# Full wwPDB X-ray Structure Validation Report ⓘ

Sep 24, 2023 – 05:29 AM EDT

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|---|---|---|
| PDB ID | : | 5TRC |
| Title | : | Crystal structure of phosphorylated AC3-AC5 domains of yeast acetyl-CoA carboxylase |
| Authors | : | Wei, J.; Tong, L. |
| Deposited on | : | 2016-10-26 |
| Resolution | : | 2.90 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.

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

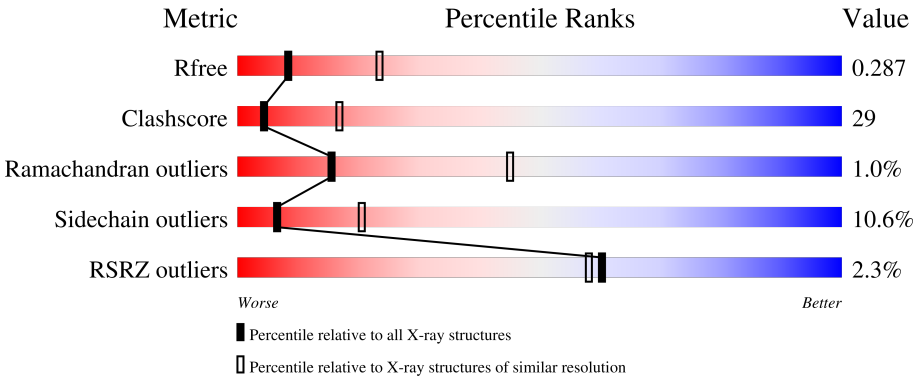
| | | |
|---|---|---|
| MolProbity | : | 4.02b-467 |
| Mogul | : | 1.8.5 (274361), CSD as541be (2020) |
| Xtriage (Phenix) | : | 1.13 |
| EDS | : | 2.35.1 |
| Percentile statistics | : | 20191225.v01 (using entries in the PDB archive December 25th 2019) |
| Refmac | : | 5.8.0158 |
| CCP4 | : | 7.0.044 (Gargrove) |
| Ideal geometry (proteins) | : | Engh & Huber (2001) |
| Ideal geometry (DNA, RNA) | : | Parkinson et al. (1996) |
| Validation Pipeline (wwPDB-VP) | : | 2.35.1 |

# 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 2.90 Å.

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




| Metric | Whole archive (#Entries) | Similar resolution (#Entries, resolution range(Å)) |
|---|---|---|
| $R_{free}$ | 130704 | 1957 (2.90-2.90) |
| Clashscore | 141614 | 2172 (2.90-2.90) |
| Ramachandran outliers | 138981 | 2115 (2.90-2.90) |
| Sidechain outliers | 138945 | 2117 (2.90-2.90) |
| RSRZ outliers | 127900 | 1906 (2.90-2.90) |

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 | 474 | 2% 48% 37% 5% 10% |
| 1 | B | 474 | 2% 37% 42% 5% 16% |

# 2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 6628 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 Acetyl-CoA carboxylase.

| Mol | Chain | Residues | Atoms | | | | | | ZeroOcc | AltConf | Trace |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | A | 426 | Total | C | N | O | P | S | 0 | 0 | 0 |
| | | | 3414 | 2178 | 581 | 648 | 1 | 6 | | | |
| 1 | B | 398 | Total | C | N | O | P | S | 0 | 0 | 0 |
| | | | 3212 | 2051 | 549 | 605 | 1 | 6 | | | |

There are 12 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|---|---|---|---|---|---|
| A | 1504 | HIS | - | expression tag | UNP Q00955 |
| A | 1505 | HIS | - | expression tag | UNP Q00955 |
| A | 1506 | HIS | - | expression tag | UNP Q00955 |
| A | 1507 | HIS | - | expression tag | UNP Q00955 |
| A | 1508 | HIS | - | expression tag | UNP Q00955 |
| A | 1509 | HIS | - | expression tag | UNP Q00955 |
| B | 1504 | HIS | - | expression tag | UNP Q00955 |
| B | 1505 | HIS | - | expression tag | UNP Q00955 |
| B | 1506 | HIS | - | expression tag | UNP Q00955 |
| B | 1507 | HIS | - | expression tag | UNP Q00955 |
| B | 1508 | HIS | - | expression tag | UNP Q00955 |
| B | 1509 | HIS | - | expression tag | UNP Q00955 |

- Molecule 2 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

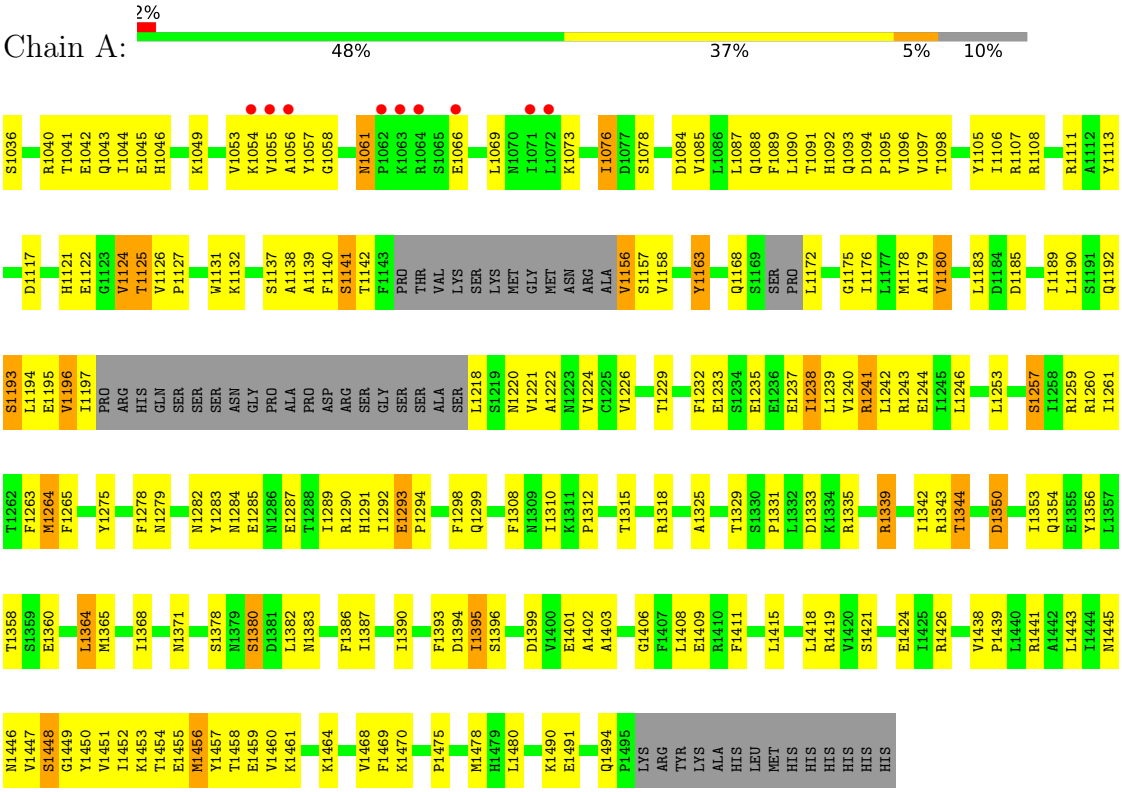
| Mol | Chain | Residues | Atoms | | ZeroOcc | AltConf |
|---|---|---|---|---|---|---|
| 2 | A | 1 | Total | Cl | 0 | 0 |
| | | | 1 | 1 | | |
| 2 | B | 1 | Total | Cl | 0 | 0 |
| | | | 1 | 1 | | |

