



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 12, 2024 – 12:37 AM EDT

PDB ID : 1M3I
Title : Perfringolysin O, new crystal form
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Deposited on : 2002-06-28
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>.

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

MolProbity : 4.02b-467
Xtrriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36.2

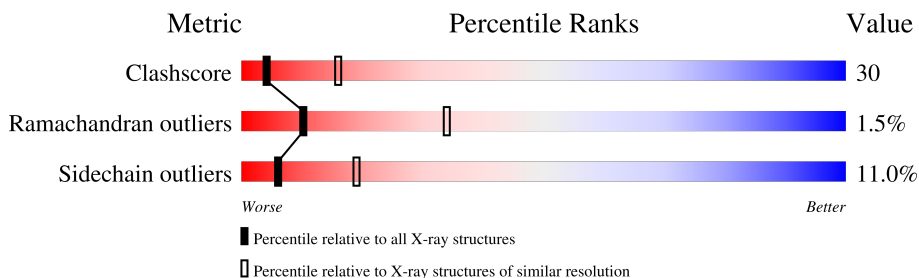
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.90 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)) |
|-----------------------|-----------------------------|---|
| Clashscore | 141614 | 2172 (2.90-2.90) |
| Ramachandran outliers | 138981 | 2115 (2.90-2.90) |
| Sidechain outliers | 138945 | 2117 (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 $\leq 5\%$

Note EDS was not executed.

| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 1 | A | 471 | |
| 1 | B | 471 | |
| 1 | C | 471 | |
| 1 | D | 471 | |

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 14920 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 perfringolysin O.

| Mol | Chain | Residues | Atoms | | | | | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|---------|-------|
| | | | Total | C | N | O | S | | | |
| 1 | A | 465 | 3657 | 2304 | 614 | 734 | 5 | 0 | 0 | 0 |
| 1 | B | 465 | 3657 | 2304 | 614 | 734 | 5 | 0 | 0 | 0 |
| 1 | C | 465 | 3657 | 2304 | 614 | 734 | 5 | 0 | 0 | 0 |
| 1 | D | 465 | 3657 | 2304 | 614 | 734 | 5 | 0 | 0 | 0 |

There are 4 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment | Reference |
|-------|---------|----------|--------|----------------|------------|
| A | 114 | LEU | PHE | see remark 999 | UNP P19995 |
| B | 114 | LEU | PHE | see remark 999 | UNP P19995 |
| C | 114 | LEU | PHE | see remark 999 | UNP P19995 |
| D | 114 | LEU | PHE | see remark 999 | UNP P19995 |

- Molecule 2 is water.

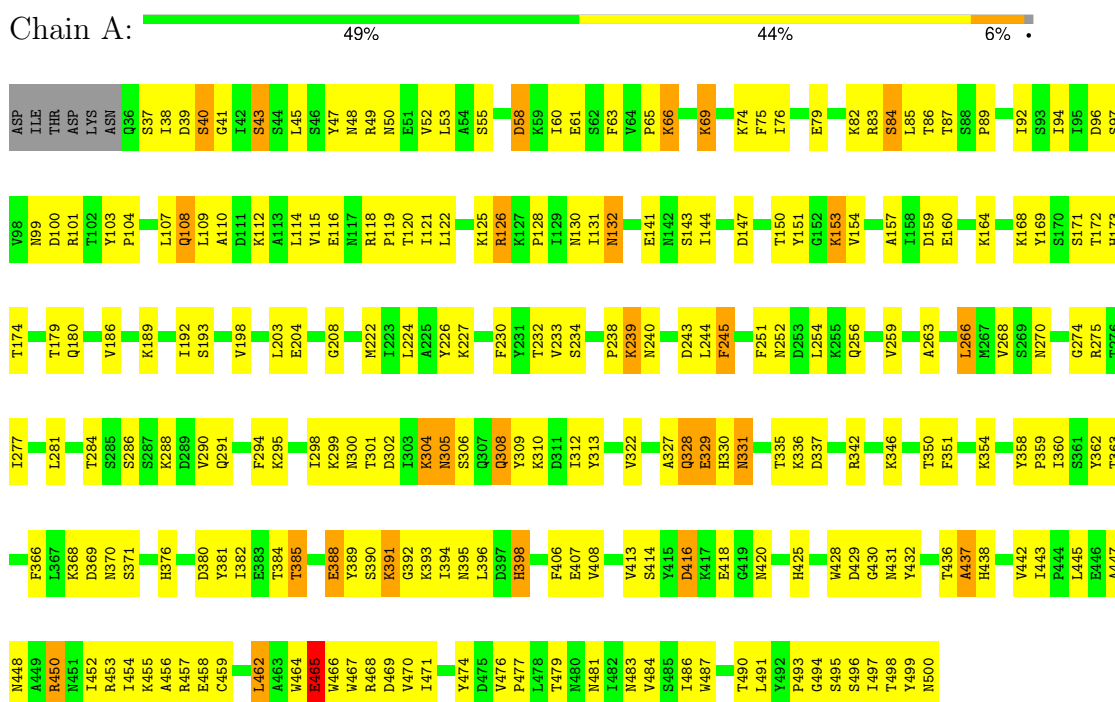
| Mol | Chain | Residues | Atoms | | ZeroOcc | AltConf |
|-----|-------|----------|-------|----|---------|---------|
| 2 | A | 70 | Total | O | 0 | 0 |
| | | | 70 | 70 | | |
| 2 | B | 88 | Total | O | 0 | 0 |
| | | | 88 | 88 | | |
| 2 | C | 58 | Total | O | 0 | 0 |
| | | | 58 | 58 | | |
| 2 | D | 76 | Total | O | 0 | 0 |
| | | | 76 | 76 | | |

3 Residue-property plots

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. 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. 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.

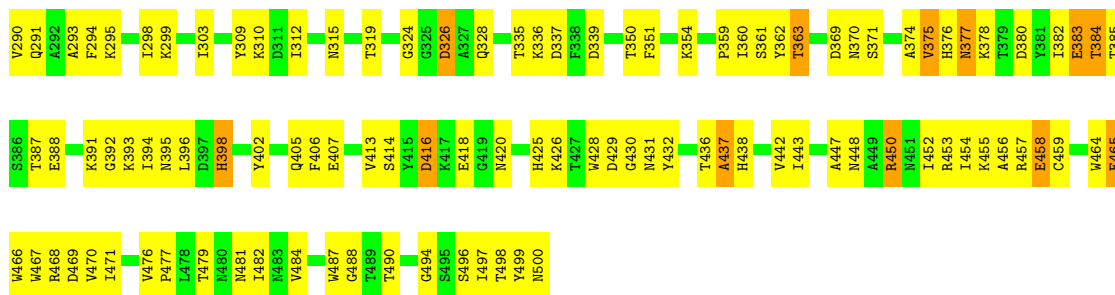
Note EDS was not executed.

- Molecule 1: perfringolysin O



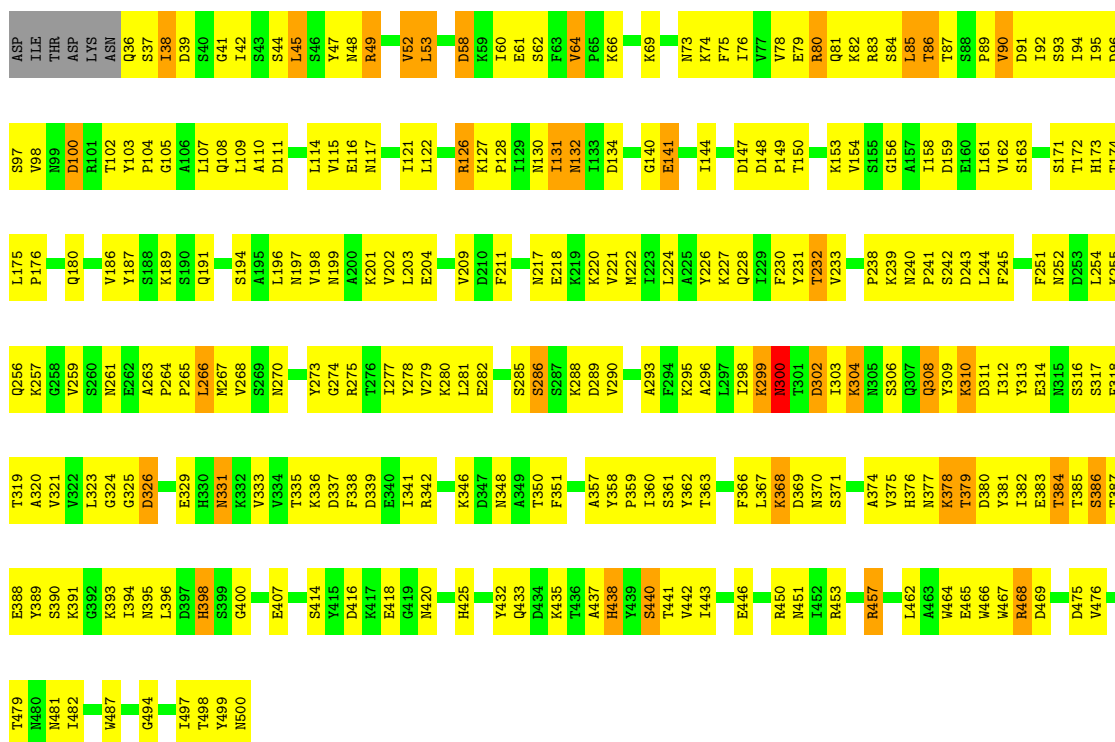
- Molecule 1: perfringolysin O





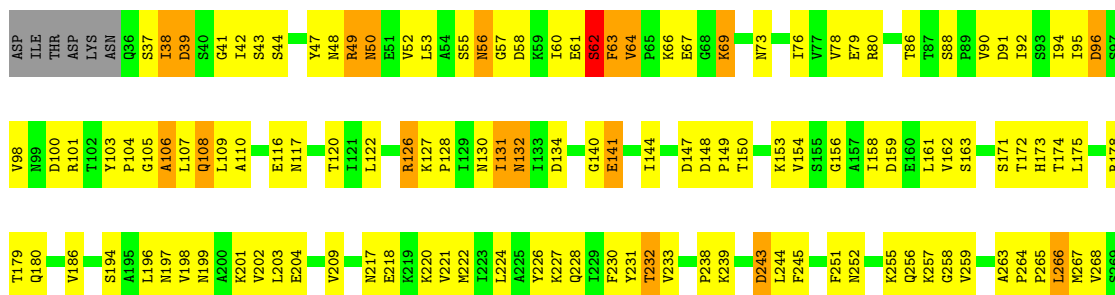
- Molecule 1: perfringolysin O

Chain C: 41% 49% 8%



- Molecule 1: perfringolysin O

Chain D: 45% 47% 6%



| | | | | | |
|------|------|------|------|------|------|
| N270 | F338 | E418 | N270 | F338 | E418 |
| Y273 | D339 | G419 | Y273 | D339 | G419 |
| G274 | E340 | N420 | G274 | E340 | N420 |
| R275 | I341 | E421 | R275 | I341 | E421 |
| T276 | R342 | H425 | T276 | R342 | H425 |
| L277 | K346 | D429 | L277 | K346 | D429 |
| Y278 | D347 | Q433 | Y278 | D347 | Q433 |
| V279 | N348 | D434 | V279 | N348 | D434 |
| E282 | F351 | K435 | E282 | F351 | K435 |
| T283 | S352 | T436 | T283 | S352 | T436 |
| S286 | T353 | A437 | S286 | T353 | A437 |
| S287 | A357 | H438 | S287 | A357 | H438 |
| K288 | Y358 | Y439 | K288 | Y358 | Y439 |
| D289 | P359 | S440 | D289 | P359 | S440 |
| K295 | I360 | T441 | K295 | I360 | T441 |
| A286 | S361 | V442 | A286 | S361 | V442 |
| L297 | Y362 | I443 | L297 | Y362 | I443 |
| I298 | T363 | P444 | I298 | T363 | P444 |
| K299 | F366 | L445 | K299 | F366 | L445 |
| N300 | L367 | E446 | N300 | L367 | E446 |
| T301 | K368 | A449 | T301 | K368 | A449 |
| D302 | D369 | R450 | D302 | D369 | R450 |
| I303 | N370 | M451 | I303 | N370 | M451 |
| K304 | S371 | I452 | K304 | S371 | I452 |
| N305 | V372 | R453 | N305 | V372 | R453 |
| S306 | A373 | R457 | S306 | A373 | R457 |
| Q307 | A374 | W464 | Q307 | A374 | W464 |
| Q308 | Y375 | E465 | Q308 | Y375 | E465 |
| Y309 | H376 | W466 | Y309 | H376 | W466 |
| K310 | N377 | W467 | K310 | N377 | W467 |
| D311 | K378 | R468 | D311 | K378 | R468 |
| I312 | E383 | D469 | I312 | E383 | D469 |
| Y313 | T384 | V470 | Y313 | T384 | V470 |
| E314 | I385 | Y474 | E314 | I385 | Y474 |
| N315 | S386 | D475 | N315 | S386 | D475 |
| S316 | K391 | D476 | S316 | K391 | D476 |
| S317 | G392 | V477 | S317 | G392 | V477 |
| F318 | K393 | L478 | F318 | K393 | L478 |
| T319 | I394 | T479 | T319 | I394 | T479 |
| A320 | N395 | N480 | A320 | N395 | N480 |
| V321 | L396 | N481 | V321 | L396 | N481 |
| V322 | D397 | I482 | V322 | D397 | I482 |
| L323 | H398 | W487 | L323 | H398 | W487 |
| D326 | S399 | G494 | D326 | S399 | G494 |
| A327 | G400 | S495 | A327 | G400 | S495 |
| Q328 | E407 | S496 | Q328 | E407 | S496 |
| E329 | H330 | I497 | E329 | H330 | I497 |
| H330 | N331 | T498 | H330 | N331 | T498 |
| N331 | K332 | Y499 | N331 | K332 | Y499 |
| K332 | D411 | N500 | K332 | D411 | N500 |
| Y333 | S414 | | Y333 | S414 | |
| V334 | Y415 | | V334 | Y415 | |
| T335 | D416 | | T335 | D416 | |
| K336 | K417 | | K336 | K417 | |
| D337 | | | D337 | | |

4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

| Property | Value | Source |
|--|--|-----------|
| Space group | P 31 | Depositor |
| Cell constants a, b, c, α , β , γ | 130.41Å 130.41Å 129.90Å 90.00° 90.00° 120.00° | Depositor |
| Resolution (Å) | 20.00 – 2.90 | Depositor |
| % Data completeness (in resolution range) | 95.2 (20.00-2.90) | Depositor |
| R_{merge} | 0.06 | Depositor |
| R_{sym} | (Not available) | Depositor |
| Refinement program | CNS 1.0 | Depositor |
| R, R_{free} | 0.233 , 0.280 | Depositor |
| Estimated twinning fraction | No twinning to report. | Xtrriage |
| Total number of atoms | 14920 | wwPDB-VP |
| Average B, all atoms (Å ²) | 67.0 | wwPDB-VP |

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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 | 0.35 | 0/3728 | 0.57 | 0/5062 |
| 1 | B | 0.36 | 0/3728 | 0.56 | 0/5062 |
| 1 | C | 0.37 | 0/3728 | 0.57 | 1/5062 (0.0%) |
| 1 | D | 0.35 | 0/3728 | 0.56 | 0/5062 |
| All | All | 0.36 | 0/14912 | 0.57 | 1/20248 (0.0%) |

There are no bond length outliers.

