



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 12, 2024 – 04:20 AM EDT

PDB ID : 1G59
Title : GLUTAMYL-TRNA SYNTHETASE COMPLEXED WITH TRNA(GLU).
Authors : Sekine, S.; Nureki, O.; Shimada, A.; Vassylyev, D.G.; Yokoyama, S.; RIKEN
Structural Genomics/Proteomics Initiative (RSGI)
Deposited on : 2000-10-31
Resolution : 2.40 Å(reported)

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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
Xtriage (Phenix) : 1.20.1
EDS : 2.36.2
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) : 2.36.2

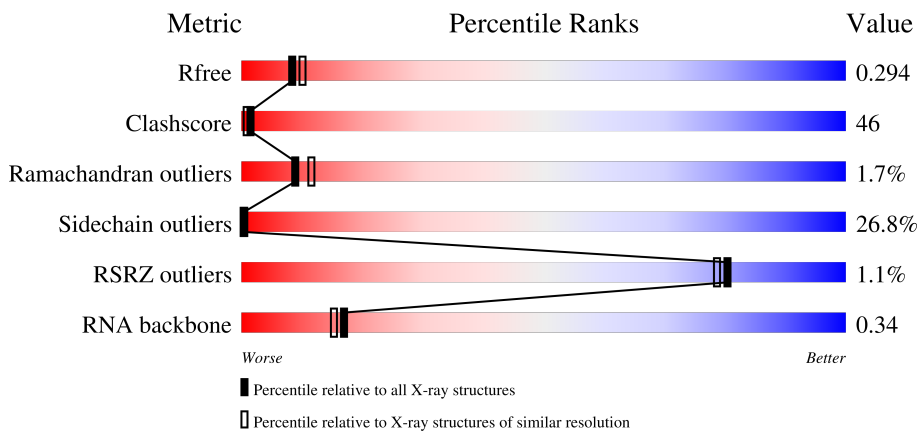
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.40 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 | 3907 (2.40-2.40) |
| Clashscore | 141614 | 4398 (2.40-2.40) |
| Ramachandran outliers | 138981 | 4318 (2.40-2.40) |
| Sidechain outliers | 138945 | 4319 (2.40-2.40) |
| RSRZ outliers | 127900 | 3811 (2.40-2.40) |
| RNA backbone | 3102 | 1174 (2.80-2.00) |

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments 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 $\leq 5\%$. 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 | B | 75 | |
| 1 | D | 75 | |
| 2 | A | 468 | |
| 2 | C | 468 | |

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 11092 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 RNA chain called TRNA(GLU).

| Mol | Chain | Residues | Atoms | | | | | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|---------|-------|
| | | | Total | C | N | O | P | | | |
| 1 | B | 75 | 1597 | 711 | 284 | 527 | 75 | 0 | 0 | 0 |
| 1 | D | 75 | 1597 | 711 | 284 | 527 | 75 | 0 | 0 | 0 |

- Molecule 2 is a protein called GLUTAMYL-TRNA SYNTHETASE.

| Mol | Chain | Residues | Atoms | | | | | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|---------|-------|
| | | | Total | C | N | O | S | | | |
| 2 | A | 468 | 3813 | 2443 | 674 | 688 | 8 | 0 | 0 | 0 |
| 2 | C | 468 | 3813 | 2443 | 674 | 688 | 8 | 0 | 0 | 0 |

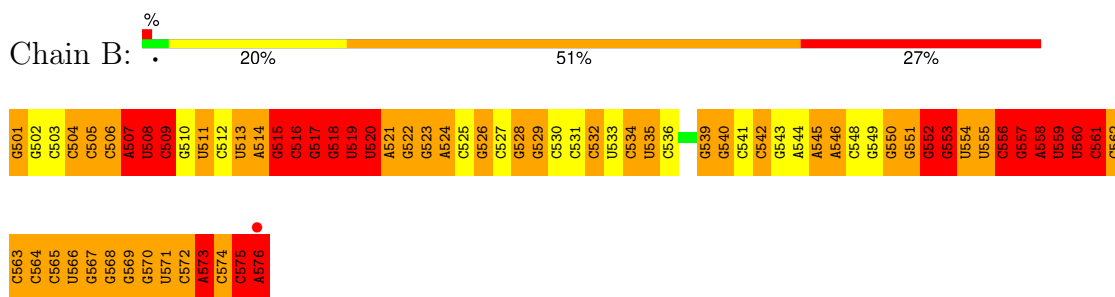
- Molecule 3 is water.

| Mol | Chain | Residues | Atoms | | ZeroOcc | AltConf |
|-----|-------|----------|--------------|----------|---------|---------|
| 3 | B | 34 | Total 34 | O 34 | 0 | 0 |
| 3 | D | 39 | Total 39 | O 39 | 0 | 0 |
| 3 | A | 107 | Total 107 | O 107 | 0 | 0 |
| 3 | C | 92 | Total 92 | O 92 | 0 | 0 |

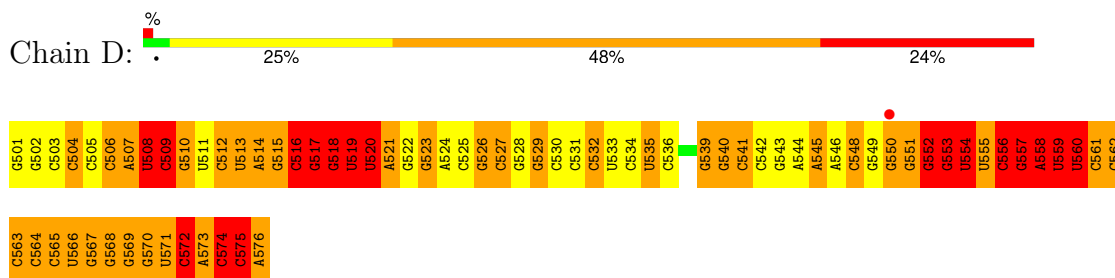
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

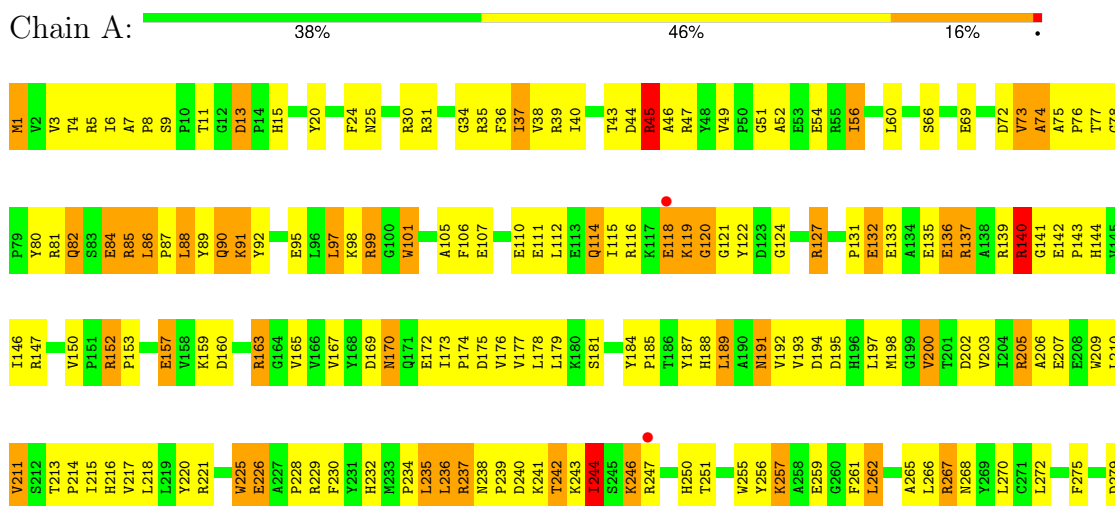
- Molecule 1: TRNA(GLU)

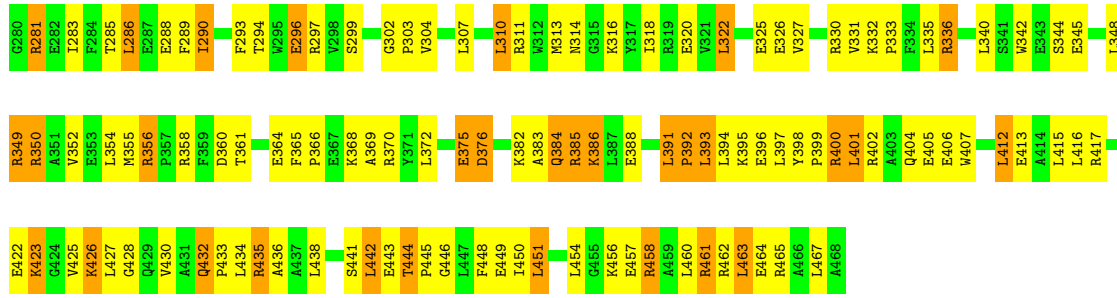


- Molecule 1: TRNA(GLU)

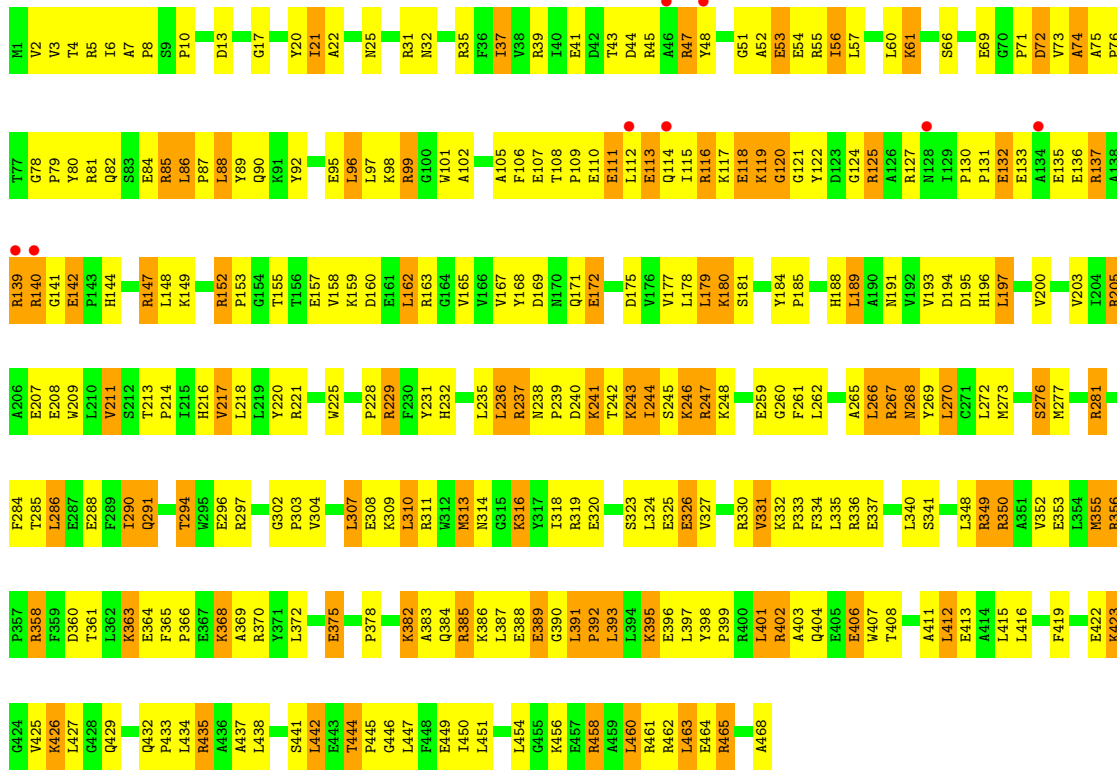


- Molecule 2: GLUTAMYL-TRNA SYNTHETASE





• Molecule 2: GLUTAMYL-TRNA SYNTHETASE



4 Data and refinement statistics

| Property | Value | Source |
|---|---|------------------|
| Space group | C 2 2 21 | Depositor |
| Cell constants a, b, c, α , β , γ | 109.98Å 218.67Å 134.67Å 90.00° 90.00° 90.00° | Depositor |
| Resolution (Å) | 30.00 – 2.40 49.13 – 2.40 | Depositor EDS |
| % Data completeness (in resolution range) | 88.4 (30.00-2.40) 88.4 (49.13-2.40) | Depositor EDS |
| R_{merge} | 0.11 | Depositor |
| R_{sym} | 0.11 | Depositor |
| $\langle I/\sigma(I) \rangle$ ¹ | 4437.30 (at 2.39Å) | Xtrriage |
| Refinement program | X-PLOR 3.1 | Depositor |
| R, R_{free} | 0.218 , 0.298 0.219 , 0.294 | Depositor DCC |
| R_{free} test set | 2847 reflections (5.06%) | wwPDB-VP |
| Wilson B-factor (Å ²) | 29.2 | Xtrriage |
| Anisotropy | 0.388 | Xtrriage |
| Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²) | 0.32 , 71.1 | EDS |
| L-test for twinning ² | $\langle L \rangle = 0.43$, $\langle L^2 \rangle = 0.26$ | Xtrriage |
| Estimated twinning fraction | No twinning to report. | Xtrriage |
| F_o, F_c correlation | 0.92 | EDS |
| Total number of atoms | 11092 | wwPDB-VP |
| Average B, all atoms (Å ²) | 36.0 | wwPDB-VP |

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 15.32% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality i

5.1 Standard geometry i

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 | B | 1.70 | 18/1782 (1.0%) | 1.82 | 53/2774 (1.9%) |
| 1 | D | 1.78 | 25/1782 (1.4%) | 1.84 | 54/2774 (1.9%) |
| 2 | A | 0.52 | 0/3908 | 0.67 | 1/5292 (0.0%) |
| 2 | C | 0.49 | 0/3908 | 0.64 | 0/5292 |
| All | All | 1.06 | 43/11380 (0.4%) | 1.20 | 108/16132 (0.7%) |

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 1 | D | 0 | 1 |
| 2 | C | 0 | 1 |
| All | All | 0 | 2 |

All (43) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|---------|-------|-------------|----------|
| 1 | D | 557 | G | P-O5' | 8.93 | 1.68 | 1.59 |
| 1 | B | 557 | G | P-O5' | 6.88 | 1.66 | 1.59 |
| 1 | B | 526 | G | C3'-C2' | -6.76 | 1.45 | 1.52 |
| 1 | D | 549 | G | C3'-C2' | -6.44 | 1.45 | 1.52 |
| 1 | B | 555 | U | C3'-C2' | -6.19 | 1.46 | 1.52 |
| 1 | B | 536 | C | C3'-C2' | -6.03 | 1.46 | 1.52 |
| 1 | B | 549 | G | C3'-C2' | -5.97 | 1.46 | 1.52 |
| 1 | D | 535 | U | C3'-C2' | -5.97 | 1.46 | 1.52 |
| 1 | D | 514 | A | C3'-C2' | -5.88 | 1.46 | 1.52 |
| 1 | B | 522 | G | C3'-C2' | -5.82 | 1.46 | 1.52 |
| 1 | B | 517 | G | O3'-P | 5.81 | 1.68 | 1.61 |
| 1 | D | 518 | G | C5'-C4' | 5.81 | 1.58 | 1.51 |
| 1 | D | 522 | G | C3'-C2' | -5.74 | 1.46 | 1.52 |
| 1 | D | 512 | C | C3'-C2' | -5.69 | 1.46 | 1.52 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|---------|-------|-------------|----------|
| 1 | B | 505 | C | P-O5' | 5.65 | 1.65 | 1.59 |
| 1 | B | 511 | U | C3'-C2' | -5.63 | 1.46 | 1.52 |
| 1 | B | 523 | G | C3'-C2' | -5.56 | 1.46 | 1.52 |
| 1 | B | 518 | G | P-O5' | 5.54 | 1.65 | 1.59 |
| 1 | D | 555 | U | C3'-C2' | -5.54 | 1.46 | 1.52 |
| 1 | D | 504 | C | C3'-C2' | -5.54 | 1.46 | 1.52 |
| 1 | B | 504 | C | C3'-C2' | -5.51 | 1.46 | 1.52 |
| 1 | B | 540 | G | C3'-C2' | -5.51 | 1.46 | 1.52 |
| 1 | B | 556 | C | C4'-C3' | -5.50 | 1.47 | 1.52 |
| 1 | B | 524 | A | C3'-C2' | -5.47 | 1.46 | 1.52 |
| 1 | D | 557 | G | O3'-P | 5.42 | 1.67 | 1.61 |
| 1 | D | 558 | A | O3'-P | 5.41 | 1.67 | 1.61 |
| 1 | B | 535 | U | C3'-C2' | -5.40 | 1.46 | 1.52 |
| 1 | D | 541 | C | C3'-C2' | -5.38 | 1.46 | 1.52 |
| 1 | D | 568 | G | C3'-C2' | -5.36 | 1.46 | 1.52 |
| 1 | D | 554 | U | C3'-C2' | -5.33 | 1.46 | 1.52 |
| 1 | D | 536 | C | C3'-C2' | -5.29 | 1.47 | 1.52 |
| 1 | D | 508 | U | C3'-C2' | -5.23 | 1.47 | 1.52 |
| 1 | D | 555 | U | P-O5' | 5.22 | 1.65 | 1.59 |
| 1 | D | 556 | C | C4-C5 | 5.17 | 1.47 | 1.43 |
| 1 | D | 526 | G | C3'-C2' | -5.17 | 1.47 | 1.52 |
| 1 | D | 506 | C | C3'-C2' | -5.17 | 1.47 | 1.52 |
| 1 | D | 545 | A | C3'-C2' | -5.16 | 1.47 | 1.52 |
| 1 | D | 510 | G | C3'-C2' | -5.11 | 1.47 | 1.52 |
| 1 | B | 535 | U | C4'-C3' | -5.11 | 1.47 | 1.52 |
| 1 | B | 569 | G | C3'-C2' | -5.05 | 1.47 | 1.52 |
| 1 | D | 527 | C | C3'-C2' | -5.05 | 1.47 | 1.52 |
| 1 | D | 558 | A | C3'-O3' | 5.04 | 1.49 | 1.42 |
| 1 | D | 528 | G | C4'-C3' | -5.02 | 1.47 | 1.52 |