# 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.

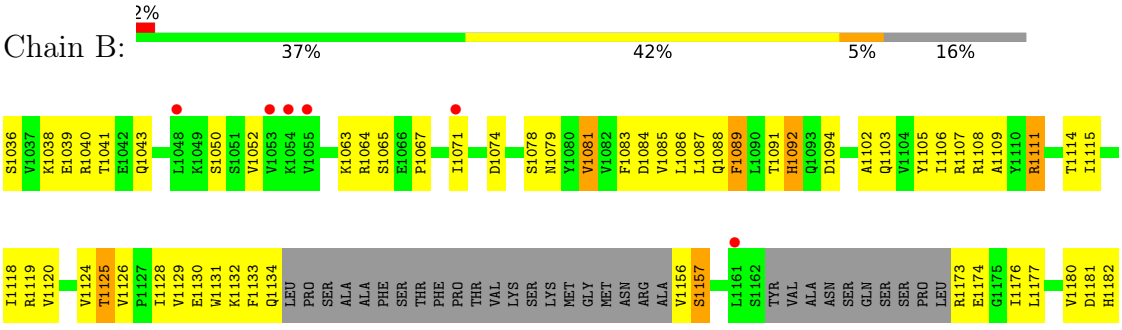
• Molecule 1: Acetyl-CoA carboxylase

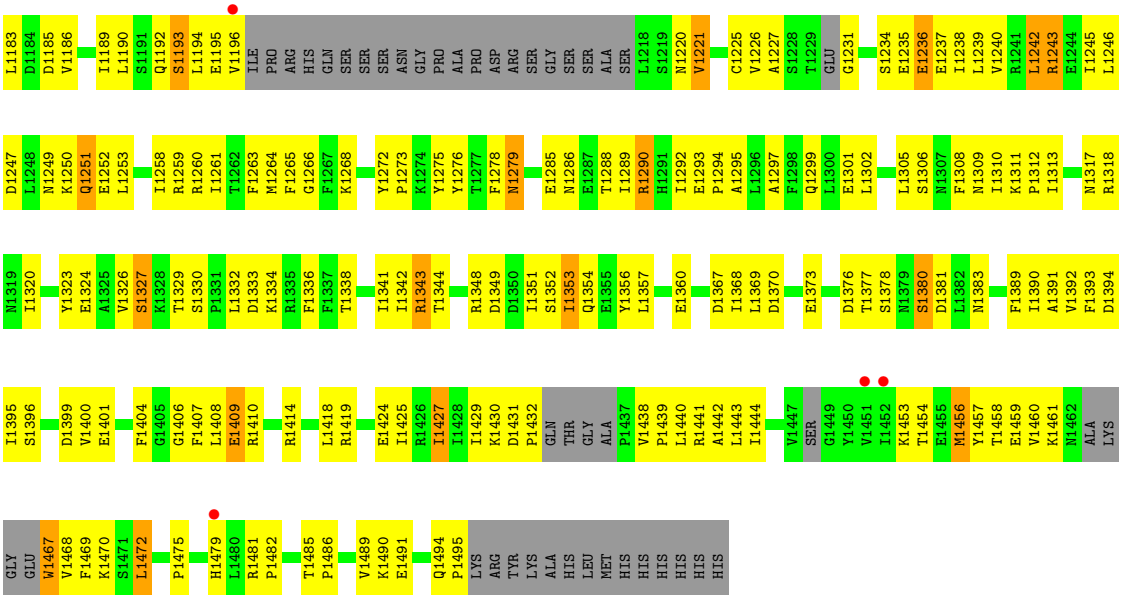
Chain A:




• Molecule 1: Acetyl-CoA carboxylase

Chain B:




L1183 D1184 D1185 V1186 I1189 L1190 S1191 Q1192 S1193 L1194 E1195 V1196 IIE PRO ARG HIS GLN SER SER SER ASN GLY PRO ALA PRO ASP ARG SER GLY SER SER ALA SER L1218 S1219 N1220 V1221 C1225 V1226 A1227 S1228 T1229 GLU G1231 S1234 E1235 E1236 E1237 I1238 L1239 V1240 R1241 L1242 R1243 E1244 I1245 L1246
D1247 L1248 N1249 K1250 Q1251 E1252 L1253 I1258 R1259 R1260 I1261 T1262 F1263 M1264 F1265 G1266 F1267 K1268 Y1272 P1273 K1274 Y1275 Y1276 T1277 F1278 N1279 E1285 N1286 E1287 T1288 I1289 R1290 H1291 I1292 E1293 P1294 A1295 L1296 A1297 F1298 Q1299 L1300 E1301 L1302 L1305 S1306 N1307 F1308 N1309 I1310 K1311 P1312 I1313 N1317 R1318
N1319 I1320 Y1323 E1324 A1325 V1326 S1327 K1328 T1329 S1330 P1331 L1332 D1333 K1334 R1335 F1336 F1337 T1338 I1341 I1342 R1343 T1344 R1348 D1349 D1350 I1351 S1352 I1353 Q1354 E1355 Y1356 L1357 E1360 D1367 I1368 L1369 D1370 E1373 D1376 T1377 S1378 N1379 S1380 D1381 L1382 N1383 F1389 I1390 A1391 V1392 F1393 D1394
I1395 S1396 D1399 V1400 E1401 F1404 G1405 G1406 F1407 L1408 E1409 R1410 R1414 L1418 R1419 E1424 I1425 R1426 I1427 I1428 I1429 K1430 D1431 P1432 GLN THR GLY ALA P1437 V1438 P1439 L1440 R1441 A1442 L1443 I1444 V1447 SER G1449 Y1450 V1451 I1452 K1453 T1454 E1455 M1456 Y1457 T1458 E1459 V1460 K1461 N1462 ALA LYS
GLY GLU W1467 V1468 F1469 K1470 S1471 L1472 P1475 H1479 L1480 R1481 P1482 T1485 P1486 V1489 K1490 E1491 Q1494 P1495 LYS ARG TYR LYS ALA HIS LEU MET HIS HIS HIS HIS HIS HIS

# 4 Data and refinement statistics (i)

| Property | Value | Source |
|---|---|---|
| Space group | P 1 21 1 | Depositor |
| Cell constants<br>a, b, c, $\alpha$, $\beta$, $\gamma$ | 56.43Å 93.19Å 110.94Å<br>90.00° 99.57° 90.00° | Depositor |
| Resolution (Å) | 46.57 – 2.90<br>46.57 – 2.88 | Depositor<br>EDS |
| % Data completeness<br>(in resolution range) | 97.5 (46.57-2.90)<br>97.5 (46.57-2.88) | Depositor<br>EDS |
| $R_{merge}$ | 0.05 | Depositor |
| $R_{sym}$ | (Not available) | Depositor |
| $< I/\sigma(I) >$ [1] | 1.90 (at 2.91Å) | Xtriage |
| Refinement program | PHENIX 1.9_1692 | Depositor |
| R, $R_{free}$ | 0.223 , 0.287<br>0.227 , 0.287 | Depositor<br>DCC |
| $R_{free}$ test set | 1272 reflections (5.07%) | wwPDB-VP |
| Wilson B-factor (Å$^2$) | 82.6 | Xtriage |
| Anisotropy | 0.145 | Xtriage |
| Bulk solvent $k_{sol}$(e/Å$^3$), $B_{sol}$(Å$^2$) | 0.30 , 61.1 | EDS |
| L-test for twinning[2] | $< \|L\| > = 0.49$, $< L^2 > = 0.33$ | Xtriage |
| Estimated twinning fraction | No twinning to report. | Xtriage |
| $F_o$,$F_c$ correlation | 0.93 | EDS |
| Total number of atoms | 6628 | wwPDB-VP |
| Average B, all atoms (Å$^2$) | 86.0 | wwPDB-VP |

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.32% 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: SEP, CL

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 | 0.61 | 0/3470 | 0.71 | 1/4703 (0.0%) |
| 1 | B | 0.53 | 0/3260 | 0.69 | 0/4410 |
| All | All | 0.57 | 0/6730 | 0.70 | 1/9113 (0.0%) |

There are no bond length outliers.

All (1) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|---|---|---|---|---|---|---|---|
| 1 | A | 1293 | GLU | C-N-CD | 5.04 | 138.98 | 128.40 |

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 | 3414 | 0 | 3409 | 166 | 0 |
| 1 | B | 3212 | 0 | 3213 | 221 | 0 |
| 2 | A | 1 | 0 | 0 | 1 | 0 |
| 2 | B | 1 | 0 | 0 | 1 | 0 |
| All | All | 6628 | 0 | 6622 | 383 | 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 29.

