



# Rearrangements of fluorinated cyclopropylamines as a novel approach toward fluoroalkene-based peptidomimetics

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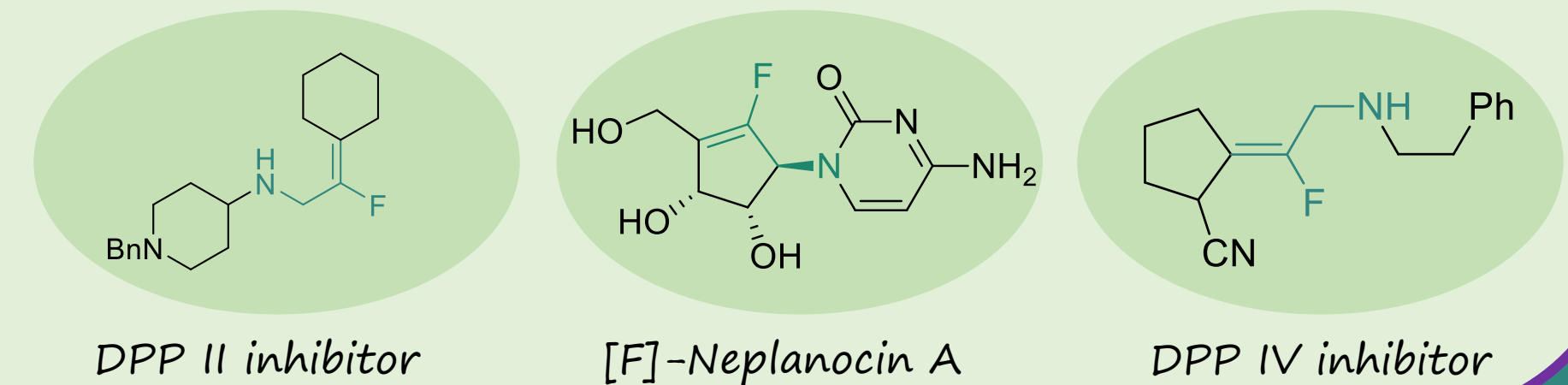
## Actuality



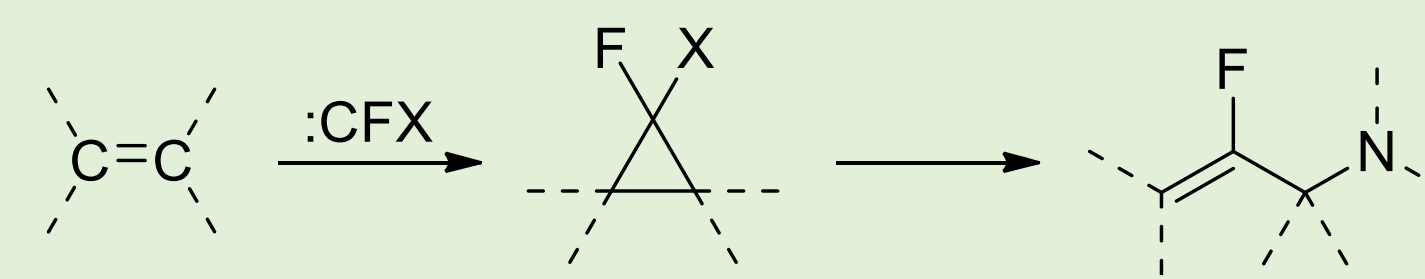
### Fluoroalkene-based peptidomimetics:

- Increased lipophilicity
- Strict conformation
- More metabolically stable

Higher biological activity



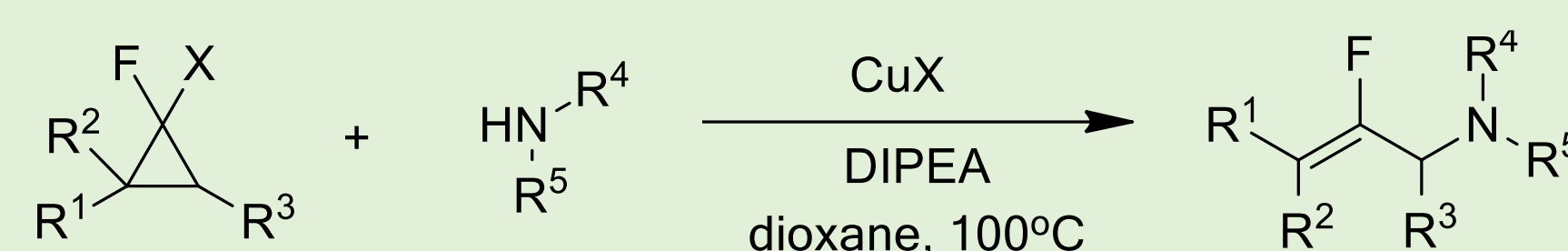
## gem-Fluorohalocyclopropane based methodology