All (108) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-------------|------|-------------|----------|
| 1 | D | 556 | C | C3'-C2'-C1' | 6.89 | 107.02 | 101.50 |
| 1 | D | 576 | A | C3'-C2'-C1' | 6.67 | 106.83 | 101.50 |
| 1 | D | 557 | G | C3'-C2'-C1' | 6.64 | 106.81 | 101.50 |
| 1 | D | 558 | A | C3'-C2'-C1' | 6.49 | 106.69 | 101.50 |
| 1 | B | 576 | A | C3'-C2'-C1' | 6.41 | 106.63 | 101.50 |
| 1 | D | 575 | C | C3'-C2'-C1' | 6.41 | 106.63 | 101.50 |
| 1 | D | 572 | C | C3'-C2'-C1' | 6.37 | 106.60 | 101.50 |
| 1 | B | 515 | G | C3'-C2'-C1' | 6.37 | 106.59 | 101.50 |
| 1 | D | 515 | G | C3'-C2'-C1' | 6.28 | 106.52 | 101.50 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-------------|-------|-------------|----------|
| 1 | B | 556 | C | C3'-C2'-C1' | 6.26 | 106.51 | 101.50 |
| 1 | D | 560 | U | C3'-C2'-C1' | 6.25 | 106.50 | 101.50 |
| 1 | B | 517 | G | C3'-C2'-C1' | 6.25 | 106.50 | 101.50 |
| 1 | B | 518 | G | C3'-C2'-C1' | 6.24 | 106.49 | 101.50 |
| 1 | D | 518 | G | C3'-C2'-C1' | 6.22 | 106.47 | 101.50 |
| 1 | D | 557 | G | N9-C1'-C2' | -6.22 | 105.16 | 112.00 |
| 1 | B | 575 | C | C3'-C2'-C1' | 6.14 | 106.41 | 101.50 |
| 1 | B | 573 | A | C3'-C2'-C1' | 6.08 | 106.36 | 101.50 |
| 1 | B | 558 | A | C3'-C2'-C1' | 6.05 | 106.34 | 101.50 |
| 1 | D | 520 | U | C3'-C2'-C1' | 6.03 | 106.32 | 101.50 |
| 1 | D | 517 | G | C3'-C2'-C1' | 5.98 | 106.29 | 101.50 |
| 1 | D | 559 | U | C3'-C2'-C1' | 5.91 | 106.23 | 101.50 |
| 1 | D | 569 | G | C3'-C2'-C1' | 5.87 | 106.20 | 101.50 |
| 1 | B | 563 | C | C3'-C2'-C1' | 5.84 | 106.17 | 101.50 |
| 1 | D | 563 | C | C3'-C2'-C1' | 5.83 | 106.17 | 101.50 |
| 1 | D | 532 | C | C3'-C2'-C1' | 5.81 | 106.15 | 101.50 |
| 1 | D | 574 | C | C3'-C2'-C1' | 5.81 | 106.15 | 101.50 |
| 1 | B | 520 | U | C3'-C2'-C1' | 5.80 | 106.14 | 101.50 |
| 1 | D | 571 | U | C3'-C2'-C1' | 5.78 | 106.13 | 101.50 |
| 1 | D | 570 | G | C3'-C2'-C1' | 5.77 | 106.12 | 101.50 |
| 1 | D | 506 | C | C3'-C2'-C1' | 5.76 | 106.11 | 101.50 |
| 1 | D | 541 | C | O4'-C1'-N1 | 5.75 | 112.80 | 108.20 |
| 1 | B | 533 | U | C3'-C2'-C1' | 5.74 | 106.09 | 101.50 |
| 1 | B | 529 | G | O4'-C1'-N9 | 5.74 | 112.79 | 108.20 |
| 1 | D | 567 | G | C3'-C2'-C1' | 5.74 | 106.09 | 101.50 |
| 1 | B | 507 | A | C3'-C2'-C1' | 5.72 | 106.07 | 101.50 |
| 1 | D | 552 | G | C3'-C2'-C1' | 5.67 | 106.04 | 101.50 |
| 1 | D | 573 | A | C3'-C2'-C1' | 5.65 | 106.02 | 101.50 |
| 1 | D | 571 | U | O4'-C1'-N1 | 5.62 | 112.70 | 108.20 |
| 1 | D | 529 | G | O4'-C1'-N9 | 5.62 | 112.70 | 108.20 |
| 1 | D | 519 | U | C3'-C2'-C1' | 5.59 | 105.97 | 101.50 |
| 1 | D | 514 | A | C3'-C2'-C1' | 5.57 | 105.96 | 101.50 |
| 1 | B | 519 | U | C3'-C2'-C1' | 5.57 | 105.95 | 101.50 |
| 1 | D | 564 | C | C3'-C2'-C1' | 5.53 | 105.92 | 101.50 |
| 1 | B | 506 | C | C3'-C2'-C1' | 5.52 | 105.92 | 101.50 |
| 1 | B | 532 | C | C3'-C2'-C1' | 5.51 | 105.91 | 101.50 |
| 1 | B | 560 | U | O4'-C1'-N1 | 5.50 | 112.60 | 108.20 |
| 1 | D | 561 | C | C3'-C2'-C1' | 5.50 | 105.90 | 101.50 |
| 1 | D | 545 | A | O4'-C1'-N9 | 5.47 | 112.58 | 108.20 |
| 1 | B | 559 | U | C3'-C2'-C1' | 5.44 | 105.85 | 101.50 |
| 1 | B | 566 | U | C3'-C2'-C1' | 5.44 | 105.85 | 101.50 |
| 1 | B | 540 | G | C3'-C2'-C1' | 5.42 | 105.84 | 101.50 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-------------|-------|-------------|----------|
| 1 | D | 550 | G | C3'-C2'-C1' | 5.42 | 105.83 | 101.50 |
| 1 | B | 539 | G | C3'-C2'-C1' | 5.42 | 105.83 | 101.50 |
| 1 | B | 545 | A | N9-C1'-C2' | -5.41 | 106.05 | 112.00 |
| 1 | D | 553 | G | C3'-C2'-C1' | 5.41 | 105.83 | 101.50 |
| 1 | D | 558 | A | P-O3'-C3' | 5.38 | 126.16 | 119.70 |
| 1 | B | 560 | U | C3'-C2'-C1' | 5.38 | 105.80 | 101.50 |
| 1 | D | 568 | G | C3'-C2'-C1' | 5.35 | 105.78 | 101.50 |
| 1 | D | 507 | A | C3'-C2'-C1' | 5.35 | 105.78 | 101.50 |
| 1 | B | 568 | G | C3'-C2'-C1' | 5.34 | 105.77 | 101.50 |
| 1 | B | 551 | G | C3'-C2'-C1' | 5.33 | 105.77 | 101.50 |
| 1 | B | 513 | U | O4'-C1'-N1 | 5.33 | 112.47 | 108.20 |
| 1 | B | 552 | G | C3'-C2'-C1' | 5.33 | 105.76 | 101.50 |
| 1 | D | 562 | C | C3'-C2'-C1' | 5.33 | 105.76 | 101.50 |
| 1 | D | 504 | C | O4'-C1'-N1 | 5.33 | 112.46 | 108.20 |
| 1 | B | 562 | C | C3'-C2'-C1' | 5.31 | 105.75 | 101.50 |
| 1 | D | 504 | C | C3'-C2'-C1' | 5.31 | 105.75 | 101.50 |
| 1 | D | 533 | U | C3'-C2'-C1' | 5.29 | 105.73 | 101.50 |
| 1 | B | 567 | G | C3'-C2'-C1' | 5.29 | 105.73 | 101.50 |
| 1 | D | 509 | C | C3'-C2'-C1' | 5.29 | 105.73 | 101.50 |
| 1 | B | 570 | G | C3'-C2'-C1' | 5.28 | 105.72 | 101.50 |
| 1 | D | 550 | G | O4'-C1'-N9 | 5.27 | 112.41 | 108.20 |
| 1 | B | 508 | U | C3'-C2'-C1' | 5.27 | 105.71 | 101.50 |
| 1 | B | 516 | C | P-O3'-C3' | 5.26 | 126.02 | 119.70 |
| 1 | B | 571 | U | C3'-C2'-C1' | 5.26 | 105.71 | 101.50 |
| 1 | D | 526 | G | O4'-C1'-N9 | 5.26 | 112.41 | 108.20 |
| 1 | B | 528 | G | O4'-C1'-N9 | 5.26 | 112.41 | 108.20 |
| 1 | D | 551 | G | C3'-C2'-C1' | 5.25 | 105.70 | 101.50 |
| 1 | B | 504 | C | C3'-C2'-C1' | 5.24 | 105.69 | 101.50 |
| 1 | B | 555 | U | O4'-C1'-N1 | 5.24 | 112.39 | 108.20 |
| 1 | B | 514 | A | C3'-C2'-C1' | 5.23 | 105.69 | 101.50 |
| 1 | D | 560 | U | O4'-C1'-N1 | 5.23 | 112.39 | 108.20 |
| 1 | B | 553 | G | C3'-C2'-C1' | 5.23 | 105.68 | 101.50 |
| 1 | B | 545 | A | O4'-C1'-N9 | 5.21 | 112.37 | 108.20 |
| 1 | B | 564 | C | C3'-C2'-C1' | 5.21 | 105.67 | 101.50 |
| 1 | B | 546 | A | C3'-C2'-C1' | 5.18 | 105.65 | 101.50 |
| 1 | D | 539 | G | C3'-C2'-C1' | 5.18 | 105.64 | 101.50 |
| 1 | D | 523 | G | C3'-C2'-C1' | 5.17 | 105.64 | 101.50 |
| 1 | B | 550 | G | C3'-C2'-C1' | 5.17 | 105.64 | 101.50 |
| 1 | D | 565 | C | C3'-C2'-C1' | 5.16 | 105.63 | 101.50 |
| 1 | B | 501 | G | C3'-C2'-C1' | 5.15 | 105.62 | 101.50 |
| 1 | B | 524 | A | O4'-C1'-N9 | 5.15 | 112.32 | 108.20 |
| 1 | D | 519 | U | O4'-C1'-N1 | 5.12 | 112.30 | 108.20 |

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| Mol | Chain | Res | Type | Atoms | Z | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-------------|-------|-------------|----------|
| 2 | A | 322 | LEU | CA-CB-CG | 5.12 | 127.08 | 115.30 |
| 1 | D | 566 | U | C3'-C2'-C1' | 5.12 | 105.59 | 101.50 |
| 1 | D | 545 | A | N9-C1'-C2' | -5.11 | 106.38 | 112.00 |
| 1 | D | 508 | U | C3'-C2'-C1' | 5.11 | 105.59 | 101.50 |
| 1 | D | 540 | G | C3'-C2'-C1' | 5.09 | 105.57 | 101.50 |
| 1 | B | 561 | C | C3'-C2'-C1' | 5.09 | 105.57 | 101.50 |
| 1 | B | 523 | G | C3'-C2'-C1' | 5.08 | 105.56 | 101.50 |
| 1 | B | 504 | C | O4'-C1'-N1 | 5.07 | 112.25 | 108.20 |
| 1 | B | 572 | C | C3'-C2'-C1' | 5.06 | 105.55 | 101.50 |
| 1 | D | 516 | C | C3'-C2'-C1' | 5.05 | 105.54 | 101.50 |
| 1 | B | 542 | C | O4'-C1'-N1 | 5.03 | 112.22 | 108.20 |
| 1 | B | 509 | C | C3'-C2'-C1' | 5.03 | 105.52 | 101.50 |
| 1 | B | 513 | U | C3'-C2'-C1' | 5.02 | 105.52 | 101.50 |
| 1 | B | 565 | C | C3'-C2'-C1' | 5.02 | 105.52 | 101.50 |
| 1 | B | 523 | G | O4'-C1'-N9 | 5.02 | 112.22 | 108.20 |

There are no chirality outliers.

All (2) planarity outliers are listed below:

| Mol | Chain | Res | Type | Group |
|-----|-------|-----|------|-----------|
| 2 | C | 269 | TYR | Sidechain |
| 1 | D | 557 | G | Sidechain |

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 | B | 1597 | 0 | 813 | 140 | 0 |
| 1 | D | 1597 | 0 | 813 | 159 | 0 |
| 2 | A | 3813 | 0 | 3822 | 314 | 0 |
| 2 | C | 3813 | 0 | 3822 | 339 | 0 |
| 3 | A | 107 | 0 | 0 | 15 | 0 |
| 3 | B | 34 | 0 | 0 | 1 | 0 |
| 3 | C | 92 | 0 | 0 | 8 | 0 |
| 3 | D | 39 | 0 | 0 | 4 | 0 |
| All | All | 11092 | 0 | 9270 | 929 | 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 46.

