



wwPDB X-ray Structure Validation Summary Report ⓘ

Jul 26, 2023 – 04:17 AM EDT

PDB ID : 1A5U
Title : PYRUVATE KINASE COMPLEX WITH BIS MG-ATP-NA-OXALATE
Authors : Larsen, T.M.; Benning, M.M.; Rayment, I.; Reed, G.H.
Deposited on : 1998-02-18
Resolution : 2.35 Å(reported)

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

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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

<https://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
Mogul : 1.8.5 (274361), CSD as541be (2020)
Xtrriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
buster-report : 1.1.7 (2018)
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) : 2.34

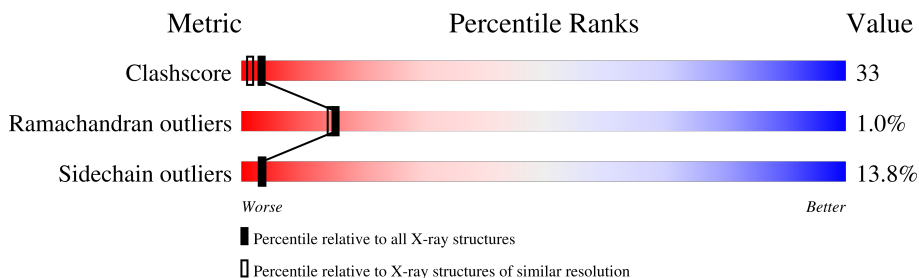
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.35 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	1232 (2.36-2.36)
Ramachandran outliers	138981	1211 (2.36-2.36)
Sidechain outliers	138945	1212 (2.36-2.36)

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	530	35% 44% 17% ..
1	B	530	46% 41% 10% ..
1	C	530	32% 45% 17% ..
1	D	530	45% 43% 9% ..
1	E	530	44% 39% 12% ..
1	F	530	41% 44% 12% ..
1	G	530	39% 45% 13% ..
1	H	530	50% 39% 8% .

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	OXL	A	533	-	-	X	-
3	OXL	F	4133	-	-	X	-
3	OXL	G	4733	-	-	X	-

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 33890 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 PYRUVATE KINASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	519	3978	2498	708	744	28	0	0	0
1	B	519	3978	2498	708	744	28	0	0	0
1	C	519	3978	2498	708	744	28	0	0	0
1	D	519	3978	2498	708	744	28	0	0	0
1	E	519	3978	2498	708	744	28	0	0	0
1	F	519	3978	2498	708	744	28	0	0	0
1	G	519	3978	2498	708	744	28	0	0	0
1	H	519	3978	2498	708	744	28	0	0	0

- Molecule 2 is SODIUM ION (three-letter code: NA) (formula: Na).

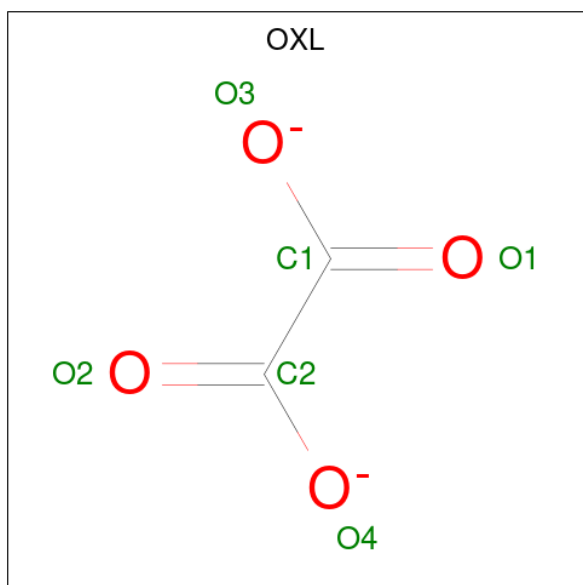
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total	Na	0	0
			1	1		
2	B	1	Total	Na	0	0
			1	1		
2	C	1	Total	Na	0	0
			1	1		
2	D	1	Total	Na	0	0
			1	1		
2	E	1	Total	Na	0	0
			1	1		
2	F	1	Total	Na	0	0
			1	1		

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Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	G	1	Total	Na	0	0
			1	1		
2	H	1	Total	Na	0	0
			1	1		

- Molecule 3 is OXALATE ION (three-letter code: OXL) (formula: C_2O_4).

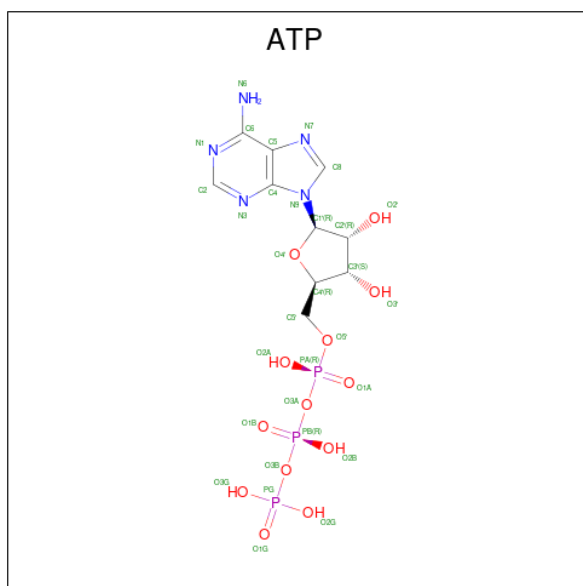


Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
3	A	1	Total	C	O	0	0
			6	2	4		
3	B	1	Total	C	O	0	0
			6	2	4		
3	C	1	Total	C	O	0	0
			6	2	4		
3	D	1	Total	C	O	0	0
			6	2	4		
3	E	1	Total	C	O	0	0
			6	2	4		
3	F	1	Total	C	O	0	0
			6	2	4		
3	G	1	Total	C	O	0	0
			6	2	4		
3	H	1	Total	C	O	0	0
			6	2	4		

- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
4	A	2	Total Mg 2 2	0	0
4	B	1	Total Mg 1 1	0	0
4	C	2	Total Mg 2 2	0	0
4	D	2	Total Mg 2 2	0	0
4	E	2	Total Mg 2 2	0	0
4	F	2	Total Mg 2 2	0	0
4	G	2	Total Mg 2 2	0	0
4	H	1	Total Mg 1 1	0	0

- Molecule 5 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula: $C_{10}H_{16}N_5O_{13}P_3$).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
5	A	1	Total C N O P 31 10 5 13 3	0	0
5	C	1	Total C N O P 31 10 5 13 3	0	0
5	D	1	Total C N O P 31 10 5 13 3	0	0

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Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
5	E	1	Total	C	N	O	P	0	0
			31	10	5	13	3		
5	F	1	Total	C	N	O	P	0	0
			31	10	5	13	3		
5	G	1	Total	C	N	O	P	0	0
			31	10	5	13	3		

- Molecule 6 is water.

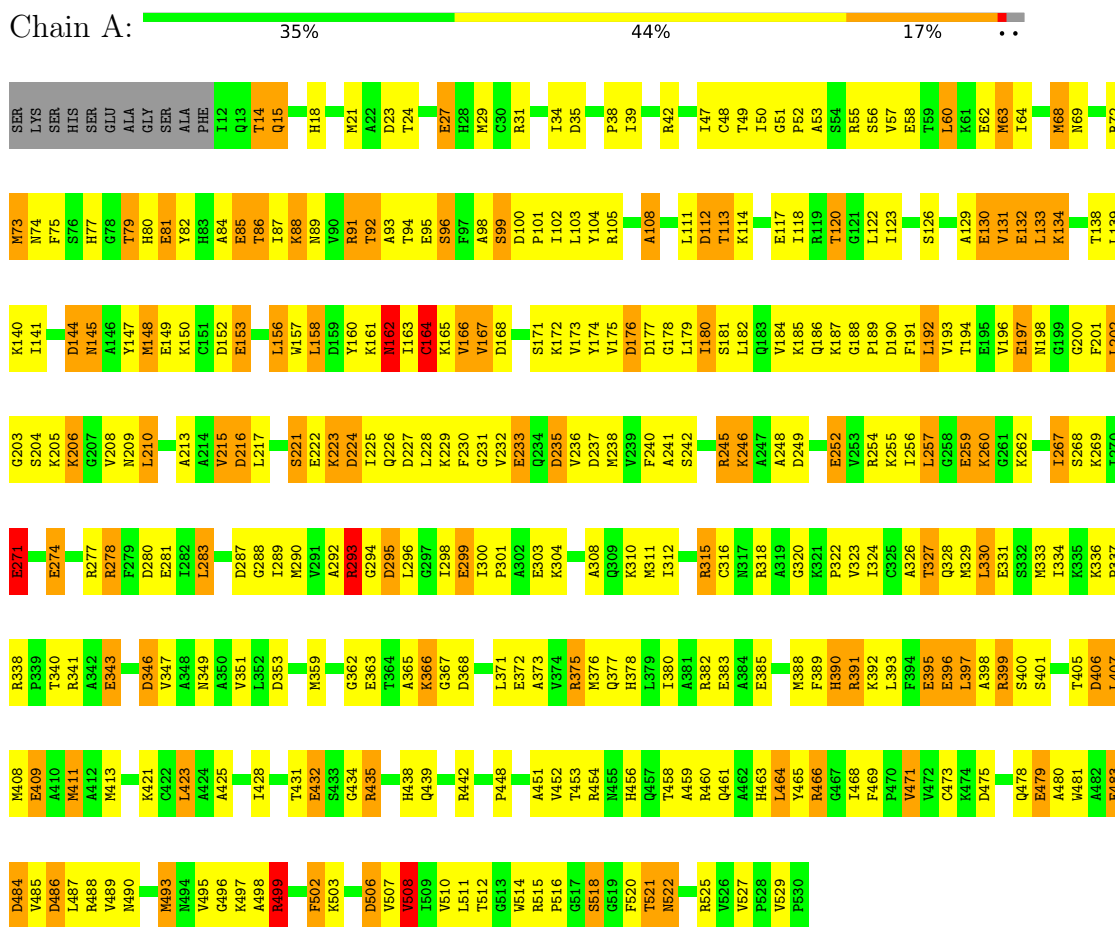
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	176	Total	O	0	0
			176	176		
6	B	260	Total	O	0	0
			260	260		
6	C	166	Total	O	0	0
			166	166		
6	D	250	Total	O	0	0
			250	250		
6	E	267	Total	O	0	0
			267	267		
6	F	185	Total	O	0	0
			185	185		
6	G	210	Total	O	0	0
			210	210		
6	H	296	Total	O	0	0
			296	296		