**Comparing to literature:**

- Ability to synthesize cyclic fluoroalkenes
- Short synthesis from readily available substrates

### Earlier in our laboratory

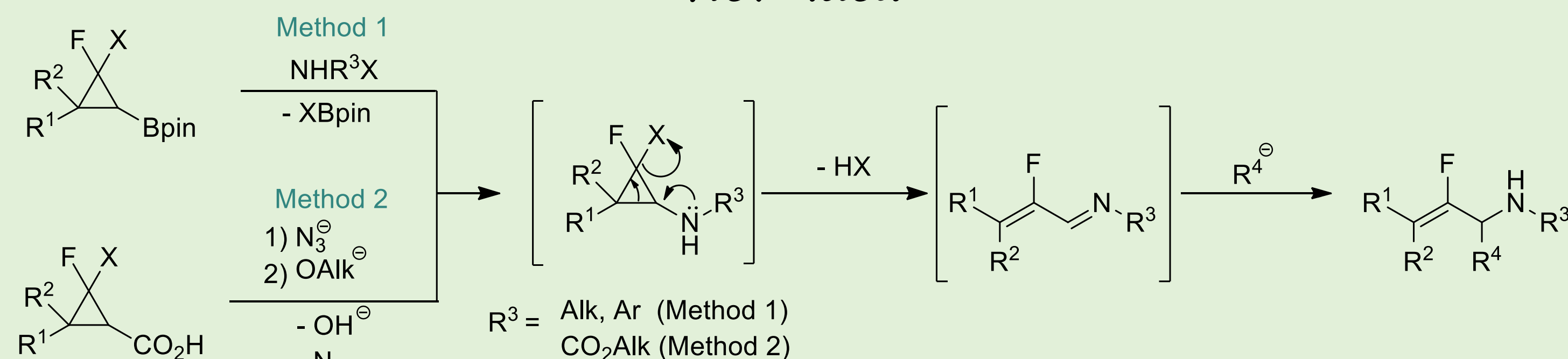


**Comparing to literature:**

- Up to 2 substituents in cyclopropane
- Less steps

M. A. Novikov, Y. A. Ibatov, N. V. Volchkov, M. B. Lipkind, S. E. Semenov, O. M. Nefedov, *J. Fluorine Chem.* **194** (2017) 58–72