All (929) 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:D:517:G:N2 | 1:D:557:G:H2' | 1.47 | 1.28 |
| 1:B:575:C:H5'' | 2:A:47:ARG:HH21 | 1.08 | 1.16 |
| 2:C:37:ILE:HG23 | 2:C:69:GLU:HB2 | 1.33 | 1.10 |
| 2:A:445:PRO:HG2 | 2:A:450:ILE:HD11 | 1.11 | 1.09 |
| 2:A:4:THR:HB | 2:A:25:ASN:HD22 | 1.21 | 1.02 |
| 2:C:4:THR:HB | 2:C:25:ASN:HD22 | 1.23 | 1.00 |
| 2:C:240:ASP:OD1 | 2:C:242:THR:HG22 | 1.61 | 0.99 |
| 2:C:262:LEU:H | 2:C:314:ASN:HD21 | 1.03 | 0.99 |
| 2:C:267:ARG:HD2 | 2:C:286:LEU:HG | 1.43 | 0.99 |
| 2:A:262:LEU:H | 2:A:314:ASN:HD21 | 1.05 | 0.98 |
| 1:D:563:C:H2' | 1:D:564:C:C6 | 1.99 | 0.98 |
| 2:A:112:LEU:HD23 | 2:A:115:ILE:HD12 | 1.41 | 0.97 |
| 1:D:574:C:H4' | 1:D:575:C:OP1 | 1.62 | 0.96 |
| 1:B:550:G:O2' | 1:B:551:G:H5' | 1.66 | 0.95 |
| 2:A:460:LEU:O | 2:A:464:GLU:HG3 | 1.66 | 0.94 |
| 2:A:77:THR:HG21 | 2:A:198:MET:HA | 1.51 | 0.93 |
| 2:C:130:PRO:HG2 | 2:C:133:GLU:HB2 | 1.47 | 0.93 |
| 2:A:1:MET:HE3 | 2:A:35:ARG:HD3 | 1.50 | 0.93 |
| 1:D:535:U:H4' | 2:C:432:GLN:HE22 | 1.34 | 0.93 |
| 1:B:556:C:C2' | 1:B:557:G:H5'' | 1.99 | 0.92 |
| 1:D:550:G:O2' | 1:D:551:G:H5' | 1.67 | 0.92 |
| 2:A:445:PRO:HG2 | 2:A:450:ILE:CD1 | 2.00 | 0.92 |
| 2:C:238:ASN:HD22 | 2:C:242:THR:HG23 | 1.34 | 0.92 |
| 1:B:557:G:H5' | 1:B:557:G:H8 | 1.33 | 0.91 |
| 2:A:375:GLU:HG3 | 2:A:465:ARG:NH1 | 1.86 | 0.91 |
| 2:A:205:ARG:HD3 | 2:A:232:HIS:CE1 | 2.06 | 0.90 |
| 1:D:556:C:H2' | 1:D:556:C:O2 | 1.72 | 0.89 |
| 2:A:205:ARG:HD3 | 2:A:232:HIS:HE1 | 1.38 | 0.89 |
| 2:A:294:THR:HG22 | 2:A:296:GLU:H | 1.37 | 0.89 |
| 2:A:111:GLU:O | 2:A:115:ILE:HG13 | 1.72 | 0.88 |
| 2:C:137:ARG:O | 2:C:142:GLU:HB2 | 1.72 | 0.88 |
| 2:C:75:ALA:HB3 | 2:C:80:TYR:CZ | 2.09 | 0.88 |
| 2:A:404:GLN:HG3 | 2:A:415:LEU:HD22 | 1.54 | 0.88 |
| 2:A:153:PRO:HD2 | 3:A:506:HOH:O | 1.74 | 0.88 |
| 2:A:205:ARG:HG3 | 2:A:209:TRP:HD1 | 1.39 | 0.88 |
| 1:B:563:C:H2' | 1:B:564:C:C6 | 2.09 | 0.86 |
| 2:C:307:LEU:O | 2:C:311:ARG:HG3 | 1.74 | 0.86 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:C:369:ALA:HB1 | 2:C:372:LEU:HD12 | 1.56 | 0.85 |
| 2:A:398:TYR:HD1 | 2:A:463:LEU:HD11 | 1.41 | 0.85 |
| 1:B:517:G:N2 | 1:B:557:G:H2' | 1.92 | 0.84 |
| 2:A:349:ARG:HG2 | 2:A:349:ARG:HH21 | 1.41 | 0.84 |
| 2:A:444:THR:HG23 | 2:A:445:PRO:HD2 | 1.57 | 0.84 |
| 2:A:384:GLN:HE21 | 2:A:388:GLU:HG3 | 1.41 | 0.84 |
| 1:D:564:C:H2' | 1:D:565:C:H6 | 1.43 | 0.83 |
| 2:C:3:VAL:CG1 | 2:C:37:ILE:HD11 | 2.08 | 0.83 |
| 2:C:463:LEU:HD23 | 2:C:463:LEU:C | 1.99 | 0.82 |
| 2:A:404:GLN:CG | 2:A:415:LEU:HD22 | 2.10 | 0.82 |
| 1:B:556:C:H2' | 1:B:557:G:H5'' | 1.61 | 0.82 |
| 2:A:407:TRP:CE2 | 2:A:456:LYS:HA | 2.14 | 0.81 |
| 2:A:152:ARG:HA | 2:A:152:ARG:HH11 | 1.44 | 0.81 |
| 1:D:563:C:H2' | 1:D:564:C:H6 | 1.40 | 0.81 |
| 1:D:564:C:H2' | 1:D:565:C:C6 | 2.16 | 0.81 |
| 2:A:73:VAL:HG12 | 2:A:73:VAL:O | 1.81 | 0.81 |
| 2:C:237:ARG:NH1 | 2:C:302:GLY:HA3 | 1.96 | 0.81 |
| 1:D:565:C:H2' | 1:D:566:U:C6 | 2.16 | 0.80 |
| 2:A:333:PRO:HD3 | 3:A:493:HOH:O | 1.81 | 0.80 |
| 2:C:205:ARG:HG3 | 2:C:209:TRP:HD1 | 1.46 | 0.80 |
| 1:D:535:U:C4' | 2:C:432:GLN:HE22 | 1.94 | 0.80 |
| 2:C:137:ARG:HH11 | 2:C:137:ARG:HB3 | 1.46 | 0.80 |
| 2:C:325:GLU:HG3 | 2:C:349:ARG:HE | 1.43 | 0.80 |
| 1:D:517:G:H21 | 1:D:557:G:H2' | 1.46 | 0.80 |
| 1:D:555:U:H5'' | 3:D:247:HOH:O | 1.82 | 0.80 |
| 2:C:95:GLU:O | 2:C:99:ARG:HB2 | 1.82 | 0.80 |
| 2:A:391:LEU:HD23 | 2:A:395:LYS:HE3 | 1.63 | 0.79 |
| 2:C:157:GLU:HG2 | 2:C:167:VAL:HG22 | 1.63 | 0.79 |
| 2:A:267:ARG:HD3 | 3:A:529:HOH:O | 1.82 | 0.79 |
| 2:A:205:ARG:HG3 | 2:A:209:TRP:CD1 | 2.18 | 0.79 |
| 1:B:570:G:H2' | 1:B:571:U:C6 | 2.18 | 0.79 |
| 2:A:30:ARG:HB3 | 2:A:290:ILE:HD13 | 1.65 | 0.78 |
| 2:C:262:LEU:N | 2:C:314:ASN:HD21 | 1.81 | 0.78 |
| 1:D:553:G:C2' | 1:D:554:U:H5' | 2.13 | 0.78 |
| 2:A:397:LEU:HG | 2:A:401:LEU:HD21 | 1.64 | 0.78 |
| 1:B:566:U:O2' | 1:B:567:G:H5' | 1.82 | 0.78 |
| 2:A:226:GLU:HA | 3:A:547:HOH:O | 1.84 | 0.77 |
| 1:D:517:G:N2 | 1:D:557:G:C2' | 2.39 | 0.77 |
| 2:C:205:ARG:HD3 | 2:C:232:HIS:CE1 | 2.18 | 0.77 |
| 2:A:445:PRO:CG | 2:A:450:ILE:HD11 | 2.06 | 0.77 |
| 2:C:2:VAL:HG21 | 2:C:32:ASN:HD22 | 1.48 | 0.77 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:262:LEU:H | 2:A:314:ASN:ND2 | 1.81 | 0.77 |
| 1:B:562:C:O2' | 1:B:563:C:H5' | 1.84 | 0.77 |
| 1:D:519:U:H2' | 1:D:521:A:OP2 | 1.84 | 0.77 |
| 1:D:512:C:OP1 | 2:C:304:VAL:HG23 | 1.84 | 0.76 |
| 1:D:556:C:H5' | 3:D:255:HOH:O | 1.84 | 0.76 |
| 2:A:236:LEU:O | 2:A:244:ILE:HG13 | 1.85 | 0.76 |
| 2:C:385:ARG:O | 2:C:389:GLU:HB2 | 1.85 | 0.76 |
| 2:C:454:LEU:O | 2:C:458:ARG:HD3 | 1.84 | 0.76 |
| 1:B:575:C:H5'' | 2:A:47:ARG:NH2 | 1.94 | 0.76 |
| 2:A:261:PHE:CE2 | 2:A:310:LEU:HD13 | 2.21 | 0.76 |
| 2:C:169:ASP:O | 2:C:172:GLU:HG3 | 1.85 | 0.76 |
| 1:B:565:C:O2' | 1:B:566:U:H5' | 1.85 | 0.76 |
| 2:C:137:ARG:HH11 | 2:C:137:ARG:CB | 1.99 | 0.76 |
| 1:B:564:C:H2' | 1:B:565:C:C6 | 2.20 | 0.75 |
| 2:A:95:GLU:O | 2:A:99:ARG:HB2 | 1.87 | 0.75 |
| 2:A:454:LEU:HD23 | 2:A:458:ARG:HE | 1.52 | 0.75 |
| 1:B:558:A:H4' | 1:B:559:U:OP1 | 1.85 | 0.75 |
| 1:B:564:C:H2' | 1:B:565:C:H6 | 1.51 | 0.75 |
| 1:D:567:G:O2' | 1:D:568:G:H5' | 1.87 | 0.74 |
| 1:B:563:C:H2' | 1:B:564:C:H6 | 1.52 | 0.74 |
| 2:C:236:LEU:HB2 | 2:C:244:ILE:HD11 | 1.67 | 0.74 |
| 2:C:262:LEU:HD22 | 2:C:330:ARG:HH11 | 1.50 | 0.74 |
| 2:A:163:ARG:NH2 | 2:A:232:HIS:O | 2.20 | 0.74 |
| 2:C:393:LEU:HD22 | 2:C:419:PHE:CE1 | 2.22 | 0.73 |
| 2:A:262:LEU:N | 2:A:314:ASN:HD21 | 1.83 | 0.73 |
| 2:A:383:ALA:HA | 2:A:442:LEU:HD22 | 1.70 | 0.73 |
| 1:B:517:G:O2' | 1:B:557:G:N2 | 2.20 | 0.73 |
| 1:B:569:G:O2' | 1:B:570:G:H5' | 1.88 | 0.73 |
| 2:C:163:ARG:NH2 | 2:C:232:HIS:O | 2.14 | 0.73 |
| 1:D:565:C:H2' | 1:D:566:U:H6 | 1.52 | 0.73 |
| 2:C:391:LEU:N | 2:C:392:PRO:HD2 | 2.02 | 0.73 |
| 2:C:75:ALA:HB3 | 2:C:80:TYR:OH | 1.89 | 0.73 |
| 1:B:566:U:H2' | 1:B:567:G:H8 | 1.54 | 0.72 |
| 2:A:39:ARG:NH2 | 2:A:195:ASP:OD2 | 2.18 | 0.72 |
| 2:C:426:LYS:HB2 | 2:C:429:GLN:NE2 | 2.03 | 0.72 |
| 2:C:8:PRO:HD2 | 2:C:39:ARG:O | 1.89 | 0.72 |
| 2:C:444:THR:HG23 | 2:C:445:PRO:HD2 | 1.71 | 0.72 |
| 2:C:235:LEU:O | 2:C:237:ARG:HD3 | 1.89 | 0.72 |
| 2:C:393:LEU:HD22 | 2:C:419:PHE:HE1 | 1.54 | 0.72 |
| 1:B:576:A:O2' | 2:A:181:SER:HB2 | 1.89 | 0.72 |
| 2:C:106:PHE:CD2 | 2:C:144:HIS:HB3 | 2.25 | 0.72 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:349:ARG:HG2 | 2:A:349:ARG:NH2 | 1.99 | 0.72 |
| 2:A:375:GLU:HG3 | 2:A:465:ARG:HH12 | 1.55 | 0.72 |
| 1:B:512:C:OP1 | 2:A:304:VAL:HG23 | 1.89 | 0.72 |
| 1:D:562:C:O2' | 1:D:563:C:H5' | 1.90 | 0.71 |
| 1:B:544:A:O2' | 1:B:545:A:H5' | 1.91 | 0.71 |
| 1:B:557:G:H5' | 1:B:557:G:C8 | 2.23 | 0.71 |
| 2:A:262:LEU:HD13 | 2:A:330:ARG:NH1 | 2.05 | 0.71 |
| 2:C:157:GLU:CG | 2:C:167:VAL:HG22 | 2.21 | 0.71 |
| 2:C:391:LEU:O | 2:C:395:LYS:HG2 | 1.90 | 0.71 |
| 1:B:553:G:C2' | 1:B:554:U:H5' | 2.21 | 0.71 |
| 2:C:110:GLU:O | 2:C:114:GLN:HG2 | 1.90 | 0.71 |
| 2:C:158:VAL:HG22 | 2:C:217:VAL:HG11 | 1.72 | 0.71 |
| 2:C:445:PRO:HG2 | 2:C:450:ILE:HD11 | 1.72 | 0.71 |
| 1:D:557:G:H5' | 1:D:557:G:H8 | 1.56 | 0.70 |
| 2:A:348:LEU:O | 2:A:352:VAL:HG23 | 1.90 | 0.70 |
| 2:C:267:ARG:HD3 | 3:C:484:HOH:O | 1.89 | 0.70 |
| 2:C:355:MET:HE1 | 2:C:445:PRO:HD3 | 1.72 | 0.70 |
| 1:D:565:C:O2' | 1:D:566:U:H5' | 1.90 | 0.70 |
| 2:A:349:ARG:HH21 | 2:A:349:ARG:CG | 2.04 | 0.70 |
| 2:C:4:THR:HB | 2:C:25:ASN:ND2 | 2.03 | 0.70 |
| 1:D:561:C:H2' | 1:D:562:C:C5 | 2.26 | 0.70 |
| 2:A:132:GLU:OE2 | 2:A:132:GLU:HA | 1.91 | 0.70 |
| 1:D:556:C:O2' | 1:D:557:G:H5'' | 1.90 | 0.70 |
| 1:D:566:U:H2' | 1:D:567:G:H8 | 1.57 | 0.70 |
| 1:D:569:G:O2' | 1:D:570:G:H5' | 1.90 | 0.70 |
| 2:C:285:THR:OG1 | 2:C:288:GLU:HG3 | 1.91 | 0.70 |
| 2:C:205:ARG:HG3 | 2:C:209:TRP:CD1 | 2.26 | 0.70 |
| 1:D:544:A:O2' | 1:D:545:A:H5' | 1.92 | 0.70 |
| 2:A:340:LEU:HD21 | 2:A:370:ARG:NH1 | 2.06 | 0.70 |
| 2:C:107:GLU:OE2 | 2:C:107:GLU:N | 2.22 | 0.70 |
| 2:C:458:ARG:CG | 2:C:458:ARG:HH11 | 2.05 | 0.70 |
| 1:B:570:G:H2' | 1:B:571:U:H6 | 1.57 | 0.69 |
| 2:A:370:ARG:HG3 | 2:A:370:ARG:HH11 | 1.55 | 0.69 |
| 2:C:262:LEU:H | 2:C:314:ASN:ND2 | 1.85 | 0.69 |
| 2:A:444:THR:HG23 | 2:A:445:PRO:CD | 2.22 | 0.69 |
| 1:D:566:U:O2' | 1:D:567:G:H5' | 1.92 | 0.69 |
| 2:A:75:ALA:HB1 | 2:A:76:PRO:HD2 | 1.75 | 0.69 |
| 2:A:81:ARG:HB3 | 2:A:84:GLU:HG2 | 1.75 | 0.69 |
| 2:C:131:PRO:O | 2:C:135:GLU:HG2 | 1.93 | 0.69 |
| 2:A:365:PHE:HB3 | 2:A:366:PRO:HD3 | 1.75 | 0.69 |
| 2:A:116:ARG:HG3 | 2:A:121:GLY:HA2 | 1.75 | 0.69 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:444:THR:HG22 | 2:A:445:PRO:O | 1.93 | 0.68 |
| 2:A:69:GLU:HB3 | 2:A:75:ALA:CB | 2.23 | 0.68 |
| 2:A:441:SER:O | 2:A:442:LEU:HB2 | 1.91 | 0.68 |
| 2:A:7:ALA:HA | 2:A:39:ARG:O | 1.93 | 0.68 |
| 2:A:56:ILE:O | 2:A:60:LEU:HG | 1.94 | 0.68 |
| 2:C:107:GLU:HB2 | 2:C:112:LEU:HD21 | 1.76 | 0.68 |
| 2:A:11:THR:HG22 | 2:A:47:ARG:O | 1.93 | 0.68 |
| 2:A:37:ILE:HG23 | 2:A:69:GLU:HB2 | 1.75 | 0.68 |
| 2:A:463:LEU:HD22 | 2:A:463:LEU:O | 1.94 | 0.68 |
| 1:B:519:U:H2' | 1:B:521:A:OP2 | 1.92 | 0.68 |
| 1:D:506:C:H2' | 1:D:507:A:C8 | 2.28 | 0.68 |
| 2:C:355:MET:HE2 | 2:C:355:MET:HA | 1.73 | 0.68 |
| 1:D:517:G:H4' | 1:D:518:G:OP1 | 1.93 | 0.68 |
| 2:C:140:ARG:HD2 | 2:C:140:ARG:N | 2.09 | 0.68 |
| 1:D:531:C:H2' | 1:D:532:C:C6 | 2.29 | 0.67 |
| 2:C:7:ALA:HA | 2:C:39:ARG:O | 1.94 | 0.67 |
| 2:C:111:GLU:O | 2:C:115:ILE:HD12 | 1.93 | 0.67 |
| 2:A:189:LEU:O | 2:A:193:VAL:HG23 | 1.94 | 0.67 |
| 2:A:393:LEU:HD23 | 2:A:394:LEU:N | 2.09 | 0.67 |
| 2:A:446:GLY:O | 2:A:450:ILE:HG12 | 1.94 | 0.67 |
| 1:D:562:C:H2' | 1:D:563:C:C6 | 2.30 | 0.67 |
| 2:A:384:GLN:NE2 | 2:A:388:GLU:HG3 | 2.10 | 0.67 |
| 2:C:444:THR:HG22 | 2:C:445:PRO:O | 1.95 | 0.67 |
| 1:D:567:G:H2' | 1:D:568:G:H8 | 1.60 | 0.67 |
| 2:C:105:ALA:O | 2:C:144:HIS:HB2 | 1.93 | 0.67 |
| 1:B:506:C:H2' | 1:B:507:A:C8 | 2.30 | 0.67 |
| 1:B:567:G:O2' | 1:B:568:G:H5' | 1.95 | 0.67 |
| 2:C:355:MET:HE3 | 2:C:445:PRO:HG3 | 1.77 | 0.67 |
| 1:B:565:C:H2' | 1:B:566:U:C6 | 2.30 | 0.67 |
| 1:D:555:U:C2' | 1:D:556:C:H5'' | 2.25 | 0.67 |
| 2:C:465:ARG:HB3 | 2:C:465:ARG:HH11 | 1.60 | 0.67 |
| 1:B:517:G:H21 | 1:B:557:G:H2' | 1.59 | 0.66 |
| 2:A:69:GLU:HB3 | 2:A:75:ALA:HB2 | 1.77 | 0.66 |
| 2:A:122:TYR:CE2 | 2:A:124:GLY:HA2 | 2.30 | 0.66 |
| 1:B:504:C:H2' | 1:B:505:C:C6 | 2.30 | 0.66 |
| 1:B:550:G:HO2' | 1:B:551:G:H5' | 1.57 | 0.66 |
| 2:A:82:GLN:HG3 | 2:A:89:TYR:OH | 1.96 | 0.66 |
| 2:A:139:ARG:C | 2:A:141:GLY:H | 1.99 | 0.66 |
| 2:A:136:GLU:HG3 | 2:A:140:ARG:NH1 | 2.11 | 0.66 |
| 2:A:213:THR:HA | 2:A:216:HIS:HD2 | 1.61 | 0.66 |
| 2:C:355:MET:CE | 2:C:358:ARG:HD2 | 2.24 | 0.66 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:518:G:H5'' | 1:D:560:U:O4 | 1.95 | 0.66 |
| 1:D:569:G:H2' | 1:D:570:G:H8 | 1.59 | 0.66 |
| 2:A:397:LEU:HG | 2:A:401:LEU:CD2 | 2.25 | 0.65 |
| 2:C:460:LEU:O | 2:C:464:GLU:HG3 | 1.96 | 0.65 |
| 2:A:75:ALA:HB3 | 2:A:80:TYR:CZ | 2.31 | 0.65 |
| 2:A:401:LEU:HB3 | 2:A:460:LEU:HD21 | 1.78 | 0.65 |
| 2:C:51:GLY:O | 2:C:54:GLU:HG2 | 1.96 | 0.65 |
| 2:C:56:ILE:HD13 | 2:C:56:ILE:N | 2.12 | 0.65 |
| 2:A:136:GLU:O | 2:A:140:ARG:HG2 | 1.97 | 0.65 |
| 2:A:240:ASP:OD1 | 2:A:242:THR:OG1 | 2.14 | 0.65 |
| 2:C:148:LEU:HB2 | 2:C:178:LEU:HD11 | 1.78 | 0.65 |
| 2:A:294:THR:HG22 | 2:A:296:GLU:N | 2.12 | 0.65 |
| 1:B:562:C:H2' | 1:B:563:C:C6 | 2.32 | 0.65 |
| 1:D:551:G:H2' | 1:D:552:G:H8 | 1.61 | 0.65 |
| 1:D:555:U:H2' | 1:D:556:C:H5'' | 1.78 | 0.65 |
| 1:D:566:U:H2' | 1:D:567:G:C8 | 2.31 | 0.65 |
| 2:C:363:LYS:O | 2:C:366:PRO:HD2 | 1.97 | 0.65 |
| 2:C:435:ARG:HD2 | 2:C:442:LEU:HA | 1.79 | 0.65 |
| 1:B:567:G:H2' | 1:B:568:G:H8 | 1.60 | 0.65 |
| 2:A:184:TYR:HE1 | 3:A:487:HOH:O | 1.80 | 0.65 |
| 2:C:147:ARG:HG2 | 2:C:147:ARG:HH11 | 1.61 | 0.65 |
| 1:D:543:G:O2' | 1:D:544:A:H5' | 1.97 | 0.64 |
| 2:C:237:ARG:HH11 | 2:C:302:GLY:HA3 | 1.60 | 0.64 |
| 2:C:44:ASP:OD2 | 2:C:47:ARG:HG2 | 1.96 | 0.64 |
| 2:C:114:GLN:O | 2:C:118:GLU:HG2 | 1.96 | 0.64 |
| 1:D:517:G:O2' | 1:D:557:G:N2 | 2.30 | 0.64 |
| 2:A:6:ILE:O | 2:A:8:PRO:HD3 | 1.97 | 0.64 |
| 2:A:101:TRP:HH2 | 3:A:575:HOH:O | 1.80 | 0.64 |
| 2:C:75:ALA:HB1 | 2:C:76:PRO:HD2 | 1.80 | 0.64 |
| 1:D:505:C:O2' | 1:D:506:C:H5' | 1.97 | 0.64 |
| 2:C:162:LEU:HD21 | 2:C:231:TYR:HD2 | 1.63 | 0.64 |
| 1:B:535:U:C4' | 2:A:432:GLN:HE22 | 2.10 | 0.64 |
| 1:B:543:G:O2' | 1:B:544:A:H5' | 1.97 | 0.64 |
| 1:D:504:C:H2' | 1:D:505:C:C6 | 2.32 | 0.64 |
| 2:C:398:TYR:HB3 | 2:C:399:PRO:HD3 | 1.79 | 0.64 |
| 1:B:566:U:H2' | 1:B:567:G:C8 | 2.32 | 0.63 |
| 2:A:391:LEU:CD2 | 2:A:395:LYS:HE3 | 2.28 | 0.63 |
| 1:B:539:G:O2' | 1:B:540:G:H5' | 1.98 | 0.63 |
| 2:C:109:PRO:HA | 2:C:112:LEU:HD12 | 1.81 | 0.63 |
| 1:B:552:G:H2' | 1:B:553:G:O4' | 1.99 | 0.63 |
| 1:D:563:C:H2' | 1:D:564:C:C5 | 2.32 | 0.63 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:568:G:H2' | 1:B:569:G:H8 | 1.64 | 0.63 |
| 1:B:505:C:O2' | 1:B:506:C:H5' | 1.99 | 0.62 |
| 1:B:561:C:H2' | 1:B:562:C:C5 | 2.35 | 0.62 |
| 2:A:237:ARG:NH1 | 2:A:302:GLY:HA3 | 2.15 | 0.62 |
| 2:A:461:ARG:O | 2:A:464:GLU:HB2 | 2.00 | 0.62 |
| 2:C:229:ARG:HH11 | 2:C:229:ARG:HB2 | 1.64 | 0.62 |
| 1:B:505:C:H2' | 1:B:506:C:H6 | 1.65 | 0.62 |
| 1:B:569:G:H2' | 1:B:570:G:H8 | 1.62 | 0.62 |
| 2:A:398:TYR:CD1 | 2:A:463:LEU:HD11 | 2.31 | 0.62 |
| 2:C:147:ARG:HG2 | 2:C:147:ARG:NH1 | 2.13 | 0.62 |
| 2:C:326:GLU:OE1 | 2:C:330:ARG:NE | 2.32 | 0.62 |
| 1:B:576:A:H5' | 2:A:45:ARG:CZ | 2.28 | 0.62 |
| 1:B:517:G:C5 | 1:B:557:G:C6 | 2.88 | 0.62 |
| 2:A:81:ARG:HB3 | 2:A:84:GLU:CG | 2.29 | 0.62 |
| 2:A:412:LEU:HG | 2:A:451:LEU:HD13 | 1.80 | 0.62 |
| 1:D:505:C:H2' | 1:D:506:C:H6 | 1.64 | 0.62 |
| 2:A:4:THR:HB | 2:A:25:ASN:ND2 | 2.05 | 0.62 |
| 2:C:236:LEU:HD12 | 2:C:303:PRO:HG2 | 1.81 | 0.62 |
| 2:A:333:PRO:HG3 | 2:A:336:ARG:NH2 | 2.16 | 0.61 |
| 2:C:115:ILE:O | 2:C:119:LYS:HG2 | 2.00 | 0.61 |
| 2:C:324:LEU:HD11 | 2:C:353:GLU:HB2 | 1.81 | 0.61 |
| 2:A:202:ASP:OD1 | 2:A:229:ARG:HD2 | 1.99 | 0.61 |
| 1:B:526:G:O2' | 1:B:527:C:H5' | 2.00 | 0.61 |
| 2:C:316:LYS:HE3 | 2:C:320:GLU:CD | 2.20 | 0.61 |
| 1:B:502:G:H2' | 1:B:503:C:C6 | 2.35 | 0.61 |
| 1:B:517:G:H4' | 1:B:518:G:OP1 | 2.01 | 0.61 |
| 2:C:398:TYR:CE2 | 2:C:402:ARG:HG3 | 2.35 | 0.61 |
| 2:A:92:TYR:O | 2:A:95:GLU:HB3 | 2.01 | 0.61 |
| 2:A:124:GLY:O | 2:A:127:ARG:HB2 | 2.00 | 0.61 |
| 2:C:71:PRO:HB3 | 2:C:81:ARG:NH1 | 2.16 | 0.61 |
| 2:C:87:PRO:O | 2:C:90:GLN:HB3 | 2.00 | 0.61 |
| 1:D:568:G:H2' | 1:D:569:G:H8 | 1.66 | 0.61 |
| 1:D:558:A:H4' | 1:D:559:U:OP1 | 2.00 | 0.61 |
| 2:A:370:ARG:NH1 | 2:A:370:ARG:HG3 | 2.13 | 0.61 |
| 2:C:89:TYR:CD2 | 2:C:185:PRO:HG3 | 2.35 | 0.61 |
| 1:D:501:G:H2' | 1:D:502:G:C8 | 2.35 | 0.60 |
| 2:C:378:PRO:HA | 3:C:530:HOH:O | 2.00 | 0.60 |
| 2:C:458:ARG:NH1 | 2:C:458:ARG:HG2 | 2.15 | 0.60 |
| 2:C:45:ARG:HG2 | 2:C:184:TYR:CE1 | 2.36 | 0.60 |
| 2:C:75:ALA:HB3 | 2:C:80:TYR:CE1 | 2.35 | 0.60 |
| 1:D:503:C:O2' | 1:D:504:C:H5' | 2.02 | 0.60 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:556:C:O2 | 1:D:556:C:C2' | 2.46 | 0.60 |
| 1:D:564:C:O2' | 1:D:565:C:H5' | 2.02 | 0.60 |
| 1:D:570:G:H2' | 1:D:571:U:C6 | 2.37 | 0.60 |
| 1:D:502:G:H2' | 1:D:503:C:C6 | 2.37 | 0.60 |
| 2:A:423:LYS:HB2 | 2:A:423:LYS:NZ | 2.16 | 0.60 |
| 2:C:136:GLU:HA | 2:C:139:ARG:HD2 | 1.83 | 0.60 |
| 2:C:350:ARG:HD3 | 2:C:350:ARG:O | 2.02 | 0.60 |
| 1:B:530:C:H2' | 1:B:531:C:H6 | 1.66 | 0.60 |
| 1:D:534:C:O2 | 2:C:435:ARG:NH2 | 2.34 | 0.60 |
| 2:A:73:VAL:O | 2:A:74:ALA:O | 2.18 | 0.60 |
| 1:B:564:C:O2' | 1:B:565:C:H5' | 2.02 | 0.60 |
| 1:D:541:C:O2' | 1:D:542:C:H5' | 2.02 | 0.60 |
| 1:B:503:C:O2' | 1:B:504:C:H5' | 2.02 | 0.60 |
| 2:A:170:ASN:HA | 2:A:173:ILE:HD12 | 1.83 | 0.60 |
| 2:A:333:PRO:HG3 | 2:A:336:ARG:HH21 | 1.66 | 0.60 |
| 2:C:426:LYS:HB2 | 2:C:429:GLN:HE21 | 1.65 | 0.60 |
| 1:D:569:G:H4' | 2:C:237:ARG:HH21 | 1.65 | 0.59 |
| 2:A:116:ARG:CG | 2:A:121:GLY:HA2 | 2.31 | 0.59 |
| 2:C:423:LYS:HB2 | 2:C:423:LYS:NZ | 2.17 | 0.59 |
| 1:D:539:G:H2' | 1:D:540:G:H8 | 1.67 | 0.59 |
| 2:C:238:ASN:O | 2:C:304:VAL:HG13 | 2.03 | 0.59 |
| 2:C:135:GLU:O | 2:C:139:ARG:HD2 | 2.03 | 0.59 |
| 2:C:139:ARG:C | 2:C:141:GLY:H | 2.06 | 0.59 |
| 1:D:506:C:OP1 | 2:C:163:ARG:HG2 | 2.03 | 0.59 |
| 1:D:563:C:C2' | 1:D:564:C:H6 | 2.15 | 0.59 |
| 1:B:523:G:O2' | 1:B:524:A:H5' | 2.02 | 0.59 |
| 2:C:211:VAL:O | 2:C:214:PRO:HD2 | 2.01 | 0.59 |
| 2:C:266:LEU:HD22 | 2:C:270:LEU:HD22 | 1.83 | 0.59 |
| 2:C:435:ARG:NH1 | 2:C:444:THR:HG22 | 2.17 | 0.59 |
| 1:B:531:C:H2' | 1:B:532:C:C6 | 2.38 | 0.59 |
| 1:B:559:U:O2' | 1:B:560:U:H5' | 2.02 | 0.59 |
| 2:A:85:ARG:NH1 | 2:A:194:ASP:OD2 | 2.36 | 0.59 |
| 2:A:327:VAL:HG12 | 2:A:352:VAL:HG11 | 1.83 | 0.59 |
| 2:C:355:MET:HE2 | 2:C:358:ARG:HD2 | 1.85 | 0.59 |
| 2:C:441:SER:O | 2:C:442:LEU:HB2 | 2.03 | 0.59 |
| 1:D:530:C:H2' | 1:D:531:C:H6 | 1.68 | 0.59 |
| 1:D:539:G:O2' | 1:D:540:G:H5' | 2.03 | 0.59 |
| 2:C:160:ASP:OD2 | 2:C:232:HIS:HD2 | 1.86 | 0.58 |
| 2:C:162:LEU:N | 2:C:162:LEU:HD23 | 2.17 | 0.58 |
| 2:C:73:VAL:O | 2:C:74:ALA:O | 2.20 | 0.58 |
| 1:D:567:G:O2' | 1:D:568:G:C5' | 2.50 | 0.58 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:178:LEU:HB3 | 2:A:189:LEU:HG | 1.85 | 0.58 |
| 2:C:75:ALA:CB | 2:C:80:TYR:OH | 2.50 | 0.58 |
| 2:C:135:GLU:O | 2:C:139:ARG:NH1 | 2.36 | 0.58 |
| 1:D:529:G:H2' | 1:D:530:C:C6 | 2.38 | 0.58 |
| 1:D:523:G:H2' | 1:D:524:A:H8 | 1.69 | 0.58 |
| 1:D:531:C:H2' | 1:D:532:C:H6 | 1.66 | 0.58 |
| 1:D:556:C:C2' | 1:D:557:G:H5'' | 2.34 | 0.58 |
| 1:D:556:C:C2' | 1:D:557:G:C5' | 2.81 | 0.58 |
| 2:A:407:TRP:CZ2 | 2:A:456:LYS:HA | 2.39 | 0.58 |
| 2:A:413:GLU:HG3 | 2:A:448:PHE:CZ | 2.39 | 0.58 |
| 2:A:137:ARG:O | 2:A:142:GLU:HB3 | 2.03 | 0.58 |
| 2:A:139:ARG:HE | 2:A:140:ARG:HH21 | 1.51 | 0.58 |
| 2:C:220:TYR:CZ | 2:C:228:PRO:HD3 | 2.38 | 0.58 |
| 2:C:404:GLN:NE2 | 2:C:415:LEU:HD13 | 2.18 | 0.58 |
| 1:D:544:A:C2' | 1:D:545:A:H5' | 2.34 | 0.58 |
| 1:D:521:A:H61 | 1:D:546:A:H2' | 1.69 | 0.57 |
| 2:A:75:ALA:HB3 | 2:A:80:TYR:OH | 2.04 | 0.57 |
| 2:A:75:ALA:HB3 | 2:A:80:TYR:CE1 | 2.39 | 0.57 |
| 2:A:139:ARG:HB3 | 2:A:140:ARG:HE | 1.70 | 0.57 |
| 2:C:268:ASN:C | 2:C:268:ASN:HD22 | 2.08 | 0.57 |
| 2:C:10:PRO:HB3 | 2:C:53:GLU:HA | 1.86 | 0.57 |
| 2:C:276:SER:O | 2:C:297:ARG:HD3 | 2.03 | 0.57 |
| 2:C:286:LEU:O | 2:C:290:ILE:HG23 | 2.05 | 0.57 |
| 1:B:556:C:H2' | 1:B:556:C:O2 | 2.05 | 0.57 |
| 2:C:3:VAL:HG11 | 2:C:37:ILE:HD11 | 1.87 | 0.57 |
| 1:B:556:C:H2' | 1:B:557:G:C5' | 2.32 | 0.57 |
| 2:A:52:ALA:O | 2:A:56:ILE:HG13 | 2.05 | 0.57 |
| 2:C:205:ARG:O | 2:C:232:HIS:HA | 2.05 | 0.57 |
| 1:B:530:C:H2' | 1:B:531:C:C6 | 2.39 | 0.56 |
| 1:B:554:U:H2' | 1:B:555:U:C6 | 2.40 | 0.56 |
| 1:D:570:G:H2' | 1:D:571:U:H6 | 1.70 | 0.56 |
| 2:A:238:ASN:HB2 | 2:A:240:ASP:OD1 | 2.04 | 0.56 |
| 2:A:450:ILE:HD13 | 2:A:450:ILE:N | 2.20 | 0.56 |
| 2:C:458:ARG:HH11 | 2:C:458:ARG:CB | 2.18 | 0.56 |
| 1:B:525:C:H2' | 1:B:526:G:C8 | 2.41 | 0.56 |
| 1:D:563:C:C2' | 1:D:564:C:C6 | 2.83 | 0.56 |
| 2:C:116:ARG:HG2 | 2:C:121:GLY:HA2 | 1.86 | 0.56 |
| 2:C:119:LYS:O | 2:C:120:GLY:C | 2.43 | 0.56 |
| 1:D:552:G:H2' | 1:D:553:G:O4' | 2.06 | 0.56 |
| 2:C:31:ARG:HD2 | 2:C:31:ARG:O | 2.05 | 0.56 |
| 2:C:74:ALA:O | 2:C:75:ALA:HB2 | 2.05 | 0.56 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:393:LEU:HA | 2:A:396:GLU:HB2 | 1.88 | 0.56 |
| 1:D:506:C:H2' | 1:D:507:A:H8 | 1.68 | 0.56 |
| 1:B:521:A:H61 | 1:B:546:A:H2' | 1.70 | 0.56 |
| 2:A:330:ARG:O | 2:A:333:PRO:HD2 | 2.06 | 0.56 |
| 1:D:517:G:C6 | 1:D:558:A:C6 | 2.94 | 0.56 |
| 2:A:114:GLN:O | 2:A:118:GLU:HG2 | 2.06 | 0.56 |
| 2:C:207:GLU:HA | 2:C:232:HIS:HB3 | 1.87 | 0.56 |
| 1:B:576:A:H5' | 2:A:45:ARG:NH2 | 2.21 | 0.56 |
| 2:A:152:ARG:HA | 2:A:152:ARG:NH1 | 2.17 | 0.56 |
| 2:C:239:PRO:HA | 2:C:304:VAL:CG1 | 2.36 | 0.56 |
| 1:D:539:G:H2' | 1:D:540:G:C8 | 2.40 | 0.56 |
| 1:D:571:U:H2' | 1:D:572:C:C6 | 2.41 | 0.56 |
| 2:A:350:ARG:NH1 | 2:A:354:LEU:HD21 | 2.20 | 0.56 |
| 2:A:383:ALA:CA | 2:A:442:LEU:HD22 | 2.36 | 0.56 |
| 2:A:398:TYR:N | 2:A:399:PRO:HD2 | 2.20 | 0.56 |
| 2:A:427:LEU:O | 2:A:430:VAL:HG12 | 2.06 | 0.55 |
| 2:C:260:GLY:HA2 | 2:C:334:PHE:CZ | 2.41 | 0.55 |
| 2:C:396:GLU:OE1 | 2:C:423:LYS:HD3 | 2.06 | 0.55 |
| 2:C:458:ARG:HH11 | 2:C:458:ARG:HB3 | 1.71 | 0.55 |
| 1:D:525:C:H2' | 1:D:526:G:C8 | 2.42 | 0.55 |
| 1:D:556:C:H2' | 1:D:557:G:H5' | 1.88 | 0.55 |
| 1:B:551:G:H2' | 1:B:552:G:H8 | 1.71 | 0.55 |
| 1:B:565:C:H2' | 1:B:566:U:H6 | 1.71 | 0.55 |
| 2:A:350:ARG:O | 2:A:350:ARG:HD3 | 2.06 | 0.55 |
| 2:A:385:ARG:HG2 | 2:A:385:ARG:HH11 | 1.70 | 0.55 |
| 2:C:458:ARG:HH11 | 2:C:458:ARG:HG2 | 1.70 | 0.55 |
| 2:A:206:ALA:HB1 | 2:A:235:LEU:CD1 | 2.37 | 0.55 |
| 2:C:331:VAL:HG21 | 2:C:365:PHE:CD2 | 2.41 | 0.55 |
| 2:A:398:TYR:CE2 | 2:A:402:ARG:HD2 | 2.42 | 0.55 |
| 2:C:446:GLY:O | 2:C:450:ILE:HG12 | 2.05 | 0.55 |
| 2:A:31:ARG:NH1 | 2:A:293:PHE:O | 2.40 | 0.55 |
| 2:C:236:LEU:CB | 2:C:244:ILE:HD11 | 2.35 | 0.55 |
| 2:C:265:ALA:HB3 | 2:C:314:ASN:HD22 | 1.72 | 0.55 |
| 1:B:529:G:H2' | 1:B:530:C:C6 | 2.42 | 0.55 |
| 1:D:523:G:H2' | 1:D:524:A:C8 | 2.41 | 0.55 |
| 1:D:530:C:O2' | 1:D:531:C:H5' | 2.07 | 0.55 |
| 2:A:105:ALA:HB2 | 2:A:147:ARG:HD2 | 1.89 | 0.55 |
| 2:A:213:THR:N | 2:A:214:PRO:HD2 | 2.22 | 0.55 |
| 2:A:214:PRO:HA | 2:A:217:VAL:HG22 | 1.87 | 0.55 |
| 2:C:236:LEU:HB3 | 2:C:244:ILE:HG12 | 1.87 | 0.55 |
| 1:D:559:U:C5 | 1:D:560:U:C5 | 2.94 | 0.55 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:575:C:O2 | 1:D:575:C:O4' | 2.22 | 0.55 |
| 2:A:170:ASN:N | 2:A:170:ASN:HD22 | 2.03 | 0.55 |
| 1:B:555:U:H2' | 1:B:556:C:H5'' | 1.89 | 0.55 |
| 1:D:526:G:O2' | 1:D:527:C:H5' | 2.07 | 0.55 |
| 1:B:523:G:H2' | 1:B:524:A:H8 | 1.72 | 0.55 |
| 1:B:558:A:O2' | 1:B:559:U:H3' | 2.07 | 0.55 |
| 1:B:539:G:H2' | 1:B:540:G:H8 | 1.71 | 0.54 |
| 2:A:74:ALA:O | 2:A:75:ALA:HB2 | 2.07 | 0.54 |
| 2:A:152:ARG:NH2 | 2:A:173:ILE:O | 2.36 | 0.54 |
| 2:C:111:GLU:O | 2:C:114:GLN:HB2 | 2.06 | 0.54 |
| 2:C:178:LEU:O | 2:C:185:PRO:HA | 2.07 | 0.54 |
| 2:C:423:LYS:HB2 | 2:C:423:LYS:HZ3 | 1.71 | 0.54 |
| 1:B:539:G:H2' | 1:B:540:G:C8 | 2.42 | 0.54 |
| 1:D:553:G:C3' | 1:D:554:U:H5' | 2.36 | 0.54 |
| 2:A:267:ARG:CD | 3:A:529:HOH:O | 2.50 | 0.54 |
| 2:A:192:VAL:HG13 | 2:A:220:TYR:CE2 | 2.42 | 0.54 |
| 2:A:391:LEU:O | 2:A:395:LYS:HG2 | 2.08 | 0.54 |
| 2:C:208:GLU:CG | 2:C:235:LEU:HD11 | 2.37 | 0.54 |
| 2:C:208:GLU:HG3 | 2:C:235:LEU:HD11 | 1.88 | 0.54 |
| 2:A:119:LYS:O | 2:A:120:GLY:C | 2.45 | 0.54 |
| 2:A:131:PRO:O | 2:A:135:GLU:HG2 | 2.07 | 0.54 |
| 2:C:110:GLU:CD | 2:C:110:GLU:H | 2.09 | 0.54 |
| 2:C:386:LYS:HE2 | 2:C:432:GLN:HB3 | 1.90 | 0.54 |
| 1:B:523:G:H2' | 1:B:524:A:C8 | 2.42 | 0.54 |
| 1:D:505:C:H2' | 1:D:506:C:C6 | 2.42 | 0.54 |
| 2:C:463:LEU:HD23 | 2:C:463:LEU:O | 2.08 | 0.54 |
| 1:B:502:G:O2' | 1:B:503:C:H5' | 2.08 | 0.54 |
| 1:B:563:C:H2' | 1:B:564:C:C5 | 2.40 | 0.54 |
| 1:D:553:G:H2' | 1:D:554:U:H5' | 1.89 | 0.54 |
| 2:C:147:ARG:NH1 | 2:C:175:ASP:O | 2.41 | 0.54 |
| 2:C:238:ASN:HB3 | 2:C:239:PRO:HD2 | 1.90 | 0.54 |
| 1:B:511:U:O2' | 1:B:512:C:H5' | 2.08 | 0.54 |
| 1:B:558:A:H1' | 1:B:560:U:C5 | 2.43 | 0.54 |
| 1:D:530:C:H2' | 1:D:531:C:C6 | 2.41 | 0.54 |
| 2:A:15:HIS:CE1 | 2:A:251:THR:HB | 2.42 | 0.54 |
| 2:C:57:LEU:O | 2:C:61:LYS:HD3 | 2.08 | 0.54 |
| 2:C:407:TRP:CE2 | 2:C:456:LYS:HA | 2.43 | 0.54 |
| 2:C:412:LEU:O | 2:C:416:LEU:HD12 | 2.08 | 0.54 |
| 1:B:568:G:H2' | 1:B:569:G:C8 | 2.43 | 0.53 |
| 1:D:535:U:N3 | 2:C:444:THR:O | 2.30 | 0.53 |
| 2:C:444:THR:HG23 | 2:C:445:PRO:CD | 2.38 | 0.53 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:C:426:LYS:O | 2:C:429:GLN:HB2 | 2.07 | 0.53 |
| 1:D:516:C:O2' | 1:D:517:G:P | 2.66 | 0.53 |
| 2:A:211:VAL:O | 2:A:214:PRO:HD2 | 2.09 | 0.53 |
| 2:A:285:THR:OG1 | 2:A:288:GLU:HG3 | 2.08 | 0.53 |
| 2:A:152:ARG:HH11 | 2:A:152:ARG:HG3 | 1.72 | 0.53 |
| 2:A:391:LEU:HA | 2:A:394:LEU:HD12 | 1.91 | 0.53 |
| 2:C:238:ASN:ND2 | 2:C:248:LYS:HD2 | 2.23 | 0.53 |
| 2:A:207:GLU:HA | 2:A:232:HIS:HB3 | 1.91 | 0.53 |
| 2:A:436:ALA:HB2 | 2:A:442:LEU:HD13 | 1.90 | 0.53 |
| 2:C:270:LEU:O | 2:C:273:MET:HB2 | 2.08 | 0.53 |
| 1:B:517:G:C6 | 1:B:557:G:C6 | 2.97 | 0.53 |
| 2:A:110:GLU:CD | 2:A:110:GLU:H | 2.12 | 0.53 |
| 2:A:407:TRP:NE1 | 2:A:456:LYS:N | 2.56 | 0.53 |
| 2:C:365:PHE:HB3 | 2:C:366:PRO:HD3 | 1.91 | 0.53 |
| 2:C:461:ARG:O | 2:C:464:GLU:HB2 | 2.08 | 0.53 |
| 1:B:541:C:O2' | 1:B:542:C:H5' | 2.08 | 0.53 |
| 1:B:505:C:H2' | 1:B:506:C:C6 | 2.44 | 0.53 |