All (383) 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:1275:TYR:O | 1:A:1290:ARG:O | 1.66 | 1.14 |
| 1:B:1221:VAL:HG11 | 1:B:1260:ARG:NH1 | 1.70 | 1.07 |
| 1:A:1445:ASN:OD1 | 1:A:1447:VAL:HG22 | 1.59 | 1.01 |
| 1:B:1221:VAL:HG13 | 1:B:1260:ARG:CG | 1.97 | 0.94 |
| 1:A:1189:ILE:O | 1:A:1193:SER:OG | 1.85 | 0.94 |
| 1:B:1221:VAL:HG13 | 1:B:1260:ARG:HG3 | 1.49 | 0.93 |
| 1:B:1221:VAL:CG1 | 1:B:1260:ARG:HG3 | 2.00 | 0.89 |
| 1:B:1482:PRO:O | 1:B:1485:THR:HG22 | 1.73 | 0.88 |
| 1:B:1313:ILE:HD11 | 1:B:1324:GLU:HB2 | 1.56 | 0.88 |
| 1:B:1305:LEU:HD12 | 1:B:1310:ILE:HD11 | 1.55 | 0.88 |
| 1:B:1221:VAL:HG11 | 1:B:1260:ARG:CZ | 2.06 | 0.85 |
| 1:B:1275:TYR:O | 1:B:1290:ARG:O | 1.96 | 0.84 |
| 1:B:1373:GLU:OE2 | 1:B:1414:ARG:NH2 | 2.12 | 0.83 |
| 1:B:1106:ILE:HD11 | 1:B:1177:LEU:HD22 | 1.59 | 0.83 |
| 1:A:1044:ILE:HD12 | 1:A:1085:VAL:HG12 | 1.63 | 0.80 |
| 1:B:1088:GLN:OE1 | 1:B:1268:LYS:HG2 | 1.81 | 0.80 |
| 1:A:1421:SER:O | 1:A:1446:ASN:HB3 | 1.83 | 0.78 |
| 1:B:1088:GLN:HE21 | 1:B:1089:PHE:HE1 | 1.29 | 0.78 |
| 1:B:1406:GLY:HA2 | 1:B:1409:GLU:HG3 | 1.64 | 0.78 |
| 1:A:1445:ASN:CG | 1:A:1447:VAL:HG22 | 2.04 | 0.77 |
| 1:B:1272:TYR:O | 1:B:1318:ARG:NH2 | 2.18 | 0.75 |
| 1:B:1461:LYS:HG2 | 1:B:1467:TRP:CD1 | 2.22 | 0.75 |
| 1:B:1305:LEU:CD1 | 1:B:1310:ILE:HD11 | 2.18 | 0.74 |
| 1:A:1408:LEU:O | 1:A:1411:PHE:N | 2.18 | 0.73 |
| 1:A:1329:THR:CG2 | 1:A:1494:GLN:HG2 | 2.19 | 0.73 |
| 1:B:1221:VAL:HG13 | 1:B:1260:ARG:HG2 | 1.70 | 0.73 |
| 1:A:1448:SER:O | 1:A:1450:TYR:N | 2.21 | 0.72 |
| 1:A:1108:ARG:NH1 | 2:A:1601:CL:CL | 2.60 | 0.72 |
| 1:A:1117:ASP:OD1 | 1:A:1132:LYS:HE2 | 1.89 | 0.71 |
| 1:A:1045:GLU:HG3 | 1:A:1089:PHE:HE2 | 1.54 | 0.71 |
| 1:A:1141:SER:OG | 1:A:1426:ARG:NH1 | 2.24 | 0.70 |
| 1:B:1039:GLU:O | 1:B:1043:GLN:HG3 | 1.90 | 0.70 |
| 1:B:1063:LYS:HE2 | 1:B:1064:ARG:HG3 | 1.71 | 0.70 |
| 1:A:1421:SER:O | 1:A:1446:ASN:CB | 2.39 | 0.69 |
| 1:A:1113:TYR:OH | 1:A:1158:VAL:HG23 | 1.93 | 0.69 |
| 1:B:1341:ILE:CG2 | 1:B:1390:ILE:HD11 | 2.22 | 0.69 |
| 1:B:1380:SER:HB2 | 1:B:1383:ASN:HD21 | 1.58 | 0.69 |
| 1:A:1045:GLU:HG3 | 1:A:1089:PHE:CE2 | 2.28 | 0.69 |
| 1:A:1342:ILE:HD11 | 1:A:1364:LEU:HD12 | 1.74 | 0.69 |
| 1:A:1329:THR:HG23 | 1:A:1494:GLN:HG2 | 1.75 | 0.68 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:A:1291:HIS:CD2 | 1:A:1318:ARG:HG2 | 2.29 | 0.68 |
| 1:B:1040:ARG:NH1 | 1:B:1084:ASP:OD2 | 2.26 | 0.68 |
| 1:B:1343:ARG:HH11 | 1:B:1343:ARG:HG2 | 1.56 | 0.68 |
| 1:A:1126:VAL:CG2 | 1:A:1127:PRO:HD2 | 2.24 | 0.67 |
| 1:B:1036:SER:HA | 1:B:1039:GLU:OE1 | 1.95 | 0.67 |
| 1:A:1315:THR:HB | 1:A:1371:ASN:HD21 | 1.60 | 0.67 |
| 1:A:1315:THR:HB | 1:A:1371:ASN:ND2 | 2.10 | 0.67 |
| 1:B:1313:ILE:CD1 | 1:B:1324:GLU:HB2 | 2.23 | 0.67 |
| 1:B:1461:LYS:HG2 | 1:B:1467:TRP:HD1 | 1.58 | 0.66 |
| 1:A:1293:GLU:OE2 | 1:A:1294:PRO:HD2 | 1.95 | 0.66 |
| 1:B:1109:ALA:O | 1:B:1295:ALA:HB1 | 1.96 | 0.66 |
| 1:B:1220:ASN:O | 1:B:1259:ARG:N | 2.29 | 0.65 |
| 1:A:1126:VAL:HG22 | 1:A:1127:PRO:HD2 | 1.78 | 0.65 |
| 1:A:1339:ARG:HG2 | 1:A:1339:ARG:HH11 | 1.62 | 0.65 |
| 1:A:1350:ASP:OD1 | 1:A:1350:ASP:N | 2.28 | 0.65 |
| 1:B:1299:GLN:OE1 | 1:B:1390:ILE:HD13 | 1.98 | 0.64 |
| 1:B:1109:ALA:O | 1:B:1295:ALA:CB | 2.46 | 0.64 |
| 1:A:1232:PHE:HE2 | 1:A:1241:ARG:HG3 | 1.63 | 0.64 |
| 1:A:1106:ILE:HD13 | 1:A:1131:TRP:CE3 | 2.33 | 0.64 |
| 1:B:1040:ARG:NH2 | 1:B:1084:ASP:OD2 | 2.30 | 0.63 |
| 1:B:1469:PHE:O | 1:B:1479:HIS:O | 2.16 | 0.63 |
| 1:B:1221:VAL:CG1 | 1:B:1260:ARG:NH1 | 2.55 | 0.63 |
| 1:B:1369:LEU:O | 1:B:1373:GLU:HG3 | 1.98 | 0.63 |
| 1:A:1121:HIS:CE1 | 1:A:1196:VAL:HG11 | 2.34 | 0.63 |
| 1:A:1445:ASN:OD1 | 1:A:1447:VAL:CG2 | 2.43 | 0.63 |
| 1:B:1174:GLU:H | 1:B:1220:ASN:ND2 | 1.97 | 0.63 |
| 1:A:1044:ILE:HD12 | 1:A:1085:VAL:CG1 | 2.28 | 0.62 |
| 1:B:1309:ASN:N | 1:B:1326:VAL:O | 2.31 | 0.62 |
| 1:B:1288:THR:HG22 | 1:B:1312:PRO:HD3 | 1.80 | 0.62 |
| 1:B:1174:GLU:O | 1:B:1220:ASN:ND2 | 2.34 | 0.61 |
| 1:B:1344:THR:HG22 | 1:B:1356:TYR:OH | 2.00 | 0.61 |
| 1:A:1088:GLN:HG3 | 1:A:1089:PHE:CD1 | 2.35 | 0.61 |
| 1:A:1457:TYR:CD2 | 1:A:1469:PHE:HB3 | 2.35 | 0.61 |
| 1:B:1440:LEU:HD23 | 1:B:1458:THR:HG22 | 1.81 | 0.61 |
| 1:B:1106:ILE:HD11 | 1:B:1177:LEU:CD2 | 2.28 | 0.61 |
| 1:B:1460:VAL:HG12 | 1:B:1461:LYS:H | 1.65 | 0.61 |
| 1:B:1460:VAL:O | 1:B:1468:VAL:N | 2.23 | 0.61 |
| 1:B:1376:ASP:OD1 | 1:B:1378:SER:HB3 | 2.01 | 0.61 |
| 1:B:1408:LEU:HD12 | 1:B:1444:ILE:CG2 | 2.30 | 0.61 |
| 1:B:1342:ILE:HD12 | 1:B:1389:PHE:CZ | 2.36 | 0.61 |
| 1:B:1272:TYR:CG | 1:B:1273:PRO:HD2 | 2.36 | 0.60 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:B:1234:SER:O | 1:B:1238:ILE:HG13 | 2.01 | 0.60 |
| 1:A:1221:VAL:HG22 | 1:A:1260:ARG:HG3 | 1.83 | 0.60 |
| 1:A:1358:THR:OG1 | 1:A:1403:ALA:HB1 | 2.01 | 0.60 |
| 1:B:1242:LEU:HD21 | 1:B:1263:PHE:CD1 | 2.36 | 0.60 |
| 1:B:1108:ARG:NH1 | 2:B:1601:CL:CL | 2.71 | 0.60 |
| 1:A:1226:VAL:O | 1:A:1226:VAL:HG12 | 2.01 | 0.60 |
| 1:A:1278:PHE:CE2 | 1:A:1285:GLU:HB2 | 2.37 | 0.60 |
| 1:B:1289:ILE:O | 1:B:1289:ILE:HG13 | 2.01 | 0.60 |
| 1:A:1226:VAL:HG11 | 1:A:1265:PHE:CE2 | 2.36 | 0.60 |
| 1:B:1289:ILE:HD11 | 1:B:1292:ILE:CG2 | 2.32 | 0.60 |
| 1:B:1087:LEU:HD12 | 1:B:1266:GLY:CA | 2.32 | 0.59 |
| 1:A:1408:LEU:HD22 | 1:A:1415:LEU:HD11 | 1.84 | 0.59 |
| 1:B:1189:ILE:O | 1:B:1193:SER:OG | 2.20 | 0.59 |
| 1:A:1124:VAL:HG13 | 1:A:1192:GLN:HG2 | 1.85 | 0.59 |
| 1:A:1343:ARG:HG3 | 1:A:1343:ARG:HH11 | 1.68 | 0.59 |