3 Residue-property plots

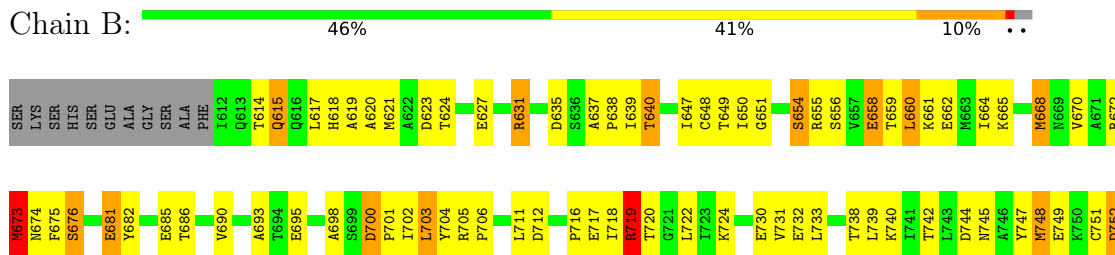
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded 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.

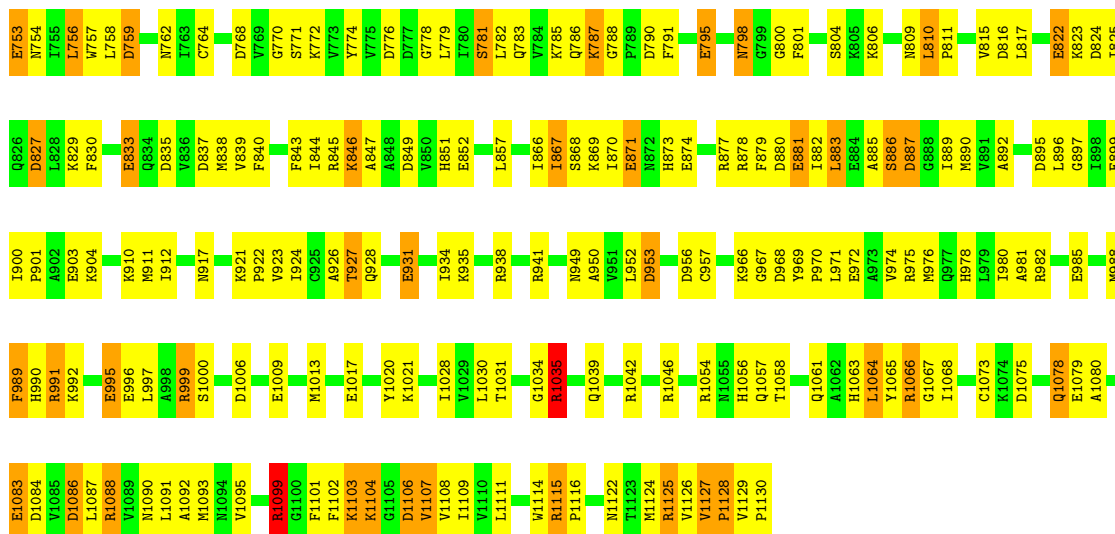
Note EDS was not executed.