All (1) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|-----|------|--------|------|-------------|----------|
| 1 | C | 300 | ASN | N-CA-C | 6.46 | 128.45 | 111.00 |

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 | 3657 | 0 | 3611 | 211 | 0 |
| 1 | B | 3657 | 0 | 3611 | 174 | 0 |
| 1 | C | 3657 | 0 | 3611 | 275 | 0 |
| 1 | D | 3657 | 0 | 3611 | 214 | 0 |
| 2 | A | 70 | 0 | 0 | 14 | 0 |
| 2 | B | 88 | 0 | 0 | 6 | 0 |
| 2 | C | 58 | 0 | 0 | 4 | 0 |
| 2 | D | 76 | 0 | 0 | 9 | 0 |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| All | All | 14920 | 0 | 14444 | 860 | 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 30.

All (860) 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:335:THR:HG22 | 1:A:337:ASP:H | 1.27 | 0.99 |
| 1:B:335:THR:HG22 | 1:B:337:ASP:H | 1.28 | 0.98 |
| 1:A:87:THR:HG22 | 1:A:89:PRO:HD3 | 1.45 | 0.97 |
| 1:C:289:ASP:HB3 | 1:C:309:TYR:HE1 | 1.25 | 0.94 |
| 1:A:301:THR:O | 1:A:304:LYS:HG3 | 1.68 | 0.94 |
| 1:C:296:ALA:HB2 | 1:C:303:ILE:HD13 | 1.52 | 0.91 |
| 1:C:82:LYS:HA | 1:C:382:ILE:HA | 1.50 | 0.91 |
| 1:D:457:ARG:HD2 | 1:D:469:ASP:OD2 | 1.71 | 0.90 |
| 1:A:109:LEU:HD21 | 1:A:122:LEU:HD21 | 1.53 | 0.89 |
| 1:A:104:PRO:HG2 | 1:A:131:ILE:HD11 | 1.54 | 0.88 |
| 1:C:481:ASN:HB2 | 1:C:500:ASN:HB2 | 1.56 | 0.88 |
| 1:D:481:ASN:HB2 | 1:D:500:ASN:HB2 | 1.56 | 0.87 |
| 1:C:457:ARG:HD2 | 1:C:469:ASP:OD2 | 1.75 | 0.87 |
| 1:C:90:VAL:HG12 | 1:C:374:ALA:HB2 | 1.58 | 0.86 |
| 1:A:481:ASN:HB2 | 1:A:500:ASN:HB2 | 1.58 | 0.85 |
| 1:C:66:LYS:HG3 | 1:C:79:GLU:HG3 | 1.59 | 0.85 |
| 1:D:457:ARG:HG3 | 1:D:468:ARG:O | 1.78 | 0.84 |
| 1:A:222:MET:HE1 | 1:A:298:ILE:HD11 | 1.60 | 0.84 |
| 1:A:75:PHE:HB2 | 1:A:447:ALA:HB3 | 1.60 | 0.83 |
| 1:A:131:ILE:HG22 | 1:A:144:ILE:HG22 | 1.59 | 0.83 |
| 1:B:481:ASN:HB2 | 1:B:500:ASN:HB2 | 1.61 | 0.82 |
| 1:A:464:TRP:HA | 1:A:467:TRP:CE3 | 2.14 | 0.82 |
| 1:B:456:ALA:HB3 | 1:B:471:ILE:HG22 | 1.61 | 0.82 |
| 1:B:465:GLU:OE2 | 1:D:91:ASP:HB2 | 1.79 | 0.82 |
| 1:C:259:VAL:HG13 | 1:C:265:PRO:HD3 | 1.61 | 0.82 |
| 1:D:259:VAL:HG13 | 1:D:265:PRO:HD3 | 1.62 | 0.82 |
| 1:B:131:ILE:HG22 | 1:B:144:ILE:HG22 | 1.59 | 0.81 |
| 1:A:456:ALA:HB3 | 1:A:471:ILE:HG22 | 1.60 | 0.81 |
| 1:D:110:ALA:HB2 | 1:D:266:LEU:HD21 | 1.63 | 0.81 |
| 1:A:37:SER:HB3 | 1:A:40:SER:OG | 1.80 | 0.80 |
| 1:A:288:LYS:HB2 | 2:A:542:HOH:O | 1.81 | 0.80 |
| 1:D:429:ASP:HB3 | 2:D:553:HOH:O | 1.81 | 0.80 |
| 1:C:457:ARG:HG3 | 1:C:468:ARG:O | 1.80 | 0.79 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:110:ALA:HB2 | 1:C:266:LEU:HD21 | 1.65 | 0.79 |
| 1:B:73:ASN:HA | 1:B:391:LYS:HE2 | 1.64 | 0.78 |
| 1:B:457:ARG:HD2 | 1:B:469:ASP:OD2 | 1.84 | 0.78 |
| 1:D:69:LYS:HG3 | 1:D:76:ILE:HB | 1.65 | 0.77 |
| 1:A:458:GLU:OE2 | 1:A:490:THR:HG23 | 1.85 | 0.77 |
| 1:A:75:PHE:CE1 | 1:A:448:ASN:HB3 | 2.20 | 0.77 |
| 1:C:289:ASP:HB2 | 1:C:308:GLN:NE2 | 2.00 | 0.76 |
| 1:C:275:ARG:HB3 | 1:C:325:GLY:H | 1.50 | 0.76 |
| 1:B:458:GLU:OE2 | 1:B:490:THR:HG23 | 1.86 | 0.76 |
| 1:D:335:THR:HG22 | 1:D:337:ASP:H | 1.49 | 0.76 |
| 1:D:61:GLU:HG3 | 1:D:62:SER:H | 1.50 | 0.75 |
| 1:C:39:ASP:OD1 | 1:C:240:ASN:HB3 | 1.86 | 0.75 |
| 1:C:44:SER:HA | 1:C:368:LYS:HZ2 | 1.50 | 0.75 |
| 1:C:37:SER:O | 1:C:251:PHE:HB2 | 1.86 | 0.75 |
| 1:D:80:ARG:HG2 | 1:D:384:THR:HG22 | 1.69 | 0.74 |
| 1:A:126:ARG:HB2 | 1:A:244:LEU:O | 1.87 | 0.74 |
| 1:D:37:SER:O | 1:D:251:PHE:HB2 | 1.86 | 0.74 |
| 1:C:335:THR:HG22 | 1:C:337:ASP:H | 1.51 | 0.74 |
| 1:C:108:GLN:HG2 | 1:C:121:ILE:HD13 | 1.69 | 0.73 |
| 1:D:61:GLU:CG | 1:D:62:SER:H | 2.01 | 0.73 |
| 1:B:86:THR:OG1 | 1:B:378:LYS:HG3 | 1.88 | 0.73 |
| 1:D:88:SER:HA | 1:D:375:VAL:O | 1.88 | 0.73 |
| 1:A:55:SER:HB3 | 1:A:115:VAL:HG13 | 1.69 | 0.73 |
| 1:B:126:ARG:HB2 | 1:B:244:LEU:O | 1.88 | 0.73 |
| 1:C:105:GLY:O | 1:C:267:MET:HG3 | 1.89 | 0.73 |
| 1:C:64:VAL:HB | 1:C:80:ARG:NH1 | 2.03 | 0.72 |
| 1:A:469:ASP:OD2 | 1:C:180:GLN:HA | 1.89 | 0.72 |
| 1:C:36:GLN:O | 1:C:251:PHE:HB3 | 1.89 | 0.72 |
| 1:D:295:LYS:HD2 | 2:D:539:HOH:O | 1.90 | 0.72 |
| 1:D:312:ILE:H | 1:D:312:ILE:HD12 | 1.55 | 0.71 |
| 1:A:252:ASN:O | 1:A:256:GLN:HB2 | 1.90 | 0.71 |
| 1:A:457:ARG:HB2 | 1:A:464:TRP:CZ3 | 2.25 | 0.71 |
| 1:C:107:LEU:HD11 | 1:C:126:ARG:HH21 | 1.55 | 0.71 |
| 1:C:44:SER:HA | 1:C:368:LYS:NZ | 2.04 | 0.71 |
| 1:B:464:TRP:HA | 1:B:467:TRP:CE3 | 2.25 | 0.71 |
| 1:A:384:THR:HG22 | 1:A:385:THR:N | 2.06 | 0.71 |
| 1:A:39:ASP:O | 1:A:43:SER:HB2 | 1.90 | 0.71 |
| 1:C:109:LEU:HD21 | 1:C:122:LEU:HD11 | 1.72 | 0.70 |
| 1:A:66:LYS:HB2 | 1:A:66:LYS:NZ | 2.05 | 0.70 |
| 1:B:252:ASN:O | 1:B:256:GLN:HB2 | 1.90 | 0.70 |
| 1:D:37:SER:C | 1:D:251:PHE:HB2 | 2.12 | 0.70 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:391:LYS:HE2 | 1:D:446:GLU:OE1 | 1.92 | 0.70 |
| 1:C:87:THR:HG22 | 1:C:89:PRO:HD3 | 1.73 | 0.70 |
| 1:D:127:LYS:HG3 | 1:D:245:PHE:O | 1.92 | 0.70 |
| 1:B:222:MET:HE3 | 1:B:298:ILE:HD11 | 1.72 | 0.70 |
| 1:C:105:GLY:H | 1:C:268:VAL:HB | 1.56 | 0.70 |
| 1:B:286:SER:HB2 | 1:B:388:GLU:HB3 | 1.73 | 0.69 |
| 1:D:322:VAL:HG21 | 1:D:327:ALA:HB1 | 1.73 | 0.69 |
| 1:D:94:ILE:HD13 | 1:D:359:PRO:HB2 | 1.74 | 0.69 |
| 1:A:342:ARG:HD3 | 2:A:503:HOH:O | 1.92 | 0.69 |
| 1:C:89:PRO:C | 1:C:91:ASP:H | 1.95 | 0.69 |
| 1:C:98:VAL:HG21 | 1:C:329:GLU:OE2 | 1.92 | 0.69 |
| 1:D:322:VAL:CG2 | 1:D:331:ASN:HB3 | 2.23 | 0.69 |
| 1:A:84:SER:HB2 | 1:A:380:ASP:OD2 | 1.93 | 0.68 |
| 1:C:49:ARG:HD3 | 2:C:505:HOH:O | 1.93 | 0.68 |
| 1:A:131:ILE:CG2 | 1:A:144:ILE:HG22 | 2.23 | 0.68 |
| 1:D:60:ILE:HG22 | 1:D:61:GLU:N | 2.08 | 0.68 |
| 1:A:310:LYS:HA | 1:A:310:LYS:HE2 | 1.75 | 0.68 |
| 1:B:131:ILE:CG2 | 1:B:144:ILE:HG22 | 2.24 | 0.68 |
| 1:A:48:ASN:O | 1:A:52:VAL:HG13 | 1.94 | 0.68 |
| 1:C:127:LYS:HG3 | 1:C:245:PHE:O | 1.93 | 0.68 |
| 1:C:104:PRO:HD2 | 1:C:154:VAL:HG11 | 1.75 | 0.68 |
| 1:C:289:ASP:HB3 | 1:C:309:TYR:CE1 | 2.18 | 0.68 |
| 1:A:131:ILE:HG12 | 1:A:233:VAL:HG12 | 1.76 | 0.67 |
| 1:C:418:GLU:HB2 | 1:C:420:ASN:ND2 | 2.08 | 0.67 |
| 1:A:222:MET:HE1 | 1:A:298:ILE:CD1 | 2.23 | 0.67 |
| 1:C:83:ARG:HB2 | 1:C:381:TYR:CE1 | 2.29 | 0.67 |
| 1:D:418:GLU:HB2 | 1:D:420:ASN:ND2 | 2.09 | 0.67 |
| 1:C:134:ASP:OD1 | 1:C:232:THR:HG23 | 1.95 | 0.67 |
| 1:B:90:VAL:O | 1:B:363:THR:HG22 | 1.94 | 0.67 |
| 1:A:96:ASP:OD2 | 1:A:99:ASN:HB2 | 1.95 | 0.67 |
| 1:A:462:LEU:HD11 | 1:C:232:THR:OG1 | 1.95 | 0.67 |
| 1:C:53:LEU:HD13 | 1:C:115:VAL:HG22 | 1.75 | 0.67 |
| 1:B:198:VAL:HG21 | 1:B:203:LEU:HD21 | 1.77 | 0.66 |
| 1:D:134:ASP:OD1 | 1:D:232:THR:HG23 | 1.96 | 0.66 |
| 1:D:398:HIS:O | 1:D:438:HIS:HA | 1.96 | 0.66 |
| 1:D:319:THR:HG23 | 1:D:334:VAL:HG22 | 1.75 | 0.66 |
| 1:A:55:SER:HB3 | 1:A:115:VAL:CG1 | 2.25 | 0.66 |
| 1:A:109:LEU:HD12 | 2:A:554:HOH:O | 1.95 | 0.66 |
| 1:B:90:VAL:HG12 | 1:B:374:ALA:HB2 | 1.77 | 0.66 |
| 1:B:295:LYS:HE2 | 1:B:299:LYS:NZ | 2.11 | 0.66 |
| 1:C:335:THR:HG22 | 1:C:336:LYS:H | 1.61 | 0.66 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:61:GLU:HG2 | 1:B:61:GLU:O | 1.96 | 0.66 |
| 1:D:52:VAL:HB | 2:D:568:HOH:O | 1.95 | 0.65 |
| 1:C:278:TYR:HE1 | 1:C:323:LEU:HD22 | 1.61 | 0.65 |
| 1:D:94:ILE:HG13 | 1:D:361:SER:HA | 1.77 | 0.65 |
| 1:B:131:ILE:HG12 | 1:B:233:VAL:HG12 | 1.79 | 0.65 |
| 1:D:335:THR:HG22 | 1:D:336:LYS:H | 1.60 | 0.65 |
| 1:C:80:ARG:HH11 | 1:C:80:ARG:HG3 | 1.61 | 0.65 |
| 1:D:61:GLU:HG3 | 1:D:62:SER:N | 2.12 | 0.65 |
| 1:A:346:LYS:HG3 | 2:A:527:HOH:O | 1.97 | 0.65 |
| 1:B:369:ASP:OD2 | 1:B:371:SER:HB3 | 1.96 | 0.65 |
| 1:C:398:HIS:O | 1:C:438:HIS:HA | 1.96 | 0.65 |
| 1:B:222:MET:HE1 | 1:B:294:PHE:HB3 | 1.79 | 0.64 |
| 1:D:396:LEU:HB2 | 1:D:441:THR:HG22 | 1.80 | 0.64 |
| 1:A:66:LYS:HB2 | 1:A:66:LYS:HZ3 | 1.62 | 0.64 |
| 1:B:107:LEU:HD11 | 1:B:126:ARG:HH21 | 1.61 | 0.64 |
| 1:C:103:TYR:CD1 | 1:C:154:VAL:HG21 | 2.32 | 0.64 |
| 1:D:94:ILE:CD1 | 1:D:359:PRO:HB2 | 2.26 | 0.64 |
| 1:A:75:PHE:CD1 | 1:A:448:ASN:HB3 | 2.32 | 0.64 |
| 1:B:426:LYS:HD2 | 2:B:548:HOH:O | 1.98 | 0.64 |
| 1:C:199:ASN:HB3 | 1:C:202:VAL:HG23 | 1.80 | 0.64 |
| 1:A:198:VAL:HG21 | 1:A:203:LEU:HD21 | 1.79 | 0.64 |
| 1:A:398:HIS:O | 1:A:438:HIS:HA | 1.97 | 0.64 |
| 1:C:308:GLN:NE2 | 1:C:312:ILE:HD11 | 2.12 | 0.64 |
| 1:A:395:ASN:HD22 | 1:A:442:VAL:HG22 | 1.61 | 0.64 |
| 1:D:148:ASP:HB3 | 1:D:153:LYS:HE2 | 1.80 | 0.64 |
| 1:D:335:THR:HG22 | 1:D:336:LYS:N | 2.12 | 0.64 |
| 1:C:64:VAL:HB | 1:C:80:ARG:HH12 | 1.63 | 0.64 |
| 1:A:491:LEU:HD22 | 1:C:176:PRO:HG2 | 1.80 | 0.64 |
| 1:C:191:GLN:HA | 1:C:379:THR:HG21 | 1.80 | 0.64 |
| 1:C:61:GLU:HA | 1:C:61:GLU:OE1 | 1.97 | 0.64 |
| 1:A:395:ASN:ND2 | 1:A:442:VAL:HG22 | 2.13 | 0.63 |
| 1:B:476:VAL:HG13 | 1:B:499:TYR:OH | 1.98 | 0.63 |
| 1:D:322:VAL:O | 1:D:323:LEU:HD23 | 1.98 | 0.63 |
| 1:B:395:ASN:HD22 | 1:B:442:VAL:HG22 | 1.62 | 0.63 |
| 1:C:293:ALA:HB2 | 1:C:309:TYR:CD1 | 2.34 | 0.63 |
| 1:D:199:ASN:HB3 | 1:D:202:VAL:HG23 | 1.80 | 0.63 |
| 1:B:80:ARG:HD3 | 1:B:382:ILE:HG21 | 1.79 | 0.63 |
| 1:A:396:LEU:HD23 | 1:A:484:VAL:HB | 1.81 | 0.62 |
| 1:C:217:ASN:ND2 | 1:C:384:THR:HB | 2.14 | 0.62 |
| 1:C:289:ASP:HB2 | 1:C:308:GLN:CD | 2.19 | 0.62 |
| 1:B:398:HIS:O | 1:B:438:HIS:HA | 1.98 | 0.62 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:150:THR:OG1 | 1:A:153:LYS:HB2 | 1.99 | 0.62 |
| 1:A:369:ASP:OD2 | 1:A:371:SER:HB3 | 1.99 | 0.62 |
| 1:A:302:ASP:HA | 1:A:304:LYS:HE3 | 1.80 | 0.62 |
| 1:C:335:THR:HG22 | 1:C:336:LYS:N | 2.14 | 0.62 |
| 1:D:63:PHE:N | 1:D:63:PHE:CD2 | 2.68 | 0.62 |
| 1:C:97:SER:O | 1:C:358:TYR:HB3 | 2.00 | 0.62 |