| 1:B:1443:LEU:HD22 | 1:B:1457:TYR:HE1 | 1.68 | 0.58 |
| 1:A:1445:ASN:OD1 | 1:A:1447:VAL:HG13 | 2.02 | 0.58 |
| 1:A:1282:ASN:O | 1:A:1284:ASN:N | 2.30 | 0.58 |
| 1:A:1406:GLY:HA2 | 1:A:1409:GLU:OE1 | 2.03 | 0.58 |
| 1:A:1196:VAL:HG12 | 1:A:1196:VAL:O | 2.04 | 0.58 |
| 1:A:1342:ILE:CD1 | 1:A:1364:LEU:HD12 | 2.34 | 0.58 |
| 1:B:1041:THR:HA | 1:B:1085:VAL:HG11 | 1.85 | 0.58 |
| 1:B:1108:ARG:O | 1:B:1111:ARG:HB2 | 2.04 | 0.58 |
| 1:B:1301:GLU:OE1 | 1:B:1441:ARG:NH2 | 2.37 | 0.58 |
| 1:A:1289:ILE:HG13 | 1:A:1289:ILE:O | 2.03 | 0.58 |
| 1:A:1353:ILE:HD11 | 1:A:1394:ASP:HB3 | 1.86 | 0.58 |
| 1:A:1353:ILE:CD1 | 1:A:1394:ASP:HB3 | 2.34 | 0.58 |
| 1:A:1447:VAL:O | 1:A:1448:SER:HB2 | 2.04 | 0.58 |
| 1:A:1344:THR:HB | 1:A:1356:TYR:OH | 2.04 | 0.57 |
| 1:B:1491:GLU:O | 1:B:1494:GLN:HG3 | 2.04 | 0.57 |
| 1:B:1091:THR:HG21 | 1:B:1227:ALA:HB2 | 1.85 | 0.57 |
| 1:B:1106:ILE:CD1 | 1:B:1177:LEU:HD22 | 2.32 | 0.57 |
| 1:B:1408:LEU:HD12 | 1:B:1444:ILE:HG21 | 1.87 | 0.57 |
| 1:B:1235:GLU:OE2 | 1:B:1276:TYR:OH | 2.20 | 0.57 |
| 1:B:1443:LEU:HD22 | 1:B:1457:TYR:CE1 | 2.39 | 0.57 |
| 1:A:1458:THR:HG22 | 1:A:1459:GLU:H | 1.69 | 0.57 |
| 1:A:1156:VAL:HG12 | 1:A:1163:TYR:O | 2.05 | 0.57 |
| 1:A:1175:GLY:HA2 | 1:A:1221:VAL:O | 2.06 | 0.56 |
| 1:A:1401:GLU:HB2 | 1:A:1456:MET:SD | 2.44 | 0.56 |
| 1:B:1052:VAL:HG22 | 1:B:1067:PRO:CA | 2.35 | 0.56 |
| 1:B:1089:PHE:N | 1:B:1089:PHE:CD1 | 2.72 | 0.56 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:A:1185:ASP:O | 1:A:1189:ILE:HG12 | 2.05 | 0.56 |
| 1:B:1124:VAL:HG22 | 1:B:1192:GLN:CD | 2.26 | 0.56 |
| 1:B:1128:ILE:CD1 | 1:B:1193:SER:HB3 | 2.36 | 0.56 |
| 1:B:1341:ILE:HG23 | 1:B:1390:ILE:HD11 | 1.86 | 0.56 |
| 1:A:1399:ASP:O | 1:A:1402:ALA:HB3 | 2.06 | 0.56 |
| 1:A:1232:PHE:CE2 | 1:A:1241:ARG:HG3 | 2.40 | 0.56 |
| 1:B:1353:ILE:HG21 | 1:B:1394:ASP:OD1 | 2.06 | 0.56 |
| 1:A:1091:THR:HG21 | 1:A:1180:VAL:O | 2.06 | 0.56 |
| 1:A:1491:GLU:HB3 | 1:A:1494:GLN:NE2 | 2.21 | 0.56 |
| 1:B:1243:ARG:HA | 1:B:1246:LEU:HD12 | 1.87 | 0.55 |
| 1:A:1088:GLN:HE21 | 1:A:1089:PHE:HE1 | 1.53 | 0.55 |
| 1:A:1194:LEU:O | 1:A:1197:ILE:HG23 | 2.06 | 0.55 |
| 1:A:1257:SER:O | 1:A:1257:SER:OG | 2.23 | 0.55 |
| 1:B:1356:TYR:CZ | 1:B:1360:GLU:HG3 | 2.41 | 0.55 |
| 1:B:1114:THR:O | 1:B:1133:PHE:HA | 2.07 | 0.55 |
| 1:B:1040:ARG:HH12 | 1:B:1084:ASP:CG | 2.10 | 0.55 |
| 1:B:1242:LEU:HA | 1:B:1245:ILE:HD12 | 1.88 | 0.55 |
| 1:A:1040:ARG:HA | 1:A:1043:GLN:HB2 | 1.89 | 0.55 |
| 1:B:1052:VAL:CG2 | 1:B:1067:PRO:HB3 | 2.37 | 0.55 |
| 1:B:1285:GLU:OE2 | 1:B:1290:ARG:CD | 2.55 | 0.55 |
| 1:A:1194:LEU:HD11 | 1:A:1253:LEU:HD23 | 1.88 | 0.54 |
| 1:A:1339:ARG:HG2 | 1:A:1339:ARG:NH1 | 2.21 | 0.54 |
| 1:A:1441:ARG:HG3 | 1:A:1469:PHE:HE1 | 1.72 | 0.54 |
| 1:A:1057:TYR:CE1 | 1:B:1040:ARG:HB3 | 2.43 | 0.54 |
| 1:B:1052:VAL:HG22 | 1:B:1067:PRO:HA | 1.89 | 0.54 |
| 1:B:1102:ALA:HB1 | 1:B:1177:LEU:HD23 | 1.89 | 0.54 |
| 1:A:1235:GLU:O | 1:A:1238:ILE:N | 2.41 | 0.54 |
| 1:B:1089:PHE:HD1 | 1:B:1089:PHE:H | 1.55 | 0.54 |
| 1:B:1425:ILE:HB | 1:B:1442:ALA:HB3 | 1.90 | 0.54 |
| 1:A:1354:GLN:HB2 | 1:A:1395:ILE:HD11 | 1.90 | 0.54 |
| 1:A:1395:ILE:HG12 | 1:A:1396:SER:H | 1.72 | 0.54 |
| 1:B:1289:ILE:CD1 | 1:B:1292:ILE:CG2 | 2.86 | 0.53 |
| 1:B:1194:LEU:O | 1:B:1196:VAL:N | 2.41 | 0.53 |
| 1:A:1342:ILE:CG1 | 1:A:1364:LEU:HD12 | 2.38 | 0.53 |
| 1:B:1310:ILE:CG2 | 1:B:1311:LYS:N | 2.71 | 0.53 |
| 1:B:1354:GLN:N | 1:B:1395:ILE:HD11 | 2.24 | 0.53 |
| 1:B:1395:ILE:HG22 | 1:B:1400:VAL:HG23 | 1.91 | 0.52 |
| 1:B:1460:VAL:HG21 | 1:B:1470:LYS:HD2 | 1.91 | 0.52 |
| 1:A:1049:LYS:O | 1:A:1053:VAL:HG23 | 2.09 | 0.52 |
| 1:B:1406:GLY:CA | 1:B:1409:GLU:HG3 | 2.36 | 0.52 |
| 1:B:1088:GLN:HG3 | 1:B:1089:PHE:CD1 | 2.43 | 0.52 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:B:1391:ALA:HB3 | 1:B:1393:PHE:CZ | 2.44 | 0.52 |
| 1:A:1058:GLY:HA2 | 1:B:1040:ARG:HG2 | 1.90 | 0.52 |
| 1:B:1182:HIS:HE2 | 1:B:1231:GLY:N | 2.08 | 0.52 |
| 1:B:1279:ASN:HD21 | 1:B:1286:ASN:HD22 | 1.57 | 0.52 |
| 1:B:1439:PRO:HG2 | 1:B:1459:GLU:HB2 | 1.92 | 0.52 |
| 1:B:1180:VAL:HG12 | 1:B:1189:ILE:HD12 | 1.92 | 0.52 |
| 1:B:1225:CYS:SG | 1:B:1226:VAL:N | 2.83 | 0.52 |
| 1:A:1178:MET:HE2 | 1:A:1193:SER:HB2 | 1.90 | 0.52 |
| 1:B:1341:ILE:HG21 | 1:B:1390:ILE:HD11 | 1.92 | 0.52 |
| 1:B:1460:VAL:HG12 | 1:B:1461:LYS:N | 2.25 | 0.52 |
| 1:A:1055:VAL:HG12 | 1:A:1061:ASN:HB3 | 1.92 | 0.52 |
| 1:A:1158:VAL:HG11 | 1:A:1298:PHE:HD2 | 1.75 | 0.52 |
| 1:A:1458:THR:HG22 | 1:A:1459:GLU:N | 2.23 | 0.52 |
| 1:A:1395:ILE:CG1 | 1:A:1396:SER:H | 2.22 | 0.51 |
| 1:B:1086:LEU:HG | 1:B:1086:LEU:O | 2.08 | 0.51 |
| 1:B:1064:ARG:O | 1:B:1065:SER:OG | 2.25 | 0.51 |
| 1:B:1106:ILE:HD12 | 1:B:1131:TRP:CZ3 | 2.45 | 0.51 |
| 1:B:1156:VAL:HG13 | 1:B:1157:SEP:N | 2.25 | 0.51 |
| 1:B:1357:LEU:HD22 | 1:B:1427:ILE:HD11 | 1.92 | 0.51 |
| 1:A:1055:VAL:HG22 | 1:A:1056:ALA:N | 2.26 | 0.51 |
| 1:B:1289:ILE:CD1 | 1:B:1292:ILE:HG22 | 2.40 | 0.51 |
| 1:B:1293:GLU:OE2 | 1:B:1294:PRO:HD2 | 2.10 | 0.51 |
| 1:B:1285:GLU:OE2 | 1:B:1290:ARG:HD2 | 2.11 | 0.51 |
| 1:B:1338:THR:HG21 | 1:B:1368:ILE:HG12 | 1.92 | 0.51 |
| 1:B:1180:VAL:HB | 1:B:1185:ASP:CB | 2.41 | 0.50 |
| 1:B:1124:VAL:HG23 | 1:B:1125:THR:OG1 | 2.10 | 0.50 |
| 1:B:1334:LYS:O | 1:B:1380:SER:HA | 2.11 | 0.50 |
| 1:B:1440:LEU:CD2 | 1:B:1458:THR:HG22 | 2.42 | 0.50 |
| 1:B:1489:VAL:CG1 | 1:B:1490:LYS:N | 2.75 | 0.50 |
| 1:A:1045:GLU:CG | 1:A:1089:PHE:HE2 | 2.21 | 0.50 |