• Molecule 1: PYRUVATE KINASE



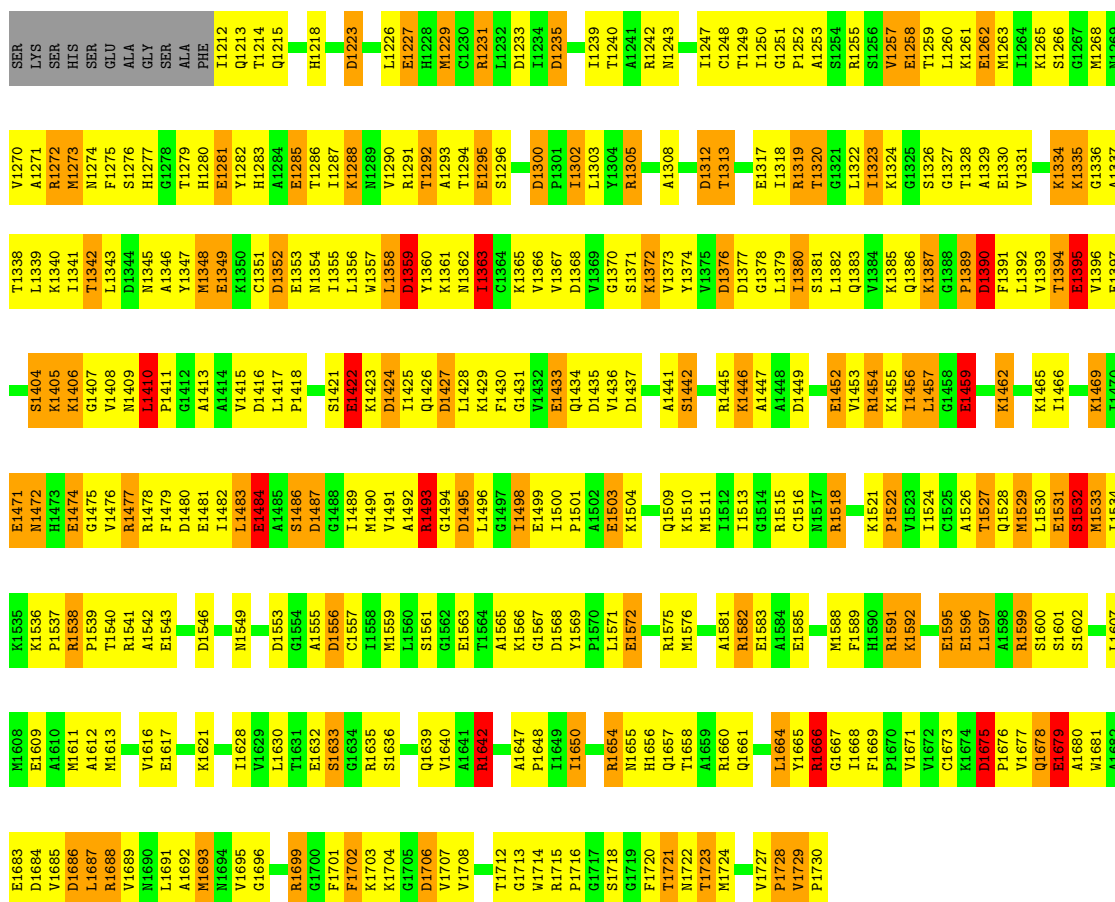
• Molecule 1: PYRUVATE KINASE





● Molecule 1: PYRUVATE KINASE

Chain C: 32% 45% 17%



● Molecule 1: PYRUVATE KINASE

Chain D: 45% 43% 9%

SER	LYS	SER	HIS	GLU	ALA	GLY	I1812	I1813	T1814	Q1815	Q1816	H1817	H1818	A1819	A1820	M1821	D1822	T1824	E1827	M1828	M1829	C1830	R1831	L1832	D1833	D1835	S1836	A1837	P1838	I1839	T1840	R1841	R1842	I1846	I1847	C1848	T1849	G1851	S1854	R1855	S1856	V1857	L1858	N1859	T1859	K1861	M1862	M1863	I1864	K1865	M1868	N1869	V1870	M1873	M1874	F1875	S1876	H1877	T1878	H1880	E1881	Y1882	H1883	H1884	E1885	T1886	I1887	R1891	T1892	A1893	T1894	E1895	S1899	D1900	P1901	I1902	L1903	Y1904	A1910	L1911	D1912	T1913	K1914	G1915	P1916	E1917	I1918	R1919	L1922	L1923	K1924	E1930	E1932	A1937	L1938	L1939	K1940	M1942	N1945	A1946	Y1947	M1948	E1949	K1950	C1951	D1952	E1953	N1954	L1956	V1957	L1958	D1959	K1960	K1961	N1962	I1963	V1966	D1968	S1971	K1972	D1976	D1977	G1978	L1979	I1980	K1985	Q1986	K1987	D1990	F1991	L1992	V1993	T1994	E1995	V1996	E1997	N1998	G2000	F2001	K2006	V2008	N2009	L2010	P2011	D2016	L2017	P2018	A2019	S2021	K2022	R2023	D2024	L2025	Q2026	D2027	F2030	E2033	Q2034	D2035	V2036	D2037	M2038	A2041	S2042	F2043	T2045	R2046	A2047	A2048	D2049	D2055	K2056	L2057	G2058	E2059	K2062	N2063	I2064	K2065	L2066	I2067	K2068	N2072	R2077	D2080	E2081	N2082	L2083	E2084	A2085	D2087	G2088	I2089	M2090	V2091	A2092	R2093	C2094	D2095	E2099	E2103	Q2109	K2110	I2113	C2116	R2117	Q2118	A2119	G2120	K2121	P2122	A2126	T2127	Q2128	M2129	L2130	E2131	K2135	R2138	P2139	T2140	R2141	A2142	E2143	G2144	S2145	D2146	A2155	D2156	K2166	C2167	Y2169	L2170	L2171	E2172	Q2173	V2174	R2175	M2176	L2179	I2180	R2182	E2185	M2188	F2189	H2190	R2191	K2192	E2195	E2196	R2199	S2200	S2201	S2202	H2203	T2204	T2205	D2206	E2209	M2213	E2217	K2221	C2222	L2223	A2224	A2225	A2226	L2230	T2231	E2232	Q2239	V2240	A2241	R2242	Y2243	R2244	P2245	R2246	A2247	P2248	I2249	V2252	R2253	R2254	R2255	H2256	I2259	R2266	V2267	D2268	E2269	A2280	A2282	A2283	D2284	V2285	D2286	L2288	E2288	L2291	A2292	H2293	R2294	V2295	G2296	R2299	F2302	K2303	K2304	G2305	D2306	V2308	L2311	T2312	R2315	P2316	G2317	S2318	G2319	F2320	T2321	N2322	T2323	M2324	R2325	V2326	P2330	L2364	Y2365	R2366	V2367	D2368	E2369	A2370	L2371	R2372	V2373	E2374	G2375	V2376	R2377	F2379	D2380	E2381	L2382	E2384	A2385	S2386	D2387	G2388	L2389	M2390	L2391	L2392	L2393	L2394	E2395	V2396	E2397	N2398	L2399	K2400	L2401	L2402	L2403	L2404	L2405	L2406	L2407	L2408	L2409	L2410	L2411	L2412	L2413	L2414	L2415	L2416	L2417	L2418	L2419	L2420	L2421	L2422	L2423	L2424	L2425	L2426	L2427	L2428	L2429	L2430	L2431	L2432	L2433	L2434	L2435	L2436	L2437	L2438	L2439	L2440	L2441	L2442	L2443	L2444	L2445	L2446	L2447	L2448	L2449	L2450	L2451	L2452	L2453	L2454	L2455	L2456	L2457	L2458	L2459	L2460	L2461	L2462	L2463	L2464	L2465	L2466	L2467	L2468	L2469	L2470	L2471	L2472	L2473	L2474	L2475	L2476	L2477	L2478	L2479	L2480	L2481	L2482	L2483	L2484	L2485	L2486	L2487	L2488	L2489	L2490	L2491	L2492	L2493	L2494	L2495	L2496	L2497	L2498	L2499	L2500	L2501	L2502	L2503	L2504	L2505	L2506	L2507	L2508	L2509	L2510	L2511	L2512	L2513	L2514	L2515	L2516	L2517	L2518	L2519	L2520	L2521	L2522	L2523	L2524	L2525	L2526	L2527	L2528	L2529	L2530	L2531	L2532	L2533	L2534	L2535	L2536	L2537	L2538	L2539	L2540	L2541	L2542	L2543	L2544	L2545	L2546	L2547	L2548	L2549	L2550	L2551	L2552	L2553	L2554	L2555	L2556	L2557	L2558	L2559	L2560	L2561	L2562	L2563	L2564	L2565	L2566	L2567	L2568	L2569	L2570	L2571	L2572	L2573	L2574	L2575	L2576	L2577	L2578	L2579	L2580	L2581	L2582	L2583	L2584	L2585	L2586	L2587	L2588	L2589	L2590	L2591	L2592	L2593	L2594	L2595	L2596	L2597	L2598	L2599	L2600	L2601	L2602	L2603	L2604	L2605	L2606	L2607	L2608	L2609	L2610	L2611	L2612	L2613	L2614	L2615	L2616	L2617	L2618	L2619	L2620	L2621	L2622	L2623	L2624	L2625	L2626	L2627	L2628	L2629	L2630	L2631	L2632	L2633	L2634	L2635	L2636	L2637	L2638	L2639	L2640	L2641	L2642	L2643	L2644	L2645	L2646	L2647	L2648	L2649	L2650	L2651	L2652	L2653	L2654	L2655	L2656	L2657	L2658	L2659	L2660	L2661	L2662	L2663	L2664	L2665	L2666	L2667	L2668	L2669	L2670	L2671	L2672	L2673	L2674	L2675	L2676	L2677	L2678	L2679	L2680	L2681	L2682	L2683	L2684	L2685	L2686	L2687	L2688	L2689	L2690	L2691	L2692	L2693	L2694	L2695	L2696	L2697	L2698	L2699	L2700	L2701	L2702	L2703	L2704	L2705	L2706	L2707	L2708	L2709	L2710	L2711	L2712	L2713	L2714	L2715	L2716	L2717	L2718	L2719	L2720	L2721	L2722	L2723	L2724	L2725	L2726	L2727	L2728	L2729	L2730	L2731	L2732	L2733	L2734	L2735	L2736	L2737	L2738	L2739	L2740	L2741	L2742	L2743	L2744	L2745	L2746	L2747	L2748	L2749	L2750	L2751	L2752	L2753	L2754	L2755	L2756	L2757	L2758	L2759	L2760	L2761	L2762	L2763	L2764	L2765	L2766	L2767	L2768	L2769	L2770	L2771	L2772	L2773	L2774	L2775	L2776	L2777	L2778	L2779	L2780	L2781	L2782	L2783	L2784	L2785	L2786	L2787	L2788	L2789	L2790	L2791	L2792	L2793	L2794	L2795	L2796	L2797	L2798	L2799	L2800	L2801	L2802	L2803	L2804	L2805	L2806	L2807	L2808	L2809	L2810	L2811	L2812	L2813	L2814	L2815	L2816	L2817	L2818	L2819	L2820	L2821	L2822	L2823	L2824	L2825	L2826	L2827	L2828	L2829	L2830	L2831	L2832	L2833	L2834	L2835	L2836	L2837	L2838	L2839	L2840	L2841	L2842	L2843	L2844	L2845	L2846	L2847	L2848	L2849	L2850	L2851	L2852	L2853	L2854	L2855	L2856	L2857	L2858	L2859	L2860	L2861	L2862	L2863	L2864	L2865	L2866	L2867	L2868	L2869	L2870	L2871	L2872	L2873	L2874	L2875	L2876	L2877	L2878	L2879	L2880	L2881	L2882	L2883	L2884	L2885	L2886	L2887	L2888	L2889	L2890	L2891	L2892	L2893	L2894	L2895	L2896	L2897	L2898	L2899	L2900	L2901	L2902	L2903	L2904	L2905	L2906	L2907	L2908	L2909	L2910	L2911	L2912	L2913	L2914	L2915	L2916	L2917	L2918	L2919	L2920	L2921	L2922	L2923	L2924	L2925	L2926	L2927	L2928	L2929	L2930	L2931	L2932	L2933	L2934	L2935	L2936	L2937	L2938	L2939	L2940	L2941	L2942	L2943	L2944	L2945	L2946	L2947	L2948	L2949	L2950	L2951	L2952	L2953	L2954	L2955	L2956	L2957	L2958	L2959	L2960	L2961	L2962	L2963	L2964	L2965	L2966	L2967	L2968	L2969	L2970	L2971	L2972	L2973	L2974	L2975	L2976	L2977	L2978	L2979	L2980	L2981	L2982	L2983	L2984	L2985	L2986	L2987	L2988	L2989	L2990	L2991	L2992	L2993	L2994	L2995	L2996	L2997	L2998	L2999	L3000	L3001	L3002	L3003	L3004	L3005	L3006	L3007	L3008	L3009	L3010	L3011	L3012	L3013	L3014	L3015	L3016	L3017	L3018	L3019	L3020	L3021	L3022	L3023	L3024	E3027	H3028	M3029	C3030	R3031	L3034	D3035	A3041	R3042	C3048	T3049	I3050	G3051	S3054	R3055	S3056	V3057	E3058	E3062	S3066	G3067	M3068	A3071	R3072	M3073	N3074	H3080	E3081	F3082	V3083	D3084	L3085	I3086	S3087	H3088	K3089	N3090	D3091	E3092	L3093	S3094	H3095	S3099	D3100	F3101	L3102	L3103	H3104	A3105	A3106	V3107	A3108	V3109	D3110	D3111	L3112	T3113	K3114	G3115	F3116	C3117	E3118	R3119	L3122	L3123	K3124	G3125	S3126	A3129	E3130	V3131	E3132	L3133	K3134	K3135	T3141	T3142	L3143	D3144	R3145	A3146	V3147	M3148	E3149	K3150	G3151	D3152	L3155	L3156	L3157	L3158	D3159	Y3160	N3161	I3162	C3163	C3164	K3165	V3166	V3167	D3168	S3171	K3172	V3173	D3176	D3177	L3178	L3179	I3180	S3181	L3182	Q3183	Q3186	M3333	L3334	K3335	L3336	P3337	R3338	L3339	E3340	K3341	A3342	E3343	D3346	V3347	A3350	V3351	L3352	D3353	G3354	A3355	D3356	C3357	K3366	Y3369	S3370	L3371	E3372	A3373	L3376	V3377	L3378	L3379	L3380	L3381	L3382	L3383	L3384	L3385	L3386	L3387	L3388	L3389	L3390	L3391	L3392	E3395	E3396	L3397	A3398	L3399	V3400	S3402	D3406	L3407	M3408	E3409	A3410	K3411	A3412	G3413	K3417	E3417	K3421	F3501	F3502	K3503	K3504	G3505	D3506	V3507	S3508	I3509	V3514	R3515	P3516	N3522	R3525	V3526	P3527	V3528	V3529	P3530	Q3461	A3462	H3463	L3464	R3465	K3466	G3467	I3468	F3469	P3470	D3475	P3476	V3477	Q3478	A3479	A3480	V3481	A3482	E3483	D3484	R3488	M3493	H3494	V3495	G3496	K3497	A3498	R3499	G3500	F3501	F3502	K3503	K3504	G3505	D3506	V3507	S3508	I3509	V3514	R3515	P3516	N3522	R3525	V3526	P3527	V3528	V3529	P3530
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• Molecule 1: PYRUVATE KINASE



