

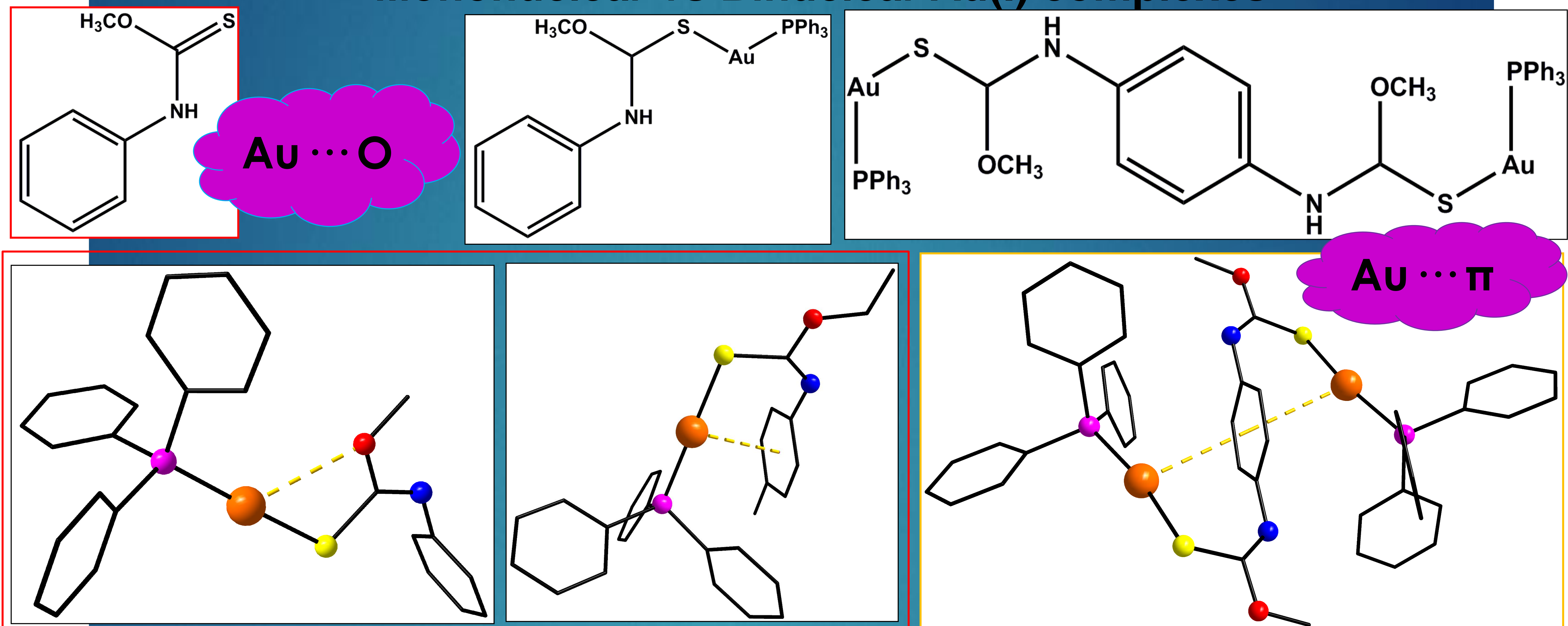
Binuclear Phosphanegold(I) Thiocarbamates: The importance of $Au \cdots \pi(\text{aryl})$ interactions and their antimicrobial activity

