Synthetic Strategy toward Substituted Phenylpropenoids for the Study of Human Rhinovirus
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Introduction

• The Human Rhinovirus (HRV) is a virus that causes respiratory illness, which is mostly referred to as the common cold.  
• Phenylpropenoid compounds have been identified to show promising bioactivity against HRV due to its ability to act as a capsid bind and produce an inhibition of virus replication.
• This study aims to provide a synthetic pathway to synthesize a phenylpropenoid using allylic oxidation and esterification reactions using accessible chemicals.

Objective

• Create an effective and efficient pathway for creating the phenylpropenoid.
• Create other possible derivatives of the phenylpropenoid from organic chemicals that are accessible.

Target Molecule

![Target Molecule Image]

Overall Retrosynthesis

Scheme 1. Overall retrosynthesis of novel phenylpropenoid target

Synthetic approach towards Bis-enoate fragment

Scheme 2. A full forward synthetic pathway of bisenoate fragment synthesis including proposed derivatives.

Methods

Allylic Oxidation
• React angelic acid (A) with C_{12}H_{14}NO_3S in CH_2Cl_2 and C_6H_8O for 5 hours at 30 °C 
• Run IR spectrum to confirm alcohol group has been added.
• Use SeO_2 in CH_3Cl_2, and 90% t-BuOOH at 25 °C

Esterification
• Add C_5H_7OOH in TsOH, H_2O, and PhH under inert gas while refluxing in a Dean-Stark Trap and reflux condenser
• Run IR to confirm removal of protecting group

Significance

• Add to the library of compounds.
• Gather characterization data on the intermediates and products.
• Yield vital information in developing a drug for HRV, which affects billions of people worldwide each year and prevent economic burden.
• Insight on the efficacy of a drug on a pathogen and offer a basis to build on to fight against HRV.
• Provide cross-protection from other pathogens which further improve the quality of life of many people.

Future Direction

• Optimize the reaction for the most yield.
• Consider different pathways to be more cost effective in synthesizing the novel phenylpropenoids.
• Test efficacy of the novel phenylpropenoids on the HRV.
• Explore effect of structural difference on bioactivity.

Scheme 3. Esterification of compound C and removal of protecting group yielding a bis-enoate fragment of the phenylpropenoid fragment.

REFERENCES