| 1:A:295:LYS:HE2 | 1:A:299:LYS:NZ | 2.14 | 0.61 |
| 1:A:304:LYS:HD2 | 1:A:304:LYS:N | 2.15 | 0.61 |
| 1:B:395:ASN:ND2 | 1:B:442:VAL:HG22 | 2.14 | 0.61 |
| 1:B:173:HIS:HB2 | 1:B:354:LYS:HG3 | 1.82 | 0.61 |
| 1:C:191:GLN:HG3 | 1:C:381:TYR:CD2 | 2.35 | 0.61 |
| 1:C:227:LYS:HE3 | 1:C:360:ILE:HG22 | 1.81 | 0.61 |
| 1:C:296:ALA:HB2 | 1:C:303:ILE:CD1 | 2.27 | 0.61 |
| 1:D:116:GLU:O | 1:D:117:ASN:HB2 | 2.00 | 0.61 |
| 1:D:196:LEU:O | 1:D:198:VAL:HG13 | 2.01 | 0.61 |
| 1:B:315:ASN:HB2 | 2:B:561:HOH:O | 2.01 | 0.61 |
| 1:B:326:ASP:OD1 | 1:B:326:ASP:N | 2.33 | 0.61 |
| 1:B:396:LEU:HD23 | 1:B:484:VAL:HB | 1.82 | 0.61 |
| 1:A:335:THR:HG22 | 1:A:336:LYS:N | 2.15 | 0.61 |
| 1:B:222:MET:CE | 1:B:298:ILE:HD11 | 2.31 | 0.61 |
| 1:A:157:ALA:O | 1:A:160:GLU:HB2 | 2.00 | 0.61 |
| 1:A:470:VAL:HG12 | 1:A:495:SER:HB3 | 1.83 | 0.61 |
| 1:C:75:PHE:O | 1:C:389:TYR:HB2 | 2.01 | 0.61 |
| 1:A:125:LYS:HE3 | 2:A:504:HOH:O | 1.99 | 0.60 |
| 1:A:335:THR:HG22 | 1:A:336:LYS:H | 1.66 | 0.60 |
| 1:A:254:LEU:HB3 | 1:A:259:VAL:HG21 | 1.84 | 0.60 |
| 1:C:148:ASP:HB3 | 1:C:153:LYS:HE2 | 1.83 | 0.60 |
| 1:A:173:HIS:HB2 | 1:A:354:LYS:HG3 | 1.83 | 0.60 |
| 1:B:324:GLY:HA3 | 2:B:501:HOH:O | 2.01 | 0.60 |
| 1:C:172:THR:HG22 | 1:C:174:THR:H | 1.66 | 0.60 |
| 1:C:196:LEU:O | 1:C:198:VAL:HG13 | 2.01 | 0.60 |
| 1:C:308:GLN:HG3 | 1:C:309:TYR:N | 2.15 | 0.60 |
| 1:C:222:MET:HE1 | 1:C:298:ILE:HD11 | 1.83 | 0.60 |
| 1:B:131:ILE:HG22 | 1:B:144:ILE:CG2 | 2.30 | 0.60 |
| 1:C:37:SER:C | 1:C:251:PHE:HB2 | 2.23 | 0.60 |
| 1:C:53:LEU:HD22 | 1:C:115:VAL:HG23 | 1.84 | 0.60 |
| 1:D:98:VAL:HG21 | 1:D:329:GLU:HG2 | 1.83 | 0.60 |
| 1:A:37:SER:C | 1:A:251:PHE:HB2 | 2.23 | 0.59 |
| 1:A:476:VAL:HG13 | 1:A:499:TYR:OH | 2.01 | 0.59 |
| 1:D:172:THR:HG22 | 1:D:174:THR:H | 1.66 | 0.59 |
| 1:C:80:ARG:HD3 | 1:C:384:THR:CG2 | 2.32 | 0.59 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:95:ILE:HG13 | 1:C:96:ASP:H | 1.66 | 0.59 |
| 1:C:351:PHE:HE2 | 2:C:535:HOH:O | 1.83 | 0.59 |
| 1:D:78:VAL:HG11 | 1:D:217:ASN:HD21 | 1.67 | 0.59 |
| 1:A:119:PRO:HD3 | 2:A:502:HOH:O | 2.03 | 0.59 |
| 1:A:131:ILE:HG22 | 1:A:144:ILE:CG2 | 2.31 | 0.59 |
| 1:B:457:ARG:HB2 | 1:B:464:TRP:CZ3 | 2.36 | 0.59 |
| 1:A:222:MET:CE | 1:A:298:ILE:HD11 | 2.30 | 0.59 |
| 1:A:328:GLN:CG | 1:A:329:GLU:H | 2.16 | 0.59 |
| 1:B:150:THR:OG1 | 1:B:153:LYS:HB2 | 2.03 | 0.59 |
| 1:B:487:TRP:CH2 | 1:B:496:SER:HB3 | 2.36 | 0.59 |
| 1:C:81:GLN:C | 1:C:382:ILE:HG13 | 2.23 | 0.59 |
| 1:A:487:TRP:CH2 | 1:A:496:SER:HB3 | 2.38 | 0.59 |
| 1:A:45:LEU:O | 1:A:368:LYS:NZ | 2.32 | 0.59 |
| 1:A:418:GLU:HB2 | 1:A:420:ASN:ND2 | 2.17 | 0.59 |
| 1:A:128:PRO:HB3 | 1:A:147:ASP:HA | 1.85 | 0.58 |
| 1:A:384:THR:CG2 | 1:A:385:THR:N | 2.66 | 0.58 |
| 1:B:335:THR:HG22 | 1:B:336:LYS:N | 2.18 | 0.58 |
| 1:C:47:TYR:CD1 | 1:C:52:VAL:HG11 | 2.38 | 0.58 |
| 1:C:82:LYS:HD2 | 1:C:380:ASP:HB3 | 1.84 | 0.58 |
| 1:D:337:ASP:OD1 | 1:D:339:ASP:HB2 | 2.04 | 0.58 |
| 1:C:45:LEU:H | 1:C:368:LYS:HZ2 | 1.50 | 0.58 |
| 1:D:140:GLY:O | 1:D:141:GLU:HG3 | 2.03 | 0.58 |
| 1:A:101:ARG:HG2 | 2:A:546:HOH:O | 2.03 | 0.58 |
| 1:A:391:LYS:HB3 | 1:A:445:LEU:O | 2.04 | 0.58 |
| 1:B:157:ALA:O | 1:B:160:GLU:HB2 | 2.04 | 0.58 |
| 1:C:186:VAL:HG23 | 1:C:221:VAL:O | 2.04 | 0.58 |
| 1:A:75:PHE:HB2 | 1:A:447:ALA:CB | 2.33 | 0.58 |
| 1:B:108:GLN:HE21 | 1:B:121:ILE:CD1 | 2.16 | 0.58 |
| 1:C:116:GLU:O | 1:C:117:ASN:HB2 | 2.03 | 0.58 |
| 1:D:416:ASP:OD2 | 1:D:420:ASN:HB2 | 2.04 | 0.58 |
| 1:D:453:ARG:NH2 | 2:D:515:HOH:O | 2.35 | 0.58 |
| 1:B:477:PRO:O | 1:B:479:THR:HG23 | 2.04 | 0.58 |
| 1:C:286:SER:OG | 1:C:386:SER:HB3 | 2.04 | 0.58 |
| 1:D:275:ARG:HA | 1:D:360:ILE:HD11 | 1.85 | 0.58 |
| 1:A:41:GLY:HA3 | 1:A:251:PHE:CD1 | 2.39 | 0.57 |
| 1:B:254:LEU:HB3 | 1:B:259:VAL:HG21 | 1.86 | 0.57 |
| 1:C:158:ILE:O | 1:C:162:VAL:HG23 | 2.03 | 0.57 |
| 1:D:61:GLU:CG | 1:D:62:SER:N | 2.66 | 0.57 |
| 1:D:109:LEU:HD22 | 1:D:263:ALA:O | 2.03 | 0.57 |
| 1:D:147:ASP:O | 1:D:149:PRO:HD3 | 2.04 | 0.57 |
| 1:A:464:TRP:HA | 1:A:467:TRP:CZ3 | 2.38 | 0.57 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:222:MET:HE3 | 1:B:298:ILE:CD1 | 2.34 | 0.57 |
| 1:C:140:GLY:O | 1:C:141:GLU:HG3 | 2.04 | 0.57 |
| 1:D:275:ARG:NH1 | 1:D:326:ASP:HB2 | 2.19 | 0.57 |
| 1:A:60:ILE:HG13 | 1:A:61:GLU:N | 2.20 | 0.57 |
| 1:B:418:GLU:HB2 | 1:B:420:ASN:ND2 | 2.19 | 0.57 |
| 1:C:279:VAL:HA | 1:C:319:THR:O | 2.03 | 0.57 |
| 1:C:337:ASP:OD1 | 1:C:339:ASP:HB2 | 2.04 | 0.57 |
| 1:C:498:THR:HG22 | 1:C:499:TYR:N | 2.19 | 0.57 |
| 1:B:295:LYS:HE2 | 1:B:299:LYS:HZ1 | 1.68 | 0.57 |
| 1:A:498:THR:HG22 | 1:A:499:TYR:N | 2.19 | 0.57 |
| 1:C:252:ASN:O | 1:C:256:GLN:HB2 | 2.04 | 0.57 |
| 1:C:416:ASP:OD2 | 1:C:420:ASN:HB2 | 2.04 | 0.57 |
| 1:A:222:MET:HE2 | 1:A:294:PHE:HB3 | 1.87 | 0.57 |
| 1:C:89:PRO:HD2 | 1:C:375:VAL:HG13 | 1.87 | 0.57 |
| 1:C:91:ASP:O | 1:C:92:ILE:HG13 | 2.05 | 0.57 |
| 1:C:128:PRO:HB3 | 1:C:147:ASP:HA | 1.87 | 0.57 |
| 1:C:175:LEU:HB2 | 1:C:351:PHE:CZ | 2.40 | 0.57 |
| 1:B:458:GLU:CD | 1:B:490:THR:HG23 | 2.25 | 0.57 |
| 1:D:128:PRO:HB3 | 1:D:147:ASP:HA | 1.87 | 0.57 |
| 1:A:172:THR:HG22 | 1:A:174:THR:H | 1.70 | 0.57 |
| 1:C:45:LEU:HD23 | 1:C:261:ASN:OD1 | 2.05 | 0.57 |
| 1:C:147:ASP:O | 1:C:149:PRO:HD3 | 2.04 | 0.57 |
| 1:D:222:MET:HE1 | 1:D:298:ILE:HD11 | 1.86 | 0.57 |
| 1:D:230:PHE:HB3 | 1:D:351:PHE:CE1 | 2.40 | 0.57 |
| 1:B:454:ILE:HG21 | 1:B:484:VAL:HG21 | 1.86 | 0.56 |
| 1:D:127:LYS:N | 1:D:244:LEU:O | 2.36 | 0.56 |
| 1:C:323:LEU:HD23 | 1:C:323:LEU:O | 2.05 | 0.56 |
| 1:D:158:ILE:O | 1:D:162:VAL:HG23 | 2.05 | 0.56 |
| 1:D:230:PHE:CE2 | 1:D:274:GLY:HA2 | 2.40 | 0.56 |
| 1:A:103:TYR:CD1 | 1:A:154:VAL:HG21 | 2.40 | 0.56 |
| 1:A:335:THR:HG22 | 1:A:337:ASP:N | 2.10 | 0.56 |
| 1:B:128:PRO:HB3 | 1:B:147:ASP:HA | 1.88 | 0.56 |
| 1:B:487:TRP:HH2 | 1:B:496:SER:HB3 | 1.68 | 0.56 |
| 1:C:396:LEU:HB2 | 1:C:441:THR:HG22 | 1.86 | 0.56 |
| 1:D:107:LEU:HD11 | 1:D:126:ARG:HH21 | 1.70 | 0.56 |
| 1:D:498:THR:HG22 | 1:D:499:TYR:N | 2.19 | 0.56 |
| 1:A:477:PRO:O | 1:A:479:THR:HG23 | 2.05 | 0.56 |
| 1:C:90:VAL:HA | 1:C:374:ALA:HA | 1.88 | 0.56 |
| 1:D:175:LEU:HB2 | 1:D:351:PHE:CE2 | 2.40 | 0.56 |
| 1:B:454:ILE:HD13 | 1:B:484:VAL:HG21 | 1.88 | 0.56 |
| 1:C:382:ILE:O | 1:C:382:ILE:HG23 | 2.06 | 0.56 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:80:ARG:NH1 | 1:C:80:ARG:HG3 | 2.20 | 0.56 |
| 1:D:175:LEU:HB2 | 1:D:351:PHE:CZ | 2.40 | 0.56 |
| 1:B:335:THR:HG22 | 1:B:336:LYS:H | 1.70 | 0.56 |
| 1:C:230:PHE:HB3 | 1:C:351:PHE:CE1 | 2.41 | 0.56 |
| 1:D:252:ASN:O | 1:D:256:GLN:HB2 | 2.06 | 0.56 |
| 1:A:454:ILE:HG21 | 1:A:484:VAL:HG21 | 1.88 | 0.56 |
| 1:C:230:PHE:CE2 | 1:C:274:GLY:HA2 | 2.41 | 0.56 |
| 1:A:52:VAL:HG23 | 1:A:53:LEU:N | 2.20 | 0.55 |
| 1:A:416:ASP:OD2 | 1:A:420:ASN:HB2 | 2.06 | 0.55 |
| 1:B:263:ALA:HB2 | 2:B:563:HOH:O | 2.06 | 0.55 |
| 1:C:320:ALA:HB3 | 1:C:333:VAL:HB | 1.89 | 0.55 |
| 1:A:92:ILE:HD12 | 1:A:362:TYR:O | 2.06 | 0.55 |
| 1:C:98:VAL:HG12 | 1:C:358:TYR:CD1 | 2.41 | 0.55 |
| 1:D:60:ILE:CG2 | 1:D:61:GLU:N | 2.69 | 0.55 |
| 1:B:416:ASP:OD2 | 1:B:420:ASN:HB2 | 2.06 | 0.55 |
| 1:C:479:THR:HB | 1:C:500:ASN:O | 2.07 | 0.55 |
| 1:A:108:GLN:HA | 1:A:120:THR:O | 2.06 | 0.55 |
| 1:A:322:VAL:H | 1:A:331:ASN:ND2 | 2.03 | 0.55 |
| 1:A:487:TRP:HH2 | 1:A:496:SER:HB3 | 1.70 | 0.55 |
| 1:D:321:VAL:HG12 | 1:D:332:LYS:HA | 1.89 | 0.55 |
| 1:C:86:THR:HG23 | 1:C:378:LYS:HG2 | 1.88 | 0.55 |
| 1:A:49:ARG:NH2 | 2:A:517:HOH:O | 2.40 | 0.55 |
| 1:B:498:THR:HG22 | 1:B:499:TYR:N | 2.21 | 0.55 |
| 1:C:198:VAL:HG21 | 1:C:203:LEU:HD21 | 1.88 | 0.55 |
| 1:A:87:THR:CG2 | 1:A:89:PRO:HD3 | 2.29 | 0.55 |
| 1:C:127:LYS:N | 1:C:244:LEU:O | 2.35 | 0.55 |
| 1:C:39:ASP:OD2 | 1:C:242:SER:N | 2.39 | 0.55 |
| 1:D:186:VAL:HG23 | 1:D:221:VAL:O | 2.06 | 0.55 |
| 1:D:303:ILE:O | 1:D:306:SER:HB3 | 2.07 | 0.55 |
| 1:A:306:SER:HB3 | 1:A:308:GLN:HG3 | 1.88 | 0.54 |
| 1:B:204:GLU:O | 1:B:208:GLY:HA2 | 2.07 | 0.54 |
| 1:C:97:SER:O | 1:C:359:PRO:HD2 | 2.06 | 0.54 |
| 1:D:49:ARG:HB3 | 1:D:366:PHE:CE1 | 2.43 | 0.54 |
| 1:D:64:VAL:HG12 | 1:D:417:LYS:O | 2.06 | 0.54 |
| 1:D:95:ILE:HG13 | 1:D:117:ASN:HD22 | 1.72 | 0.54 |
| 1:A:335:THR:CG2 | 1:A:337:ASP:H | 2.11 | 0.54 |
| 1:C:175:LEU:HB2 | 1:C:351:PHE:CE2 | 2.41 | 0.54 |
| 1:D:179:THR:HB | 2:D:562:HOH:O | 2.06 | 0.54 |
| 1:A:428:TRP:HA | 2:A:544:HOH:O | 2.07 | 0.54 |
| 1:D:69:LYS:O | 1:D:76:ILE:N | 2.39 | 0.54 |
| 1:D:103:TYR:HB2 | 1:D:104:PRO:HD2 | 1.89 | 0.54 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:433:GLN:O | 1:D:435:LYS:HG2 | 2.07 | 0.54 |
| 1:A:304:LYS:HD2 | 1:A:304:LYS:H | 1.72 | 0.54 |
| 1:C:73:ASN:HA | 1:C:391:LYS:HD2 | 1.88 | 0.54 |
| 1:C:308:GLN:HE21 | 1:C:312:ILE:HD11 | 1.71 | 0.54 |
| 1:D:57:GLY:HA3 | 1:D:378:LYS:O | 2.07 | 0.54 |
| 1:D:309:TYR:HA | 1:D:312:ILE:HD13 | 1.89 | 0.54 |
| 1:B:94:ILE:HD13 | 1:B:359:PRO:HB2 | 1.88 | 0.54 |
| 1:C:53:LEU:HG | 1:C:114:LEU:HD23 | 1.88 | 0.54 |
| 1:D:39:ASP:OD2 | 1:D:39:ASP:N | 2.41 | 0.54 |
| 1:D:198:VAL:HG21 | 1:D:203:LEU:HD21 | 1.88 | 0.54 |
| 1:A:47:TYR:CD1 | 1:A:52:VAL:HG11 | 2.42 | 0.54 |
| 1:C:98:VAL:HG12 | 1:C:358:TYR:CE1 | 2.43 | 0.54 |
| 1:A:470:VAL:HG11 | 1:A:486:ILE:HB | 1.89 | 0.54 |
| 1:C:131:ILE:HG22 | 1:C:144:ILE:HG22 | 1.90 | 0.54 |
| 1:A:458:GLU:CD | 1:A:490:THR:HG23 | 2.27 | 0.54 |
| 1:B:172:THR:HG22 | 1:B:174:THR:H | 1.73 | 0.54 |
| 1:B:289:ASP:HB3 | 1:B:309:TYR:HE1 | 1.72 | 0.54 |
| 1:C:227:LYS:HZ1 | 1:C:361:SER:CB | 2.21 | 0.54 |