| 1:B:1132:LYS:HA | 1:B:1173:ARG:O | 2.11 | 0.50 |
| 1:B:1220:ASN:O | 1:B:1258:ILE:HA | 2.11 | 0.50 |
| 1:B:1236:GLU:O | 1:B:1240:VAL:HG12 | 2.12 | 0.50 |
| 1:B:1353:ILE:HD12 | 1:B:1353:ILE:H | 1.75 | 0.50 |
| 1:A:1113:TYR:CZ | 1:A:1158:VAL:HG23 | 2.46 | 0.50 |
| 1:A:1353:ILE:HD13 | 1:A:1395:ILE:N | 2.26 | 0.50 |
| 1:B:1369:LEU:HD22 | 1:B:1418:LEU:HD12 | 1.94 | 0.50 |
| 1:B:1429:ILE:HB | 1:B:1438:VAL:HG13 | 1.94 | 0.50 |
| 1:A:1240:VAL:O | 1:A:1244:GLU:HG3 | 2.12 | 0.49 |
| 1:B:1194:LEU:HD11 | 1:B:1253:LEU:HD23 | 1.94 | 0.49 |
| 1:A:1092:HIS:ND1 | 1:A:1093:GLN:N | 2.61 | 0.49 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:B:1128:ILE:CG2 | 1:B:1176:ILE:HG23 | 2.41 | 0.49 |
| 1:B:1071:ILE:HD12 | 1:B:1071:ILE:N | 2.27 | 0.49 |
| 1:B:1265:PHE:N | 1:B:1265:PHE:CD1 | 2.78 | 0.49 |
| 1:A:1441:ARG:HG3 | 1:A:1469:PHE:CE1 | 2.48 | 0.49 |
| 1:B:1183:LEU:HD12 | 1:B:1186:VAL:HG21 | 1.93 | 0.49 |
| 1:B:1391:ALA:HB3 | 1:B:1393:PHE:CE2 | 2.47 | 0.49 |
| 1:A:1220:ASN:N | 1:A:1257:SER:O | 2.41 | 0.49 |
| 1:B:1481:ARG:HG3 | 1:B:1481:ARG:HH11 | 1.77 | 0.49 |
| 1:B:1301:GLU:CD | 1:B:1441:ARG:HH22 | 2.16 | 0.49 |
| 1:A:1329:THR:HG21 | 1:A:1494:GLN:OE1 | 2.13 | 0.48 |
| 1:B:1074:ASP:O | 1:B:1078:SER:HB2 | 2.13 | 0.48 |
| 1:A:1246:LEU:HD13 | 1:A:1283:TYR:HB3 | 1.95 | 0.48 |
| 1:B:1126:VAL:HG21 | 1:B:1189:ILE:HD13 | 1.94 | 0.48 |
| 1:B:1194:LEU:CD2 | 1:B:1258:ILE:HD11 | 2.43 | 0.48 |
| 1:B:1260:ARG:HB3 | 1:B:1279:ASN:HB3 | 1.95 | 0.48 |
| 1:B:1468:VAL:HG12 | 1:B:1469:PHE:N | 2.27 | 0.48 |
| 1:B:1089:PHE:O | 1:B:1092:HIS:HB3 | 2.14 | 0.48 |
| 1:B:1489:VAL:HG12 | 1:B:1490:LYS:N | 2.28 | 0.48 |
| 1:A:1278:PHE:CD2 | 1:A:1285:GLU:HA | 2.48 | 0.48 |
| 1:A:1283:TYR:CD1 | 1:A:1283:TYR:N | 2.82 | 0.48 |
| 1:B:1174:GLU:H | 1:B:1220:ASN:HD21 | 1.62 | 0.48 |
| 1:B:1260:ARG:HG3 | 1:B:1260:ARG:HH11 | 1.78 | 0.48 |
| 1:B:1393:PHE:O | 1:B:1430:LYS:N | 2.41 | 0.48 |
| 1:A:1364:LEU:HD13 | 1:A:1387:ILE:HG12 | 1.94 | 0.47 |
| 1:B:1242:LEU:HD21 | 1:B:1263:PHE:CE1 | 2.49 | 0.47 |
| 1:B:1258:ILE:O | 1:B:1258:ILE:HG22 | 2.14 | 0.47 |
| 1:B:1102:ALA:O | 1:B:1106:ILE:HG12 | 2.13 | 0.47 |
| 1:B:1272:TYR:CD1 | 1:B:1273:PRO:HD2 | 2.49 | 0.47 |
| 1:B:1395:ILE:CG2 | 1:B:1396:SER:N | 2.78 | 0.47 |
| 1:B:1441:ARG:HG2 | 1:B:1469:PHE:HE1 | 1.79 | 0.47 |
| 1:B:1089:PHE:N | 1:B:1089:PHE:HD1 | 2.11 | 0.47 |
| 1:B:1239:LEU:HD21 | 1:B:1276:TYR:CD1 | 2.50 | 0.47 |
| 1:B:1264:MET:O | 1:B:1264:MET:HG2 | 2.14 | 0.47 |
| 1:B:1401:GLU:HB2 | 1:B:1456:MET:SD | 2.55 | 0.47 |
| 1:A:1069:LEU:O | 1:A:1073:LYS:HG2 | 2.15 | 0.47 |
| 1:A:1087:LEU:HD11 | 1:A:1264:MET:HE2 | 1.96 | 0.47 |
| 1:A:1408:LEU:HD22 | 1:A:1415:LEU:CD1 | 2.45 | 0.47 |
| 1:B:1085:VAL:HG12 | 1:B:1085:VAL:O | 2.14 | 0.47 |
| 1:A:1395:ILE:HD11 | 1:A:1399:ASP:HB3 | 1.97 | 0.47 |
| 1:B:1081:VAL:HG12 | 1:B:1344:THR:O | 2.14 | 0.47 |
| 1:A:1090:LEU:HB3 | 1:A:1179:ALA:HB2 | 1.97 | 0.46 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:A:1222:ALA:O | 1:A:1261:ILE:HA | 2.14 | 0.46 |
| 1:A:1468:VAL:HG12 | 1:A:1469:PHE:O | 2.16 | 0.46 |
| 1:A:1041:THR:HG23 | 1:A:1088:GLN:NE2 | 2.31 | 0.46 |
| 1:A:1448:SER:C | 1:A:1450:TYR:H | 2.18 | 0.46 |
| 1:A:1460:VAL:HG21 | 1:A:1470:LYS:HD3 | 1.97 | 0.46 |
| 1:B:1343:ARG:HG2 | 1:B:1343:ARG:NH1 | 2.28 | 0.46 |
| 1:A:1138:ALA:CB | 1:A:1461:LYS:HE2 | 2.46 | 0.46 |
| 1:B:1180:VAL:HB | 1:B:1185:ASP:HB3 | 1.98 | 0.46 |
| 1:B:1468:VAL:CG1 | 1:B:1469:PHE:N | 2.79 | 0.46 |
| 1:A:1456:MET:HE3 | 1:A:1456:MET:HB2 | 1.69 | 0.46 |
| 1:B:1264:MET:C | 1:B:1265:PHE:HD1 | 2.19 | 0.46 |
| 1:B:1310:ILE:HG22 | 1:B:1311:LYS:N | 2.31 | 0.46 |
| 1:A:1279:ASN:O | 1:A:1283:TYR:HA | 2.17 | 0.46 |
| 1:B:1124:VAL:HG22 | 1:B:1192:GLN:OE1 | 2.15 | 0.46 |
| 1:B:1081:VAL:HG12 | 1:B:1344:THR:C | 2.36 | 0.45 |
| 1:B:1249:ASN:OD1 | 1:B:1252:GLU:HB2 | 2.16 | 0.45 |
| 1:B:1279:ASN:OD1 | 1:B:1279:ASN:N | 2.49 | 0.45 |
| 1:B:1308:PHE:HA | 1:B:1327:SER:HA | 1.98 | 0.45 |
| 1:B:1431:ASP:HA | 1:B:1432:PRO:HD2 | 1.78 | 0.45 |
| 1:A:1454:THR:O | 1:A:1454:THR:OG1 | 2.33 | 0.45 |
| 1:B:1260:ARG:HA | 1:B:1278:PHE:O | 2.17 | 0.45 |
| 1:A:1382:LEU:HD23 | 1:A:1382:LEU:HA | 1.64 | 0.45 |
| 1:B:1239:LEU:HD21 | 1:B:1276:TYR:CE1 | 2.51 | 0.45 |
| 1:B:1333:ASP:OD1 | 1:B:1490:LYS:HE2 | 2.16 | 0.45 |
| 1:A:1380:SER:HB2 | 1:A:1383:ASN:HD21 | 1.81 | 0.45 |
| 1:A:1264:MET:HE2 | 1:A:1264:MET:HB2 | 1.65 | 0.45 |
| 1:A:1342:ILE:HG13 | 1:A:1364:LEU:HD12 | 1.98 | 0.45 |
| 1:B:1183:LEU:O | 1:B:1186:VAL:HG23 | 2.15 | 0.45 |
| 1:B:1395:ILE:O | 1:B:1429:ILE:HG23 | 2.16 | 0.45 |
| 1:A:1308:PHE:HB3 | 1:A:1325:ALA:HB1 | 1.97 | 0.45 |
| 1:A:1329:THR:CG2 | 1:A:1494:GLN:CG | 2.92 | 0.45 |
| 1:B:1180:VAL:HG23 | 1:B:1181:ASP:N | 2.30 | 0.45 |
| 1:B:1348:ARG:HG3 | 1:B:1348:ARG:HH11 | 1.82 | 0.45 |
| 1:A:1108:ARG:O | 1:A:1111:ARG:NH1 | 2.49 | 0.45 |
| 1:A:1264:MET:HE3 | 1:A:1275:TYR:CE2 | 2.52 | 0.45 |
| 1:B:1040:ARG:CZ | 1:B:1084:ASP:OD2 | 2.64 | 0.45 |
| 1:B:1180:VAL:HG12 | 1:B:1189:ILE:CD1 | 2.47 | 0.45 |
| 1:B:1351:ILE:CG2 | 1:B:1352:SER:N | 2.79 | 0.45 |
| 1:A:1084:ASP:OD1 | 1:A:1085:VAL:N | 2.50 | 0.44 |
| 1:A:1451:VAL:HG13 | 1:A:1452:ILE:N | 2.32 | 0.44 |
| 1:B:1092:HIS:NE2 | 1:B:1094:ASP:HB3 | 2.31 | 0.44 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:B:1109:ALA:O | 1:B:1295:ALA:HB3 | 2.17 | 0.44 |
| 1:A:1339:ARG:HH11 | 1:A:1339:ARG:CG | 2.29 | 0.44 |
| 1:B:1124:VAL:HG13 | 1:B:1192:GLN:HG3 | 1.98 | 0.44 |
| 1:B:1289:ILE:HD12 | 1:B:1292:ILE:HG22 | 1.99 | 0.44 |