| 1:B:544:A:C2' | 1:B:545:A:H5' | 2.39 | 0.53 |
| 2:A:91:LYS:HG2 | 2:A:92:TYR:N | 2.23 | 0.53 |
| 2:C:458:ARG:CG | 2:C:458:ARG:NH1 | 2.67 | 0.53 |
| 1:D:569:G:O2' | 1:D:570:G:C5' | 2.58 | 0.52 |
| 2:A:178:LEU:O | 2:A:185:PRO:HA | 2.09 | 0.52 |
| 1:D:518:G:C5' | 1:D:560:U:O4 | 2.57 | 0.52 |
| 1:D:551:G:H2' | 1:D:552:G:C8 | 2.43 | 0.52 |
| 1:D:542:C:O2' | 1:D:543:G:H5' | 2.08 | 0.52 |
| 2:A:107:GLU:OE2 | 2:A:107:GLU:N | 2.37 | 0.52 |
| 2:A:188:HIS:HA | 2:A:216:HIS:HE1 | 1.74 | 0.52 |
| 2:A:238:ASN:O | 2:A:304:VAL:HG13 | 2.09 | 0.52 |
| 1:B:556:C:C2' | 1:B:557:G:C5' | 2.81 | 0.52 |
| 2:A:147:ARG:HB3 | 2:A:175:ASP:O | 2.09 | 0.52 |
| 2:C:41:GLU:HA | 2:C:82:GLN:HG3 | 1.90 | 0.52 |
| 2:C:388:GLU:HA | 2:C:391:LEU:HD22 | 1.91 | 0.52 |
| 2:C:375:GLU:HG3 | 2:C:465:ARG:HH21 | 1.74 | 0.52 |
| 2:A:73:VAL:O | 2:A:73:VAL:CG1 | 2.51 | 0.52 |
| 2:A:77:THR:O | 2:A:77:THR:HG22 | 2.10 | 0.52 |
| 2:A:92:TYR:CE2 | 2:A:225:TRP:HH2 | 2.28 | 0.52 |
| 2:A:435:ARG:HD2 | 2:A:444:THR:HB | 1.91 | 0.52 |
| 1:B:556:C:C3' | 1:B:557:G:C5' | 2.88 | 0.52 |
| 1:D:561:C:H2' | 1:D:562:C:C6 | 2.44 | 0.52 |
| 2:A:286:LEU:O | 2:A:290:ILE:HG23 | 2.10 | 0.52 |
| 2:A:307:LEU:O | 2:A:311:ARG:HG3 | 2.10 | 0.52 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:3:VAL:HB | 2:A:200:VAL:HA | 1.92 | 0.52 |
| 2:A:311:ARG:HH11 | 2:A:311:ARG:HB3 | 1.75 | 0.52 |
| 2:C:122:TYR:CE2 | 2:C:124:GLY:HA2 | 2.44 | 0.52 |
| 2:C:435:ARG:HD3 | 2:C:444:THR:HB | 1.91 | 0.52 |
| 1:B:518:G:N2 | 1:B:557:G:H1' | 2.25 | 0.52 |
| 1:B:525:C:H2' | 1:B:526:G:H8 | 1.75 | 0.52 |
| 1:B:556:C:C3' | 1:B:557:G:H5'' | 2.39 | 0.52 |
| 1:D:556:C:C2' | 1:D:557:G:H5' | 2.40 | 0.52 |
| 2:A:152:ARG:NH1 | 2:A:152:ARG:HG3 | 2.25 | 0.52 |
| 2:A:279:ASP:OD2 | 2:A:281:ARG:HB3 | 2.11 | 0.52 |
| 2:A:316:LYS:HE2 | 2:A:320:GLU:CD | 2.30 | 0.52 |
| 2:A:401:LEU:CB | 2:A:460:LEU:HD21 | 2.40 | 0.52 |
| 1:B:506:C:H2' | 1:B:507:A:H8 | 1.72 | 0.51 |
| 2:A:86:LEU:HA | 2:A:89:TYR:HD2 | 1.75 | 0.51 |
| 2:A:262:LEU:HB2 | 2:A:314:ASN:ND2 | 2.25 | 0.51 |
| 2:C:326:GLU:O | 2:C:330:ARG:HG3 | 2.10 | 0.51 |
| 2:A:262:LEU:HB2 | 2:A:314:ASN:HD21 | 1.74 | 0.51 |
| 2:C:169:ASP:OD2 | 2:C:171:GLN:HB2 | 2.10 | 0.51 |
| 2:C:208:GLU:HG2 | 2:C:235:LEU:HD21 | 1.93 | 0.51 |
| 2:C:229:ARG:HH11 | 2:C:229:ARG:CG | 2.23 | 0.51 |
| 2:A:44:ASP:O | 2:A:46:ALA:N | 2.43 | 0.51 |
| 2:A:112:LEU:HA | 2:A:115:ILE:HD12 | 1.93 | 0.51 |
| 2:C:71:PRO:HB3 | 2:C:81:ARG:HH11 | 1.76 | 0.51 |
| 2:C:239:PRO:HD3 | 3:C:478:HOH:O | 2.10 | 0.51 |
| 1:D:517:G:C4 | 1:D:558:A:C2 | 2.98 | 0.51 |
| 2:A:262:LEU:HD13 | 2:A:330:ARG:HH11 | 1.73 | 0.51 |
| 2:C:330:ARG:HD3 | 3:C:509:HOH:O | 2.10 | 0.51 |
| 2:A:194:ASP:O | 2:A:198:MET:HB2 | 2.11 | 0.51 |
| 2:C:355:MET:HE1 | 2:C:358:ARG:HD2 | 1.91 | 0.51 |
| 1:D:517:G:C2 | 1:D:558:A:C5 | 2.98 | 0.51 |
| 2:A:417:ARG:NH1 | 2:A:427:LEU:HD22 | 2.26 | 0.51 |
| 2:C:426:LYS:H | 2:C:429:GLN:NE2 | 2.09 | 0.51 |
| 2:C:261:PHE:CE2 | 2:C:310:LEU:HD13 | 2.46 | 0.51 |
| 2:C:385:ARG:HH11 | 2:C:385:ARG:CB | 2.24 | 0.51 |
| 1:B:508:U:C2 | 1:B:515:G:O6 | 2.64 | 0.50 |
| 1:B:527:C:H2' | 1:B:528:G:H8 | 1.76 | 0.50 |
| 2:A:423:LYS:HB2 | 2:A:423:LYS:HZ3 | 1.76 | 0.50 |
| 2:C:135:GLU:HB3 | 2:C:139:ARG:CZ | 2.41 | 0.50 |
| 2:C:246:LYS:HE3 | 2:C:246:LYS:O | 2.12 | 0.50 |
| 2:A:257:LYS:HG2 | 3:A:507:HOH:O | 2.11 | 0.50 |
| 1:B:518:G:H5'' | 1:B:560:U:O4 | 2.10 | 0.50 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:517:G:H22 | 1:D:557:G:H2' | 1.60 | 0.50 |
| 1:D:534:C:H5'' | 3:D:70:HOH:O | 2.11 | 0.50 |
| 2:A:461:ARG:NH2 | 2:A:462:ARG:HB2 | 2.26 | 0.50 |
| 1:B:561:C:H2' | 1:B:562:C:C6 | 2.46 | 0.50 |
| 2:C:53:GLU:HG2 | 2:C:54:GLU:N | 2.26 | 0.50 |
| 2:C:422:GLU:HG2 | 2:C:423:LYS:NZ | 2.26 | 0.50 |
| 1:D:517:G:C6 | 1:D:557:G:C6 | 2.99 | 0.50 |
| 2:A:169:ASP:HB3 | 2:A:172:GLU:HG3 | 1.94 | 0.50 |
| 2:C:195:ASP:HA | 2:C:200:VAL:HG13 | 1.92 | 0.50 |
| 1:B:553:G:C3' | 1:B:554:U:H5' | 2.41 | 0.50 |
| 1:D:505:C:H4' | 2:C:163:ARG:HD2 | 1.93 | 0.50 |
| 2:A:332:LYS:O | 2:A:336:ARG:HG3 | 2.12 | 0.50 |
| 2:A:404:GLN:HG2 | 2:A:415:LEU:HD22 | 1.91 | 0.50 |
| 2:C:6:ILE:HG13 | 2:C:6:ILE:O | 2.12 | 0.50 |
| 2:C:195:ASP:O | 2:C:200:VAL:HG13 | 2.11 | 0.50 |
| 2:C:246:LYS:HG3 | 2:C:247:ARG:N | 2.23 | 0.50 |
| 1:B:504:C:H2' | 1:B:505:C:H6 | 1.75 | 0.50 |
| 1:B:540:G:H2' | 1:B:541:C:C6 | 2.47 | 0.50 |
| 1:D:508:U:H6 | 1:D:508:U:O5' | 1.94 | 0.50 |
| 2:A:400:ARG:HH22 | 2:A:422:GLU:CD | 2.15 | 0.50 |
| 2:C:358:ARG:NH1 | 2:C:445:PRO:HB3 | 2.26 | 0.50 |
| 2:C:79:PRO:HB3 | 2:C:84:GLU:OE1 | 2.12 | 0.50 |
| 2:C:348:LEU:O | 2:C:352:VAL:HG23 | 2.12 | 0.50 |
| 1:B:542:C:O2' | 1:B:543:G:H5' | 2.12 | 0.49 |
| 2:A:393:LEU:HD23 | 2:A:393:LEU:C | 2.33 | 0.49 |
| 2:C:238:ASN:HD22 | 2:C:242:THR:CG2 | 2.16 | 0.49 |
| 1:D:525:C:H2' | 1:D:526:G:H8 | 1.77 | 0.49 |
| 1:D:569:G:H2' | 1:D:570:G:C8 | 2.45 | 0.49 |
| 2:A:157:GLU:HG3 | 2:A:167:VAL:HG22 | 1.94 | 0.49 |
| 2:C:243:LYS:HG2 | 2:C:243:LYS:O | 2.11 | 0.49 |
| 1:B:562:C:O2' | 1:B:563:C:C5' | 2.59 | 0.49 |
| 1:D:525:C:O2' | 1:D:526:G:H5' | 2.13 | 0.49 |
| 2:C:391:LEU:N | 2:C:392:PRO:CD | 2.73 | 0.49 |
| 2:A:376:ASP:O | 2:A:376:ASP:CG | 2.50 | 0.49 |
| 2:C:116:ARG:HG2 | 2:C:120:GLY:O | 2.12 | 0.49 |
| 2:C:5:ARG:HH21 | 2:C:195:ASP:CG | 2.15 | 0.49 |
| 1:B:508:U:O5' | 1:B:508:U:H6 | 1.94 | 0.49 |
| 2:A:105:ALA:O | 2:A:144:HIS:HB2 | 2.12 | 0.49 |
| 2:A:157:GLU:HG2 | 3:A:488:HOH:O | 2.12 | 0.49 |
| 1:D:553:G:O2' | 1:D:554:U:H5' | 2.13 | 0.49 |
| 2:A:20:TYR:O | 2:A:24:PHE:HD1 | 1.96 | 0.49 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:C:406:GLU:HG3 | 2:C:408:THR:HG23 | 1.94 | 0.49 |
| 2:A:239:PRO:HA | 2:A:304:VAL:HG11 | 1.95 | 0.48 |
| 2:C:238:ASN:HD21 | 2:C:245:SER:N | 2.11 | 0.48 |
| 2:C:385:ARG:HH11 | 2:C:385:ARG:HB2 | 1.78 | 0.48 |
| 2:C:435:ARG:HH11 | 2:C:444:THR:CG2 | 2.26 | 0.48 |
| 2:A:44:ASP:C | 2:A:46:ALA:H | 2.17 | 0.48 |
| 2:C:265:ALA:CB | 2:C:314:ASN:HD22 | 2.25 | 0.48 |
| 2:C:267:ARG:NH2 | 2:C:284:PHE:O | 2.46 | 0.48 |
| 2:C:465:ARG:O | 2:C:468:ALA:HB3 | 2.14 | 0.48 |
| 2:C:122:TYR:OH | 2:C:125:ARG:HG2 | 2.13 | 0.48 |
| 2:C:277:MET:HB2 | 3:C:549:HOH:O | 2.13 | 0.48 |
| 2:C:390:GLY:C | 2:C:392:PRO:HD2 | 2.32 | 0.48 |
| 2:A:386:LYS:HE3 | 2:A:432:GLN:HG2 | 1.94 | 0.48 |
| 2:C:213:THR:O | 2:C:217:VAL:HG12 | 2.13 | 0.48 |
| 1:B:556:C:O2' | 1:B:557:G:H5'' | 2.13 | 0.48 |
| 1:D:535:U:H4' | 2:C:432:GLN:NE2 | 2.16 | 0.48 |
| 2:A:160:ASP:OD2 | 2:A:232:HIS:HD2 | 1.96 | 0.48 |
| 2:C:361:THR:O | 2:C:364:GLU:HB2 | 2.14 | 0.48 |
| 1:D:511:U:O2' | 1:D:512:C:H5' | 2.14 | 0.48 |
| 2:A:314:ASN:HB3 | 2:A:360:ASP:O | 2.12 | 0.48 |
| 2:C:196:HIS:HD2 | 3:C:529:HOH:O | 1.97 | 0.48 |
| 2:C:236:LEU:O | 2:C:244:ILE:HG13 | 2.12 | 0.48 |
| 2:C:425:VAL:HG22 | 2:C:429:GLN:OE1 | 2.13 | 0.48 |
| 1:D:509:C:H4' | 1:D:510:G:OP2 | 2.13 | 0.48 |
| 2:C:3:VAL:HG13 | 2:C:37:ILE:HD11 | 1.94 | 0.48 |
| 2:C:125:ARG:HE | 2:C:125:ARG:HB3 | 1.28 | 0.48 |
| 2:C:323:SER:OG | 2:C:326:GLU:HB2 | 2.14 | 0.48 |
| 1:B:530:C:O2' | 1:B:531:C:H5' | 2.14 | 0.48 |
| 1:B:531:C:H2' | 1:B:532:C:H6 | 1.76 | 0.48 |
| 1:B:553:G:H2' | 1:B:554:U:H5' | 1.94 | 0.48 |
| 1:B:569:G:H2' | 1:B:570:G:C8 | 2.47 | 0.48 |
| 2:A:6:ILE:HD11 | 2:A:38:VAL:HG22 | 1.96 | 0.48 |
| 2:A:396:GLU:OE1 | 2:A:423:LYS:HE2 | 2.13 | 0.48 |
| 2:C:463:LEU:C | 2:C:463:LEU:CD2 | 2.73 | 0.48 |
| 1:B:573:A:C2 | 1:B:575:C:N3 | 2.82 | 0.48 |
| 1:D:504:C:H2' | 1:D:505:C:H6 | 1.74 | 0.48 |
| 1:D:517:G:H21 | 1:D:557:G:C2' | 2.18 | 0.48 |
| 2:C:115:ILE:CG2 | 2:C:122:TYR:HA | 2.44 | 0.48 |
| 2:C:397:LEU:HG | 2:C:401:LEU:HD22 | 1.96 | 0.48 |
| 1:B:509:C:H4' | 1:B:510:G:OP2 | 2.14 | 0.48 |
| 1:B:551:G:H2' | 1:B:552:G:C8 | 2.49 | 0.48 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:561:C:H2' | 1:D:562:C:H5 | 1.76 | 0.48 |
| 2:A:333:PRO:HA | 2:A:336:ARG:CZ | 2.44 | 0.48 |
| 1:D:568:G:H2' | 1:D:569:G:C8 | 2.48 | 0.47 |
| 2:A:213:THR:HA | 2:A:216:HIS:CD2 | 2.45 | 0.47 |
| 2:C:17:GLY:O | 2:C:20:TYR:HB3 | 2.14 | 0.47 |
| 1:D:555:U:C3' | 1:D:556:C:H5'' | 2.44 | 0.47 |
| 2:A:75:ALA:HB1 | 2:A:76:PRO:CD | 2.42 | 0.47 |
| 2:A:463:LEU:HD22 | 2:A:467:LEU:HG | 1.96 | 0.47 |
| 2:C:75:ALA:HB1 | 2:C:76:PRO:CD | 2.43 | 0.47 |
| 2:C:229:ARG:HH11 | 2:C:229:ARG:CB | 2.26 | 0.47 |
| 1:B:562:C:H6 | 1:B:562:C:O5' | 1.96 | 0.47 |
| 1:D:556:C:H2' | 1:D:557:G:C5' | 2.44 | 0.47 |
| 2:A:255:TRP:CZ2 | 2:A:259:GLU:HG3 | 2.49 | 0.47 |
| 2:C:86:LEU:N | 2:C:87:PRO:HD2 | 2.29 | 0.47 |
| 2:C:96:LEU:HB3 | 2:C:102:ALA:HB2 | 1.96 | 0.47 |
| 1:D:523:G:O2' | 1:D:524:A:H5' | 2.15 | 0.47 |
| 2:A:133:GLU:HG2 | 2:A:137:ARG:HD2 | 1.95 | 0.47 |
| 2:A:176:VAL:HG11 | 2:A:215:ILE:HD13 | 1.95 | 0.47 |
| 2:A:355:MET:HG3 | 2:A:369:ALA:HB2 | 1.95 | 0.47 |
| 2:A:435:ARG:CD | 2:A:444:THR:HB | 2.43 | 0.47 |
| 2:C:281:ARG:HG2 | 2:C:281:ARG:HH11 | 1.80 | 0.47 |
| 1:D:540:G:H2' | 1:D:541:C:C6 | 2.49 | 0.47 |
| 1:D:557:G:H5' | 1:D:557:G:C8 | 2.43 | 0.47 |
| 2:A:40:ILE:O | 2:A:82:GLN:HB2 | 2.14 | 0.47 |
| 1:B:552:G:C4 | 1:B:553:G:C8 | 3.02 | 0.47 |
| 1:B:555:U:C2' | 1:B:556:C:H5'' | 2.44 | 0.47 |
| 1:D:556:C:O2 | 1:D:557:G:C8 | 2.67 | 0.47 |
| 2:A:69:GLU:CB | 2:A:75:ALA:HB2 | 2.43 | 0.47 |
| 2:C:140:ARG:HD2 | 2:C:140:ARG:H | 1.80 | 0.47 |
| 2:C:281:ARG:HG2 | 2:C:281:ARG:NH1 | 2.29 | 0.47 |
| 1:B:516:C:O2' | 1:B:517:G:P | 2.72 | 0.47 |
| 1:B:517:G:O6 | 1:B:555:U:H1' | 2.13 | 0.47 |
| 1:D:505:C:O3' | 2:C:163:ARG:HG2 | 2.15 | 0.47 |
| 2:C:238:ASN:HD21 | 2:C:245:SER:CB | 2.27 | 0.47 |
| 2:C:383:ALA:HA | 2:C:442:LEU:HD13 | 1.97 | 0.47 |
| 2:C:401:LEU:CD1 | 2:C:415:LEU:HD23 | 2.45 | 0.47 |
| 2:C:422:GLU:HG2 | 2:C:423:LYS:HZ2 | 1.80 | 0.47 |
| 1:B:534:C:H4' | 2:A:426:LYS:NZ | 2.30 | 0.47 |
| 2:A:51:GLY:HA2 | 2:A:54:GLU:OE1 | 2.15 | 0.47 |
| 2:A:157:GLU:CG | 2:A:167:VAL:HG22 | 2.44 | 0.47 |
| 2:A:275:PHE:CE2 | 2:A:297:ARG:HB2 | 2.49 | 0.47 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:C:441:SER:O | 2:C:442:LEU:CB | 2.63 | 0.47 |
| 1:B:556:C:C2' | 1:B:556:C:O2 | 2.61 | 0.46 |
| 2:A:139:ARG:C | 2:A:141:GLY:N | 2.66 | 0.46 |
| 2:A:202:ASP:CG | 2:A:229:ARG:HH11 | 2.18 | 0.46 |
| 2:C:110:GLU:OE2 | 2:C:110:GLU:N | 2.38 | 0.46 |
| 1:D:501:G:O5' | 1:D:501:G:H8 | 1.99 | 0.46 |
| 2:A:1:MET:SD | 2:A:34:GLY:HA2 | 2.55 | 0.46 |
| 2:A:1:MET:CE | 2:A:35:ARG:HH11 | 2.28 | 0.46 |
| 2:A:136:GLU:HA | 2:A:140:ARG:NH2 | 2.30 | 0.46 |
| 2:A:438:LEU:O | 2:A:462:ARG:HD3 | 2.15 | 0.46 |
| 2:C:185:PRO:HB3 | 2:C:189:LEU:HD12 | 1.96 | 0.46 |
| 2:C:323:SER:O | 2:C:327:VAL:HG23 | 2.15 | 0.46 |
| 2:C:402:ARG:HA | 2:C:460:LEU:HD11 | 1.96 | 0.46 |
| 1:B:561:C:O2 | 1:B:562:C:C5 | 2.69 | 0.46 |
| 1:D:552:G:C4 | 1:D:553:G:C8 | 3.03 | 0.46 |
| 2:A:118:GLU:HG2 | 2:A:118:GLU:H | 1.52 | 0.46 |
| 2:A:391:LEU:N | 2:A:392:PRO:CD | 2.79 | 0.46 |
| 2:C:355:MET:HA | 2:C:358:ARG:HG3 | 1.97 | 0.46 |
| 2:C:446:GLY:O | 2:C:449:GLU:HG2 | 2.14 | 0.46 |
| 2:A:139:ARG:O | 2:A:141:GLY:N | 2.48 | 0.46 |
| 2:A:294:THR:CG2 | 2:A:296:GLU:HG3 | 2.45 | 0.46 |
| 2:C:137:ARG:O | 2:C:142:GLU:CB | 2.55 | 0.46 |
| 2:C:160:ASP:OD1 | 2:C:162:LEU:HB2 | 2.14 | 0.46 |
| 2:C:314:ASN:O | 2:C:318:ILE:HG13 | 2.16 | 0.46 |
| 2:A:205:ARG:O | 2:A:232:HIS:HA | 2.15 | 0.46 |
| 2:A:250:HIS:HA | 3:A:572:HOH:O | 2.15 | 0.46 |
| 2:A:335:LEU:HD13 | 2:A:342:TRP:CE3 | 2.49 | 0.46 |
| 2:C:107:GLU:HB2 | 2:C:112:LEU:CD2 | 2.44 | 0.46 |
| 1:B:504:C:H3' | 3:B:82:HOH:O | 2.15 | 0.46 |
| 1:D:524:A:H2' | 1:D:525:C:C6 | 2.51 | 0.46 |
| 1:D:556:C:C2 | 1:D:557:G:C8 | 3.04 | 0.46 |
| 2:A:6:ILE:C | 2:A:8:PRO:HD3 | 2.36 | 0.46 |
| 2:A:294:THR:HB | 2:A:297:ARG:HG3 | 1.98 | 0.46 |
| 2:A:407:TRP:CD1 | 2:A:456:LYS:N | 2.84 | 0.46 |
| 1:B:514:A:C5 | 1:B:522:G:C6 | 3.04 | 0.46 |
| 1:D:503:C:H2' | 1:D:504:C:C6 | 2.51 | 0.46 |
| 1:D:553:G:H2' | 1:D:554:U:C6 | 2.51 | 0.46 |
| 2:A:88:LEU:CD1 | 2:A:92:TYR:HE1 | 2.29 | 0.46 |
| 2:A:400:ARG:H | 2:A:400:ARG:HG2 | 1.50 | 0.46 |
| 2:C:178:LEU:HB3 | 2:C:189:LEU:HG | 1.97 | 0.46 |
| 2:C:435:ARG:HH11 | 2:C:444:THR:HG22 | 1.80 | 0.46 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:239:PRO:HA | 2:A:304:VAL:CG1 | 2.46 | 0.45 |
| 2:C:117:LYS:NZ | 2:C:117:LYS:HB2 | 2.31 | 0.45 |
| 2:C:147:ARG:HH11 | 2:C:147:ARG:CG | 2.26 | 0.45 |
| 1:B:534:C:O5' | 1:B:534:C:H6 | 1.99 | 0.45 |
| 1:D:506:C:P | 2:C:163:ARG:HG2 | 2.56 | 0.45 |
| 1:D:516:C:O2' | 1:D:517:G:OP2 | 2.34 | 0.45 |
| 2:A:75:ALA:CB | 2:A:80:TYR:OH | 2.65 | 0.45 |
| 2:A:203:VAL:HB | 2:A:230:PHE:CD1 | 2.51 | 0.45 |
| 2:A:358:ARG:CZ | 2:A:445:PRO:HA | 2.46 | 0.45 |
| 1:D:520:U:H2' | 1:D:521:A:H5' | 1.98 | 0.45 |
| 2:A:152:ARG:HH11 | 2:A:152:ARG:CG | 2.29 | 0.45 |
| 2:A:265:ALA:CB | 2:A:314:ASN:HD22 | 2.30 | 0.45 |
| 2:C:97:LEU:C | 2:C:99:ARG:H | 2.20 | 0.45 |
| 2:C:132:GLU:OE1 | 2:C:136:GLU:HG2 | 2.16 | 0.45 |
| 1:D:517:G:C2 | 1:D:558:A:C4 | 3.04 | 0.45 |
| 1:D:520:U:C2' | 1:D:521:A:H5' | 2.47 | 0.45 |
| 2:A:87:PRO:O | 2:A:90:GLN:HB2 | 2.15 | 0.45 |
| 2:A:88:LEU:HD11 | 2:A:92:TYR:HE1 | 1.81 | 0.45 |
| 2:C:168:TYR:CD2 | 2:C:214:PRO:HG3 | 2.51 | 0.45 |
| 2:C:213:THR:N | 2:C:214:PRO:CD | 2.79 | 0.45 |
| 2:C:382:LYS:HG2 | 3:C:483:HOH:O | 2.15 | 0.45 |
| 1:D:562:C:O5' | 1:D:562:C:H6 | 1.99 | 0.45 |
| 2:A:86:LEU:N | 2:A:87:PRO:CD | 2.79 | 0.45 |
| 2:C:168:TYR:CE2 | 2:C:214:PRO:HG3 | 2.52 | 0.45 |
| 2:C:203:VAL:HG12 | 2:C:205:ARG:HD2 | 1.98 | 0.45 |
| 2:C:404:GLN:NE2 | 2:C:404:GLN:HA | 2.30 | 0.45 |
| 2:C:408:THR:OG1 | 2:C:411:ALA:CB | 2.65 | 0.45 |
| 2:C:318:ILE:O | 2:C:356:ARG:HD3 | 2.17 | 0.45 |
| 2:A:354:LEU:HD22 | 2:A:449:GLU:HG3 | 1.98 | 0.45 |
| 2:C:139:ARG:NH1 | 2:C:139:ARG:HG3 | 2.32 | 0.45 |
| 2:C:331:VAL:CG2 | 2:C:365:PHE:CD2 | 3.00 | 0.45 |
| 1:B:524:A:H2' | 1:B:525:C:C6 | 2.52 | 0.45 |
| 1:D:501:G:H2' | 1:D:502:G:H8 | 1.81 | 0.45 |
| 2:A:202:ASP:OD2 | 2:A:229:ARG:NH1 | 2.49 | 0.45 |
| 2:C:239:PRO:HA | 2:C:304:VAL:HG11 | 1.99 | 0.45 |
| 2:A:13:ASP:OD1 | 2:A:13:ASP:N | 2.49 | 0.45 |
| 2:A:397:LEU:C | 2:A:399:PRO:HD2 | 2.37 | 0.45 |
| 2:C:111:GLU:O | 2:C:115:ILE:CD1 | 2.63 | 0.45 |
| 2:C:426:LYS:HE2 | 2:C:427:LEU:H | 1.82 | 0.45 |
| 1:B:567:G:O2' | 1:B:568:G:C5' | 2.64 | 0.44 |
| 2:A:89:TYR:CG | 2:A:185:PRO:HG3 | 2.52 | 0.44 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:139:ARG:HE | 2:A:140:ARG:NH2 | 2.15 | 0.44 |
| 2:A:311:ARG:HB3 | 2:A:311:ARG:NH1 | 2.32 | 0.44 |
| 1:B:501:G:H2' | 1:B:502:G:C8 | 2.52 | 0.44 |
| 1:D:556:C:C3' | 1:D:557:G:H5' | 2.48 | 0.44 |
| 2:A:206:ALA:HB1 | 2:A:235:LEU:HD11 | 1.99 | 0.44 |
| 2:A:444:THR:CG2 | 2:A:445:PRO:N | 2.80 | 0.44 |
| 2:C:316:LYS:HE3 | 2:C:320:GLU:OE1 | 2.16 | 0.44 |
| 1:B:509:C:H5 | 1:B:523:G:O6 | 2.01 | 0.44 |
| 1:D:517:G:C2 | 1:D:557:G:H2' | 2.37 | 0.44 |
| 2:C:179:LEU:HD23 | 2:C:179:LEU:HA | 1.70 | 0.44 |
| 1:B:569:G:O2' | 1:B:570:G:C5' | 2.63 | 0.44 |
| 1:D:562:C:O2' | 1:D:563:C:C5' | 2.62 | 0.44 |
| 2:A:107:GLU:HG2 | 2:A:115:ILE:HD11 | 1.99 | 0.44 |
| 2:A:261:PHE:HZ | 2:A:311:ARG:HG2 | 1.82 | 0.44 |
| 2:A:275:PHE:HE2 | 2:A:297:ARG:HB2 | 1.83 | 0.44 |
| 1:D:502:G:O2' | 1:D:503:C:H5' | 2.17 | 0.44 |
| 1:D:509:C:H5 | 1:D:523:G:O6 | 2.01 | 0.44 |
| 2:A:142:GLU:HG3 | 2:A:143:PRO:HD2 | 2.00 | 0.44 |
| 2:A:246:LYS:HA | 2:A:251:THR:HG23 | 1.99 | 0.44 |
| 2:A:372:LEU:HD23 | 2:A:372:LEU:HA | 1.80 | 0.44 |
| 2:A:89:TYR:CD2 | 2:A:185:PRO:HG3 | 2.53 | 0.44 |
| 2:A:434:LEU:O | 2:A:434:LEU:HD12 | 2.17 | 0.44 |
| 2:A:30:ARG:CB | 2:A:290:ILE:HD13 | 2.41 | 0.44 |
| 2:A:202:ASP:CG | 2:A:229:ARG:NH1 | 2.71 | 0.44 |
| 2:C:262:LEU:HD11 | 2:C:318:ILE:HG12 | 1.99 | 0.44 |
| 1:B:558:A:H2' | 1:B:560:U:OP2 | 2.17 | 0.44 |
| 1:B:563:C:C2' | 1:B:564:C:H6 | 2.27 | 0.44 |
| 1:D:556:C:C3' | 1:D:557:G:C5' | 2.96 | 0.44 |
| 2:C:69:GLU:HB3 | 2:C:75:ALA:HB2 | 1.99 | 0.44 |
| 1:D:508:U:O2' | 1:D:546:A:H1' | 2.18 | 0.44 |
| 1:D:517:G:C5 | 1:D:557:G:C6 | 3.06 | 0.44 |
| 2:A:75:ALA:N | 3:A:566:HOH:O | 2.51 | 0.44 |
| 2:C:324:LEU:O | 2:C:324:LEU:HD23 | 2.17 | 0.44 |
| 2:C:332:LYS:HB2 | 2:C:333:PRO:CD | 2.48 | 0.44 |
| 1:B:550:G:O2' | 1:B:551:G:C5' | 2.53 | 0.43 |
| 1:D:567:G:H2' | 1:D:568:G:C8 | 2.47 | 0.43 |
| 2:C:132:GLU:OE2 | 2:C:132:GLU:HA | 2.18 | 0.43 |
| 2:C:310:LEU:O | 2:C:313:MET:HB3 | 2.18 | 0.43 |
| 1:B:573:A:H2 | 1:B:575:C:N3 | 2.15 | 0.43 |
| 2:C:51:GLY:O | 2:C:53:GLU:N | 2.52 | 0.43 |
| 2:C:72:ASP:OD1 | 2:C:72:ASP:N | 2.36 | 0.43 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:C:124:GLY:O | 2:C:127:ARG:HB2 | 2.18 | 0.43 |
| 1:D:560:U:H3' | 1:D:561:C:C5 | 2.53 | 0.43 |
| 2:A:86:LEU:HA | 2:A:89:TYR:CD2 | 2.53 | 0.43 |
| 2:A:136:GLU:HG3 | 2:A:140:ARG:CZ | 2.48 | 0.43 |
| 2:A:265:ALA:HB3 | 2:A:314:ASN:HD22 | 1.83 | 0.43 |
| 2:C:96:LEU:HB3 | 2:C:102:ALA:CB | 2.47 | 0.43 |
| 2:C:319:ARG:HA | 2:C:356:ARG:HH11 | 1.82 | 0.43 |
| 1:B:520:U:C2' | 1:B:521:A:H5' | 2.48 | 0.43 |
| 2:A:74:ALA:HB1 | 3:A:570:HOH:O | 2.17 | 0.43 |
| 2:A:187:TYR:O | 2:A:191:ASN:HB3 | 2.18 | 0.43 |
| 2:C:355:MET:O | 2:C:356:ARG:C | 2.57 | 0.43 |
| 1:B:520:U:H2' | 1:B:521:A:H5' | 2.00 | 0.43 |
| 1:D:513:U:O2' | 1:D:514:A:H5' | 2.18 | 0.43 |
| 1:D:551:G:C4 | 1:D:552:G:C8 | 3.06 | 0.43 |
| 1:D:569:G:C4' | 2:C:237:ARG:HH21 | 2.31 | 0.43 |
| 2:C:39:ARG:NH2 | 2:C:195:ASP:OD2 | 2.50 | 0.43 |
| 2:C:193:VAL:O | 2:C:197:LEU:HB2 | 2.17 | 0.43 |
| 2:C:290:ILE:HG13 | 2:C:291:GLN:N | 2.33 | 0.43 |
| 2:C:358:ARG:O | 2:C:368:LYS:HE3 | 2.18 | 0.43 |
| 1:B:553:G:H4' | 1:B:553:G:OP1 | 2.18 | 0.43 |
| 2:A:188:HIS:HA | 2:A:216:HIS:CE1 | 2.52 | 0.43 |
| 2:A:318:ILE:O | 2:A:356:ARG:HD3 | 2.17 | 0.43 |
| 2:C:188:HIS:HD2 | 2:C:216:HIS:CE1 | 2.36 | 0.43 |
| 1:B:518:G:C5' | 1:B:560:U:O4 | 2.66 | 0.43 |
| 2:A:84:GLU:HG2 | 2:A:84:GLU:H | 1.56 | 0.43 |
| 2:A:401:LEU:HD13 | 2:A:401:LEU:N | 2.34 | 0.43 |
| 2:A:407:TRP:CE2 | 2:A:456:LYS:CA | 2.97 | 0.43 |
| 2:C:31:ARG:O | 2:C:31:ARG:CD | 2.67 | 0.43 |
| 1:B:516:C:O2' | 1:B:517:G:OP2 | 2.36 | 0.43 |
| 1:D:574:C:O2 | 2:C:181:SER:OG | 2.34 | 0.43 |
| 2:A:184:TYR:CE1 | 3:A:487:HOH:O | 2.57 | 0.43 |
| 2:C:69:GLU:HB3 | 2:C:75:ALA:CB | 2.49 | 0.43 |
| 2:C:122:TYR:HE1 | 2:C:125:ARG:HD2 | 1.84 | 0.43 |
| 2:C:438:LEU:O | 2:C:462:ARG:NH1 | 2.44 | 0.43 |
| 1:B:555:U:C3' | 1:B:556:C:H5'' | 2.49 | 0.42 |
| 1:D:569:G:N3 | 1:D:570:G:C8 | 2.87 | 0.42 |
| 2:A:325:GLU:H | 2:A:325:GLU:CD | 2.22 | 0.42 |
| 2:C:6:ILE:CD1 | 2:C:60:LEU:HD11 | 2.49 | 0.42 |
| 1:B:561:C:C2 | 1:B:562:C:C5 | 3.07 | 0.42 |
| 1:D:553:G:H4' | 1:D:553:G:OP1 | 2.18 | 0.42 |
| 3:D:259:HOH:O | 2:C:172:GLU:HG2 | 2.19 | 0.42 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:A:220:TYR:CE1 | 2:A:228:PRO:HD3 | 2.54 | 0.42 |
| 2:A:236:LEU:HD12 | 2:A:303:PRO:HG2 | 2.01 | 0.42 |
| 2:A:256:TYR:O | 2:A:261:PHE:HB2 | 2.19 | 0.42 |
| 2:C:355:MET:SD | 2:C:369:ALA:HB2 | 2.59 | 0.42 |
| 2:A:174:PRO:HG2 | 2:A:176:VAL:CG1 | 2.50 | 0.42 |
| 2:A:345:GLU:O | 2:A:349:ARG:HG3 | 2.19 | 0.42 |
| 2:A:361:THR:O | 2:A:364:GLU:HB2 | 2.20 | 0.42 |
| 2:A:385:ARG:HD3 | 3:A:489:HOH:O | 2.19 | 0.42 |
| 2:C:169:ASP:OD2 | 2:C:169:ASP:C | 2.57 | 0.42 |
| 2:C:229:ARG:CG | 2:C:229:ARG:NH1 | 2.79 | 0.42 |
| 2:C:314:ASN:HB3 | 2:C:360:ASP:O | 2.20 | 0.42 |
| 2:C:318:ILE:O | 2:C:356:ARG:NH1 | 2.37 | 0.42 |
| 1:D:510:G:H2' | 1:D:511:U:C6 | 2.55 | 0.42 |
| 1:D:555:U:H2' | 1:D:556:C:C5' | 2.47 | 0.42 |
| 2:A:137:ARG:NH1 | 2:A:137:ARG:HG2 | 2.34 | 0.42 |
| 2:C:406:GLU:HG2 | 2:C:411:ALA:HB2 | 2.00 | 0.42 |
| 2:A:20:TYR:HE2 | 2:A:234:PRO:O | 2.03 | 0.42 |
| 2:A:43:THR:HG23 | 2:A:82:GLN:HB3 | 2.01 | 0.42 |
| 2:A:350:ARG:HH11 | 2:A:354:LEU:HD21 | 1.85 | 0.42 |
| 2:A:426:LYS:O | 2:A:427:LEU:C | 2.57 | 0.42 |
| 2:C:270:LEU:HD12 | 2:C:273:MET:HG3 | 2.01 | 0.42 |
| 2:C:387:LEU:CD1 | 2:C:437:ALA:HB2 | 2.50 | 0.42 |
| 2:C:423:LYS:NZ | 2:C:423:LYS:CB | 2.82 | 0.42 |
| 2:C:462:ARG:O | 2:C:465:ARG:HB2 | 2.19 | 0.42 |
| 1:B:544:A:HO2' | 1:B:545:A:H5' | 1.83 | 0.42 |
| 2:A:105:ALA:CB | 2:A:147:ARG:HD2 | 2.50 | 0.42 |
| 2:C:85:ARG:O | 2:C:88:LEU:HB2 | 2.20 | 0.42 |
| 2:C:355:MET:CE | 2:C:445:PRO:HD3 | 2.46 | 0.42 |
| 1:D:550:G:O2' | 1:D:551:G:C5' | 2.55 | 0.42 |
| 2:A:6:ILE:HD13 | 2:A:36:PHE:HZ | 1.85 | 0.42 |
| 2:A:463:LEU:C | 2:A:463:LEU:HD13 | 2.40 | 0.42 |
| 2:C:92:TYR:O | 2:C:95:GLU:HB3 | 2.19 | 0.42 |
| 2:C:130:PRO:HA | 2:C:131:PRO:HD2 | 1.86 | 0.42 |
| 2:C:238:ASN:HD21 | 2:C:245:SER:HB3 | 1.85 | 0.42 |
| 2:A:188:HIS:CD2 | 2:A:216:HIS:CE1 | 3.08 | 0.42 |
| 2:A:242:THR:O | 2:A:243:LYS:C | 2.58 | 0.42 |
| 2:A:442:LEU:HA | 2:A:442:LEU:HD12 | 1.83 | 0.42 |
| 2:C:89:TYR:HB3 | 2:C:189:LEU:CD1 | 2.50 | 0.42 |
| 2:C:159:LYS:HB2 | 2:C:165:VAL:HG22 | 2.02 | 0.42 |
| 2:C:340:LEU:HD12 | 2:C:366:PRO:HB3 | 2.02 | 0.41 |
| 1:B:558:A:H2' | 1:B:561:C:H41 | 1.85 | 0.41 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:D:524:A:H2' | 1:D:525:C:H6 | 1.86 | 0.41 |
| 2:A:240:ASP:CG | 2:A:242:THR:OG1 | 2.57 | 0.41 |
| 2:C:130:PRO:HG2 | 2:C:133:GLU:CB | 2.35 | 0.41 |
| 2:C:137:ARG:HB3 | 2:C:137:ARG:NH1 | 2.23 | 0.41 |
| 2:C:392:PRO:HA | 3:C:558:HOH:O | 2.21 | 0.41 |
| 2:A:332:LYS:HB2 | 2:A:333:PRO:HD3 | 2.01 | 0.41 |
| 2:C:115:ILE:HG21 | 2:C:122:TYR:HA | 2.02 | 0.41 |
| 1:B:510:G:H2' | 1:B:511:U:H6 | 1.85 | 0.41 |
| 2:A:327:VAL:CG1 | 2:A:352:VAL:HG11 | 2.50 | 0.41 |
| 2:C:169:ASP:HB3 | 2:C:172:GLU:CG | 2.51 | 0.41 |
| 2:C:218:LEU:O | 2:C:221:ARG:HB3 | 2.21 | 0.41 |
| 2:A:11:THR:HA | 2:A:49:VAL:HG23 | 2.03 | 0.41 |
| 2:A:283:ILE:HD13 | 2:A:313:MET:HE3 | 2.02 | 0.41 |
| 2:A:446:GLY:O | 2:A:449:GLU:HG2 | 2.20 | 0.41 |
| 2:C:47:ARG:HG2 | 2:C:47:ARG:H | 1.69 | 0.41 |
| 2:C:53:GLU:OE1 | 2:C:81:ARG:NH1 | 2.54 | 0.41 |
| 2:C:85:ARG:NH1 | 2:C:194:ASP:OD2 | 2.54 | 0.41 |
| 2:C:214:PRO:HA | 2:C:217:VAL:HG13 | 2.02 | 0.41 |
| 2:C:395:LYS:HG2 | 2:C:395:LYS:H | 1.42 | 0.41 |
| 2:C:403:ALA:O | 2:C:404:GLN:C | 2.58 | 0.41 |
| 1:B:502:G:O5' | 1:B:502:G:H8 | 2.04 | 0.41 |
| 1:D:575:C:O2 | 1:D:575:C:H5'' | 2.20 | 0.41 |
| 2:A:89:TYR:HB3 | 2:A:189:LEU:HD13 | 2.01 | 0.41 |
| 2:A:106:PHE:CD1 | 2:A:106:PHE:N | 2.88 | 0.41 |
| 2:C:48:TYR:CD1 | 2:C:48:TYR:C | 2.93 | 0.41 |
| 2:A:150:VAL:HG21 | 2:A:173:ILE:HG22 | 2.03 | 0.41 |
| 2:A:275:PHE:CD1 | 2:A:289:PHE:HE1 | 2.39 | 0.41 |
| 2:A:370:ARG:HH11 | 2:A:370:ARG:CG | 2.28 | 0.41 |
| 2:C:107:GLU:OE1 | 2:C:122:TYR:CZ | 2.73 | 0.41 |
| 2:C:113:GLU:HG3 | 2:C:116:ARG:NH2 | 2.35 | 0.41 |
| 1:B:576:A:H5' | 2:A:45:ARG:NH1 | 2.36 | 0.41 |
| 1:D:564:C:O2' | 1:D:565:C:C5' | 2.67 | 0.41 |
| 2:C:119:LYS:HB3 | 2:C:119:LYS:HE2 | 1.70 | 0.41 |
| 2:C:139:ARG:C | 2:C:141:GLY:N | 2.72 | 0.41 |
| 2:C:426:LYS:HE2 | 2:C:426:LYS:HA | 2.02 | 0.41 |
| 1:B:563:C:C2' | 1:B:564:C:C6 | 2.94 | 0.41 |
| 1:D:546:A:O2' | 1:D:548:C:H4' | 2.21 | 0.41 |
| 2:A:398:TYR:CE1 | 2:A:464:GLU:HG2 | 2.56 | 0.41 |
| 2:A:426:LYS:HD2 | 2:A:427:LEU:N | 2.36 | 0.41 |
| 2:C:56:ILE:HD13 | 2:C:56:ILE:H | 1.82 | 0.41 |
| 2:C:56:ILE:CD1 | 2:C:56:ILE:H | 2.34 | 0.41 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:C:432:GLN:N | 2:C:433:PRO:HD2 | 2.35 | 0.41 |
| 2:C:463:LEU:HD23 | 2:C:464:GLU:N | 2.33 | 0.41 |
| 2:A:441:SER:O | 2:A:442:LEU:CB | 2.63 | 0.41 |
| 2:C:139:ARG:HG3 | 2:C:139:ARG:HH11 | 1.86 | 0.41 |
| 2:C:332:LYS:O | 2:C:333:PRO:C | 2.59 | 0.41 |
| 1:B:566:U:O2' | 1:B:567:G:C5' | 2.62 | 0.40 |
| 2:A:97:LEU:C | 2:A:99:ARG:H | 2.24 | 0.40 |
| 2:A:451:LEU:HD23 | 2:A:451:LEU:HA | 1.83 | 0.40 |
| 2:C:21:ILE:HG22 | 2:C:22:ALA:N | 2.36 | 0.40 |
| 2:C:332:LYS:O | 2:C:335:LEU:N | 2.54 | 0.40 |
| 2:C:434:LEU:HD23 | 2:C:447:LEU:HD21 | 2.03 | 0.40 |
| 1:B:574:C:O5' | 2:A:177:VAL:CG1 | 2.69 | 0.40 |
| 1:D:543:G:O2' | 1:D:544:A:C5' | 2.68 | 0.40 |
| 2:C:116:ARG:CG | 2:C:121:GLY:HA2 | 2.51 | 0.40 |
| 2:C:152:ARG:CB | 2:C:153:PRO:HD3 | 2.51 | 0.40 |
| 2:C:426:LYS:O | 2:C:427:LEU:C | 2.60 | 0.40 |
| 2:A:283:ILE:HD13 | 2:A:313:MET:CE | 2.52 | 0.40 |
| 2:C:86:LEU:N | 2:C:87:PRO:CD | 2.84 | 0.40 |
| 2:C:319:ARG:HA | 2:C:356:ARG:HD2 | 2.03 | 0.40 |
| 2:A:397:LEU:O | 2:A:401:LEU:HD22 | 2.22 | 0.40 |
| 2:A:398:TYR:CD2 | 2:A:398:TYR:C | 2.94 | 0.40 |
| 2:A:458:ARG:HD2 | 2:A:458:ARG:O | 2.22 | 0.40 |
| 2:C:115:ILE:HG21 | 2:C:122:TYR:HD1 | 1.86 | 0.40 |
| 1:B:510:G:H2' | 1:B:511:U:C6 | 2.57 | 0.40 |
| 1:D:555:U:C3' | 1:D:556:C:C5' | 2.99 | 0.40 |
| 2:A:225:TRP:HZ3 | 3:A:501:HOH:O | 2.04 | 0.40 |
| 2:A:412:LEU:O | 2:A:416:LEU:HG | 2.21 | 0.40 |
| 2:A:432:GLN:N | 2:A:433:PRO:HD2 | 2.36 | 0.40 |
| 2:C:180:LYS:HD3 | 2:C:184:TYR:O | 2.21 | 0.40 |
| 2:C:294:THR:HG23 | 2:C:296:GLU:N | 2.36 | 0.40 |
| 2:C:319:ARG:HA | 2:C:356:ARG:NH1 | 2.36 | 0.40 |