| 1:D:105:GLY:N | 1:D:268:VAL:O | 2.36 | 0.54 |
| 1:D:328:GLN:O | 1:D:331:ASN:HB2 | 2.08 | 0.54 |
| 1:D:109:LEU:HD22 | 1:D:263:ALA:HB1 | 1.90 | 0.54 |
| 1:A:110:ALA:HB2 | 1:A:266:LEU:HD21 | 1.91 | 0.53 |
| 1:C:89:PRO:C | 1:C:91:ASP:N | 2.62 | 0.53 |
| 1:A:328:GLN:HG2 | 1:A:329:GLU:HG2 | 1.90 | 0.53 |
| 1:D:90:VAL:HG12 | 1:D:374:ALA:HB2 | 1.89 | 0.53 |
| 1:A:310:LYS:HE2 | 1:A:313:TYR:HD1 | 1.72 | 0.53 |
| 1:D:78:VAL:HG11 | 1:D:217:ASN:ND2 | 2.24 | 0.53 |
| 1:C:47:TYR:HB2 | 1:C:52:VAL:CG1 | 2.38 | 0.53 |
| 1:C:53:LEU:CD2 | 1:C:115:VAL:HG23 | 2.39 | 0.53 |
| 1:C:191:GLN:CA | 1:C:379:THR:HG21 | 2.38 | 0.53 |
| 1:D:86:THR:HA | 1:D:377:ASN:O | 2.07 | 0.53 |
| 1:D:109:LEU:HD12 | 1:D:120:THR:HG21 | 1.89 | 0.53 |
| 1:C:85:LEU:C | 1:C:85:LEU:HD23 | 2.29 | 0.53 |
| 1:C:100:ASP:C | 1:C:102:THR:H | 2.12 | 0.53 |
| 1:A:396:LEU:HD11 | 1:A:443:ILE:HD11 | 1.90 | 0.53 |
| 2:A:541:HOH:O | 1:C:462:LEU:HD22 | 2.08 | 0.53 |
| 1:D:479:THR:HB | 1:D:500:ASN:O | 2.08 | 0.53 |
| 1:C:83:ARG:N | 1:C:381:TYR:O | 2.40 | 0.53 |
| 1:A:63:PHE:O | 1:A:65:PRO:HD3 | 2.08 | 0.53 |
| 1:C:110:ALA:HB2 | 1:C:266:LEU:CD2 | 2.38 | 0.53 |
| 1:C:217:ASN:HD21 | 1:C:384:THR:HB | 1.74 | 0.53 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:474:TYR:O | 1:C:295:LYS:NZ | 2.42 | 0.52 |
| 1:D:67:GLU:HG2 | 1:D:69:LYS:HD3 | 1.90 | 0.52 |
| 1:B:141:GLU:HB3 | 1:B:164:LYS:HE2 | 1.92 | 0.52 |
| 1:D:369:ASP:OD2 | 1:D:371:SER:HB3 | 2.09 | 0.52 |
| 1:C:79:GLU:HB2 | 1:C:385:THR:OG1 | 2.10 | 0.52 |
| 1:D:304:LYS:O | 1:D:313:TYR:HE1 | 1.91 | 0.52 |
| 1:B:131:ILE:HD12 | 1:B:154:VAL:HG13 | 1.92 | 0.52 |
| 1:C:38:ILE:HD12 | 1:C:242:SER:HB3 | 1.91 | 0.52 |
| 1:C:148:ASP:H | 1:C:153:LYS:HE2 | 1.75 | 0.52 |
| 1:C:265:PRO:HB2 | 1:C:367:LEU:HD12 | 1.91 | 0.52 |
| 1:C:465:GLU:CD | 1:C:465:GLU:H | 2.12 | 0.52 |
| 1:A:484:VAL:HG22 | 1:A:497:ILE:HD12 | 1.92 | 0.52 |
| 1:C:433:GLN:O | 1:C:435:LYS:HG2 | 2.10 | 0.52 |
| 1:B:59:LYS:HD2 | 1:B:59:LYS:N | 2.24 | 0.52 |
| 1:B:89:PRO:HD2 | 1:B:375:VAL:O | 2.10 | 0.52 |
| 1:B:396:LEU:HD11 | 1:B:443:ILE:HD11 | 1.91 | 0.52 |
| 1:C:53:LEU:HD22 | 1:C:115:VAL:CG2 | 2.40 | 0.52 |
| 1:C:280:LYS:O | 1:C:318:PHE:HA | 2.10 | 0.52 |
| 1:A:392:GLY:HA3 | 1:A:479:THR:O | 2.10 | 0.52 |
| 1:B:60:ILE:HG23 | 1:B:60:ILE:O | 2.09 | 0.52 |
| 1:B:335:THR:HG22 | 1:B:337:ASP:N | 2.11 | 0.52 |
| 1:B:459:CYS:HA | 1:B:467:TRP:CE2 | 2.45 | 0.52 |
| 1:B:179:THR:HA | 1:B:227:LYS:O | 2.10 | 0.52 |
| 1:A:350:THR:CG2 | 1:A:351:PHE:N | 2.72 | 0.52 |
| 1:B:392:GLY:HA3 | 1:B:479:THR:O | 2.10 | 0.52 |
| 1:C:53:LEU:HD21 | 1:C:111:ASP:O | 2.10 | 0.52 |
| 1:A:38:ILE:HG12 | 1:A:254:LEU:HD11 | 1.90 | 0.51 |
| 1:C:95:ILE:HG23 | 1:C:117:ASN:HD22 | 1.75 | 0.51 |
| 1:C:369:ASP:OD2 | 1:C:371:SER:HB3 | 2.09 | 0.51 |
| 1:D:131:ILE:HG22 | 1:D:144:ILE:HG22 | 1.92 | 0.51 |
| 1:A:457:ARG:HD2 | 1:A:469:ASP:OD1 | 2.11 | 0.51 |
| 1:C:61:GLU:HG3 | 1:C:62:SER:N | 2.26 | 0.51 |
| 1:C:310:LYS:NZ | 1:C:314:GLU:HG3 | 2.25 | 0.51 |
| 1:B:107:LEU:CD1 | 1:B:126:ARG:HH21 | 2.22 | 0.51 |
| 1:B:464:TRP:HA | 1:B:467:TRP:CZ3 | 2.45 | 0.51 |
| 1:C:302:ASP:OD1 | 1:C:302:ASP:N | 2.42 | 0.51 |
| 1:D:110:ALA:HB2 | 1:D:266:LEU:CD2 | 2.36 | 0.51 |
| 1:D:148:ASP:H | 1:D:153:LYS:HE2 | 1.74 | 0.51 |
| 1:D:265:PRO:HB2 | 1:D:367:LEU:HD12 | 1.92 | 0.51 |
| 1:D:308:GLN:CA | 1:D:308:GLN:HE21 | 2.24 | 0.51 |
| 1:C:265:PRO:HG2 | 1:C:367:LEU:HD12 | 1.92 | 0.51 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:454:ILE:HD13 | 1:A:484:VAL:HG21 | 1.93 | 0.51 |
| 1:B:350:THR:CG2 | 1:B:351:PHE:N | 2.73 | 0.51 |
| 1:D:63:PHE:N | 1:D:63:PHE:HD2 | 2.09 | 0.51 |
| 1:D:358:TYR:HB3 | 1:D:359:PRO:HD2 | 1.91 | 0.51 |
| 1:A:452:ILE:HD12 | 1:A:476:VAL:O | 2.11 | 0.51 |
| 1:B:293:ALA:HB2 | 1:B:309:TYR:CD1 | 2.46 | 0.51 |
| 1:C:100:ASP:HB3 | 1:C:102:THR:OG1 | 2.10 | 0.51 |
| 1:A:222:MET:HE3 | 1:A:281:LEU:HD13 | 1.93 | 0.51 |
| 1:A:239:LYS:HG3 | 1:A:240:ASN:ND2 | 2.26 | 0.51 |
| 1:A:458:GLU:HG2 | 1:A:459:CYS:H | 1.75 | 0.51 |
| 1:D:148:ASP:CB | 1:D:153:LYS:HE2 | 2.40 | 0.51 |
| 1:B:239:LYS:HG3 | 1:B:240:ASN:ND2 | 2.26 | 0.51 |
| 1:B:484:VAL:HG22 | 1:B:497:ILE:HD12 | 1.91 | 0.51 |
| 1:D:55:SER:OG | 1:D:377:ASN:HA | 2.10 | 0.51 |
| 1:A:491:LEU:HD22 | 1:C:176:PRO:CG | 2.40 | 0.51 |
| 1:C:104:PRO:HD2 | 1:C:154:VAL:CG1 | 2.40 | 0.51 |
| 1:D:238:PRO:HG3 | 1:D:244:LEU:HG | 1.93 | 0.51 |
| 1:B:458:GLU:O | 1:B:467:TRP:HB3 | 2.11 | 0.51 |
| 1:C:36:GLN:C | 1:C:251:PHE:HB3 | 2.31 | 0.51 |
| 1:C:80:ARG:HD3 | 1:C:384:THR:HG21 | 1.93 | 0.51 |
| 1:C:89:PRO:O | 1:C:91:ASP:N | 2.44 | 0.51 |
| 1:D:144:ILE:HB | 1:D:161:LEU:HD21 | 1.93 | 0.51 |
| 1:A:141:GLU:HB3 | 1:A:164:LYS:HE2 | 1.92 | 0.50 |
| 1:A:407:GLU:HG3 | 1:A:432:TYR:CZ | 2.46 | 0.50 |
| 1:A:470:VAL:HG22 | 1:A:493:PRO:CB | 2.41 | 0.50 |
| 1:B:107:LEU:CG | 1:B:126:ARG:HH21 | 2.24 | 0.50 |
| 1:C:80:ARG:HG2 | 1:C:384:THR:HG22 | 1.93 | 0.50 |
| 1:C:275:ARG:HA | 1:C:360:ILE:HD11 | 1.93 | 0.50 |
| 1:A:368:LYS:NZ | 2:A:551:HOH:O | 2.44 | 0.50 |
| 1:B:55:SER:OG | 1:B:377:ASN:HB2 | 2.11 | 0.50 |
| 1:C:41:GLY:O | 1:C:45:LEU:HD12 | 2.11 | 0.50 |
| 1:C:108:GLN:HB2 | 1:C:266:LEU:HD12 | 1.93 | 0.50 |
| 1:A:350:THR:HG22 | 1:A:351:PHE:N | 2.25 | 0.50 |
| 1:B:498:THR:HG22 | 1:B:499:TYR:H | 1.76 | 0.50 |
| 1:B:110:ALA:HB2 | 1:B:266:LEU:HD21 | 1.94 | 0.50 |
| 1:C:47:TYR:HB2 | 1:C:52:VAL:HG11 | 1.94 | 0.50 |
| 1:C:321:VAL:HG23 | 1:C:321:VAL:O | 2.11 | 0.50 |
| 1:D:398:HIS:CE1 | 1:D:400:GLY:H | 2.30 | 0.50 |
| 1:D:230:PHE:HZ | 1:D:275:ARG:NH1 | 2.10 | 0.50 |
| 1:D:270:ASN:O | 1:D:362:TYR:HB2 | 2.12 | 0.50 |
| 1:A:37:SER:O | 1:A:251:PHE:HB2 | 2.12 | 0.50 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:350:THR:HG22 | 1:B:351:PHE:N | 2.26 | 0.50 |
| 1:B:452:ILE:HD12 | 1:B:476:VAL:O | 2.12 | 0.50 |
| 1:C:95:ILE:HG23 | 1:C:117:ASN:HB3 | 1.94 | 0.50 |
| 1:C:227:LYS:NZ | 1:C:361:SER:CB | 2.75 | 0.50 |
| 1:D:150:THR:O | 1:D:154:VAL:HG23 | 2.11 | 0.50 |
| 1:D:465:GLU:H | 1:D:465:GLU:CD | 2.13 | 0.50 |
| 1:A:498:THR:HG22 | 1:A:499:TYR:H | 1.76 | 0.50 |
| 1:B:222:MET:HE2 | 1:B:281:LEU:HD13 | 1.94 | 0.50 |
| 1:D:222:MET:HE3 | 1:D:224:LEU:HD21 | 1.94 | 0.50 |
| 1:A:85:LEU:HD23 | 1:A:86:THR:N | 2.27 | 0.50 |
| 1:A:131:ILE:HD12 | 1:A:154:VAL:HG13 | 1.94 | 0.50 |
| 1:C:238:PRO:HG3 | 1:C:244:LEU:HG | 1.93 | 0.50 |
| 1:C:295:LYS:HE2 | 1:C:299:LYS:NZ | 2.27 | 0.50 |
| 1:D:50:ASN:HA | 1:D:376:HIS:NE2 | 2.26 | 0.50 |
| 1:A:204:GLU:O | 1:A:208:GLY:HA2 | 2.11 | 0.49 |
| 1:D:53:LEU:CD1 | 1:D:373:ALA:HB1 | 2.42 | 0.49 |
| 1:D:425:HIS:HE1 | 1:D:453:ARG:NH2 | 2.10 | 0.49 |
| 1:A:322:VAL:H | 1:A:331:ASN:HD21 | 1.60 | 0.49 |
| 1:A:394:ILE:HD13 | 1:A:454:ILE:HD11 | 1.94 | 0.49 |
| 1:B:309:TYR:O | 1:B:312:ILE:N | 2.45 | 0.49 |
| 1:D:98:VAL:HG11 | 1:D:329:GLU:CG | 2.41 | 0.49 |
| 1:D:107:LEU:CD2 | 1:D:267:MET:HB2 | 2.42 | 0.49 |
| 1:A:66:LYS:NZ | 1:A:79:GLU:HG3 | 2.26 | 0.49 |
| 1:B:407:GLU:HG3 | 1:B:432:TYR:CZ | 2.48 | 0.49 |
| 1:B:464:TRP:O | 1:B:466:TRP:N | 2.46 | 0.49 |
| 1:C:109:LEU:CD2 | 1:C:122:LEU:HD11 | 2.40 | 0.49 |
| 1:C:126:ARG:HG3 | 1:C:149:PRO:HD2 | 1.93 | 0.49 |
| 1:A:132:ASN:ND2 | 1:A:143:SER:OG | 2.35 | 0.49 |
| 1:A:291:GLN:O | 1:A:295:LYS:HG3 | 2.13 | 0.49 |
| 1:C:78:VAL:HG12 | 1:C:386:SER:OG | 2.13 | 0.49 |
| 1:D:395:ASN:HD22 | 1:D:442:VAL:HG22 | 1.77 | 0.49 |
| 1:A:245:PHE:N | 1:A:245:PHE:CD1 | 2.80 | 0.49 |
| 1:A:328:GLN:CG | 1:A:329:GLU:HG2 | 2.42 | 0.49 |
| 1:A:407:GLU:HG3 | 1:A:432:TYR:OH | 2.12 | 0.49 |
| 1:B:104:PRO:HG2 | 1:B:131:ILE:HD11 | 1.94 | 0.49 |
| 1:B:245:PHE:CD1 | 1:B:245:PHE:N | 2.80 | 0.49 |
| 1:D:58:ASP:HB3 | 2:D:524:HOH:O | 2.12 | 0.49 |
| 1:C:377:ASN:ND2 | 1:C:378:LYS:H | 2.10 | 0.49 |
| 1:C:497:ILE:HG23 | 1:C:497:ILE:O | 2.12 | 0.49 |
| 1:D:66:LYS:HG3 | 1:D:79:GLU:HG2 | 1.94 | 0.49 |
| 1:A:131:ILE:HG12 | 1:A:233:VAL:CG1 | 2.42 | 0.49 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:38:ILE:HG13 | 1:C:39:ASP:H | 1.77 | 0.49 |
| 1:D:47:TYR:CE2 | 1:D:264:PRO:HB3 | 2.46 | 0.49 |
| 1:B:96:ASP:OD2 | 1:B:99:ASN:HB2 | 2.13 | 0.49 |
| 1:C:270:ASN:O | 1:C:362:TYR:HB2 | 2.13 | 0.49 |
| 1:C:300:ASN:O | 1:C:300:ASN:ND2 | 2.39 | 0.49 |
| 1:A:464:TRP:C | 1:A:466:TRP:H | 2.16 | 0.49 |
| 1:B:468:ARG:HB3 | 1:D:178:ARG:HA | 1.94 | 0.49 |
| 1:C:255:LYS:HA | 1:C:259:VAL:O | 2.12 | 0.49 |
| 1:D:96:ASP:OD2 | 1:D:100:ASP:HB2 | 2.13 | 0.49 |
| 2:B:528:HOH:O | 1:C:440:SER:HB3 | 2.12 | 0.48 |
| 1:C:91:ASP:HA | 1:C:363:THR:HG22 | 1.95 | 0.48 |
| 1:C:144:ILE:HB | 1:C:161:LEU:HD21 | 1.95 | 0.48 |
| 1:D:303:ILE:HG22 | 1:D:309:TYR:CE2 | 2.48 | 0.48 |
| 1:D:446:GLU:OE1 | 1:D:446:GLU:HA | 2.12 | 0.48 |
| 1:D:41:GLY:HA3 | 1:D:251:PHE:CZ | 2.49 | 0.48 |
| 1:A:76:ILE:HD13 | 1:A:76:ILE:N | 2.27 | 0.48 |
| 1:A:384:THR:CG2 | 1:A:385:THR:H | 2.26 | 0.48 |
| 1:A:470:VAL:HG22 | 1:A:493:PRO:HB3 | 1.96 | 0.48 |
| 1:B:402:TYR:CD1 | 1:B:458:GLU:HG3 | 2.48 | 0.48 |
| 1:B:405:GLN:HG3 | 1:B:459:CYS:SG | 2.54 | 0.48 |
| 1:C:288:LYS:HG3 | 1:C:289:ASP:OD2 | 2.14 | 0.48 |
| 1:D:265:PRO:HG2 | 1:D:367:LEU:HD12 | 1.95 | 0.48 |
| 1:A:82:LYS:HA | 1:A:382:ILE:HG12 | 1.95 | 0.48 |
| 1:C:451:ASN:O | 1:C:453:ARG:NH1 | 2.47 | 0.48 |
| 1:C:105:GLY:N | 1:C:268:VAL:O | 2.46 | 0.48 |
| 1:C:150:THR:O | 1:C:154:VAL:HG23 | 2.13 | 0.48 |
| 1:D:295:LYS:HE2 | 1:D:299:LYS:NZ | 2.29 | 0.48 |
| 1:A:413:VAL:HG12 | 1:A:448:ASN:HB2 | 1.95 | 0.48 |
| 1:B:226:TYR:HB2 | 1:B:277:ILE:HB | 1.96 | 0.48 |
| 1:D:308:GLN:HG3 | 1:D:309:TYR:N | 2.29 | 0.48 |