SER	LYS	SER	HIS	GLU	ALA	GLY	I3012	Q3013	T3014	Q3015	Q3016	L3017	H3018	A3019	A3020	M3021	D3022	T3023	T3024	E3027	H3028	M3029	C3030	R3031	L3034	D3035	A3041	R3042	C3048	T3049	I3050	G3051	S3054	R3055	S3056	V3057	E3058	E3062	S3066	G3067	M3068	A3071	R3072	M3073	N3074	H3080	E3081	F3082	V3083	D3084	L3085	I3086	S3087	H3088	K3089	N3090	D3091	E3092	L3093	S3094	H3095	S3099	D3100	F3101	L3102	L3103	H3104	A3105	A3106	V3107	A3108	V3109	D3110	D3111	L3112	T3113	K3114	G3115	F3116	C3117	E3118	R3119	L3122	L3123	K3124	G3125	S3126	A3129	E3130	V3131	E3132	L3133	K3134	K3135	T3141	T3142	L3143	D3144	R3145	A3146	V3147	M3148	E3149	K3150	G3151	D3152	L3155	L3156	L3157	L315
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● Molecule 1: PYRUVATE KINASE

Chain F: 41% 44% 12% ..

SER	LYS	SER	HIS	K3740	GLU	ALA	GLY	SER	ALA	PHE	I3612	I3613	I3614	I3615	I3621	I3622	I3623	I3624	E3627	H3628	I3629	C3630	R3631	L3632	L3633	L3634	L3635	P3638	I3639	T3640	R3641	R3642	I3646	I3647	C3648	T3649	I3650	G3651	I3652	A3653	R3654	R3655	E3658	T3659	L3660	K3661	E3662	I3663	E3730	I3664	K3665	S3666	G3667	I3669
R3672	M3673	N3674	F3675	S3676	T3679	H3680	E3681	Y3682	H3683	A3684	I3687	K3688	N3689	V3690	R3691	T3694	S3695	F3697	A3698	S3699	D3700	L3702	L3703	Y3704	R3705	V3709	L3711	D3712	T3713	K3714	G3715	P3716	I3717	I3718	R3719	T3720	G3721	L3722	I3723	K3724	G3725	S3726	T3728	A3729	I3730	E3731	E3732	L3733	K3734	M3735				
G3736	L3739	G3807	I3741	L3742	L3743	D3744	E3749	K3750	C3751	D3752	E3753	I3754	L3755	L3756	L3757	L3758	I3759	K3760	K3761	N3762	L3763	C3764	K3765	V3766	V3767	D3768	K3772	I3773	Y3774	D3776	G3777	G3778	L3779	L3782	K3783	V3784	G3785	I3786	K3787	G3788	P3789	D3790	F3791	L3792	I3793	T3794	E3795	V3796	E3797	G3800	F3801	L3802	G3803	
S3804	K3805	K3806	N3808	V3809	L3810	P3811	A3812	A3813	V3815	D3816	L3817	P3818	A3819	V3820	K3821	E3822	K3823	D3824	I3825	Q3826	L3827	K3828	F3830	V3831	E3832	E3833	K3834	D3835	V3836	D3837	M3838	S3842	F3843	I3844	K3846	E3852	I3856	L3857	G3858	E3859	K3862	M3863	I3864	K3865	I3866	I3867	S3868	K3869	L3870	E3871	N3872			
H3873	E3874	G3875	V3877	R3877	F3878	D3880	E3881	L3882	E3884	S3885	S3886	D3887	E3888	L3889	L3890	G3891	A3892	R3893	C3894	D3895	L3896	G3897	L3898	E3899	E3903	K3904	V3905	F3906	K3910	H3911	C3916	N3917	R3918	K3921	P3922	L3930	E3931	S3932	K3933	I3934	K3935	K3936	G4014	P3939	V4015	V4016	E4017	Y4020						
S3945	D3946	N3949	D3953	G3954	A3955	D3956	M3959	L3960	S3961	G3962	E3963	T3964	A3965	K3966	G3967	D3968	Y3969	P3970	L3971	L3972	R3975	M3976	Q3977	I3980	R3981	R3982	E3983	M3988	H3989	R3990	R3991	K3992	L3993	F3994	E3995	E3996	R3999	S4002	D4006	L4007	M4008	E4009	M4013	G4014	D4106	V4107	G4113	V4114	R4115					
V4029	L4030	T4031	E4032	S4033	G4034	Q4039	Y4043	R4044	P4048	A4051	V4052	L4053	R4054	M4055	H4056	Q4057	T4058	Q4061	H4063	L4064	Y4065	R4066	G4067	D4075	P4076	E4079	A4080	V4081	L4082	E4083	D4084	V4085	D4086	L4087	E4088	V4089	M4093	G4096	F4102	R4103	K4104	G4105	D4106	V4107	G4113	V4114	R4115							
S4118	M4122	V4126	V4127	P4128	P4129	P4130																																																

● Molecule 1: PYRUVATE KINASE

Chain G: 39% 45% 13% ..