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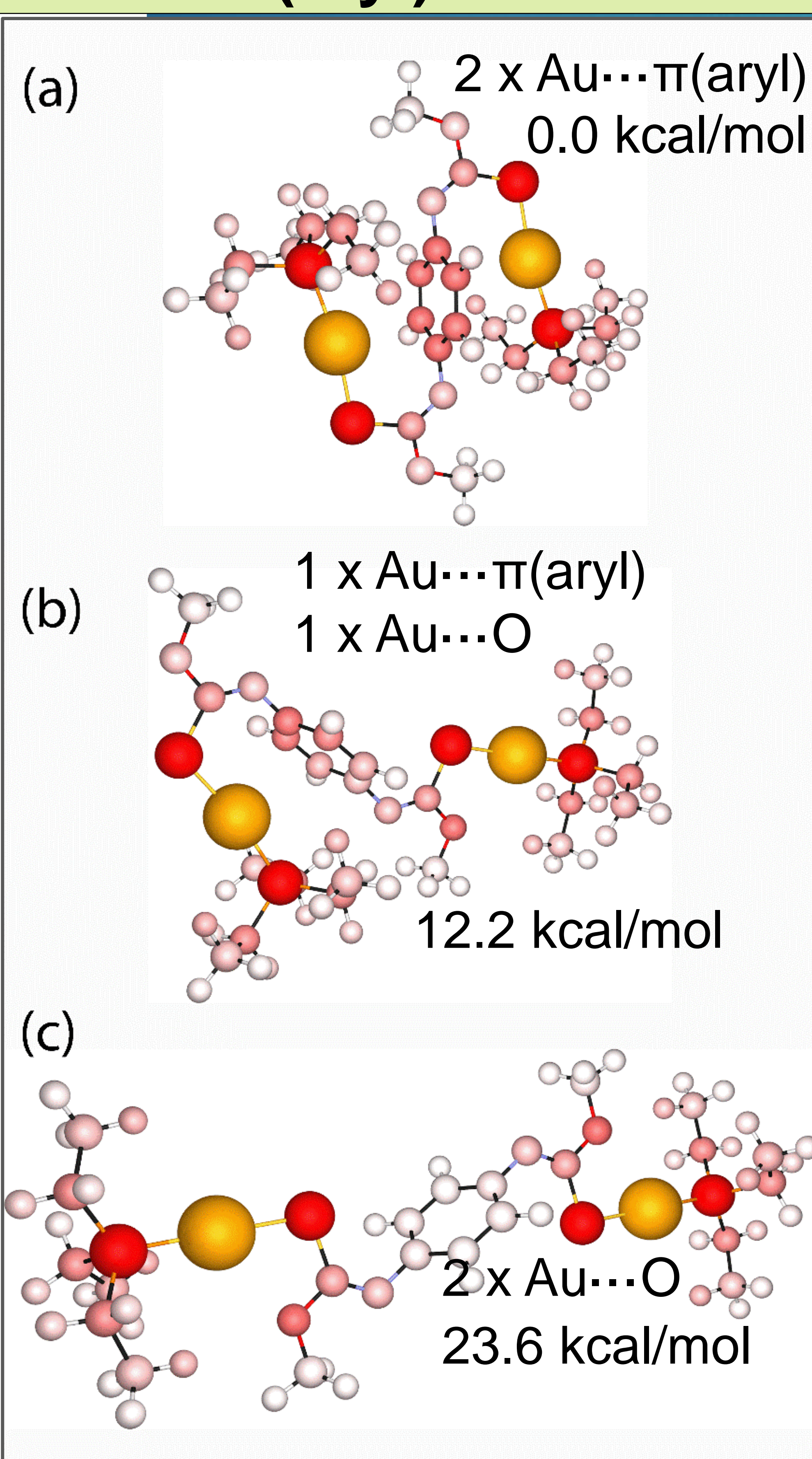
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Mononuclear vs Binuclear Au(I) complexes



Au... $\pi(\text{aryl})$ vs Au...O



Au... π
interactions:
comparatively
rare

Conclusion

Compounds **1 – 3** feature unanticipated intramolecular Au... $\pi(\text{aryl})$ interactions. Theory shows these interactions provide energies of stabilisation greater than 12 kcal mol⁻¹ compared to putative Au...O interactions. Compounds **1 – 3** exhibited, predominantly, a bactericidal effect on Gram-positive (**1 – 3**) and Gram-negative (only **1**) pathogens.

Antimicrobial Activity

Microorganism	1	2	3	L	Standard Anti-biotics
Gram-positive bacteria					
<i>B. cereus</i> ATCC10876	22	–	–	–	11 ^a
<i>B. subtilis</i> ATCC6633	27	10	8	–	24 ^a
<i>E. faecalis</i> ATCC29212	20	9	–	–	11 ^a
<i>E. faecium</i> ATCC19434	18	9	8	–	16 ^b
<i>L. monocytogenes</i> ATCC19117	20	9	8	–	27 ^a
<i>S. aureus</i> (MRSA) ATCC43300	23	9	7	–	14^b
<i>S. aureus</i> ATCC25923	30	9	–	–	18 ^b
<i>S. saprophyticus</i> ATCC15305	30	9	8	–	29 ^a
Gram-negative bacteria					
<i>A. baumannii</i> ATCC19606	13	–	–	–	16 ^a
<i>A. hydrophilla</i> ATCC35654	8	–	–	–	22 ^a
<i>C. freundii</i> ATCC8090	8	–	–	–	26 ^a
<i>E. aerogenes</i> ATCC13048	7	–	–	–	20 ^a
<i>E. cloacae</i> ATCC35030	8	–	–	–	20 ^a
<i>E. coli</i> ATCC25922	10	–	–	–	18 ^a
<i>K. pneumonia</i> ATCC700603	8	–	–	–	13 ^a
<i>P. aeruginosa</i> ATCC27853	14 (T)	–	–	–	14 ^a
<i>P. mirabilis</i> ATCC25933	8	–	–	–	14 ^b
<i>P. vulgaris</i> ATCC13315	14	–	–	–	19 ^b
<i>S. typhimurium</i> ATCC14028	9	–	–	–	24 ^a
<i>S. paratyphiA</i> ATCC9150	9	–	–	–	22 ^a
<i>S. flexneri</i> ATCC12022	12	–	–	–	18 ^a
<i>S. sonnei</i> ATCC9290	10	–	–	–	19 ^a
<i>S. maltophilia</i> ATCC13637	9	–	–	–	23 ^b
<i>V. parahaemolyticus</i> ATCC17802	23	–	–	–	30 ^a

The diameter of inhibition zones in millimetres (mm) were measured after 24 h incubation; –, no zone of inhibition; (T), partial zone of inhibition; ^aTetracycline; ^bChloramphenicol.

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