An $n \rightarrow \pi^*$ Interaction in Aspirin: Implications for Structure and Reactivity

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Table S1. SCF energies (atomic units; au) of conformations **1**–**8** and compounds **9**–**17** calculated at B3LYP/6–311+g(2d,p) level of theory.

	Energy	Zero-point correction	Energy (corrected)
1	–648.90486736	0.156289	–648.74857836
2	–648.90352357	0.156276	–648.74724757
3	–648.89968559	0.156511	–648.74317459
4	–648.89608416	0.155933	–648.74015116
5	–648.89632496	0.156233	–648.74008996
6	–648.89602928	0.156205	–648.73982428
7	–648.36068901	0.142654	–648.21803501
8	–648.35897360	0.142703	–648.21627060
9	–852.94412753	0.144945	–852.79918253
10	–740.64220400	0.141245	–740.50095900
11	–762.92065233	0.174901	–762.74575133
12	–782.36282729	0.215057	–782.14777029
13	–852.94527260	0.145006	–852.80026660
14	–740.64241835	0.141267	–740.50115135
15	–762.91909983	0.174853	–762.74424683
16	–782.36260440	0.214879	–782.14772540
17	–836.35529075	0.144033	–836.21125775

Table S2. Atomic coordinates of conformation **1**.

Atom	*x*	*y*	*z*
C	–2.230697	0.489144	0.176517
C	–2.962483	–0.687391	0.201165
C	–0.855930	0.485360	–0.093807
H	–2.718526	1.434406	0.366055
C	–0.099142	1.762837	–0.137471
C	–2.327725	–1.899451	–0.049511
C	–0.234591	–0.749617	–0.335898
H	–4.023695	–0.658819	0.413737
O	1.083083	1.890045	–0.351962
O	–0.891156	2.843649	0.087939
O	1.101854	–0.843211	–0.683006
C	–0.965978	–1.927494	–0.317353
H	–2.890459	–2.825045	–0.033993
C	2.044167	–0.690381	0.311725
H	–0.305871	3.615338	0.046459
H	–0.450355	–2.858535	–0.513895
O	1.762207	–0.639924	1.474003
C	3.416660	–0.612520	–0.285295
H	4.160962	–0.709935	0.500991
H	3.519900	0.359416	–0.772337
H	3.554458	–1.384228	–1.043246

Table S3. Atomic coordinates of conformation **2**.

Atom	*x*	*y*	*z*
C	–2.271795	0.463516	0.171187
C	–2.967594	–0.733188	0.188161
C	–0.897837	0.507663	–0.097778
H	–2.773624	1.402021	0.364787
C	–0.280396	1.863683	–0.095556
C	–2.293169	–1.923849	–0.064340
C	–0.237138	–0.703773	–0.342244
H	–4.029977	–0.738613	0.396609
O	1.019131	1.906301	–0.473995
O	–0.879227	2.869506	0.203632
O	1.109327	–0.768613	–0.679532
C	–0.930787	–1.905417	–0.327052
H	–2.824806	–2.867696	–0.054258
C	2.037807	–0.679596	0.329299
H	1.276918	2.839668	–0.410479
H	–0.385125	–2.819375	–0.523107
O	1.745092	–0.593803	1.487453
C	3.424904	–0.715952	–0.243617
H	4.151162	–0.708845	0.564904
H	3.571364	0.153713	–0.886751
H	3.555546	–1.606519	–0.860537

Table S4. Atomic coordinates of conformation **3**.

Atom	*x*	*y*	*z*
C	–2.311983	0.354510	0.215422
C	–2.915244	–0.891385	0.295300
C	–0.949110	0.481174	–0.069469
H	–2.888511	1.257626	0.369410
C	–0.391394	1.878423	–0.138249
C	–2.165352	–2.039522	0.061189
C	–0.219417	–0.682389	–0.307102
H	–3.969723	–0.966058	0.529490
O	–0.925122	2.745681	–0.776107
O	0.710006	2.131793	0.590569
O	1.117224	–0.649356	–0.744713
C	–0.817654	–1.932634	–0.253346
H	–2.629201	–3.016911	0.109855
C	2.116775	–0.544328	0.169039
H	0.982928	1.349460	1.107091
H	–0.221848	–2.809392	–0.472923
O	1.920709	–0.281421	1.331179
C	3.455362	–0.772534	–0.465519
H	4.239145	–0.601480	0.267264
H	3.578705	–0.100127	–1.316103
H	3.514067	–1.794579	–0.845104

Table S5. Atomic coordinates of conformation **4**.