SER	LYS	SER	HIS	K4340	GLU	ALA	GLY	SER	ALA	PHE	I4212	I4213	I4214	Q4215	Q4216	L4217	M4221	M4222	D4223	E4227	C4230	D4233	L4234	D4235	T4240	A4241	R4242	M4243	L4247	C4248	T4249	L4250	G4251	C4321	L4322	A4323	R4325	S4256	V4257	E4258	T4259	L4260	K4261	E4262	M4263	K4265	E4268	M4269	V4270	M4273			
M4274	F4275	S4276	H4277	H4280	E4281	Y4282	E4285	T4286	M4289	V4290	R4291	T4292	A4293	T4294	E4295	S4296	D4300	P4301	L4302	Y4304	R4305	P4306	D4307	S4371	K4372	A4373	Y4374	V4375	D4376	C4378	L4379	L4380	S4381	L4382	Q4383	V4384	K4385	Q4386	K4387	C4388	P4389	D4390	F4391	L4392	V4393	T4394	E4395	V4396	E4397	F4401	L4402	G4403	S4404
L4405	K4406	G4407	N4408	N4409	L4410	D4411	G4412	A4413	D4416	R4417	E4422	K4423	D4424	I4425	R4426	D4427	L4428	K4429	F4430	K4431	V4366	V4367	D4368	V4369	D4437	M4438	S4442	F4443	L4444	R4445	D4449	V4450	H4451	E4452	K4455	I4456	T4457	L4458	G4459	E4459	I4464	K4465	D4390	I4466	I4467	I4470	E4471	R4474	E4475	G4476	V4477	R4478	F4479
I4482	L4483	E4484	A4485	S4486	D4487	G4488	L4489	A4492	R4493	C4494	D4495	L4496	L4497	I4498	E4499	L4500	P4501	A4502	E4503	K4504	V4505	F4506	L4507	A4508	Q4509	I4512	I4513	C4516	M4517	K4521	V4522	V4523	I4524	C4525	A4526	T4527	D4528	M4529	L4530	E4531	S4532	I4533	L4534	R4538	F4539	T4540	R4541	A4542	E4543	G4544	S4545	R4478	D4546

4 Data and refinement statistics

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

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, α , β , γ	95.30Å 216.50Å 258.60Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	30.00 – 2.35	Depositor
% Data completeness (in resolution range)	85.0 (30.00-2.35)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	TNT 5D	Depositor
R, R_{free}	0.190 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	33890	wwPDB-VP
Average B, all atoms (Å ²)	39.0	wwPDB-VP

5 Model quality i

5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: NA, MG, OXL, ATP

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	1.06	31/4041 (0.8%)	1.39	57/5452 (1.0%)
1	B	1.02	25/4041 (0.6%)	1.39	59/5452 (1.1%)
1	C	0.98	26/4041 (0.6%)	1.39	66/5452 (1.2%)
1	D	1.01	29/4041 (0.7%)	1.39	56/5452 (1.0%)
1	E	1.01	29/4041 (0.7%)	1.43	63/5452 (1.2%)
1	F	0.97	24/4041 (0.6%)	1.40	62/5452 (1.1%)
1	G	0.99	30/4041 (0.7%)	1.39	60/5452 (1.1%)
1	H	1.01	29/4041 (0.7%)	1.37	62/5452 (1.1%)
All	All	1.00	223/32328 (0.7%)	1.39	485/43616 (1.1%)

The worst 5 of 223 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	162	ASN	N-CA	18.25	1.82	1.46
1	A	241	ALA	C-N	-8.32	1.15	1.34
1	D	1917	GLU	CD-OE2	8.30	1.34	1.25
1	B	681	GLU	CD-OE2	8.22	1.34	1.25
1	G	4595	GLU	CD-OE1	8.00	1.34	1.25

The worst 5 of 485 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	1919	ARG	NE-CZ-NH1	14.55	127.58	120.30
1	D	1919	ARG	NE-CZ-NH2	-12.64	113.98	120.30
1	F	4066	ARG	NE-CZ-NH1	11.98	126.29	120.30
1	B	1127	VAL	C-N-CD	-11.61	95.06	120.60
1	A	164	CYS	O-C-N	11.47	141.05	122.70

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	3978	0	4054	349	2
1	B	3978	0	4056	228	0
1	C	3978	0	4056	364	5
1	D	3978	0	4055	269	5
1	E	3978	0	4056	251	12
1	F	3978	0	4056	264	2
1	G	3978	0	4056	293	2
1	H	3978	0	4056	208	18
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
2	E	1	0	0	0	0
2	F	1	0	0	0	0
2	G	1	0	0	0	0
2	H	1	0	0	0	0
3	A	6	0	0	2	0
3	B	6	0	0	0	0
3	C	6	0	0	1	0
3	D	6	0	0	1	0
3	E	6	0	0	1	0
3	F	6	0	0	2	0
3	G	6	0	0	2	0
3	H	6	0	0	1	0
4	A	2	0	0	0	0
4	B	1	0	0	0	0
4	C	2	0	0	0	0
4	D	2	0	0	0	0
4	E	2	0	0	0	0
4	F	2	0	0	0	0
4	G	2	0	0	0	0
4	H	1	0	0	0	0
5	A	31	0	12	4	0
5	C	31	0	12	4	0
5	D	31	0	12	1	0
5	E	31	0	12	2	0
5	F	31	0	12	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	G	31	0	12	0	0
6	A	176	0	0	10	0
6	B	260	0	0	13	0
6	C	166	0	0	12	0
6	D	250	0	0	18	0
6	E	267	0	0	17	0
6	F	185	0	0	11	0
6	G	210	0	0	6	0
6	H	296	0	0	15	2
All	All	33890	0	32517	2117	24

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 33.

The worst 5 of 2117 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:162:ASN:N	1:A:162:ASN:CA	1.82	1.40
1:C:1678:GLN:HB2	1:C:1684:ASP:HB2	1.31	1.13
1:A:122:LEU:HD23	1:A:204:SER:HB3	1.28	1.12
1:E:3142:THR:HG22	1:E:3144:ASP:H	1.06	1.07
1:E:3493:MET:HE2	1:E:3530:PRO:HD2	1.37	1.06

The worst 5 of 24 symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:3149:GLU:OE1	1:H:4934:LYS:CE[3_655]	0.67	1.53
1:E:3149:GLU:CD	1:H:4934:LYS:NZ[3_655]	1.03	1.17
1:E:3149:GLU:CD	1:H:4934:LYS:CE[3_655]	1.23	0.97
1:D:1924:LYS:NZ	1:H:4858:GLU:OE1[1_455]	1.38	0.82
1:E:3149:GLU:OE1	1:H:4934:LYS:CD[3_655]	1.43	0.77

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	517/530 (98%)	476 (92%)	36 (7%)	5 (1%)	15	15
1	B	517/530 (98%)	485 (94%)	30 (6%)	2 (0%)	34	38
1	C	517/530 (98%)	464 (90%)	42 (8%)	11 (2%)	7	4
1	D	517/530 (98%)	487 (94%)	27 (5%)	3 (1%)	25	27
1	E	517/530 (98%)	484 (94%)	26 (5%)	7 (1%)	11	9
1	F	517/530 (98%)	486 (94%)	27 (5%)	4 (1%)	19	20
1	G	517/530 (98%)	487 (94%)	27 (5%)	3 (1%)	25	27
1	H	517/530 (98%)	485 (94%)	27 (5%)	5 (1%)	15	15
All	All	4136/4240 (98%)	3854 (93%)	242 (6%)	40 (1%)	15	15

5 of 40 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	1337	ALA
1	C	1533	MET
1	F	3729	ALA
1	F	3789	PRO
1	G	4389	PRO

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	426/434 (98%)	348 (82%)	78 (18%)	1	1
1	B	426/434 (98%)	377 (88%)	49 (12%)	5	5
1	C	426/434 (98%)	346 (81%)	80 (19%)	1	1
1	D	426/434 (98%)	379 (89%)	47 (11%)	6	5
1	E	426/434 (98%)	370 (87%)	56 (13%)	4	4

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	F	426/434 (98%)	365 (86%)	61 (14%)	3	3
1	G	426/434 (98%)	367 (86%)	59 (14%)	3	3
1	H	426/434 (98%)	384 (90%)	42 (10%)	8	7
All	All	3408/3472 (98%)	2936 (86%)	472 (14%)	3	3

5 of 472 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	1990	ASP
1	H	4934	LYS
1	E	3259	GLU
1	H	4899	SER
1	G	4392	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 113 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	2257	GLN
1	H	5257	GLN
1	E	3457	GLN
1	H	5256	HIS
1	G	4549	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](#)