| 1:D:201:LYS:N | 1:D:201:LYS:HE2 | 2.28 | 0.48 |
| 1:A:226:TYR:HB2 | 1:A:277:ILE:HB | 1.95 | 0.47 |
| 1:B:275:ARG:HA | 1:B:360:ILE:HD11 | 1.96 | 0.47 |
| 1:D:498:THR:CG2 | 1:D:499:TYR:N | 2.77 | 0.47 |
| 1:A:418:GLU:HB2 | 1:A:420:ASN:HD21 | 1.79 | 0.47 |
| 1:B:108:GLN:HE21 | 1:B:121:ILE:HD13 | 1.79 | 0.47 |
| 1:B:335:THR:CG2 | 1:B:337:ASP:H | 2.12 | 0.47 |
| 1:C:61:GLU:HG3 | 1:C:62:SER:H | 1.80 | 0.47 |
| 1:C:148:ASP:CB | 1:C:153:LYS:HE2 | 2.44 | 0.47 |
| 1:C:217:ASN:ND2 | 1:C:384:THR:CB | 2.77 | 0.47 |
| 1:D:465:GLU:HG2 | 1:D:466:TRP:CZ3 | 2.49 | 0.47 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:275:ARG:HA | 1:A:360:ILE:HD11 | 1.97 | 0.47 |
| 1:D:476:VAL:HG11 | 1:D:482:ILE:HD13 | 1.95 | 0.47 |
| 1:C:60:ILE:O | 1:C:82:LYS:NZ | 2.36 | 0.47 |
| 1:C:76:ILE:CD1 | 1:C:388:GLU:HG3 | 2.45 | 0.47 |
| 1:A:222:MET:CE | 1:A:224:LEU:HD21 | 2.45 | 0.47 |
| 1:C:394:ILE:HB | 1:C:443:ILE:HB | 1.97 | 0.47 |
| 1:A:179:THR:HA | 1:A:227:LYS:O | 2.15 | 0.47 |
| 1:A:491:LEU:CD2 | 1:C:176:PRO:HG2 | 2.44 | 0.47 |
| 1:B:54:ALA:HA | 1:B:376:HIS:O | 2.15 | 0.47 |
| 1:B:88:SER:N | 1:B:89:PRO:HD3 | 2.30 | 0.47 |
| 1:B:116:GLU:O | 1:B:118:ARG:HG2 | 2.15 | 0.47 |
| 1:B:126:ARG:HG3 | 1:B:126:ARG:HH11 | 1.80 | 0.47 |
| 1:C:98:VAL:HG13 | 1:C:324:GLY:O | 2.15 | 0.47 |
| 1:C:222:MET:HE3 | 1:C:224:LEU:HD21 | 1.97 | 0.47 |
| 1:D:106:ALA:O | 1:D:267:MET:HG3 | 2.15 | 0.47 |
| 1:D:283:THR:HB | 1:D:316:SER:OG | 2.14 | 0.47 |
| 1:D:487:TRP:NE1 | 1:D:494:GLY:HA3 | 2.29 | 0.47 |
| 1:C:267:MET:HG2 | 1:C:268:VAL:N | 2.30 | 0.47 |
| 1:C:358:TYR:HB3 | 1:C:359:PRO:HD2 | 1.96 | 0.47 |
| 1:A:268:VAL:HG13 | 1:A:362:TYR:CD1 | 2.50 | 0.47 |
| 1:C:285:SER:HB3 | 1:C:312:ILE:HG23 | 1.96 | 0.47 |
| 1:C:375:VAL:HG22 | 1:C:376:HIS:N | 2.30 | 0.47 |
| 1:D:451:ASN:O | 1:D:453:ARG:NH1 | 2.48 | 0.47 |
| 1:B:295:LYS:NZ | 1:D:474:TYR:O | 2.48 | 0.47 |
| 1:C:86:THR:HG23 | 1:C:378:LYS:CG | 2.45 | 0.47 |
| 1:C:498:THR:CG2 | 1:C:499:TYR:N | 2.78 | 0.47 |
| 1:A:126:ARG:HG3 | 1:A:126:ARG:HH11 | 1.80 | 0.46 |
| 1:B:407:GLU:HG3 | 1:B:432:TYR:OH | 2.13 | 0.46 |
| 1:D:48:ASN:O | 1:D:52:VAL:HG22 | 2.15 | 0.46 |
| 1:D:224:LEU:HB2 | 1:D:279:VAL:HB | 1.97 | 0.46 |
| 1:A:109:LEU:HB3 | 1:A:263:ALA:HB1 | 1.97 | 0.46 |
| 1:B:94:ILE:HD12 | 1:B:361:SER:HA | 1.97 | 0.46 |
| 1:D:126:ARG:HG3 | 1:D:149:PRO:HD2 | 1.96 | 0.46 |
| 1:B:413:VAL:HG12 | 1:B:448:ASN:HB2 | 1.98 | 0.46 |
| 1:C:95:ILE:CG2 | 1:C:117:ASN:HB3 | 2.45 | 0.46 |
| 1:C:227:LYS:NZ | 1:C:361:SER:HB3 | 2.30 | 0.46 |
| 1:C:425:HIS:HE1 | 1:C:453:ARG:NH2 | 2.13 | 0.46 |
| 1:A:116:GLU:O | 1:A:118:ARG:HG2 | 2.16 | 0.46 |
| 1:B:75:PHE:HB2 | 1:B:447:ALA:HB3 | 1.96 | 0.46 |
| 1:C:60:ILE:HG13 | 1:C:61:GLU:N | 2.31 | 0.46 |
| 1:B:222:MET:HE3 | 1:B:224:LEU:HD21 | 1.97 | 0.46 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:487:TRP:N | 1:B:494:GLY:O | 2.48 | 0.46 |
| 1:C:48:ASN:O | 1:C:52:VAL:HG22 | 2.16 | 0.46 |
| 1:C:108:GLN:HE21 | 1:C:121:ILE:HD11 | 1.80 | 0.46 |
| 1:C:446:GLU:OE1 | 1:C:446:GLU:HA | 2.14 | 0.46 |
| 1:A:101:ARG:HB3 | 1:A:151:TYR:CG | 2.50 | 0.46 |
| 1:C:39:ASP:CG | 1:C:242:SER:H | 2.18 | 0.46 |
| 1:D:92:ILE:O | 1:D:361:SER:HA | 2.16 | 0.46 |
| 1:D:339:ASP:O | 1:D:342:ARG:HB2 | 2.16 | 0.46 |
| 1:A:186:VAL:HG13 | 1:A:192:ILE:HB | 1.98 | 0.46 |
| 1:C:94:ILE:HG22 | 1:C:360:ILE:O | 2.15 | 0.46 |
| 1:C:187:TYR:CE2 | 1:C:383:GLU:HG2 | 2.50 | 0.46 |
| 1:C:321:VAL:HA | 1:C:331:ASN:O | 2.16 | 0.46 |
| 1:C:476:VAL:HG11 | 1:C:482:ILE:HD13 | 1.96 | 0.46 |
| 1:B:83:ARG:HH22 | 1:D:421:GLU:CD | 2.19 | 0.46 |
| 1:B:418:GLU:HB2 | 1:B:420:ASN:HD21 | 1.80 | 0.46 |
| 1:C:201:LYS:HE2 | 1:C:201:LYS:N | 2.31 | 0.46 |
| 1:D:64:VAL:O | 1:D:80:ARG:HD2 | 2.16 | 0.46 |
| 1:D:270:ASN:HB2 | 1:D:363:THR:OG1 | 2.15 | 0.46 |
| 1:D:301:THR:O | 1:D:304:LYS:HG3 | 2.16 | 0.46 |
| 1:B:101:ARG:NH1 | 1:B:101:ARG:HG2 | 2.31 | 0.45 |
| 1:B:168:LYS:HE2 | 1:B:169:TYR:OH | 2.16 | 0.45 |
| 1:B:222:MET:CE | 1:B:224:LEU:HD21 | 2.46 | 0.45 |
| 1:C:76:ILE:HD13 | 1:C:388:GLU:HA | 1.97 | 0.45 |
| 1:C:290:VAL:HG22 | 1:C:312:ILE:HD13 | 1.98 | 0.45 |
| 1:A:306:SER:O | 1:A:309:TYR:N | 2.49 | 0.45 |
| 1:C:220:LYS:O | 1:C:282:GLU:HA | 2.16 | 0.45 |
| 1:C:224:LEU:HB2 | 1:C:279:VAL:HB | 1.97 | 0.45 |
| 1:D:60:ILE:CG2 | 1:D:61:GLU:H | 2.29 | 0.45 |
| 1:D:288:LYS:HG3 | 1:D:289:ASP:OD2 | 2.16 | 0.45 |
| 1:B:41:GLY:HA3 | 1:B:251:PHE:CD1 | 2.52 | 0.45 |
| 1:C:42:ILE:HD12 | 1:C:241:PRO:CB | 2.46 | 0.45 |
| 1:C:78:VAL:HA | 1:C:385:THR:O | 2.16 | 0.45 |
| 1:C:398:HIS:CE1 | 1:C:400:GLY:H | 2.34 | 0.45 |
| 1:D:38:ILE:O | 1:D:42:ILE:HG13 | 2.17 | 0.45 |
| 1:D:320:ALA:HB2 | 1:D:341:ILE:HD12 | 1.98 | 0.45 |
| 1:A:96:ASP:O | 1:A:100:ASP:N | 2.48 | 0.45 |
| 1:A:168:LYS:HE2 | 1:A:169:TYR:OH | 2.17 | 0.45 |
| 1:C:465:GLU:HG2 | 1:C:466:TRP:CZ3 | 2.52 | 0.45 |
| 1:D:148:ASP:H | 1:D:153:LYS:CE | 2.30 | 0.45 |
| 1:B:458:GLU:OE1 | 1:B:490:THR:HG23 | 2.17 | 0.45 |
| 1:C:96:ASP:O | 1:C:100:ASP:N | 2.49 | 0.45 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:270:ASN:HB2 | 1:C:363:THR:OG1 | 2.17 | 0.45 |
| 1:A:38:ILE:HG22 | 1:A:39:ASP:N | 2.32 | 0.45 |
| 1:A:60:ILE:CG1 | 1:A:61:GLU:N | 2.80 | 0.45 |
| 1:A:295:LYS:HE2 | 1:A:299:LYS:HZ1 | 1.78 | 0.45 |
| 1:B:42:ILE:CD1 | 1:B:241:PRO:HB3 | 2.47 | 0.45 |
| 1:B:94:ILE:HD12 | 1:B:361:SER:CA | 2.46 | 0.45 |
| 1:C:395:ASN:HD22 | 1:C:442:VAL:HG22 | 1.80 | 0.45 |
| 1:A:85:LEU:HD21 | 1:A:87:THR:OG1 | 2.16 | 0.45 |
| 1:A:406:PHE:HB2 | 1:A:428:TRP:HZ3 | 1.80 | 0.45 |
| 1:D:320:ALA:HB2 | 1:D:341:ILE:HG23 | 1.99 | 0.45 |
| 1:A:85:LEU:HD23 | 1:A:85:LEU:C | 2.37 | 0.45 |
| 1:A:108:GLN:O | 1:A:266:LEU:HD12 | 2.17 | 0.45 |
| 1:B:47:TYR:O | 1:B:47:TYR:CD1 | 2.69 | 0.45 |
| 1:B:186:VAL:HG13 | 1:B:192:ILE:HB | 1.98 | 0.45 |
| 1:B:280:LYS:HB3 | 1:B:319:THR:HB | 1.98 | 0.45 |
| 1:C:47:TYR:HD1 | 1:C:52:VAL:HG11 | 1.81 | 0.45 |
| 1:C:227:LYS:HE3 | 1:C:360:ILE:CG2 | 2.47 | 0.45 |
| 1:A:110:ALA:HB2 | 1:A:266:LEU:CD2 | 2.47 | 0.45 |
| 1:B:384:THR:O | 1:B:384:THR:HG22 | 2.17 | 0.45 |
| 1:C:312:ILE:O | 1:C:316:SER:HB2 | 2.17 | 0.45 |
| 1:D:47:TYR:HB2 | 1:D:52:VAL:HG11 | 1.99 | 0.45 |
| 1:D:231:TYR:OH | 1:D:357:ALA:HB3 | 2.17 | 0.45 |
| 1:B:309:TYR:O | 1:B:310:LYS:C | 2.55 | 0.44 |
| 1:D:91:ASP:OD2 | 1:D:361:SER:HB2 | 2.17 | 0.44 |
| 1:A:222:MET:HE3 | 1:A:224:LEU:HD21 | 1.99 | 0.44 |
| 1:C:180:GLN:HB2 | 1:C:227:LYS:HB3 | 1.97 | 0.44 |
| 1:A:47:TYR:HD1 | 1:A:52:VAL:HG11 | 1.82 | 0.44 |
| 1:A:94:ILE:CD1 | 1:A:359:PRO:HB2 | 2.48 | 0.44 |
| 1:A:97:SER:HB3 | 1:A:358:TYR:HB3 | 1.99 | 0.44 |
| 1:A:109:LEU:CD2 | 1:A:122:LEU:HD21 | 2.37 | 0.44 |
| 1:A:416:ASP:OD1 | 1:A:418:GLU:N | 2.51 | 0.44 |
| 1:D:156:GLY:O | 1:D:159:ASP:HB2 | 2.16 | 0.44 |
| 1:D:255:LYS:HA | 1:D:259:VAL:O | 2.17 | 0.44 |
| 1:A:114:LEU:HD12 | 2:A:502:HOH:O | 2.17 | 0.44 |
| 1:B:73:ASN:ND2 | 1:B:391:LYS:HE3 | 2.32 | 0.44 |
| 1:B:335:THR:HG21 | 1:B:337:ASP:HB3 | 2.00 | 0.44 |
| 1:B:394:ILE:HD13 | 1:B:454:ILE:HD11 | 1.99 | 0.44 |
| 1:C:49:ARG:NH2 | 1:C:369:ASP:OD2 | 2.50 | 0.44 |
| 1:C:278:TYR:CE1 | 1:C:323:LEU:HD22 | 2.47 | 0.44 |
| 1:C:457:ARG:HG2 | 1:C:467:TRP:HB2 | 2.00 | 0.44 |
| 1:A:69:LYS:HE3 | 1:A:69:LYS:HB3 | 1.85 | 0.44 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:295:LYS:HE2 | 1:A:299:LYS:HZ2 | 1.80 | 0.44 |
| 1:A:329:GLU:H | 1:A:329:GLU:HG2 | 1.45 | 0.44 |
| 1:A:487:TRP:N | 1:A:494:GLY:O | 2.47 | 0.44 |
| 1:B:75:PHE:CB | 1:B:447:ALA:HB3 | 2.48 | 0.44 |
| 1:B:406:PHE:HB2 | 1:B:428:TRP:HZ3 | 1.83 | 0.44 |
| 1:C:339:ASP:O | 1:C:342:ARG:HB2 | 2.17 | 0.44 |
| 1:D:222:MET:CE | 1:D:298:ILE:HD11 | 2.48 | 0.44 |
| 1:D:393:LYS:HD2 | 2:D:512:HOH:O | 2.18 | 0.44 |
| 1:B:83:ARG:NH2 | 1:D:421:GLU:OE1 | 2.48 | 0.44 |
| 1:B:268:VAL:HG13 | 1:B:362:TYR:CD1 | 2.53 | 0.44 |
| 1:D:425:HIS:CE1 | 1:D:453:ARG:NH2 | 2.85 | 0.44 |
| 1:A:58:ASP:OD2 | 1:A:58:ASP:N | 2.50 | 0.44 |
| 1:A:232:THR:HG21 | 1:C:466:TRP:CD1 | 2.53 | 0.44 |
| 1:A:234:SER:HB3 | 1:A:270:ASN:OD1 | 2.18 | 0.44 |
| 1:A:327:ALA:HA | 2:A:543:HOH:O | 2.18 | 0.44 |
| 1:A:406:PHE:O | 1:A:431:ASN:HA | 2.17 | 0.44 |
| 1:A:465:GLU:HG3 | 1:A:466:TRP:CZ3 | 2.53 | 0.44 |
| 1:B:73:ASN:ND2 | 1:B:391:LYS:CE | 2.80 | 0.44 |
| 1:B:416:ASP:OD1 | 1:B:418:GLU:N | 2.50 | 0.44 |
| 1:C:303:ILE:CG1 | 1:C:304:LYS:N | 2.80 | 0.44 |
| 1:D:267:MET:HG2 | 1:D:268:VAL:N | 2.32 | 0.44 |
| 1:C:98:VAL:HG21 | 1:C:329:GLU:CD | 2.36 | 0.44 |
| 1:C:156:GLY:O | 1:C:159:ASP:HB2 | 2.17 | 0.44 |
| 1:C:275:ARG:NH1 | 1:C:326:ASP:HB2 | 2.33 | 0.44 |
| 1:D:37:SER:O | 1:D:38:ILE:C | 2.56 | 0.44 |
| 1:D:407:GLU:HB2 | 1:D:464:TRP:CH2 | 2.53 | 0.44 |
| 1:A:66:LYS:HZ1 | 1:A:79:GLU:HG3 | 1.83 | 0.44 |
| 1:A:244:LEU:HA | 2:A:550:HOH:O | 2.18 | 0.44 |
| 1:C:36:GLN:N | 2:C:518:HOH:O | 2.50 | 0.44 |
| 1:C:58:ASP:O | 1:C:380:ASP:HB2 | 2.18 | 0.44 |
| 1:C:231:TYR:OH | 1:C:357:ALA:HB3 | 2.18 | 0.44 |
| 1:D:126:ARG:HB2 | 1:D:244:LEU:O | 2.18 | 0.44 |
| 1:B:303:ILE:HD13 | 1:B:303:ILE:N | 2.33 | 0.43 |
| 1:B:457:ARG:HG3 | 1:B:468:ARG:O | 2.18 | 0.43 |
| 1:A:101:ARG:O | 1:A:151:TYR:CD1 | 2.71 | 0.43 |
| 1:A:425:HIS:CE1 | 1:A:453:ARG:NH2 | 2.86 | 0.43 |
| 1:B:49:ARG:O | 1:B:52:VAL:HG22 | 2.17 | 0.43 |
| 1:C:41:GLY:HA3 | 1:C:251:PHE:CD1 | 2.54 | 0.43 |
| 1:D:96:ASP:HB2 | 1:D:100:ASP:HB3 | 2.00 | 0.43 |
| 1:D:180:GLN:HB2 | 1:D:227:LYS:HB3 | 1.99 | 0.43 |
| 1:D:310:LYS:O | 1:D:314:GLU:HB2 | 2.19 | 0.43 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:335:THR:CG2 | 1:D:336:LYS:H | 2.30 | 0.43 |