Atom	*x*	*y*	*z*
C	–2.146087	0.767709	0.053715
C	–3.056398	–0.277969	0.138821
C	–0.784579	0.527239	–0.151039
H	–2.500556	1.790586	0.109000
C	0.165338	1.673484	–0.326446
C	–2.607536	–1.589056	0.035854
C	–0.354376	–0.800118	–0.254160
H	–4.109140	–0.067981	0.279313
O	1.009279	1.723573	–1.178368
O	–0.006563	2.715368	0.525372
O	0.965738	–1.130601	–0.513605
C	–1.255458	–1.848642	–0.153648
H	–3.307057	–2.413053	0.104538
C	1.939893	–0.748729	0.379083
H	–0.586342	2.457515	1.254589
H	–0.883015	–2.862231	–0.228182
O	1.695836	–0.234913	1.434601
C	3.298193	–1.058791	–0.172513
H	4.041350	–0.959409	0.614440
H	3.512834	–0.344318	–0.971044
H	3.323659	–2.059281	–0.604650

Table S6. Atomic coordinates of conformation **5**.

Atom	*x*	*y*	*z*
C	–2.258754	0.193126	0.260423
C	–2.776570	–1.092525	0.286744
C	–0.917611	0.425801	–0.066810
H	–2.888341	1.038813	0.500676
C	–0.372302	1.808001	–0.032595
C	–1.960316	–2.170345	–0.042537
C	–0.105711	–0.671873	–0.392010
H	–3.813660	–1.252637	0.552941
O	0.779013	2.105256	0.173752
O	–1.330923	2.746750	–0.231089
O	1.180934	–0.505434	–0.858874
C	–0.633626	–1.958059	–0.391903
H	–2.358889	–3.177703	–0.040108
C	2.295481	–0.474980	–0.035112
H	–0.889397	3.607330	–0.156870
H	0.007592	–2.779543	–0.685731
C	2.061075	–0.629975	1.443133
O	3.362737	–0.349816	–0.554103
H	3.027948	–0.655789	1.938621
H	1.508722	–1.545333	1.662247
H	1.481931	0.215788	1.814743

Table S7. Atomic coordinates of conformation **6**.

Atom	*x*	*y*	*z*
C	–2.280052	0.259052	0.253272
C	–2.821321	–1.015536	0.265725
C	–0.934670	0.476002	–0.068457
H	–2.886600	1.123193	0.490322
C	–0.475234	1.894573	–0.053470
C	–2.022518	–2.104651	–0.071624
C	–0.141835	–0.632955	–0.400280
H	–3.862339	–1.159628	0.525547
O	0.862357	2.044147	0.067213
O	–1.223312	2.840507	–0.109860
O	1.156378	–0.490965	–0.853831
C	–0.691767	–1.910566	–0.413673
H	–2.437822	–3.105190	–0.081839
C	2.256737	–0.553807	–0.021041
H	1.037875	2.998447	0.052034
H	–0.064051	–2.740109	–0.714215
C	2.000124	–0.792846	1.443884
O	3.337265	–0.428885	–0.515014
H	2.958583	–0.824245	1.954953
H	1.469356	–1.733688	1.599468
H	1.386707	0.007187	1.859650

Table S8. Atomic coordinates of conformation **7**.

