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Title of research project **:** **Synthesis of Naftifine Related Allylamine Antimycotics**

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Summary of the Project titled "Synthesis of Naftifine Related Allylamine Antimycotics"

Introduction:

Systemic antifungal drugs are used to treat infections in various parts of the body that are caused by a fungus. Fungal infections can either be systemic, meaning that the infection is deep or topical (dermatophytic), meaning that the infection is superficial and occurs on the skin.[1]
Fungal infections on the skin are usually treated with creams or ointments (topical antifungal drugs). However, systemic infections, yeast infections or topical infections that do not clear up after treatment with creams or ointments may need to be treated with systemic antifungal drugs. These drugs are used, for example, to treat common fungal infections such as tinea (ringworm), which occurs on the skin or candidiasis (a yeast infection, also known as trush), which can occur in the throat, in the vagina, or in other parts of the body. They are also used to treat other deep fungal infections such as histoplasmosis, blastomycosis, and aspergillosis, which can affect the lungs and other organs. They are sometimes used to prevent or treat fungal infections in people whose immune systems are weakened, such as bone marrow or organ transplant patients and people with AIDS.

Another classification of antifungal drugs by chemical structure, spectrum of activity, pharmacokinetics, tolerability and etc. exists:

- **Polyene** antibiotics: nystatin, levorin, natamycin, amphotericin B - The drugs belonging to the above mentioned group are mostly of bacterial origin. They work by increasing the permeability of the fungal cellular membranes.
- **Imidazole derivates**: clotrimazole, ketoconazole, miconazole, oxiconazole, bifonazole - This type of antifungal drugs work by inhibiting ergosterol synthesis. Ergosterol is a key component of the fungal cellular membrane, inhibition of its synthesis leads to fungistatic or fungicidal effect. infusions.
- **Triazole:** fluconazole, itraconazole: A newly developed branch of antifungal drugs which takes its origin in Imidazoles. The mode of action of the drugs does not differ from the Imidazoles, however the drugs in the group have proven to be more effective in safe during treatment.
- **Allylamines**: terbinafine, naftifine: Group of synthetic antifungal drugs, with high lipophilicity which are used topically and systemically.
- **Drugs belonging to other chemical groups**: griseofulvin, flucytosine, chloronitrophenol, potassium iodide[1]

Present work:

The main objective was to develop a convenient method for the synthesis of an antimicrobial drug Naftifine which is used for the topical administration against some fungi causing skin infections. Naftifine causes interruption of ergosterol synthesis and accumulation of squalene in fungal organisms. The reported methods for the synthesis of Naftifine suffer either in critical reaction conditions or very low yields. The plan was to design a synthesis of Naftifine and its analogues using available starting materials.

The synthesis included the following steps:
I. Amidation of substituted aromatic acid.
II. Reduction of amide by lithium aluminium hydride to yield amine .
III.Conversion of this amine into conjugated amide via water mediated and also microwave assisted Wittig reaction.
IV. Final reaction with lithium aluminium hydride gives desired allylamine.