| 1:A:192:ILE:HG23 | 1:A:193:SER:N | 2.34 | 0.43 |
| 1:C:91:ASP:C | 1:C:92:ILE:HG13 | 2.39 | 0.43 |
| 1:D:98:VAL:HG11 | 1:D:329:GLU:HG3 | 2.00 | 0.43 |
| 1:D:226:TYR:HB2 | 1:D:277:ILE:HB | 1.99 | 0.43 |
| 1:D:497:ILE:HG23 | 1:D:497:ILE:O | 2.18 | 0.43 |
| 1:A:172:THR:CG2 | 1:A:174:THR:H | 2.31 | 0.43 |
| 1:B:189:LYS:O | 1:B:193:SER:HB3 | 2.19 | 0.43 |
| 1:C:90:VAL:HA | 1:C:374:ALA:CB | 2.48 | 0.43 |
| 1:D:96:ASP:CB | 1:D:100:ASP:CB | 2.97 | 0.43 |
| 1:A:238:PRO:HB2 | 1:A:243:ASP:HB2 | 2.01 | 0.43 |
| 1:B:101:ARG:HG2 | 1:B:101:ARG:HH11 | 1.83 | 0.43 |
| 1:B:131:ILE:HG12 | 1:B:233:VAL:CG1 | 2.46 | 0.43 |
| 1:C:66:LYS:HG3 | 1:C:79:GLU:CG | 2.38 | 0.43 |
| 1:C:90:VAL:HA | 1:C:374:ALA:CA | 2.48 | 0.43 |
| 1:C:148:ASP:H | 1:C:153:LYS:CE | 2.32 | 0.43 |
| 1:C:187:TYR:CZ | 1:C:383:GLU:HG2 | 2.53 | 0.43 |
| 1:D:263:ALA:N | 1:D:264:PRO:HD3 | 2.34 | 0.43 |
| 1:A:180:GLN:HB2 | 1:A:227:LYS:HB3 | 1.99 | 0.43 |
| 1:B:94:ILE:HD12 | 1:B:361:SER:N | 2.33 | 0.43 |
| 1:B:172:THR:CG2 | 1:B:174:THR:H | 2.32 | 0.43 |
| 1:C:108:GLN:HE21 | 1:C:121:ILE:CD1 | 2.32 | 0.43 |
| 1:C:265:PRO:HB2 | 1:C:367:LEU:CD1 | 2.48 | 0.43 |
| 1:B:275:ARG:NH2 | 1:B:350:THR:O | 2.52 | 0.43 |
| 1:B:457:ARG:CZ | 1:D:180:GLN:NE2 | 2.82 | 0.43 |
| 1:C:122:LEU:HD22 | 1:C:257:LYS:CB | 2.49 | 0.43 |
| 1:C:275:ARG:HH11 | 1:C:326:ASP:HB2 | 1.84 | 0.43 |
| 1:C:407:GLU:HB2 | 1:C:464:TRP:CH2 | 2.54 | 0.43 |
| 1:B:48:ASN:CG | 1:B:51:GLU:HG2 | 2.39 | 0.43 |
| 1:B:407:GLU:HB3 | 1:B:455:LYS:HB3 | 2.01 | 0.43 |
| 1:B:456:ALA:O | 1:B:470:VAL:N | 2.47 | 0.43 |
| 1:C:263:ALA:N | 1:C:264:PRO:HD3 | 2.34 | 0.43 |
| 1:D:95:ILE:HG13 | 1:D:117:ASN:ND2 | 2.33 | 0.43 |
| 1:D:220:LYS:O | 1:D:282:GLU:HA | 2.19 | 0.43 |
| 1:D:312:ILE:HD12 | 1:D:312:ILE:N | 2.28 | 0.43 |
| 1:A:75:PHE:O | 1:A:389:TYR:HB2 | 2.19 | 0.43 |
| 1:B:406:PHE:O | 1:B:431:ASN:HA | 2.19 | 0.43 |
| 1:D:109:LEU:HD12 | 1:D:120:THR:CG2 | 2.49 | 0.43 |
| 1:B:199:ASN:HB3 | 1:B:202:VAL:HG23 | 2.01 | 0.42 |
| 1:B:425:HIS:CE1 | 1:B:453:ARG:NH2 | 2.87 | 0.42 |
| 1:B:488:GLY:N | 2:B:525:HOH:O | 2.45 | 0.42 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:425:HIS:CE1 | 1:C:453:ARG:NH2 | 2.87 | 0.42 |
| 1:C:487:TRP:NE1 | 1:C:494:GLY:HA3 | 2.34 | 0.42 |
| 1:A:305:ASN:O | 1:A:306:SER:C | 2.58 | 0.42 |
| 1:A:408:VAL:N | 1:A:431:ASN:HD21 | 2.17 | 0.42 |
| 1:B:83:ARG:NH1 | 1:D:421:GLU:OE1 | 2.51 | 0.42 |
| 1:B:108:GLN:HA | 1:B:120:THR:O | 2.19 | 0.42 |
| 1:C:122:LEU:HD22 | 1:C:257:LYS:HB2 | 2.00 | 0.42 |
| 1:C:300:ASN:ND2 | 1:C:300:ASN:C | 2.73 | 0.42 |
| 1:C:300:ASN:C | 1:C:300:ASN:HD22 | 2.20 | 0.42 |
| 1:D:487:TRP:HH2 | 1:D:496:SER:HB3 | 1.83 | 0.42 |
| 1:D:56:ASN:HD22 | 1:D:57:GLY:N | 2.18 | 0.42 |
| 1:A:483:ASN:O | 1:A:497:ILE:HA | 2.19 | 0.42 |
| 1:B:360:ILE:HD13 | 1:B:360:ILE:HA | 1.80 | 0.42 |
| 1:D:172:THR:HG22 | 1:D:173:HIS:N | 2.34 | 0.42 |
| 1:A:407:GLU:HB3 | 1:A:455:LYS:HB3 | 2.01 | 0.42 |
| 1:C:107:LEU:CD1 | 1:C:126:ARG:HH21 | 2.25 | 0.42 |
| 1:C:204:GLU:HA | 1:C:209:VAL:H | 1.85 | 0.42 |
| 1:D:273:TYR:HA | 1:D:358:TYR:O | 2.19 | 0.42 |
| 1:B:180:GLN:HB2 | 1:B:227:LYS:HB3 | 2.01 | 0.42 |
| 1:A:144:ILE:HG21 | 1:A:157:ALA:HB1 | 2.02 | 0.42 |
| 1:B:230:PHE:CE2 | 1:B:274:GLY:HA2 | 2.54 | 0.42 |
| 1:B:291:GLN:O | 1:B:295:LYS:HG3 | 2.20 | 0.42 |
| 1:C:303:ILE:CG1 | 1:C:304:LYS:H | 2.33 | 0.42 |
| 1:D:53:LEU:HD11 | 1:D:373:ALA:HB1 | 2.01 | 0.42 |
| 1:D:107:LEU:HD23 | 1:D:267:MET:HB2 | 2.01 | 0.42 |
| 1:D:478:LEU:HD22 | 2:D:534:HOH:O | 2.20 | 0.42 |
| 1:A:107:LEU:O | 1:A:121:ILE:HA | 2.19 | 0.42 |
| 1:A:230:PHE:CE2 | 1:A:274:GLY:HA2 | 2.55 | 0.42 |
| 1:A:464:TRP:O | 1:A:466:TRP:N | 2.47 | 0.42 |
| 1:C:41:GLY:HA3 | 1:C:251:PHE:CE1 | 2.55 | 0.42 |
| 1:C:273:TYR:HA | 1:C:358:TYR:O | 2.19 | 0.42 |
| 1:D:173:HIS:HB2 | 1:D:353:THR:OG1 | 2.20 | 0.42 |
| 1:D:199:ASN:OD1 | 1:D:201:LYS:HG2 | 2.20 | 0.42 |
| 1:A:407:GLU:HA | 1:A:431:ASN:ND2 | 2.35 | 0.42 |
| 1:B:238:PRO:HB2 | 1:B:243:ASP:HB2 | 2.01 | 0.42 |
| 1:C:126:ARG:HB2 | 1:C:244:LEU:O | 2.20 | 0.42 |
| 1:C:407:GLU:HG3 | 1:C:432:TYR:OH | 2.20 | 0.42 |
| 1:D:295:LYS:HA | 1:D:298:ILE:HD12 | 2.02 | 0.42 |
| 1:A:52:VAL:HG21 | 1:A:366:PHE:CZ | 2.54 | 0.41 |
| 1:A:52:VAL:CG2 | 1:A:53:LEU:N | 2.83 | 0.41 |
| 1:A:436:THR:O | 1:A:437:ALA:C | 2.57 | 0.41 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:219:LYS:HE2 | 1:B:282:GLU:OE2 | 2.19 | 0.41 |
| 1:C:226:TYR:HB2 | 1:C:277:ILE:HB | 2.02 | 0.41 |
| 1:C:259:VAL:HG13 | 1:C:265:PRO:CD | 2.41 | 0.41 |
| 1:C:265:PRO:CG | 1:C:367:LEU:HD12 | 2.50 | 0.41 |
| 1:D:394:ILE:HB | 1:D:443:ILE:HB | 2.01 | 0.41 |
| 1:A:429:ASP:C | 1:A:431:ASN:H | 2.24 | 0.41 |
| 1:B:61:GLU:O | 1:B:61:GLU:CG | 2.68 | 0.41 |
| 1:C:500:ASN:ND2 | 2:C:525:HOH:O | 2.54 | 0.41 |
| 1:D:258:GLY:O | 1:D:263:ALA:HB3 | 2.20 | 0.41 |
| 1:D:457:ARG:HG2 | 1:D:467:TRP:HB2 | 2.01 | 0.41 |
| 1:B:110:ALA:HB2 | 1:B:266:LEU:CD2 | 2.50 | 0.41 |
| 1:B:192:ILE:HG23 | 1:B:193:SER:N | 2.34 | 0.41 |
| 1:D:122:LEU:HD22 | 1:D:257:LYS:CB | 2.50 | 0.41 |
| 1:D:310:LYS:HE2 | 1:D:310:LYS:HA | 2.02 | 0.41 |
| 1:A:308:GLN:O | 1:A:312:ILE:HG13 | 2.20 | 0.41 |
| 1:A:453:ARG:HH11 | 1:A:453:ARG:HG2 | 1.85 | 0.41 |
| 1:C:172:THR:HG22 | 1:C:173:HIS:N | 2.36 | 0.41 |
| 1:C:274:GLY:O | 1:C:360:ILE:HD11 | 2.21 | 0.41 |
| 1:C:295:LYS:HA | 1:C:298:ILE:HD12 | 2.01 | 0.41 |
| 1:D:122:LEU:HD22 | 1:D:257:LYS:HB2 | 2.02 | 0.41 |
| 1:D:339:ASP:O | 1:D:342:ARG:N | 2.54 | 0.41 |
| 1:A:74:LYS:NZ | 1:A:388:GLU:HG2 | 2.36 | 0.41 |
| 1:A:83:ARG:HB3 | 1:A:381:TYR:CZ | 2.55 | 0.41 |
| 1:A:94:ILE:HD12 | 1:A:359:PRO:HB2 | 2.03 | 0.41 |
| 1:A:103:TYR:HB2 | 1:A:104:PRO:HD2 | 2.01 | 0.41 |
| 1:B:108:GLN:HE21 | 1:B:121:ILE:HD11 | 1.86 | 0.41 |
| 1:C:52:VAL:HG21 | 1:C:366:PHE:CZ | 2.55 | 0.41 |
| 1:C:92:ILE:HG21 | 1:C:362:TYR:CZ | 2.56 | 0.41 |
| 1:D:306:SER:O | 1:D:307:GLN:C | 2.58 | 0.41 |
| 1:A:413:VAL:HB | 1:A:450:ARG:HD3 | 2.02 | 0.41 |
| 1:B:413:VAL:HB | 1:B:450:ARG:HD3 | 2.02 | 0.41 |
| 1:D:476:VAL:CG1 | 1:D:482:ILE:HD13 | 2.50 | 0.41 |
| 1:B:38:ILE:HA | 1:B:251:PHE:HB2 | 2.01 | 0.41 |
| 1:C:61:GLU:OE1 | 1:C:61:GLU:CA | 2.66 | 0.41 |
| 1:C:108:GLN:HB2 | 1:C:266:LEU:CD1 | 2.50 | 0.41 |
| 1:C:325:GLY:HA2 | 1:C:358:TYR:HD1 | 1.86 | 0.41 |
| 1:D:50:ASN:HA | 1:D:376:HIS:CE1 | 2.56 | 0.41 |
| 1:D:108:GLN:HA | 1:D:120:THR:O | 2.21 | 0.41 |
| 1:D:204:GLU:HA | 1:D:209:VAL:H | 1.85 | 0.41 |
| 1:A:50:ASN:HA | 1:A:376:HIS:NE2 | 2.35 | 0.41 |
| 1:A:189:LYS:O | 1:A:193:SER:HB3 | 2.20 | 0.41 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:A:335:THR:HG21 | 1:A:337:ASP:HB3 | 2.02 | 0.41 |
| 1:B:198:VAL:HG11 | 1:B:278:TYR:CE2 | 2.56 | 0.41 |
| 1:C:407:GLU:HG3 | 1:C:432:TYR:CE2 | 2.56 | 0.41 |
| 1:D:78:VAL:HG22 | 1:D:386:SER:HB2 | 2.02 | 0.41 |
| 1:D:265:PRO:HB2 | 1:D:367:LEU:CD1 | 2.51 | 0.41 |
| 1:D:444:PRO:HD2 | 2:D:503:HOH:O | 2.21 | 0.41 |
| 1:A:309:TYR:HA | 1:A:312:ILE:HD12 | 2.02 | 0.41 |
| 1:A:491:LEU:C | 1:A:493:PRO:HD3 | 2.41 | 0.41 |
| 1:C:105:GLY:HA2 | 1:C:267:MET:CG | 2.51 | 0.41 |
| 1:C:222:MET:CE | 1:C:281:LEU:HD13 | 2.51 | 0.41 |
| 1:D:96:ASP:CB | 1:D:100:ASP:HB3 | 2.51 | 0.41 |
| 1:D:132:ASN:O | 1:D:233:VAL:HA | 2.21 | 0.41 |
| 1:D:274:GLY:O | 1:D:360:ILE:HD11 | 2.21 | 0.41 |
| 1:B:337:ASP:OD1 | 1:B:339:ASP:HB2 | 2.20 | 0.41 |
| 1:C:64:VAL:CB | 1:C:80:ARG:NH1 | 2.80 | 0.41 |
| 1:D:307:GLN:O | 1:D:310:LYS:HB2 | 2.21 | 0.41 |
| 1:D:335:THR:CG2 | 1:D:336:LYS:N | 2.80 | 0.41 |
| 1:B:144:ILE:HG21 | 1:B:157:ALA:HB1 | 2.03 | 0.40 |
| 1:B:212:ASN:O | 1:B:215:ALA:N | 2.54 | 0.40 |
| 1:C:254:LEU:C | 1:C:256:GLN:H | 2.25 | 0.40 |
| 1:C:310:LYS:HE2 | 1:C:313:TYR:HB2 | 2.03 | 0.40 |
| 1:B:436:THR:O | 1:B:437:ALA:C | 2.59 | 0.40 |
| 1:C:154:VAL:O | 1:C:158:ILE:HG13 | 2.21 | 0.40 |
| 1:C:191:GLN:N | 1:C:379:THR:HG21 | 2.35 | 0.40 |
| 1:D:238:PRO:CB | 1:D:243:ASP:HB2 | 2.52 | 0.40 |
| 1:D:417:LYS:HB2 | 1:D:417:LYS:NZ | 2.36 | 0.40 |
| 1:B:42:ILE:HD12 | 1:B:241:PRO:CB | 2.51 | 0.40 |
| 1:B:83:ARG:HG3 | 1:B:383:GLU:HB2 | 2.03 | 0.40 |
| 1:C:228:GLN:OE1 | 1:C:348:ASN:O | 2.39 | 0.40 |
| 1:C:350:THR:HG22 | 1:C:351:PHE:N | 2.37 | 0.40 |
| 1:D:53:LEU:HD23 | 1:D:53:LEU:HA | 1.95 | 0.40 |
| 1:D:109:LEU:CD2 | 1:D:263:ALA:O | 2.69 | 0.40 |
| 1:D:465:GLU:HG2 | 1:D:466:TRP:CE3 | 2.56 | 0.40 |
| 1:D:470:VAL:HG12 | 1:D:495:SER:HB3 | 2.04 | 0.40 |
| 1:B:497:ILE:HG23 | 1:B:497:ILE:O | 2.21 | 0.40 |
| 1:C:132:ASN:O | 1:C:233:VAL:HA | 2.21 | 0.40 |
| 1:C:189:LYS:HA | 1:C:211:PHE:CE2 | 2.57 | 0.40 |
| 1:C:199:ASN:OD1 | 1:C:201:LYS:HG2 | 2.21 | 0.40 |
| 1:C:338:PHE:O | 1:C:341:ILE:HB | 2.22 | 0.40 |
| 1:A:335:THR:CG2 | 1:A:336:LYS:N | 2.83 | 0.40 |
| 1:B:429:ASP:C | 1:B:431:ASN:H | 2.25 | 0.40 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:477:PRO:HG2 | 1:B:499:TYR:CE2 | 2.57 | 0.40 |
| 1:B:482:ILE:HG23 | 1:B:497:ILE:HD11 | 2.04 | 0.40 |
| 1:C:335:THR:CG2 | 1:C:336:LYS:N | 2.82 | 0.40 |
| 1:C:476:VAL:CG1 | 1:C:482:ILE:HD13 | 2.51 | 0.40 |
| 1:D:228:GLN:OE1 | 1:D:348:ASN:O | 2.40 | 0.40 |
| 1:D:297:LEU:HD21 | 1:D:318:PHE:CZ | 2.56 | 0.40 |
| 1:D:411:ASP:O | 1:D:449:ALA:HA | 2.22 | 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 | 463/471 (98%) | 421 (91%) | 35 (8%) | 7 (2%) | 10 34 |
| 1 | B | 463/471 (98%) | 417 (90%) | 39 (8%) | 7 (2%) | 10 34 |
| 1 | C | 463/471 (98%) | 416 (90%) | 41 (9%) | 6 (1%) | 12 37 |
| 1 | D | 463/471 (98%) | 424 (92%) | 31 (7%) | 8 (2%) | 9 31 |
| All | All | 1852/1884 (98%) | 1678 (91%) | 146 (8%) | 28 (2%) | 10 34 |