Atom	*x*	*y*	*z*
C	–2.196746	0.632637	0.251664
C	–2.993685	–0.506199	0.252234
C	–0.831674	0.585713	–0.044928
H	–2.610664	1.610520	0.465385
C	–0.012091	1.905402	–0.015701
C	–2.438299	–1.740617	–0.075482
C	–0.304934	–0.668545	–0.361333
H	–4.048276	–0.431687	0.497626
O	1.219002	1.785958	0.188221
O	–0.686267	2.942654	–0.183665
O	1.027514	–0.789157	–0.767196
C	–1.086998	–1.816542	–0.389942
H	–3.049337	–2.636972	–0.088113
C	1.988878	–0.816689	0.203779
H	–0.622140	–2.758802	–0.655521
O	1.791741	–1.183691	1.331655
C	3.316684	–0.404334	–0.364727
H	4.118014	–0.712931	0.304490
H	3.287546	0.683955	–0.448066
H	3.462132	–0.825152	–1.361306

Table S9. Atomic coordinates of conformation **8**.

Atom	*x*	*y*	*z*
C	0.000000	0.000000	0.000000
C	1.389009	0.000000	0.000000
C	–0.746117	1.184206	0.000000
H	–0.549889	–0.933628	–0.016878
C	–2.287042	1.084120	0.049157
C	2.081690	1.208189	–0.039212
C	–0.025788	2.379219	–0.025950
H	1.932056	–0.939333	0.013289
O	–2.833274	1.719614	0.981052
O	–2.789772	0.343684	–0.816954
O	–0.665625	3.619801	–0.141902
C	1.366192	2.398429	–0.068037
H	3.165815	1.225544	–0.061698
C	–1.040858	4.355567	0.945599
H	1.872177	3.355258	–0.131833
C	–0.903677	3.713009	2.296929
O	–1.463267	5.468065	0.756797
H	–1.176046	4.443367	3.055692
H	0.113627	3.354627	2.465453
H	–1.582478	2.852485	2.310950

Table S10. Atomic coordinates of optimized conformation of compound **9**.

Atom	*x*	*y*	*z*
C	–1.215153	0.799875	0.017767
C	–2.076158	–0.288944	–0.040507
C	0.155723	0.636489	–0.169605
H	–1.585247	1.801036	0.185809
C	1.068265	1.897439	–0.109775
C	–1.614982	–1.574323	–0.318228
C	0.609006	–0.660753	–0.430788
O	0.473964	2.971073	–0.317241
O	1.943646	–0.900531	–0.713946
C	–0.259450	–1.748477	–0.519142
H	–2.309275	–2.399952	–0.368019
C	2.832935	–0.899494	0.340098
H	0.150648	–2.726385	–0.738196
O	2.514505	–1.170714	1.464205
C	4.223517	–0.628638	–0.151536
H	4.944995	–0.921484	0.608854
H	4.283269	0.444825	–0.338375
H	4.413853	–1.157489	–1.087176
N	–3.509997	–0.090964	0.175511
O	–4.255622	–1.067698	0.058344
O	–3.910485	1.033499	0.462862

Table S11. Atomic coordinates of optimized conformation of compound **10**.

Atom	*x*	*y*	*z*
C	–1.575317	0.765315	0.062602
C	–2.440084	–0.332119	0.002516
C	–0.203552	0.632372	–0.140532
H	–1.948709	1.763851	0.250313
C	0.684796	1.909637	–0.058567
C	–1.933480	–1.604595	–0.297293
C	0.270845	–0.650731	–0.427324
O	1.897653	1.715896	0.182360
O	0.067183	2.977092	–0.233078
O	1.608898	–0.856880	–0.735628
C	–0.576446	–1.752033	–0.517394
H	–2.599765	–2.456230	–0.354067
C	2.507557	–0.882817	0.305983
H	–0.151564	–2.719285	–0.755542
O	2.207226	–1.193105	1.425645
C	3.888814	–0.571130	–0.189056
C	–3.843632	–0.167724	0.228919
N	–4.979161	–0.054308	0.407882
H	3.929908	0.510638	–0.328228
H	4.624052	–0.886363	0.548947
H	4.075511	–1.053514	–1.150118

Table S12. Atomic coordinates of optimized conformation of compound **11**.

