



Synthesis, Characterization, Antimicrobial Evaluation and Anticancer Activity of Some New Homobinuclear Schiff Base Complexes

Sami A. ALHARBI^{1,*} & Ahmed Z. SAYED²

¹ Chemistry Department, University College in Al-Jamoum, Umm Al-Qura University,
21955, Makah, Saudi Arabia

² Chemistry Department, Faculty of Science (Boys), Al-Azhar University, 11884, Nasr City, Cairo, Egypt

SUMMARY. The synthesis of new provided complexes was achieved from the interaction of a Schiff base (1) with nitrates of Cr(III) and Fe(III), Cd(II), Ni(II), Co(II), Cu(II), Mn(II) and Zn(II). The condensation of 4-amino-*N,N*-diethylbenzenesulfonamide (ADB) with 4,6-diacetyl-resorcinol (DAR) in a 2:1 molar ratio provided the ligand. Elemental, spectral and thermal analyses were used to confirm the ligand and its complexes. The spectral data showed that H₂L has two centres of chelation through two azomethine nitrogen atoms and two phenolic oxygen atoms. The compounds 2-9 were tested against antimicrobial and anticancer activities and showed the best results. The study of the molecular docking for compounds H₂L, 2 and 7 was performed via different interactive sites in the dihydrofolate reductase (DHFR) enzyme.

RESUMEN. La síntesis de los nuevos complejos se logró a partir de la interacción de una base de Schiff (1) con nitratos de Cr(III) y Fe(III), Cd(II), Ni(II), Co(II), Cu(II), Mn(II) y Zn(II). La condensación de 4-amino-*N,N*-diethylbenzenosulfonamida (ADB) con 4,6-diacetil-resorcinol (DAR) en una relación molar 2:1 proporcionó el ligando. Se usaron análisis elementales, espectrales y térmicos para confirmar el ligando y sus complejos. Los datos espectrales mostraron que el H₂L tiene dos centros de quelación a través de dos átomos de nitrógeno de azometina y dos átomos de oxígeno fenólico. Los compuestos 2-9 se probaron contra actividades antimicrobianas y anticancerígenas y mostraron los mejores resultados. El estudio del acoplamiento molecular para los compuestos H₂L, 2 y 7 se realizó a través de diferentes sitios interactivos en la enzima dihidrofolato reductasa (DHFR).

KEY WORDS: anticancer, antimicrobial, binuclear complexes, molecular docking, Schiff base.

* Authors to whom correspondence should be addressed. *E-mail:* sadharbi@uqu.edu.sa