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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 | |
|-----|-------|----------------|-----------|---------|----------|-------------|----|
| 2 | A | 466/468 (100%) | 420 (90%) | 37 (8%) | 9 (2%) | 8 | 10 |
| 2 | C | 466/468 (100%) | 415 (89%) | 44 (9%) | 7 (2%) | 10 | 14 |
| All | All | 932/936 (100%) | 835 (90%) | 81 (9%) | 16 (2%) | 9 | 11 |

All (16) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2 | A | 74 | ALA |
| 2 | C | 74 | ALA |
| 2 | A | 78 | GLY |
| 2 | A | 120 | GLY |
| 2 | C | 78 | GLY |
| 2 | C | 120 | GLY |
| 2 | C | 241 | LYS |
| 2 | A | 45 | ARG |
| 2 | A | 140 | ARG |
| 2 | A | 241 | LYS |
| 2 | C | 52 | ALA |
| 2 | C | 140 | ARG |
| 2 | C | 392 | PRO |
| 2 | A | 392 | PRO |
| 2 | A | 244 | ILE |
| 2 | A | 428 | 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 | |
|-----|-------|----------------|-----------|-----------|-------------|---|
| 2 | A | 393/393 (100%) | 290 (74%) | 103 (26%) | 0 | 0 |
| 2 | C | 393/393 (100%) | 285 (72%) | 108 (28%) | 0 | 0 |
| All | All | 786/786 (100%) | 575 (73%) | 211 (27%) | 0 | 0 |