| 1:A:1041:THR:OG1 | 1:A:1085:VAL:HG22 | 2.17 | 0.44 |
| 1:A:1183:LEU:HD23 | 1:A:1232:PHE:CZ | 2.52 | 0.44 |
| 1:B:1084:ASP:N | 1:B:1084:ASP:OD1 | 2.48 | 0.44 |
| 1:A:1176:ILE:HG21 | 1:A:1178:MET:HE2 | 1.99 | 0.44 |
| 1:B:1107:ARG:NH2 | 1:B:1118:ILE:HD12 | 2.31 | 0.44 |
| 1:A:1315:THR:CG2 | 1:A:1371:ASN:HD22 | 2.30 | 0.44 |
| 1:A:1418:LEU:O | 1:A:1419:ARG:HB2 | 2.18 | 0.44 |
| 1:A:1438:VAL:HA | 1:A:1439:PRO:HD2 | 1.55 | 0.44 |
| 1:A:1224:VAL:O | 1:A:1263:PHE:HA | 2.16 | 0.44 |
| 1:B:1424:GLU:HA | 1:B:1442:ALA:O | 2.18 | 0.44 |
| 1:B:1442:ALA:C | 1:B:1443:LEU:HD12 | 2.38 | 0.44 |
| 1:A:1395:ILE:HG12 | 1:A:1399:ASP:HB2 | 1.98 | 0.44 |
| 1:B:1221:VAL:CG1 | 1:B:1260:ARG:CG | 2.72 | 0.44 |
| 1:A:1395:ILE:CG1 | 1:A:1399:ASP:HB2 | 2.48 | 0.44 |
| 1:B:1408:LEU:HD12 | 1:B:1444:ILE:HG22 | 1.99 | 0.44 |
| 1:A:1076:ILE:HG12 | 1:A:1107:ARG:HB3 | 2.00 | 0.43 |
| 1:A:1106:ILE:CD1 | 1:A:1131:TRP:CE3 | 3.01 | 0.43 |
| 1:B:1348:ARG:HD2 | 1:B:1351:ILE:HD12 | 2.00 | 0.43 |
| 1:A:1054:LYS:NZ | 1:A:1066:GLU:O | 2.49 | 0.43 |
| 1:A:1195:GLU:C | 1:A:1197:ILE:H | 2.22 | 0.43 |
| 1:B:1180:VAL:CG1 | 1:B:1189:ILE:HD12 | 2.48 | 0.43 |
| 1:A:1395:ILE:HG12 | 1:A:1396:SER:N | 2.34 | 0.43 |
| 1:B:1128:ILE:HD11 | 1:B:1193:SER:HB3 | 2.01 | 0.43 |
| 1:B:1356:TYR:CE2 | 1:B:1360:GLU:HG3 | 2.53 | 0.43 |
| 1:A:1190:LEU:O | 1:A:1193:SER:OG | 2.36 | 0.43 |
| 1:B:1249:ASN:O | 1:B:1251:GLN:N | 2.51 | 0.43 |
| 1:A:1364:LEU:CD2 | 1:A:1368:ILE:HG13 | 2.49 | 0.43 |
| 1:A:1246:LEU:HD13 | 1:A:1283:TYR:CB | 2.48 | 0.43 |
| 1:A:1094:ASP:OD1 | 1:A:1096:VAL:HG23 | 2.18 | 0.43 |
| 1:A:1450:TYR:N | 1:A:1450:TYR:CD1 | 2.86 | 0.43 |
| 1:A:1088:GLN:HG3 | 1:A:1089:PHE:CE1 | 2.54 | 0.43 |
| 1:A:1168:GLN:HG3 | 1:A:1168:GLN:O | 2.19 | 0.43 |
| 1:A:1333:ASP:CG | 1:A:1490:LYS:HD2 | 2.40 | 0.43 |
| 1:B:1285:GLU:OE2 | 1:B:1290:ARG:HD3 | 2.18 | 0.43 |
| 1:B:1342:ILE:HD13 | 1:B:1360:GLU:HB3 | 2.00 | 0.43 |
| 1:B:1439:PRO:CG | 1:B:1459:GLU:HB2 | 2.49 | 0.43 |
| 1:A:1046:HIS:NE2 | 1:B:1050:SER:CB | 2.82 | 0.42 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:B:1381:ASP:OD1 | 1:B:1419:ARG:NH2 | 2.42 | 0.42 |
| 1:A:1386:PHE:HD1 | 1:A:1424:GLU:O | 2.02 | 0.42 |
| 1:B:1481:ARG:HG3 | 1:B:1481:ARG:NH1 | 2.35 | 0.42 |
| 1:A:1218:LEU:O | 1:A:1259:ARG:HD2 | 2.20 | 0.42 |
| 1:B:1460:VAL:O | 1:B:1467:TRP:HA | 2.19 | 0.42 |
| 1:B:1260:ARG:NH1 | 1:B:1260:ARG:HG3 | 2.34 | 0.42 |
| 1:A:1057:TYR:HE1 | 1:B:1040:ARG:HB3 | 1.83 | 0.42 |
| 1:B:1261:ILE:HD11 | 1:B:1263:PHE:CZ | 2.54 | 0.42 |
| 1:A:1055:VAL:CG2 | 1:A:1056:ALA:N | 2.82 | 0.42 |
| 1:A:1105:TYR:CE1 | 1:A:1264:MET:HE1 | 2.55 | 0.42 |
| 1:A:1126:VAL:HG22 | 1:A:1127:PRO:CD | 2.47 | 0.42 |
| 1:A:1176:ILE:HG21 | 1:A:1178:MET:CE | 2.50 | 0.42 |
| 1:A:1448:SER:C | 1:A:1450:TYR:N | 2.73 | 0.42 |
| 1:B:1404:PHE:O | 1:B:1407:PHE:HB2 | 2.20 | 0.42 |
| 1:A:1092:HIS:CD2 | 1:A:1097:VAL:HG21 | 2.54 | 0.42 |
| 1:A:1287:GLU:HB3 | 1:A:1312:PRO:HG3 | 2.02 | 0.42 |
| 1:B:1243:ARG:NH1 | 1:B:1243:ARG:HG2 | 2.35 | 0.41 |
| 1:A:1096:VAL:O | 1:A:1096:VAL:HG12 | 2.20 | 0.41 |
| 1:A:1299:GLN:NE2 | 1:A:1390:ILE:HD13 | 2.35 | 0.41 |
| 1:B:1083:PHE:N | 1:B:1083:PHE:CD1 | 2.86 | 0.41 |
| 1:B:1494:GLN:HA | 1:B:1495:PRO:HD2 | 1.76 | 0.41 |
| 1:B:1132:LYS:HG2 | 1:B:1174:GLU:HG2 | 2.01 | 0.41 |
| 1:A:1078:SER:O | 1:A:1108:ARG:NH2 | 2.53 | 0.41 |
| 1:A:1390:ILE:O | 1:A:1390:ILE:HG22 | 2.19 | 0.41 |
| 1:A:1451:VAL:CG1 | 1:A:1452:ILE:N | 2.84 | 0.41 |
| 1:A:1455:GLU:OE1 | 1:A:1457:TYR:OH | 2.32 | 0.41 |
| 1:B:1079:ASN:ND2 | 1:B:1392:VAL:HB | 2.35 | 0.41 |
| 1:A:1041:THR:HG23 | 1:A:1088:GLN:HE22 | 1.85 | 0.41 |
| 1:A:1094:ASP:HA | 1:A:1095:PRO:HD3 | 1.91 | 0.41 |
| 1:B:1038:LYS:HE2 | 1:B:1038:LYS:HB3 | 1.91 | 0.41 |
| 1:B:1336:PHE:CE1 | 1:B:1377:THR:HA | 2.55 | 0.41 |
| 1:A:1343:ARG:HG3 | 1:A:1343:ARG:NH1 | 2.33 | 0.41 |
| 1:B:1317:ASN:HB3 | 1:B:1320:ILE:HD12 | 2.02 | 0.41 |
| 1:B:1336:PHE:N | 1:B:1383:ASN:OD1 | 2.49 | 0.41 |
| 1:A:1125:THR:HB | 1:A:1126:VAL:H | 1.58 | 0.41 |
| 1:B:1120:VAL:HG22 | 1:B:1129:VAL:HG13 | 2.03 | 0.41 |
| 1:B:1243:ARG:O | 1:B:1247:ASP:N | 2.44 | 0.41 |
| 1:B:1332:LEU:HD23 | 1:B:1332:LEU:HA | 1.77 | 0.41 |
| 1:B:1472:LEU:HD22 | 1:B:1472:LEU:HA | 1.82 | 0.41 |
| 1:B:1250:LYS:HA | 1:B:1253:LEU:HD12 | 2.02 | 0.41 |
| 1:B:1349:ASP:OD1 | 1:B:1349:ASP:N | 2.52 | 0.41 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:B:1356:TYR:CZ | 1:B:1360:GLU:CG | 3.03 | 0.41 |
| 1:B:1395:ILE:HG22 | 1:B:1396:SER:N | 2.35 | 0.41 |
| 1:A:1139:ALA:HB3 | 1:A:1140:PHE:CD1 | 2.56 | 0.41 |
| 1:B:1087:LEU:HD12 | 1:B:1266:GLY:HA2 | 2.01 | 0.40 |
| 1:A:1443:LEU:HD12 | 1:A:1443:LEU:N | 2.36 | 0.40 |
| 1:B:1302:LEU:HD21 | 1:B:1323:TYR:CE2 | 2.56 | 0.40 |
| 1:A:1395:ILE:CG1 | 1:A:1396:SER:N | 2.83 | 0.40 |
| 1:B:1105:TYR:CZ | 1:B:1264:MET:HE1 | 2.56 | 0.40 |
| 1:B:1289:ILE:HD11 | 1:B:1297:ALA:HB2 | 2.03 | 0.40 |
| 1:B:1348:ARG:HG3 | 1:B:1348:ARG:NH1 | 2.36 | 0.40 |
| 1:B:1485:THR:HA | 1:B:1486:PRO:HD3 | 1.85 | 0.40 |
| 1:B:1036:SER:HB3 | 1:B:1040:ARG:HG3 | 2.04 | 0.40 |
| 1:A:1233:GLU:OE1 | 1:A:1233:GLU:HA | 2.22 | 0.40 |
| 1:A:1242:LEU:O | 1:A:1246:LEU:HG | 2.22 | 0.40 |
| 1:A:1353:ILE:HG21 | 1:A:1393:PHE:HB3 | 2.03 | 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 | 417/474 (88%) | 371 (89%) | 40 (10%) | 6 (1%) | 11 | 36 |
| 1 | B | 381/474 (80%) | 350 (92%) | 29 (8%) | 2 (0%) | 29 | 61 |
| All | All | 798/948 (84%) | 721 (90%) | 69 (9%) | 8 (1%) | 15 | 45 |

