OVERCOMING BACTERIAL RESISTANCE: GLYCOSYLATED THIAMPHENICOL AS A NEXT-GENERATION ANTIMICROBIAL PRODRUG

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Antimicrobial resistance (AMR) remains a global health challenge, demanding innovative approaches to enhance antibiotic efficacy. Thiamphenicol, a broad-spectrum antibiotic structurally related to chloramphenicol, has seen limited application due to resistance mechanisms developed by bacteria CAT (chloramphenicol acetyltransferase). Inspired by previous studies [1] demonstrating that glycosylation effectively protects antibiotics from CAT enzymatic inactivation, this work presents a glycosylated derivative of thiamphenicol as a promising antimicrobial prodrug. Through strategic conjugation with glucose, the modified thiamphenicol aims to circumvent bacterial defense systems, enhance aqueous solubility, and reduce toxicity compared to the parent compound. This study outlines a novel approach, highlighting the potential of glycosylation to transform existing antibiotics into more effective and safer therapeutic options in the fight against bacterial infections.

References:

1. M. Dziadas, N. Pachura, A. Duda-Madej, M. Garbicz, T. Gębarowski, A.Dominguez-Martin, M. Rowińska-Żyrek, *Carbohydrate Research*, **2025**, *550*, 109387