Of 36 ligands modelled in this entry, 22 are monoatomic - leaving 14 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	ATP	A	535	4,2	26,33,33	1.58	7 (26%)	31,52,52	1.33	4 (12%)
3	OXL	A	533	4	5,5,5	1.68	2 (40%)	6,6,6	0.90	0
3	OXL	B	1133	4	5,5,5	1.57	2 (40%)	6,6,6	1.39	0
5	ATP	E	3535	4,2	26,33,33	1.58	4 (15%)	31,52,52	1.05	2 (6%)
3	OXL	H	5333	4	5,5,5	1.56	2 (40%)	6,6,6	1.47	0
3	OXL	D	2333	4	5,5,5	1.53	2 (40%)	6,6,6	1.69	1 (16%)
5	ATP	C	1735	4	26,33,33	1.59	5 (19%)	31,52,52	1.69	5 (16%)
5	ATP	F	4135	4,2	26,33,33	1.62	4 (15%)	31,52,52	1.04	3 (9%)
3	OXL	F	4133	4	5,5,5	1.26	0	6,6,6	1.16	0
3	OXL	G	4733	4	5,5,5	1.28	0	6,6,6	1.17	0
5	ATP	D	2335	4,2	26,33,33	1.63	6 (23%)	31,52,52	1.37	5 (16%)
3	OXL	E	3533	4	5,5,5	1.27	0	6,6,6	1.16	0
3	OXL	C	1733	4	5,5,5	1.54	2 (40%)	6,6,6	1.67	2 (33%)
5	ATP	G	4735	4,2	26,33,33	1.59	4 (15%)	31,52,52	1.32	3 (9%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	ATP	A	535	4,2	-	3/18/38/38	0/3/3/3
3	OXL	A	533	4	-	1/4/4/4	-
3	OXL	B	1133	4	-	1/4/4/4	-
5	ATP	E	3535	4,2	-	3/18/38/38	0/3/3/3
3	OXL	H	5333	4	-	0/4/4/4	-
3	OXL	D	2333	4	-	0/4/4/4	-
5	ATP	C	1735	4	-	2/18/38/38	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	ATP	F	4135	4,2	-	0/18/38/38	0/3/3/3
3	OXL	F	4133	4	-	1/4/4/4	-
3	OXL	G	4733	4	-	1/4/4/4	-
5	ATP	D	2335	4,2	-	2/18/38/38	0/3/3/3
3	OXL	E	3533	4	-	1/4/4/4	-
3	OXL	C	1733	4	-	1/4/4/4	-
5	ATP	G	4735	4,2	-	3/18/38/38	0/3/3/3

The worst 5 of 40 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	E	3535	ATP	PG-O3G	-4.88	1.36	1.54
5	D	2335	ATP	PG-O3G	-4.80	1.36	1.54
5	C	1735	ATP	PG-O3G	-4.14	1.38	1.54
5	G	4735	ATP	PG-O3G	-4.06	1.39	1.54
5	F	4135	ATP	C2-N1	4.02	1.41	1.33

The worst 5 of 25 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	C	1735	ATP	C5-C6-N6	5.59	128.85	120.35
5	G	4735	ATP	C5-C6-N6	5.13	128.15	120.35
5	D	2335	ATP	O2G-PG-O1G	4.39	127.86	110.68
5	A	535	ATP	O2G-PG-O1G	3.73	125.28	110.68
5	C	1735	ATP	O2G-PG-O1G	3.66	125.02	110.68

There are no chirality outliers.

5 of 19 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	E	3535	ATP	PB-O3B-PG-O3G
5	D	2335	ATP	PB-O3B-PG-O3G
5	A	535	ATP	PB-O3A-PA-O1A
5	E	3535	ATP	PB-O3A-PA-O1A
5	A	535	ATP	PG-O3B-PB-O1B

There are no ring outliers.

11 monomers are involved in 21 short contacts:

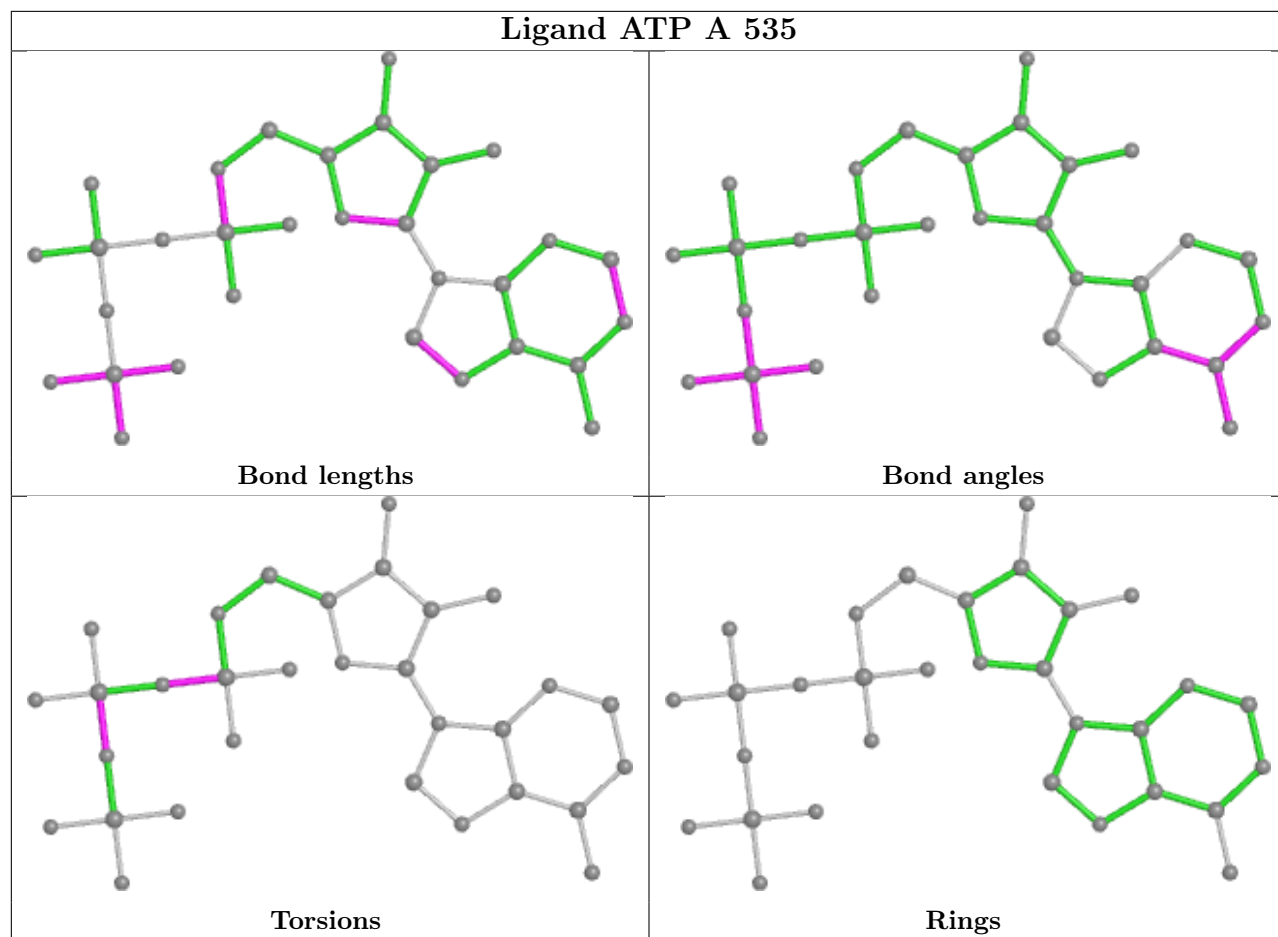
Mol	Chain	Res	Type	Clashes	Symm-Clashes
5	A	535	ATP	4	0

