

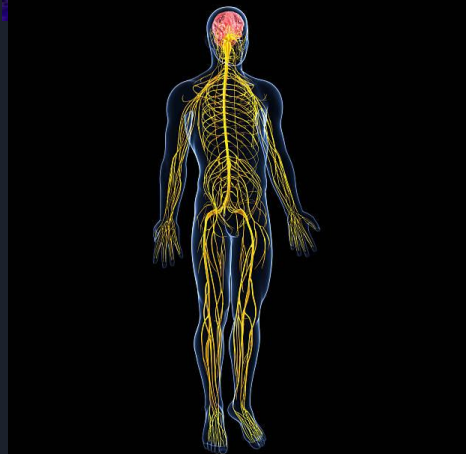
# Trypanosomiasis: Pioneering Treatment for a Neglected Disease.



By Andrew Blancarte



# Signs and Symptoms



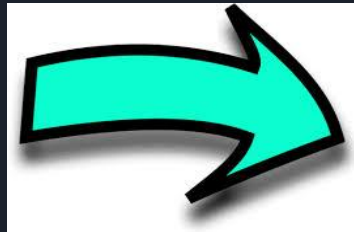
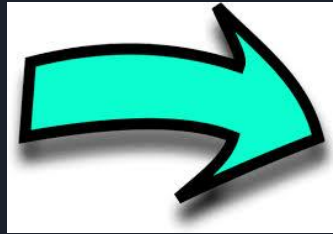
## First Stage (Peripheral Nervous System) :

- Fever
- Swelling
- Joint Pain/ Headache

## Second Stage (Central Nervous System):

- Confusion
- Violent Behavior
- Convulsions
- Sleeping Sickness/ Irregularity

# Why is it such a problem?



# Our Role

Aim to facilitate the production of the treatment by optimizing reproducibility and minimizing cost.



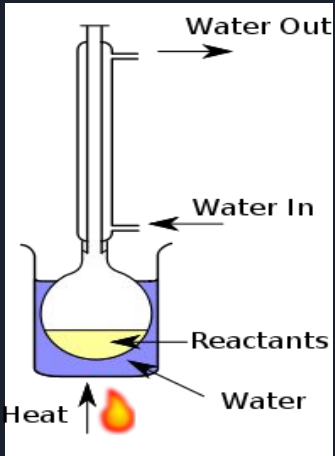
## Tasks

- Find cost/time effective way to reach end product
- Perfecting technique to increase yield
- Adjusting known procedure when necessary
- Molecule compliant with drug-like properties
  - Lipiphilic
  - Ingestible
  - Long half-life

# Methodology

## Synthesis

### Reflux



Heat speeds up the reaction.

## Extraction

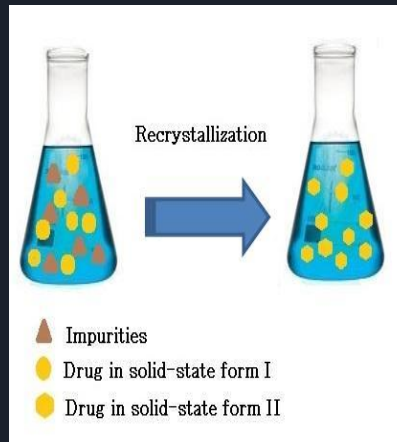
### Rotary Evaporator



A vacuum evaporates the solvent and leaves only product.

## Purification

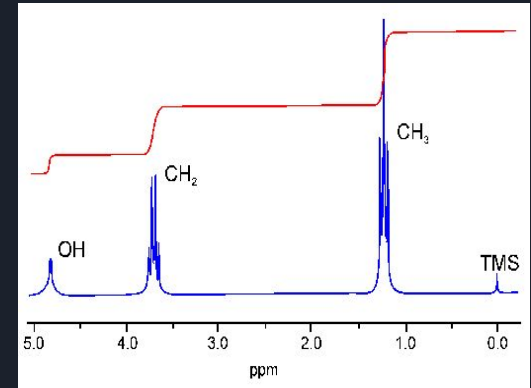
### Recrystallization



Further recrystallization to purify product.

## Characterization

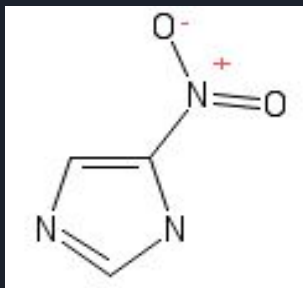
### Nuclear Magnetic Resonance



Instrument that uses distinct proton movement to identify compounds.