All (211) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2 | A | 1 | MET |
| 2 | A | 5 | ARG |
| 2 | A | 9 | SER |
| 2 | A | 13 | ASP |
| 2 | A | 37 | ILE |
| 2 | A | 45 | ARG |
| 2 | A | 56 | ILE |
| 2 | A | 66 | SER |
| 2 | A | 72 | ASP |
| 2 | A | 73 | VAL |
| 2 | A | 82 | GLN |
| 2 | A | 84 | GLU |
| 2 | A | 85 | ARG |
| 2 | A | 86 | LEU |
| 2 | A | 88 | LEU |
| 2 | A | 90 | GLN |
| 2 | A | 91 | LYS |
| 2 | A | 97 | LEU |
| 2 | A | 98 | LYS |
| 2 | A | 99 | ARG |
| 2 | A | 101 | TRP |
| 2 | A | 114 | GLN |
| 2 | A | 118 | GLU |
| 2 | A | 119 | LYS |
| 2 | A | 127 | ARG |
| 2 | A | 132 | GLU |
| 2 | A | 136 | GLU |
| 2 | A | 137 | ARG |
| 2 | A | 140 | ARG |
| 2 | A | 146 | ILE |
| 2 | A | 152 | ARG |
| 2 | A | 157 | GLU |
| 2 | A | 159 | LYS |
| 2 | A | 163 | ARG |
| 2 | A | 165 | VAL |
| 2 | A | 170 | ASN |
| 2 | A | 179 | LEU |
| 2 | A | 189 | LEU |
| 2 | A | 191 | ASN |
| 2 | A | 197 | LEU |
| 2 | A | 200 | VAL |
| 2 | A | 205 | ARG |
| 2 | A | 210 | LEU |