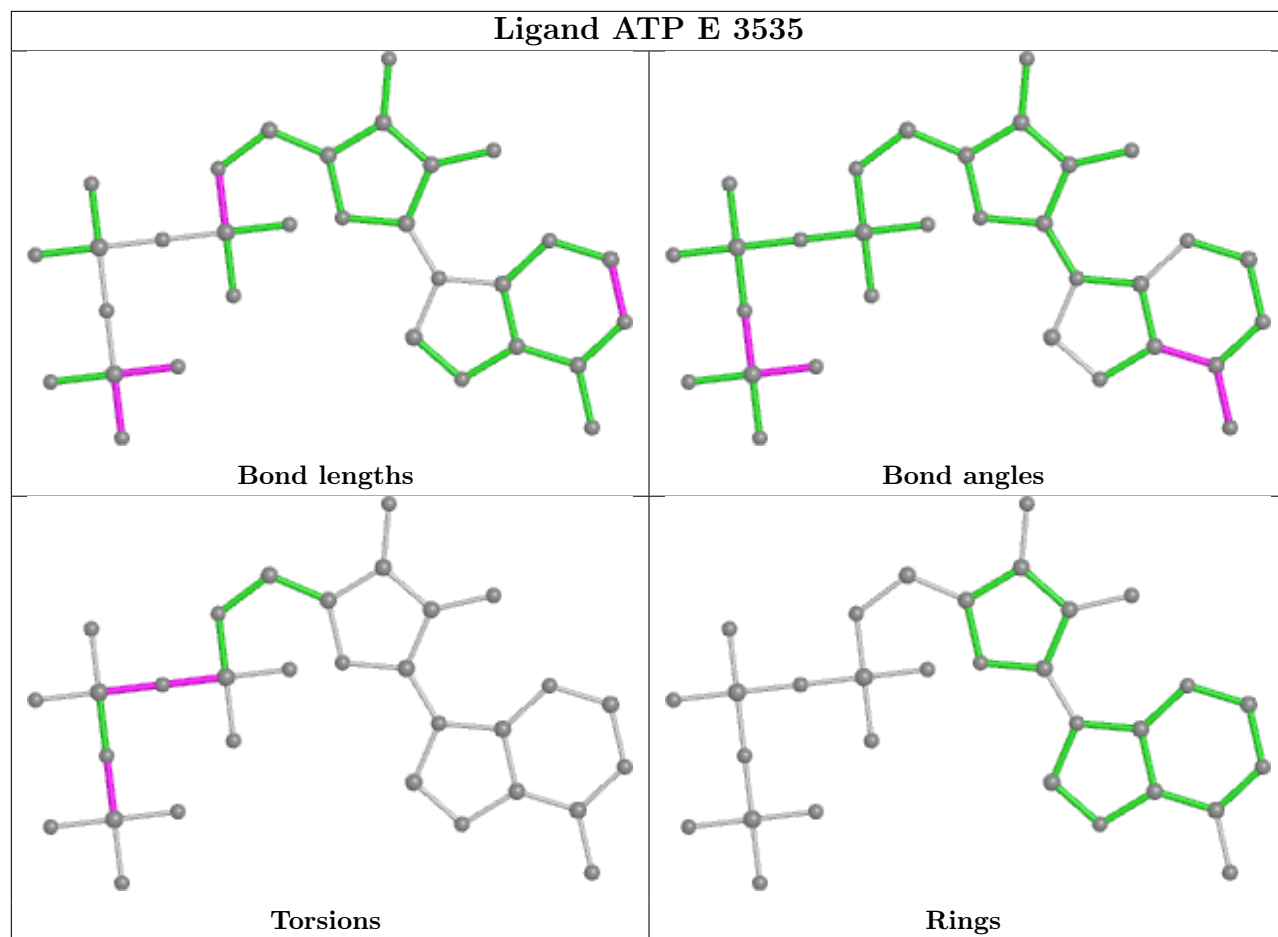
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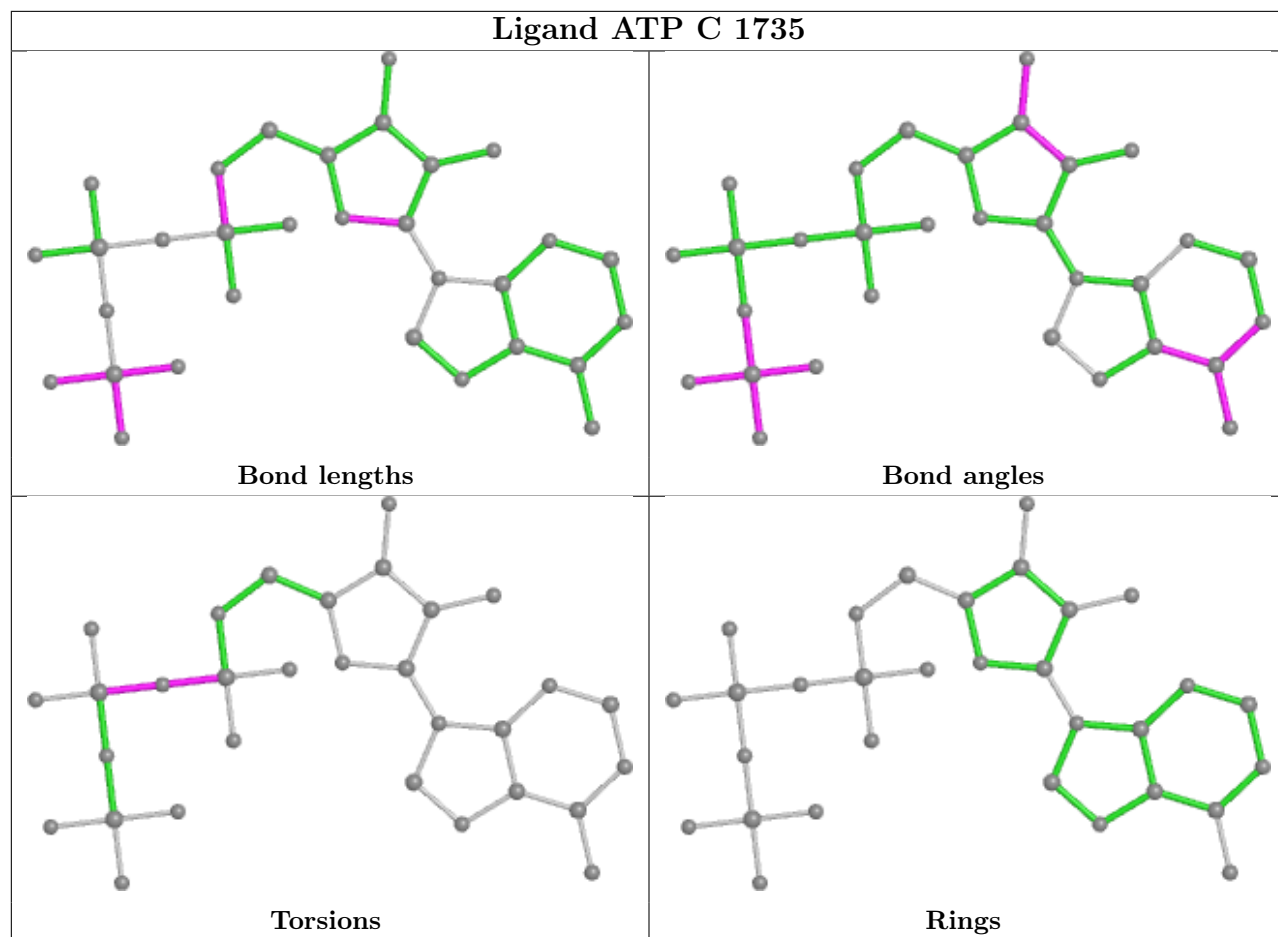
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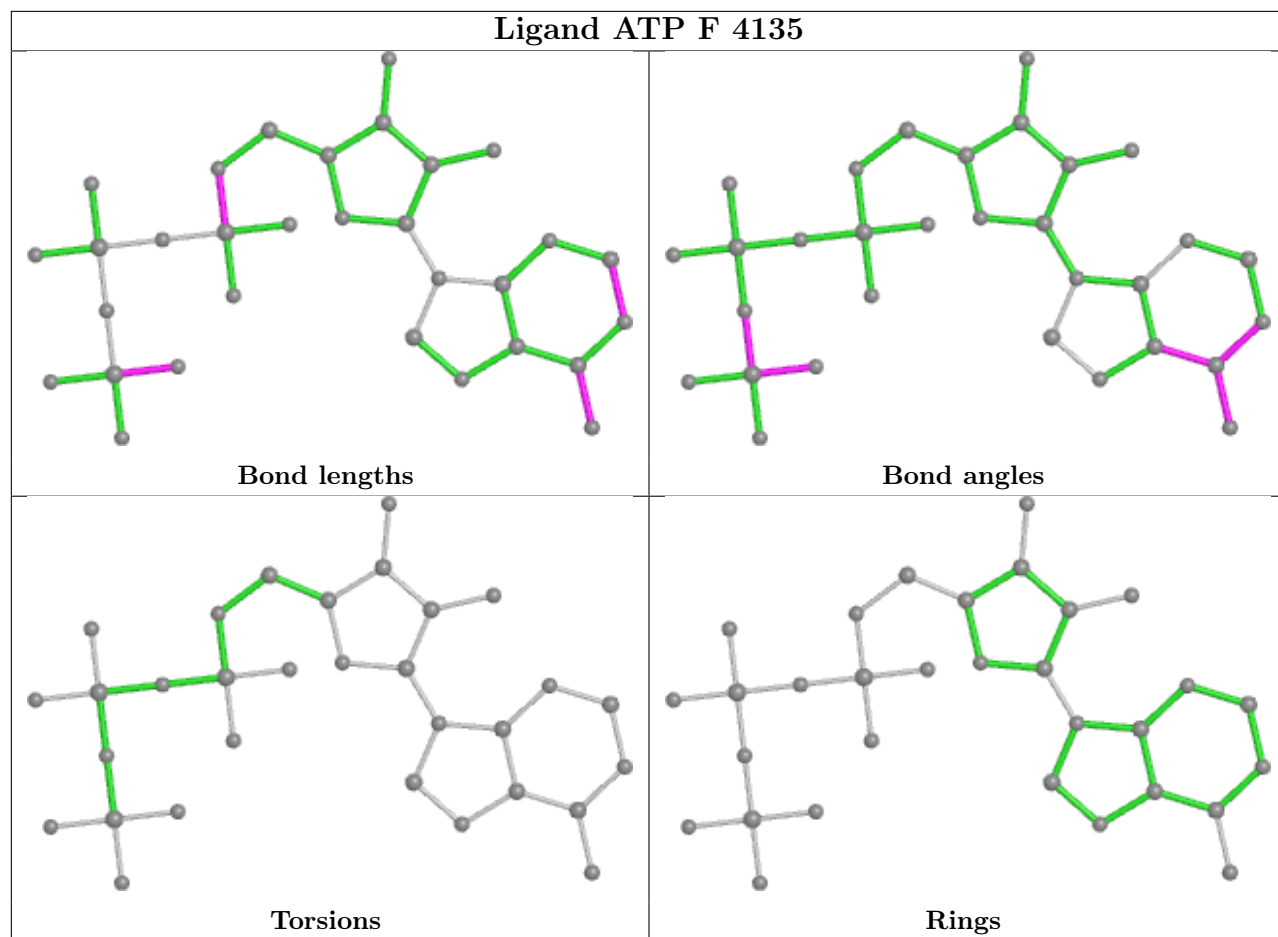
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	533	OXL	2	0
5	E	3535	ATP	2	0
3	H	5333	OXL	1	0
3	D	2333	OXL	1	0
5	C	1735	ATP	4	0
3	F	4133	OXL	2	0
3	G	4733	OXL	2	0
5	D	2335	ATP	1	0
3	E	3533	OXL	1	0
3	C	1733	OXL	1	0