All (8) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | A | 1449 | GLY |
| 1 | B | 1195 | GLU |
| 1 | B | 1475 | PRO |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | A | 1378 | SER |
| 1 | A | 1331 | PRO |
| 1 | A | 1196 | VAL |
| 1 | A | 1475 | PRO |
| 1 | A | 1395 | ILE |

### 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 | 380/421 (90%) | 340 (90%) | 40 (10%) | 7 21 |
| 1 | B | 359/421 (85%) | 321 (89%) | 38 (11%) | 6 20 |
| All | All | 739/842 (88%) | 661 (89%) | 78 (11%) | 6 20 |

All (78) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | A | 1036 | SER |
| 1 | A | 1042 | GLU |
| 1 | A | 1061 | ASN |
| 1 | A | 1076 | ILE |
| 1 | A | 1098 | THR |
| 1 | A | 1122 | GLU |
| 1 | A | 1124 | VAL |
| 1 | A | 1125 | THR |
| 1 | A | 1137 | SER |
| 1 | A | 1141 | SER |
| 1 | A | 1142 | THR |
| 1 | A | 1156 | VAL |
| 1 | A | 1163 | TYR |
| 1 | A | 1172 | LEU |
| 1 | A | 1180 | VAL |
| 1 | A | 1193 | SER |
| 1 | A | 1229 | THR |
| 1 | A | 1237 | GLU |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | A | 1238 | ILE |
| 1 | A | 1239 | LEU |
| 1 | A | 1241 | ARG |
| 1 | A | 1243 | ARG |
| 1 | A | 1257 | SER |
| 1 | A | 1264 | MET |
| 1 | A | 1292 | ILE |
| 1 | A | 1310 | ILE |
| 1 | A | 1335 | ARG |
| 1 | A | 1339 | ARG |
| 1 | A | 1344 | THR |
| 1 | A | 1350 | ASP |
| 1 | A | 1360 | GLU |
| 1 | A | 1364 | LEU |
| 1 | A | 1365 | MET |
| 1 | A | 1380 | SER |
| 1 | A | 1448 | SER |
| 1 | A | 1453 | LYS |
| 1 | A | 1456 | MET |
| 1 | A | 1464 | LYS |
| 1 | A | 1478 | MET |
| 1 | A | 1480 | LEU |
| 1 | B | 1081 | VAL |
| 1 | B | 1089 | PHE |
| 1 | B | 1092 | HIS |
| 1 | B | 1103 | GLN |
| 1 | B | 1111 | ARG |
| 1 | B | 1115 | ILE |
| 1 | B | 1119 | ARG |
| 1 | B | 1125 | THR |
| 1 | B | 1130 | GLU |
| 1 | B | 1134 | GLN |
| 1 | B | 1190 | LEU |
| 1 | B | 1193 | SER |
| 1 | B | 1221 | VAL |
| 1 | B | 1236 | GLU |
| 1 | B | 1237 | GLU |
| 1 | B | 1242 | LEU |
| 1 | B | 1243 | ARG |
| 1 | B | 1251 | GLN |
| 1 | B | 1279 | ASN |
| 1 | B | 1290 | ARG |

