**Supporting data for**

**New sulfonylhydrazones containing methane sulfonic acid hydrazide** **having human anti-carbonic anhydrase and anti-microbial activity: Synthesis, spectroscopic characterization, electrochemical properties and biological activities**

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**Fig. S1.** FT-IR spectrum of **II**

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**Fig. S2.** FT-IR spectrum of **III**



**Fig. S3.** FT-IR spectrum of **IV**



**Fig. S4.** 1H NMR (DMSO-*d*6) spectrum of **II**



**Fig. S5.** 1H NMR (DMSO-*d*6) spectrum of **III**



**Fig. S6.** 1H NMR (DMSO-*d*6) spectrum of **IV**



**Fig. S7.** 13C NMR (DMSO-*d*6) spectrum of **II**



**Fig. S8.** 13C NMR (DMSO-*d*6) spectrum of **III**



**Fig. S9.** 13C NMR (DMSO-*d*6) spectrum of **IV**



**Fig. S10.** Packing motif of the crystal **IV**

Table S1. *Hydrogen-bond geometry (Å, o) for* ***IV***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| D-H---A | D-H | H---A | D---A | D-H---A |
| N2-H2---O2 | 0.91( 5) | 2.00 (5) | 2.91 (6) | 174 (5) |
| O1-H1a---N1 | 0.79 (7) | 1.97 (7) | 2.64 (6) | 143 (7) |

Table S2**.** *MBC/MFC values of compounds against the bacterial and fungal strains tested*

|  |
| --- |
| MBC/MFC (µg/mL) |
| Gram-positive bacteria | **Gram-negative bacteria** | **Fungi** |
| Compounds | *S. aureus* | *S. epidermidis* | *E. coli* | *P. aeruginosa* | *S. maltophilia* | *K. pneumoniae* | *C. albicans* | *A. fumigatus* |
| II | 64 | 64 | 128 | 64 | 32 | 128 | 16 | 32 |
| III | 64 | 8 | 128 | 64 | 32 | 128 | 32 | 32 |
| 1V | 256 | 128 | 128 | 128 | 32 | 128 | 16 | 32 |
| Sulfamethoxazole | 256 | >256 | 256 | >256 | 128 | 256 | - | - |
| Sulfisoxazole | >256 | >256 | >256 | >256 | >256 | >256 | - | - |
| Fluconazole | - | - | - | - | - | - | 64 | 128 |