# The Chemistry

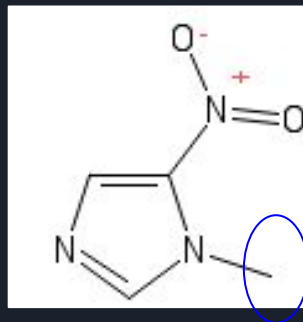
1



Alkalation



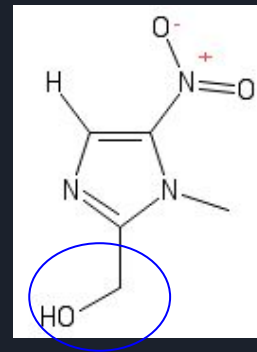
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Hydroxylation



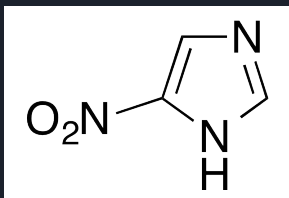
3



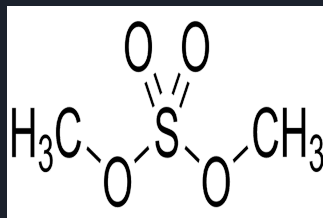
# Results

## Alkalation

### Reactants



5-Nitro Imidazole

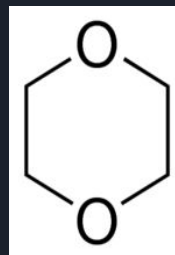


Dimethyl Sulfate



Methyl p-Toluene Sulfonate

### Solvent



Dioxane

3 mL

### Instrument



Microwave

140° C  
15 Minutes



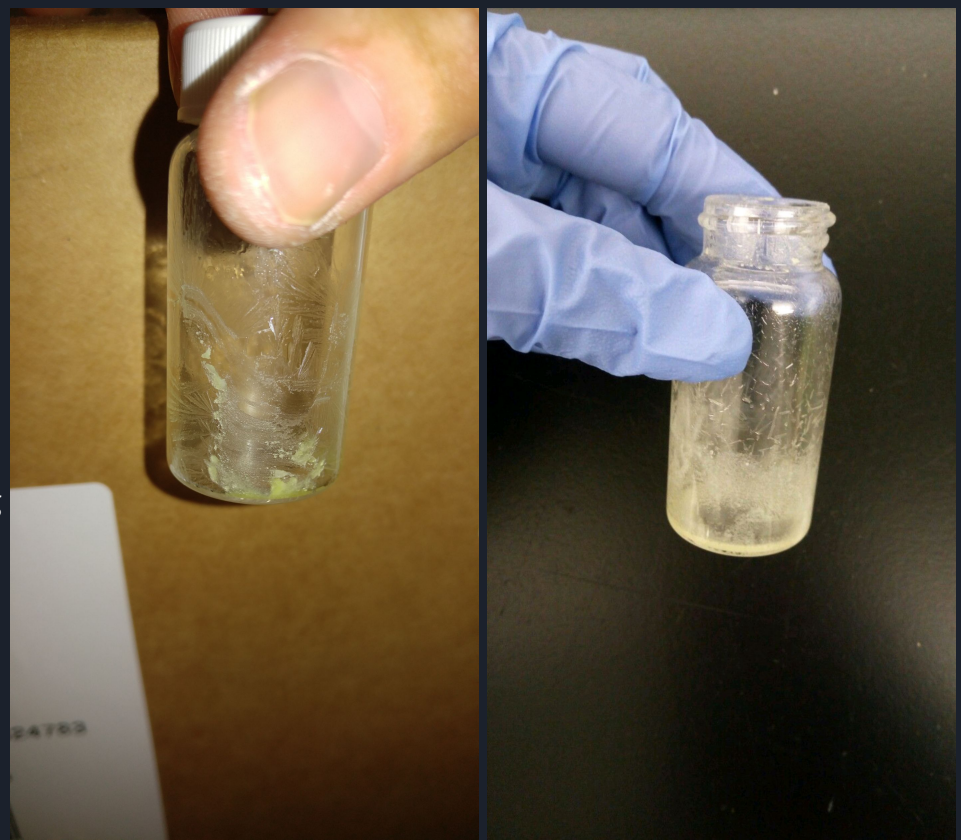
# Conclusion

## Our findings:

- Most efficient synthesis through 6 step process.
- Ideal conditions: dimethyl sulfate and microwave heating
- Improved yield of 72%

## Next Step:

- Provide knowledge to other organizations to complete the reactions on a larger scale.
- Continue research on each individual step
- Provide low-cost and widely available treatment!





# Acknowledgment

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