Introduction

- Human rhinovirus (HRV) is the most prevalent cause of the common cold
  - HRV is leading cause of upper respiratory infection
  - Leads to school and work absences
  - Results in economic burden
- Phenylpropenoids have stable antiviral activity
  - EC50 of 2.4 ± 0.04 μM against HRV39
  - Capsid binders because interacts with capsid proteins
- Phenylpropenoid previously obtained from Bupleurum fruticosum

Objective

This study aims to design an efficient synthesis of the phenylpropenol fragment and create derivative compounds to investigate the effect on biological activity.

Methods

- Literature analysis was conducted to research reaction procedures
- Commercial availability of starting materials was explored
- Literature analysis and starting material availability allowed for design of a synthetic pathway for 1

Results

- Compound 2 will be synthesized via a Wittig Olefination of a substituted benzaldehyde followed by a carbonyl reduction, as seen in Scheme 2
  - The Wittig Olefination reaction will be performed using a phosphorane reagent to create intermediate 4, which will undergo a reduction using DIBALH as seen in Scheme 3
  - Reduction reactions will be carried out under inert conditions due to flammable and hazardous reagents
  - Reduction reactions can alternatively be done using lithium aluminum hydride and hydronium
- Derivative compounds 2a-2d in Figure 2 will undergo Wittig Olefination and reduction reactions as well, with 2a requiring alternative methods
  - 2a and 2b can still hydrogen bond, but 2a has ring strain and 2b has a strong electron-withdrawing group
  - 2c and 2d cannot hydrogen bond and are sterically hindered, but 2c contains leaving groups and 2d is highly conjugated and UV active
  - Compound 6 will go through a Heck coupling reaction followed by an epoxidation to obtain compound 5a

Concluding Remarks

- The compounds generated from these efforts will be employed in further synthetic transformations to create uniquely substituted phenylpropenoids for biological evaluation
- This study will provide new synthetic pathways and intermediates to the scientific community
- These compounds can lead to potential HRV treatments

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Structure Confirmation

- Reaction progress will be gaged using TLC plates
- Structural determination and verification of products will be obtained using IR, 1H NMR, 13C NMR, and MS techniques

References