

TITLE: Comparison of Conventional and Microwave-assisted Synthesis of Chemokine Receptor Type 4 (CXCR4) Antagonists

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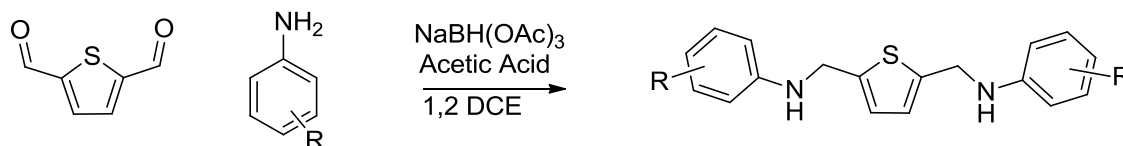
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Introduction: Chemokine receptor type 4 (CXCR4) is a G-protein coupled receptor (GPCR) this is specific for the chemokine stromal cell derived factor-1 (SDF-1/CXCL12). The formation of this receptor ligand complex is responsible for physiological occurrences such as cancer metastasis, leukocyte migration and hematopoiesis. Several p-xylyl-enediamine derivatives have shown antagonistic properties.

Purpose: The purpose of this study is to synthesize p-xylyl-enediamine derivatives by a reductive amination reaction. These syntheses will be carried out using a traditional method and a microwave method. Our goal is to compare the yields of the two methods and optimize the reaction conditions.

Method: Compounds are initially synthesized using traditional methods such as no heat and continuous stirring for a set amount of time. A simultaneous reaction is also conducted using a CEM microwave at a constant temperature for a set amount of cycles. The yield of both reactions is compared to determine the most efficient method of synthesizing the compounds.



Results: In preparation for other reactions, this reaction was synthesized. Thin layer chromatography (TLC) was used to determine the different products in the mixture. The products were isolated via column chromatography, from which the products were confirmed through NMR and Mass Spectroscopy. The yields of the desired products were calculated.

Conclusions: Once the most effective method for the synthesis of CXCR4 antagonists by reductive amination is determined, these syntheses will be scaled up. Several derivatives will be synthesized and tested for efficacy.