Atom	*x*	*y*	*z*
C	–1.531899	0.528247	0.001271
C	–2.276583	–0.643060	–0.037139
C	–0.144484	0.524561	–0.181019
H	–1.975308	1.503061	0.149847
C	0.595958	1.893113	–0.115494
C	–1.645045	–1.862240	–0.282468
C	0.464725	–0.706292	–0.417558
O	1.832002	1.845348	0.079498
O	–0.141657	2.892411	–0.252444
O	1.830744	–0.787555	–0.709656
C	–0.272884	–1.883126	–0.475635
H	–2.233607	–2.771262	–0.318045
C	2.708952	–0.715217	0.332674
H	0.243746	–2.815249	–0.672364
O	2.434571	–1.012501	1.465212
C	4.063954	–0.288038	–0.156252
H	4.818379	–0.517988	0.594168
H	4.004026	0.790075	–0.317768
H	4.305279	–0.768320	–1.106245
C	–4.316401	0.518594	0.403224
H	–5.368769	0.262774	0.527098
H	–3.947481	0.996061	1.316930
H	–4.208513	1.223189	–0.427919
O	–3.645099	–0.700403	0.145475

Table S13. Atomic coordinates of optimized conformation of compound **12**.

Atom	*x*	*y*	*z*
C	–1.112001	0.792822	0.150127
C	–2.016272	–0.272829	0.062474
C	0.250482	0.657308	–0.091666
H	–1.438831	1.790166	0.413877
C	1.150343	1.919690	0.045662
C	–1.516024	–1.528403	–0.299561
C	0.712225	–0.617304	–0.438470
O	2.367830	1.708973	0.253755
O	0.545362	3.007967	–0.053829
O	2.051266	–0.819752	–0.788971
C	–0.154234	–1.689219	–0.544452
H	–2.167504	–2.385806	–0.400574
C	2.959870	–0.949379	0.221608
H	0.241091	–2.657783	–0.828123
O	2.685123	–1.333740	1.327540
C	4.339413	–0.616862	–0.272078
H	4.390893	0.472761	–0.320697
H	5.084761	–1.001760	0.421894
H	4.502024	–1.016822	–1.274632
C	–4.247332	–1.226769	0.399326
C	–4.030548	1.067446	–0.294612
H	–3.826322	–1.990206	1.055024
H	–5.223025	–0.938660	0.798170
H	–4.412712	–1.680476	–0.595475
H	–3.402729	1.952627	–0.242475
H	–4.239871	0.860819	–1.359082
H	–4.978152	1.292210	0.202512
N	–3.391689	–0.060524	0.370211

Table S14. Atomic coordinates of optimized conformation of compound **13**.

Atom	*x*	*y*	*z*
C	–0.569861	1.911937	0.301640
C	0.537251	1.123484	–0.032247
H	–0.388419	2.956083	0.522516
C	1.948902	1.750682	–0.032421
C	–2.049373	0.066056	–0.030395
C	0.293586	–0.213787	–0.364938
O	2.850473	1.038362	0.461184
O	1.999858	2.900283	–0.510333
O	1.358867	–1.011184	–0.775102
C	–0.979461	–0.751331	–0.382573
C	2.072375	–1.661216	0.202804
H	–1.141214	–1.783251	–0.655687
O	1.619126	–1.941467	1.277771
C	3.447472	–1.992589	–0.295493
N	–3.396421	–0.486580	–0.039852
O	–4.329547	0.241806	0.305905
O	–3.548642	–1.657363	–0.393571
H	3.905815	–2.738681	0.350547
H	3.414433	–2.341517	–1.328711
H	4.016866	–1.060681	–0.263993
C	–1.855411	1.400099	0.323447
H	–2.706490	2.010597	0.588521

Table S15. Atomic coordinates of optimized conformation of compound **14**.

Atom	*x*	*y*	*z*
C	–0.993933	1.801677	0.300323
C	0.149819	1.066925	–0.026706
H	–0.853409	2.852056	0.522446
C	1.529600	1.776735	–0.013326
C	–2.411584	–0.115280	–0.034769
C	–0.034653	–0.277634	–0.362126
O	2.502907	1.061525	0.313021
O	1.487601	2.985900	–0.312938
O	1.051268	–1.039515	–0.785756
C	–1.285970	–0.869713	–0.381532
C	1.839450	–1.609636	0.183918
H	–1.380726	–1.910697	–0.661248
O	1.446121	–1.870471	1.287480
C	3.204364	–1.903494	–0.364196
H	3.723464	–2.600949	0.290364
H	3.139633	–2.299854	–1.378858
H	3.732347	–0.948124	–0.398313
C	–3.709204	–0.714291	–0.046639
N	–4.761157	–1.192046	–0.056399
C	–2.256203	1.233250	0.315834
H	–3.126500	1.821142	0.581254

Table S16. Atomic coordinates of optimized conformation of compound **15**.