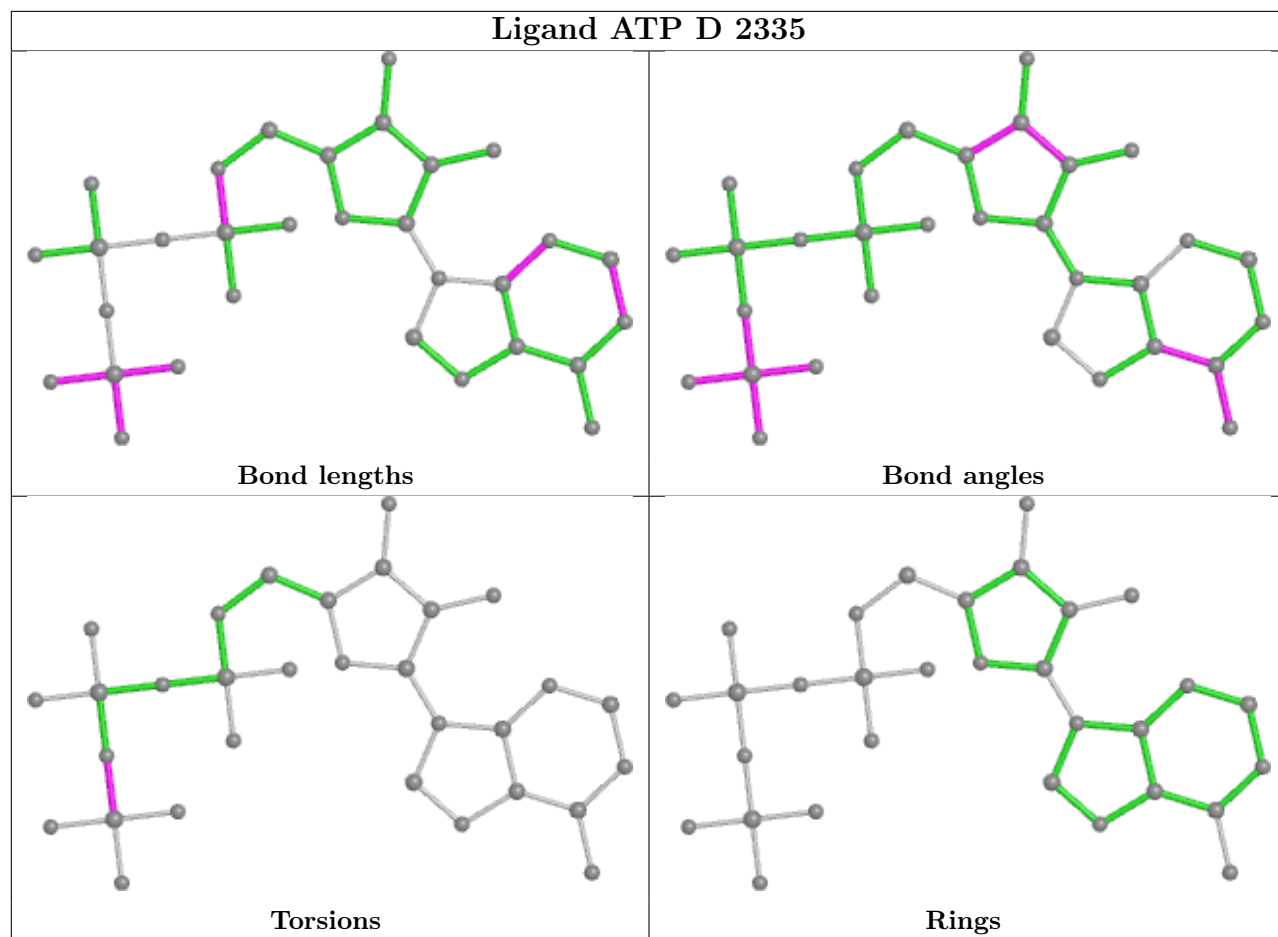
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

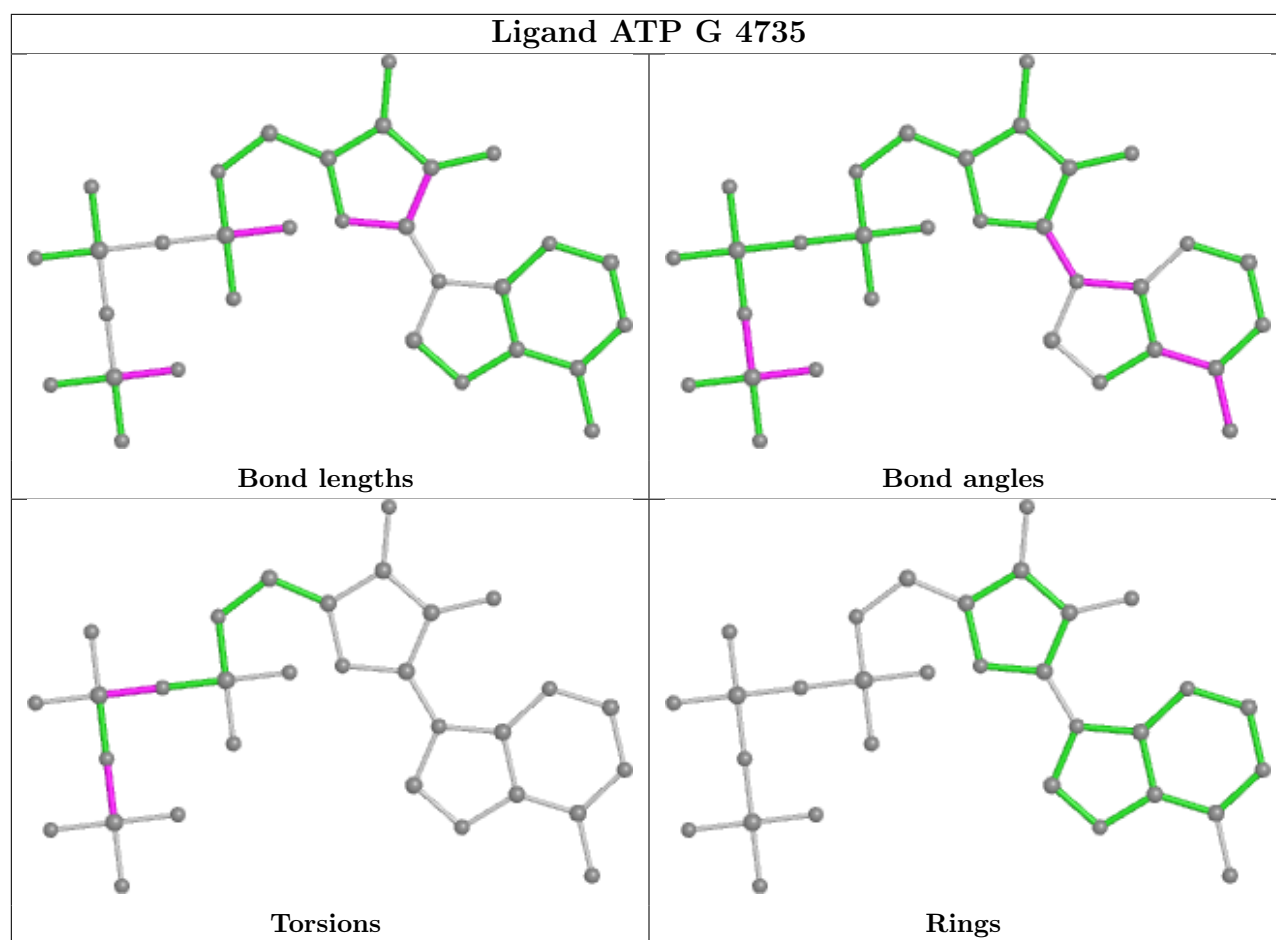












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	A	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	A	241:ALA	C	242:SER	N	1.14

6 Fit of model and data

6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.