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| Mol | Chain | Res | Type |
|------------|--------------|------------|-------------|
| 2 | A | 211 | VAL |
| 2 | A | 218 | LEU |
| 2 | A | 221 | ARG |
| 2 | A | 225 | TRP |
| 2 | A | 226 | GLU |
| 2 | A | 235 | LEU |
| 2 | A | 236 | LEU |
| 2 | A | 237 | ARG |
| 2 | A | 242 | THR |
| 2 | A | 244 | ILE |
| 2 | A | 246 | LYS |
| 2 | A | 247 | ARG |
| 2 | A | 257 | LYS |
| 2 | A | 262 | LEU |
| 2 | A | 266 | LEU |
| 2 | A | 267 | ARG |
| 2 | A | 268 | ASN |
| 2 | A | 270 | LEU |
| 2 | A | 272 | LEU |
| 2 | A | 281 | ARG |
| 2 | A | 286 | LEU |
| 2 | A | 290 | ILE |
| 2 | A | 296 | GLU |
| 2 | A | 299 | SER |
| 2 | A | 310 | LEU |
| 2 | A | 322 | LEU |
| 2 | A | 326 | GLU |
| 2 | A | 331 | VAL |
| 2 | A | 336 | ARG |
| 2 | A | 344 | SER |
| 2 | A | 349 | ARG |
| 2 | A | 350 | ARG |
| 2 | A | 356 | ARG |
| 2 | A | 368 | LYS |
| 2 | A | 375 | GLU |
| 2 | A | 376 | ASP |
| 2 | A | 382 | LYS |
| 2 | A | 384 | GLN |
| 2 | A | 385 | ARG |
| 2 | A | 386 | LYS |
| 2 | A | 391 | LEU |
| 2 | A | 393 | LEU |

