	A	501	GDP	C4-C5-N7	-2.36	107.13	109.41
2	B	502	GDP	C6-N1-C2	4.55	122.61	116.06
2	A	501	GDP	C2-N3-C4	4.69	120.64	115.16
2	A	501	GDP	C6-N1-C2	5.07	123.35	116.06
2	B	502	GDP	C2-N3-C4	5.20	121.23	115.16

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 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<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	392/458 (85%)	0.56	43 (10%) 6 6	20, 40, 87, 115	0
1	B	387/458 (84%)	0.50	32 (8%) 12 12	22, 40, 81, 109	0
All	All	779/916 (85%)	0.53	75 (9%) 9 9	20, 40, 85, 115	0

All (75) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	338	GLY	7.1
1	A	381	PHE	6.1
1	B	384	PRO	5.6
1	B	432	TYR	4.9
1	B	382	LEU	4.9
1	B	383	ALA	4.9
1	A	383	ALA	4.8
1	A	437	ASP	4.8
1	B	437	ASP	4.7
1	A	435	HIS	4.7
1	B	338	GLY	4.6
1	A	438	SER	4.5
1	B	40	VAL	4.5
1	B	381	PHE	4.3
1	A	390	LYS	4.2
1	A	39	ILE	4.1
1	A	341	LEU	4.1
1	A	382	LEU	4.1
1	B	385	ASN	4.1
1	A	384	PRO	4.1
1	B	380	PRO	4.0
1	A	439	LYS	3.9
1	A	278	THR	3.5
1	A	433	ILE	3.4

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Mol	Chain	Res	Type	RSRZ
1	B	435	HIS	3.4
1	A	244	GLY	3.3
1	A	434	LYS	3.3
1	B	249	GLU	3.3
1	A	44	HIS	3.3
1	A	374	ILE	3.3
1	B	394	LEU	3.3
1	A	436	ASN	3.2
1	B	430	ILE	3.2
1	B	433	ILE	3.2
1	A	376	GLY	3.2
1	A	243	SER	3.2
1	A	280	PRO	3.1
1	A	432	TYR	3.1
1	B	39	ILE	3.1
1	A	385	ASN	3.0
1	B	375	CYS	3.0
1	A	76	PHE	2.9
1	B	339	GLU	2.9
1	B	434	LYS	2.9
1	B	438	SER	2.8
1	A	157	LEU	2.8
1	B	389	THR	2.8
1	A	46	PHE	2.8
1	A	375	CYS	2.8
1	B	439	LYS	2.8
1	B	46	PHE	2.7
1	B	436	ASN	2.7
1	A	389	THR	2.7
1	A	386	ASP	2.6
1	A	339	GLU	2.6
1	A	242	VAL	2.6
1	A	149	GLY	2.6
1	A	43	ASP	2.6
1	B	386	ASP	2.5
1	A	337	GLN	2.4
1	A	120	THR	2.3
1	B	371	MET	2.3
1	B	247	HIS	2.3
1	B	120	THR	2.3
1	A	388	GLN	2.2
1	B	431	GLN	2.2

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Mol	Chain	Res	Type	RSRZ
1	B	244	GLY	2.2
1	A	371	MET	2.2
1	B	343	HIS	2.1
1	A	113	ARG	2.1
1	B	374	ILE	2.1
1	A	367	TYR	2.1
1	A	380	PRO	2.0
1	A	387	LEU	2.0
1	A	343	HIS	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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
2	GDP	B	502	28/28	0.92	0.14	0.82	37,54,70,75	0
4	SO4	B	501	5/5	0.97	0.12	0.08	63,67,71,77	0
2	GDP	A	501	28/28	0.92	0.14	0.03	35,49,65,71	0
3	MG	B	503	1/1	0.84	0.11	-	60,60,60,60	0
3	MG	A	502	1/1	0.88	0.13	-	64,64,64,64	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.