

Some New Amino Acid-Sulfanilamide Conjugates as Potential Antimicrobial Agents: Synthesis, Characterization, and Molecular Docking Studies

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SUMMARY. A sulfonamide is a functional group that serves as a scaffold in both medicinal and synthetic organic chemistry. It is the basis of many sulfa drugs. Several new amino acid-sulfanilamide conjugates were synthesized, and evaluated for its antibacterial and antifungal activity. On the basis of their elementary and spectral evaluations, the structures of the synthesized compounds have been verified. Antibacterial activity of the synthesized compounds (**5a-c**) was tested against *S. aureus*, *B. subtilis*, *E. coli*, and *P. aeruginosa*, and antifungal activity were tested against *C. albicans* and *A. niger* and compared with the reference drug Gentamycin for antibacterial activity and Miconazole for antifungal activity. All tested compounds showed significant antibacterial and antifungal activity. Amongst all the compounds (**5a-c**), compound **5a** exhibited encouraging antibacterial, and antifungal activities and would be an effective candidate. These compounds also displayed moderate inhibitory activity towards dihydrofolate reductase, reflecting their potential to act as an effective antimicrobial agent.

RESUMEN. Una sulfonamida es un grupo funcional que sirve como andamio en química orgánica sintética y medicinal. Es la base de muchas sulfonamidas. Se sintetizaron varios conjugados nuevos de aminoácido-sulfanilamida y se evaluaron por su actividad antibacteriana y antifúngica. Sobre la base de sus evaluaciones elementales y espectrales, se han verificado las estructuras de los compuestos sintetizados. La actividad antibacteriana de los compuestos sintetizados (**5a-c**) se probó contra *S. aureus*, *B. subtilis*, *E. coli* y *P. aeruginosa*, y la actividad antifúngica se probó contra *C. albicans* y *A. niger* y se comparó con el fármaco de referencia gentamicina para actividad antibacteriana y miconazol para actividad antifúngica. Todos los compuestos probados mostraron una actividad antibacteriana y antifúngica significativa. Entre todos los compuestos (**5a-c**), el compuesto **5a** exhibió actividades antibacterianas y antifúngicas alentadoras y sería un candidato eficaz. Estos compuestos también mostraron una actividad inhibitoria moderada hacia la dihidrofolato reductasa, lo que refleja su potencial para actuar como un agente antimicrobiano eficaz.

KEY WORDS: amino acid-sulfanilamide conjugate, antibacterial, antifungal, synthesis.

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