Atom	*x*	*y*	*z*
C	–0.975221	1.643863	0.192507
C	0.229547	0.996597	–0.067747
H	–0.912085	2.707335	0.388285
C	1.542399	1.827623	–0.049696
C	–2.253678	–0.365933	–0.104590
C	0.137623	–0.372282	–0.348447
O	2.613852	1.176115	–0.022836
O	1.379717	3.065827	–0.057732
O	1.264778	–1.106266	–0.718295
C	–1.072146	–1.048160	–0.377558
C	2.165415	–1.431674	0.259719
H	–1.096636	–2.105542	–0.607776
O	1.876453	–1.548393	1.420538
C	3.511326	–1.715783	–0.343703
C	–4.628210	–0.470554	0.135624
H	–5.404250	–1.231577	0.055003
H	–4.636159	–0.054173	1.149306
H	–4.837465	0.334007	–0.578723
O	–3.408613	–1.120976	–0.152144
H	3.956548	–0.745716	–0.571187
H	4.128362	–2.258513	0.370370
H	3.409659	–2.280577	–1.272341
C	–2.208555	0.994424	0.188565
H	–3.108471	1.555578	0.402762

Table S17. Atomic coordinates of optimized conformation of compound **16**.

Atom	*x*	*y*	*z*
C	–0.480649	1.864193	0.158862
C	0.631131	1.066262	–0.097571
H	–0.292502	2.925827	0.264107
C	2.029459	1.732849	–0.201864
C	–2.015916	–0.006222	0.072395
C	0.365648	–0.297441	–0.261799
O	3.018750	0.961976	–0.162782
O	2.011705	2.977071	–0.308869
O	1.382062	–1.190632	–0.607620
C	–0.912265	–0.827399	–0.183196
C	2.286517	–1.537439	0.359031
H	–1.024352	–1.898327	–0.293240
O	2.043917	–1.523351	1.536268
C	3.559516	–2.029931	–0.268868
H	4.102142	–1.143087	–0.600433
H	4.144446	–2.579722	0.466563
H	3.347704	–2.655904	–1.137916
C	–3.734038	–1.437297	–0.915353
C	–4.381318	0.289051	0.630900
H	–2.948621	–2.140424	–1.180864
H	–4.614848	–2.011648	–0.615418
H	–3.991399	–0.858357	–1.819819
H	–4.096321	0.793456	1.554506
H	–4.659946	1.058773	–0.110630
H	–5.268725	–0.315872	0.832679
N	–3.313375	–0.583734	0.186969
C	–1.775493	1.360866	0.247062
H	–2.590965	2.045962	0.438112

Table S18. Atomic coordinates of optimized conformation of compound **17**.

Atom	*x*	*y*	*z*
C	–1.741024	–1.925407	0.223761
C	–0.703737	–2.838452	0.372452
C	–1.484517	–0.576096	–0.024612
H	–2.778740	–2.233734	0.279116
C	–2.698659	0.383130	–0.154820
C	0.613841	–2.420846	0.225244
C	–0.142547	–0.191715	–0.148233
H	–0.923130	–3.882688	0.585785
O	–2.601018	1.505650	0.386957
O	–3.682774	–0.102676	–0.772297
O	0.099015	1.140927	–0.492899
C	0.933594	–1.091906	–0.063195
H	1.446940	–3.106992	0.315739
C	0.676776	1.964723	0.390798
O	0.876004	1.731868	1.557190
C	1.048987	3.255678	–0.297904
H	1.330203	4.000615	0.445510
H	0.215230	3.614389	–0.903784
H	1.895852	3.038198	–0.952802
C	2.439223	–0.754253	–0.309092
O	2.710414	0.359667	–0.815887
O	3.243612	–1.667802	0.004941