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| Mol | Chain | Res | Type |
|------------|--------------|------------|-------------|
| 2 | A | 400 | ARG |
| 2 | A | 401 | LEU |
| 2 | A | 405 | GLU |
| 2 | A | 406 | GLU |
| 2 | A | 412 | LEU |
| 2 | A | 423 | LYS |
| 2 | A | 425 | VAL |
| 2 | A | 426 | LYS |
| 2 | A | 432 | GLN |
| 2 | A | 435 | ARG |
| 2 | A | 442 | LEU |
| 2 | A | 443 | GLU |
| 2 | A | 444 | THR |
| 2 | A | 451 | LEU |
| 2 | A | 457 | GLU |
| 2 | A | 458 | ARG |
| 2 | A | 461 | ARG |
| 2 | A | 463 | LEU |
| 2 | C | 13 | ASP |
| 2 | C | 21 | ILE |
| 2 | C | 35 | ARG |
| 2 | C | 37 | ILE |
| 2 | C | 43 | THR |
| 2 | C | 47 | ARG |
| 2 | C | 53 | GLU |
| 2 | C | 55 | ARG |
| 2 | C | 56 | ILE |
| 2 | C | 61 | LYS |
| 2 | C | 66 | SER |
| 2 | C | 72 | ASP |
| 2 | C | 85 | ARG |
| 2 | C | 86 | LEU |
| 2 | C | 88 | LEU |
| 2 | C | 96 | LEU |
| 2 | C | 98 | LYS |
| 2 | C | 99 | ARG |
| 2 | C | 101 | TRP |
| 2 | C | 108 | THR |
| 2 | C | 111 | GLU |
| 2 | C | 113 | GLU |
| 2 | C | 116 | ARG |
| 2 | C | 118 | GLU |

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| Mol | Chain | Res | Type |
|------------|--------------|------------|-------------|
| 2 | C | 119 | LYS |
| 2 | C | 125 | ARG |
| 2 | C | 132 | GLU |
| 2 | C | 137 | ARG |
| 2 | C | 139 | ARG |
| 2 | C | 142 | GLU |
| 2 | C | 147 | ARG |
| 2 | C | 149 | LYS |
| 2 | C | 152 | ARG |
| 2 | C | 155 | THR |
| 2 | C | 162 | LEU |
| 2 | C | 172 | GLU |
| 2 | C | 177 | VAL |
| 2 | C | 179 | LEU |
| 2 | C | 180 | LYS |
| 2 | C | 189 | LEU |
| 2 | C | 191 | ASN |
| 2 | C | 197 | LEU |
| 2 | C | 205 | ARG |
| 2 | C | 211 | VAL |
| 2 | C | 217 | VAL |
| 2 | C | 225 | TRP |
| 2 | C | 229 | ARG |
| 2 | C | 236 | LEU |
| 2 | C | 237 | ARG |
| 2 | C | 241 | LYS |
| 2 | C | 243 | LYS |
| 2 | C | 244 | ILE |
| 2 | C | 246 | LYS |
| 2 | C | 247 | ARG |
| 2 | C | 259 | GLU |
| 2 | C | 266 | LEU |
| 2 | C | 267 | ARG |
| 2 | C | 268 | ASN |
| 2 | C | 270 | LEU |
| 2 | C | 272 | LEU |
| 2 | C | 276 | SER |
| 2 | C | 281 | ARG |
| 2 | C | 286 | LEU |
| 2 | C | 290 | ILE |
| 2 | C | 291 | GLN |
| 2 | C | 294 | THR |

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| Mol | Chain | Res | Type |
|------------|--------------|------------|-------------|
| 2 | C | 307 | LEU |
| 2 | C | 308 | GLU |
| 2 | C | 309 | LYS |
| 2 | C | 310 | LEU |
| 2 | C | 313 | MET |
| 2 | C | 316 | LYS |
| 2 | C | 326 | GLU |
| 2 | C | 331 | VAL |
| 2 | C | 336 | ARG |
| 2 | C | 337 | GLU |
| 2 | C | 341 | SER |
| 2 | C | 349 | ARG |
| 2 | C | 350 | ARG |
| 2 | C | 355 | MET |
| 2 | C | 356 | ARG |
| 2 | C | 358 | ARG |
| 2 | C | 363 | LYS |
| 2 | C | 368 | LYS |
| 2 | C | 370 | ARG |
| 2 | C | 375 | GLU |
| 2 | C | 382 | LYS |
| 2 | C | 384 | GLN |
| 2 | C | 385 | ARG |
| 2 | C | 389 | GLU |
| 2 | C | 391 | LEU |
| 2 | C | 393 | LEU |
| 2 | C | 395 | LYS |
| 2 | C | 401 | LEU |
| 2 | C | 402 | ARG |
| 2 | C | 406 | GLU |
| 2 | C | 412 | LEU |
| 2 | C | 413 | GLU |
| 2 | C | 423 | LYS |
| 2 | C | 426 | LYS |
| 2 | C | 435 | ARG |
| 2 | C | 442 | LEU |
| 2 | C | 444 | THR |
| 2 | C | 451 | LEU |
| 2 | C | 458 | ARG |
| 2 | C | 460 | LEU |
| 2 | C | 463 | LEU |
| 2 | C | 465 | ARG |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (18) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2 | A | 25 | ASN |
| 2 | A | 114 | GLN |
| 2 | A | 170 | ASN |
| 2 | A | 216 | HIS |
| 2 | A | 232 | HIS |
| 2 | A | 314 | ASN |
| 2 | A | 384 | GLN |
| 2 | A | 429 | GLN |
| 2 | C | 25 | ASN |
| 2 | C | 170 | ASN |
| 2 | C | 188 | HIS |
| 2 | C | 196 | HIS |
| 2 | C | 216 | HIS |
| 2 | C | 232 | HIS |
| 2 | C | 314 | ASN |
| 2 | C | 404 | GLN |
| 2 | C | 429 | GLN |
| 2 | C | 432 | GLN |

5.3.3 RNA [i](#)

| Mol | Chain | Analysed | Backbone Outliers | Pucker Outliers |
|-----|-------|---------------|-------------------|-----------------|
| 1 | B | 74/75 (98%) | 23 (31%) | 14 (18%) |
| 1 | D | 74/75 (98%) | 22 (29%) | 14 (18%) |
| All | All | 148/150 (98%) | 45 (30%) | 28 (18%) |

All (45) RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | B | 508 | U |
| 1 | B | 509 | C |
| 1 | B | 513 | U |
| 1 | B | 516 | C |
| 1 | B | 517 | G |
| 1 | B | 518 | G |
| 1 | B | 519 | U |
| 1 | B | 520 | U |
| 1 | B | 521 | A |
| 1 | B | 534 | C |
| 1 | B | 548 | C |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | B | 553 | G |
| 1 | B | 554 | U |
| 1 | B | 556 | C |
| 1 | B | 557 | G |
| 1 | B | 558 | A |
| 1 | B | 559 | U |
| 1 | B | 561 | C |
| 1 | B | 572 | C |
| 1 | B | 573 | A |
| 1 | B | 574 | C |
| 1 | B | 575 | C |
| 1 | B | 576 | A |
| 1 | D | 508 | U |
| 1 | D | 509 | C |
| 1 | D | 513 | U |
| 1 | D | 516 | C |
| 1 | D | 517 | G |
| 1 | D | 518 | G |
| 1 | D | 519 | U |
| 1 | D | 520 | U |
| 1 | D | 521 | A |
| 1 | D | 548 | C |
| 1 | D | 553 | G |
| 1 | D | 554 | U |
| 1 | D | 556 | C |
| 1 | D | 557 | G |
| 1 | D | 558 | A |
| 1 | D | 559 | U |
| 1 | D | 560 | U |
| 1 | D | 572 | C |
| 1 | D | 573 | A |
| 1 | D | 574 | C |
| 1 | D | 575 | C |
| 1 | D | 576 | A |

All (28) RNA pucker outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | B | 507 | A |
| 1 | B | 509 | C |
| 1 | B | 515 | G |
| 1 | B | 516 | C |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | B | 517 | G |
| 1 | B | 518 | G |
| 1 | B | 552 | G |
| 1 | B | 553 | G |
| 1 | B | 556 | C |
| 1 | B | 557 | G |
| 1 | B | 558 | A |
| 1 | B | 560 | U |
| 1 | B | 573 | A |
| 1 | B | 575 | C |
| 1 | D | 509 | C |
| 1 | D | 515 | G |
| 1 | D | 516 | C |
| 1 | D | 517 | G |
| 1 | D | 518 | G |
| 1 | D | 552 | G |
| 1 | D | 553 | G |
| 1 | D | 556 | C |
| 1 | D | 557 | G |
| 1 | D | 558 | A |
| 1 | D | 560 | U |
| 1 | D | 572 | C |
| 1 | D | 574 | C |
| 1 | D | 575 | C |

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

There are no chain breaks in this entry.

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

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

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th 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 | B | 75/75 (100%) | -0.52 | 1 (1%) 77 75 | 28, 44, 77, 99 | 0 |
| 1 | D | 75/75 (100%) | -0.25 | 1 (1%) 77 75 | 26, 47, 81, 98 | 0 |
| 2 | A | 468/468 (100%) | -0.39 | 2 (0%) 92 91 | 10, 27, 50, 74 | 0 |
| 2 | C | 468/468 (100%) | -0.32 | 8 (1%) 70 68 | 10, 29, 57, 85 | 0 |
| All | All | 1086/1086 (100%) | -0.36 | 12 (1%) 80 79 | 10, 30, 65, 99 | 0 |

All (12) RSRZ outliers are listed below:

| Mol | Chain | Res | Type | RSRZ |
|-----|-------|-----|------|------|
| 1 | B | 576 | A | 4.0 |
| 2 | C | 112 | LEU | 3.2 |
| 2 | C | 114 | GLN | 3.2 |
| 2 | C | 48 | TYR | 3.1 |
| 1 | D | 550 | G | 2.6 |
| 2 | A | 118 | GLU | 2.6 |
| 2 | C | 139 | ARG | 2.4 |
| 2 | C | 46 | ALA | 2.4 |
| 2 | C | 134 | ALA | 2.3 |
| 2 | C | 128 | ASN | 2.1 |
| 2 | A | 247 | ARG | 2.0 |
| 2 | C | 140 | ARG | 2.0 |

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

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

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands

There are no ligands in this entry.

6.5 Other polymers

There are no such residues in this entry.