All (28) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | A | 462 | LEU |
| 1 | B | 58 | ASP |
| 1 | D | 38 | ILE |
| 1 | D | 62 | SER |
| 1 | A | 465 | GLU |
| 1 | B | 465 | GLU |
| 1 | D | 438 | HIS |
| 1 | A | 416 | ASP |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | B | 416 | ASP |
| 1 | C | 90 | VAL |
| 1 | C | 368 | LYS |
| 1 | C | 437 | ALA |
| 1 | C | 438 | HIS |
| 1 | D | 368 | LYS |
| 1 | D | 437 | ALA |
| 1 | A | 437 | ALA |
| 1 | B | 437 | ALA |
| 1 | D | 307 | GLN |
| 1 | A | 330 | HIS |
| 1 | B | 65 | PRO |
| 1 | C | 141 | GLU |
| 1 | D | 106 | ALA |
| 1 | D | 141 | GLU |
| 1 | A | 430 | GLY |
| 1 | C | 38 | ILE |
| 1 | A | 290 | VAL |
| 1 | B | 290 | VAL |
| 1 | B | 430 | GLY |

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 | 412/418 (99%) | 374 (91%) | 38 (9%) | 9 | 27 |
| 1 | B | 412/418 (99%) | 372 (90%) | 40 (10%) | 8 | 25 |
| 1 | C | 412/418 (99%) | 357 (87%) | 55 (13%) | 4 | 11 |
| 1 | D | 412/418 (99%) | 364 (88%) | 48 (12%) | 5 | 16 |
| All | All | 1648/1672 (99%) | 1467 (89%) | 181 (11%) | 6 | 19 |