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| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | B | 1306 | SER |
| 1 | B | 1327 | SER |
| 1 | B | 1329 | THR |
| 1 | B | 1330 | SER |
| 1 | B | 1343 | ARG |
| 1 | B | 1353 | ILE |
| 1 | B | 1367 | ASP |
| 1 | B | 1370 | ASP |
| 1 | B | 1380 | SER |
| 1 | B | 1399 | ASP |
| 1 | B | 1409 | GLU |
| 1 | B | 1410 | ARG |
| 1 | B | 1427 | ILE |
| 1 | B | 1453 | LYS |
| 1 | B | 1454 | THR |
| 1 | B | 1456 | MET |
| 1 | B | 1467 | TRP |
| 1 | B | 1472 | LEU |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

| Mol | Chain | Res | Type |
|---|---|---|---|
| 1 | A | 1061 | ASN |
| 1 | A | 1088 | GLN |
| 1 | A | 1121 | HIS |
| 1 | A | 1192 | GLN |
| 1 | A | 1371 | ASN |
| 1 | B | 1134 | GLN |
| 1 | B | 1220 | ASN |
| 1 | B | 1286 | 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)

2 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 | SEP | A | 1157 | 1 | 8,9,10 | 1.29 | 1 (12%) | 8,12,14 | 1.06 | 0 |
| 1 | SEP | B | 1157 | 1 | 8,9,10 | 1.49 | 2 (25%) | 8,12,14 | 1.06 | 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 |
|---|---|---|---|---|---|---|---|
| 1 | SEP | A | 1157 | 1 | - | 2/5/8/10 | - |
| 1 | SEP | B | 1157 | 1 | - | 1/5/8/10 | - |

All (3) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|---|---|---|---|---|---|---|---|
| 1 | A | 1157 | SEP | P-O1P | 3.04 | 1.60 | 1.50 |
| 1 | B | 1157 | SEP | P-O1P | 2.74 | 1.59 | 1.50 |
| 1 | B | 1157 | SEP | P-O3P | 2.15 | 1.63 | 1.54 |

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms |
|---|---|---|---|---|
| 1 | A | 1157 | SEP | N-CA-CB-OG |
| 1 | A | 1157 | SEP | CB-OG-P-O2P |
| 1 | B | 1157 | SEP | N-CA-CB-OG |

There are no ring outliers.

1 monomer is involved in 1 short contact:

| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|---|---|---|---|---|---|
| 1 | B | 1157 | SEP | 1 | 0 |

## 5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

## 5.6 Ligand geometry (i)

Of 2 ligands modelled in this entry, 2 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

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, $95^{th}$ 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 | 425/474 (89%) | 0.16 | 9 (2%) | 63 | 61 | 39, 77, 116, 143 | 0 |
| 1 | B | 397/474 (83%) | 0.25 | 10 (2%) | 57 | 55 | 59, 95, 126, 148 | 0 |
| All | All | 822/948 (86%) | 0.21 | 19 (2%) | 60 | 58 | 39, 86, 122, 148 | 0 |

All (19) RSRZ outliers are listed below:

| Mol | Chain | Res | Type | RSRZ |
|---|---|---|---|---|
| 1 | A | 1054 | LYS | 5.0 |
| 1 | A | 1055 | VAL | 3.3 |
| 1 | A | 1072 | LEU | 3.2 |
| 1 | B | 1053 | VAL | 3.2 |
| 1 | B | 1054 | LYS | 3.0 |
| 1 | A | 1071 | ILE | 2.9 |
| 1 | B | 1161 | LEU | 2.9 |
| 1 | B | 1451 | VAL | 2.8 |
| 1 | A | 1066 | GLU | 2.8 |
| 1 | B | 1048 | LEU | 2.8 |
| 1 | B | 1055 | VAL | 2.6 |
| 1 | A | 1062 | PRO | 2.5 |
| 1 | B | 1196 | VAL | 2.3 |
| 1 | B | 1071 | ILE | 2.2 |
| 1 | B | 1479 | HIS | 2.1 |
| 1 | A | 1064 | ARG | 2.1 |
| 1 | B | 1452 | ILE | 2.1 |
| 1 | A | 1056 | ALA | 2.0 |
| 1 | A | 1063 | LYS | 2.0 |

## 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 | SEP | B | 1157 | 10/11 | 0.93 | 0.18 | 83,100,104,105 | 0 |
| 1 | SEP | A | 1157 | 10/11 | 0.97 | 0.21 | 55,65,71,75 | 0 |

## 6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

## 6.4 Ligands (i)

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

| Mol | Type | Chain | Res | Atoms | RSCC | RSR | B-factors(Å$^2$) | Q<0.9 |
|---|---|---|---|---|---|---|---|---|
| 2 | CL | A | 1601 | 1/1 | 0.94 | 0.09 | 71,71,71,71 | 0 |
| 2 | CL | B | 1601 | 1/1 | 0.98 | 0.12 | 76,76,76,76 | 0 |

## 6.5 Other polymers (i)

There are no such residues in this entry.