All (181) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | A | 40 | SER |

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| Mol | Chain | Res | Type |
|------------|--------------|------------|-------------|
| 1 | A | 43 | SER |
| 1 | A | 58 | ASP |
| 1 | A | 66 | LYS |
| 1 | A | 69 | LYS |
| 1 | A | 84 | SER |
| 1 | A | 108 | GLN |
| 1 | A | 112 | LYS |
| 1 | A | 126 | ARG |
| 1 | A | 130 | ASN |
| 1 | A | 132 | ASN |
| 1 | A | 153 | LYS |
| 1 | A | 159 | ASP |
| 1 | A | 171 | SER |
| 1 | A | 239 | LYS |
| 1 | A | 245 | PHE |
| 1 | A | 266 | LEU |
| 1 | A | 284 | THR |
| 1 | A | 286 | SER |
| 1 | A | 300 | ASN |
| 1 | A | 304 | LYS |
| 1 | A | 305 | ASN |
| 1 | A | 308 | GLN |
| 1 | A | 328 | GLN |
| 1 | A | 329 | GLU |
| 1 | A | 331 | ASN |
| 1 | A | 363 | THR |
| 1 | A | 370 | ASN |
| 1 | A | 385 | THR |
| 1 | A | 388 | GLU |
| 1 | A | 390 | SER |
| 1 | A | 391 | LYS |
| 1 | A | 393 | LYS |
| 1 | A | 398 | HIS |
| 1 | A | 414 | SER |
| 1 | A | 450 | ARG |
| 1 | A | 465 | GLU |
| 1 | A | 468 | ARG |
| 1 | B | 47 | TYR |
| 1 | B | 49 | ARG |
| 1 | B | 52 | VAL |
| 1 | B | 58 | ASP |
| 1 | B | 59 | LYS |

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| Mol | Chain | Res | Type |
|------------|--------------|------------|-------------|
| 1 | B | 60 | ILE |
| 1 | B | 79 | GLU |
| 1 | B | 87 | THR |
| 1 | B | 93 | SER |
| 1 | B | 101 | ARG |
| 1 | B | 108 | GLN |
| 1 | B | 112 | LYS |
| 1 | B | 126 | ARG |
| 1 | B | 130 | ASN |
| 1 | B | 132 | ASN |
| 1 | B | 153 | LYS |
| 1 | B | 159 | ASP |
| 1 | B | 171 | SER |
| 1 | B | 197 | ASN |
| 1 | B | 239 | LYS |
| 1 | B | 245 | PHE |
| 1 | B | 266 | LEU |
| 1 | B | 284 | THR |
| 1 | B | 286 | SER |
| 1 | B | 326 | ASP |
| 1 | B | 328 | GLN |
| 1 | B | 363 | THR |
| 1 | B | 370 | ASN |
| 1 | B | 375 | VAL |
| 1 | B | 377 | ASN |
| 1 | B | 380 | ASP |
| 1 | B | 383 | GLU |
| 1 | B | 384 | THR |
| 1 | B | 385 | THR |
| 1 | B | 387 | THR |
| 1 | B | 393 | LYS |
| 1 | B | 398 | HIS |
| 1 | B | 414 | SER |
| 1 | B | 450 | ARG |
| 1 | B | 458 | GLU |
| 1 | C | 45 | LEU |
| 1 | C | 49 | ARG |
| 1 | C | 52 | VAL |
| 1 | C | 53 | LEU |
| 1 | C | 58 | ASP |
| 1 | C | 64 | VAL |
| 1 | C | 69 | LYS |

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| Mol | Chain | Res | Type |
|------------|--------------|------------|-------------|
| 1 | C | 74 | LYS |
| 1 | C | 80 | ARG |
| 1 | C | 84 | SER |
| 1 | C | 85 | LEU |
| 1 | C | 86 | THR |
| 1 | C | 93 | SER |
| 1 | C | 100 | ASP |
| 1 | C | 126 | ARG |
| 1 | C | 130 | ASN |
| 1 | C | 131 | ILE |
| 1 | C | 132 | ASN |
| 1 | C | 163 | SER |
| 1 | C | 171 | SER |
| 1 | C | 194 | SER |
| 1 | C | 197 | ASN |
| 1 | C | 218 | GLU |
| 1 | C | 232 | THR |
| 1 | C | 239 | LYS |
| 1 | C | 243 | ASP |
| 1 | C | 266 | LEU |
| 1 | C | 286 | SER |
| 1 | C | 299 | LYS |
| 1 | C | 300 | ASN |
| 1 | C | 302 | ASP |
| 1 | C | 304 | LYS |
| 1 | C | 306 | SER |
| 1 | C | 308 | GLN |
| 1 | C | 310 | LYS |
| 1 | C | 311 | ASP |
| 1 | C | 317 | SER |
| 1 | C | 326 | ASP |
| 1 | C | 331 | ASN |
| 1 | C | 346 | LYS |
| 1 | C | 370 | ASN |
| 1 | C | 378 | LYS |
| 1 | C | 379 | THR |
| 1 | C | 384 | THR |
| 1 | C | 386 | SER |
| 1 | C | 387 | THR |
| 1 | C | 390 | SER |
| 1 | C | 393 | LYS |
| 1 | C | 398 | HIS |

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| Mol | Chain | Res | Type |
|------------|--------------|------------|-------------|
| 1 | C | 414 | SER |
| 1 | C | 440 | SER |
| 1 | C | 450 | ARG |
| 1 | C | 457 | ARG |
| 1 | C | 468 | ARG |
| 1 | C | 475 | ASP |
| 1 | D | 39 | ASP |
| 1 | D | 43 | SER |
| 1 | D | 44 | SER |
| 1 | D | 49 | ARG |
| 1 | D | 50 | ASN |
| 1 | D | 56 | ASN |
| 1 | D | 62 | SER |
| 1 | D | 63 | PHE |
| 1 | D | 64 | VAL |
| 1 | D | 69 | LYS |
| 1 | D | 73 | ASN |
| 1 | D | 96 | ASP |
| 1 | D | 101 | ARG |
| 1 | D | 108 | GLN |
| 1 | D | 126 | ARG |
| 1 | D | 130 | ASN |
| 1 | D | 131 | ILE |
| 1 | D | 132 | ASN |
| 1 | D | 163 | SER |
| 1 | D | 171 | SER |
| 1 | D | 194 | SER |
| 1 | D | 197 | ASN |
| 1 | D | 218 | GLU |
| 1 | D | 232 | THR |
| 1 | D | 239 | LYS |
| 1 | D | 243 | ASP |
| 1 | D | 266 | LEU |
| 1 | D | 286 | SER |
| 1 | D | 299 | LYS |
| 1 | D | 304 | LYS |
| 1 | D | 305 | ASN |
| 1 | D | 306 | SER |
| 1 | D | 308 | GLN |
| 1 | D | 311 | ASP |
| 1 | D | 328 | GLN |
| 1 | D | 330 | HIS |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | D | 346 | LYS |
| 1 | D | 370 | ASN |
| 1 | D | 375 | VAL |
| 1 | D | 383 | GLU |
| 1 | D | 393 | LYS |
| 1 | D | 398 | HIS |
| 1 | D | 414 | SER |
| 1 | D | 440 | SER |
| 1 | D | 450 | ARG |
| 1 | D | 457 | ARG |
| 1 | D | 468 | ARG |
| 1 | D | 475 | ASP |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (55) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | A | 81 | GLN |
| 1 | A | 108 | GLN |
| 1 | A | 132 | ASN |
| 1 | A | 197 | ASN |
| 1 | A | 217 | ASN |
| 1 | A | 240 | ASN |
| 1 | A | 307 | GLN |
| 1 | A | 328 | GLN |
| 1 | A | 331 | ASN |
| 1 | A | 395 | ASN |
| 1 | A | 420 | ASN |
| 1 | A | 483 | ASN |
| 1 | A | 500 | ASN |
| 1 | B | 73 | ASN |
| 1 | B | 108 | GLN |
| 1 | B | 132 | ASN |
| 1 | B | 197 | ASN |
| 1 | B | 217 | ASN |
| 1 | B | 240 | ASN |
| 1 | B | 308 | GLN |
| 1 | B | 395 | ASN |
| 1 | B | 420 | ASN |
| 1 | B | 483 | ASN |
| 1 | B | 500 | ASN |
| 1 | C | 48 | ASN |
| 1 | C | 99 | ASN |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | C | 108 | GLN |
| 1 | C | 117 | ASN |
| 1 | C | 197 | ASN |
| 1 | C | 205 | ASN |
| 1 | C | 217 | ASN |
| 1 | C | 308 | GLN |
| 1 | C | 315 | ASN |
| 1 | C | 331 | ASN |
| 1 | C | 370 | ASN |
| 1 | C | 377 | ASN |
| 1 | C | 395 | ASN |
| 1 | C | 420 | ASN |
| 1 | C | 483 | ASN |
| 1 | D | 56 | ASN |
| 1 | D | 73 | ASN |
| 1 | D | 99 | ASN |
| 1 | D | 108 | GLN |
| 1 | D | 117 | ASN |
| 1 | D | 180 | GLN |
| 1 | D | 197 | ASN |
| 1 | D | 205 | ASN |
| 1 | D | 217 | ASN |
| 1 | D | 308 | GLN |
| 1 | D | 330 | HIS |
| 1 | D | 395 | ASN |
| 1 | D | 420 | ASN |
| 1 | D | 451 | ASN |
| 1 | D | 483 | ASN |

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data [i](#)

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

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates [i](#)

EDS was not executed - this section is therefore empty.

6.4 Ligands [i](#)

EDS was not executed - this section is therefore empty.

6.5 Other polymers [i](#)

EDS was not executed - this section is therefore empty.