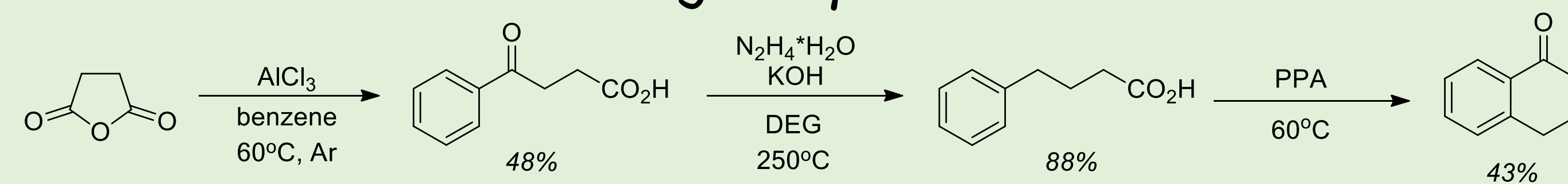
## New idea



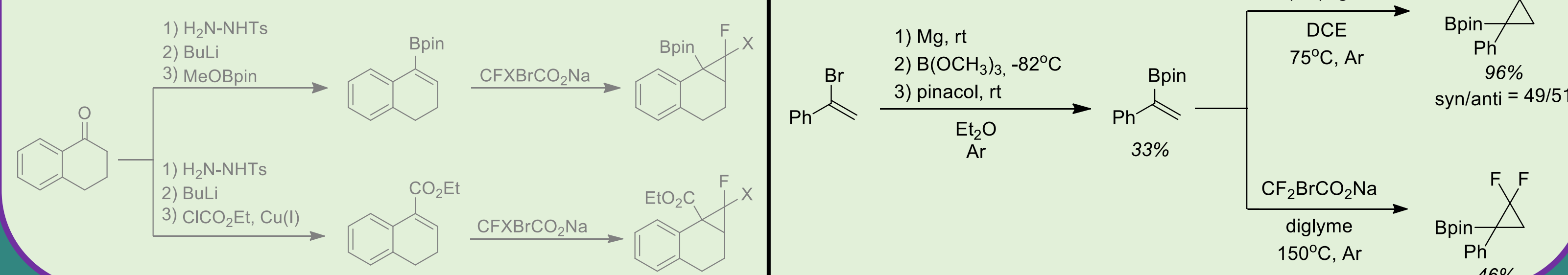
**Advantages:**

- Rearrangement occurs without heating (functional groups tolerance)
- Possibility to synthesize R<sup>4</sup> separately (convergent synthesis)

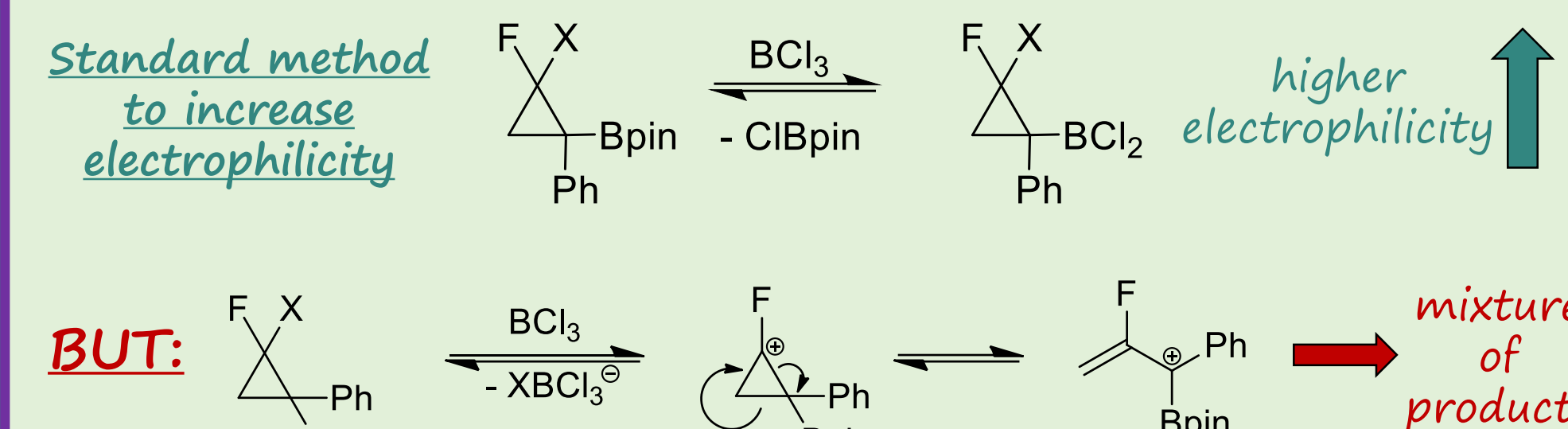
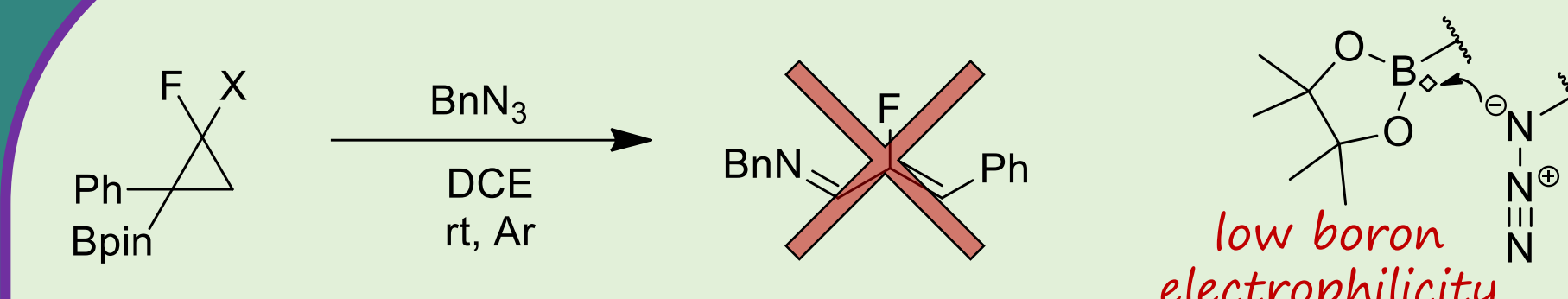
## Starting compounds



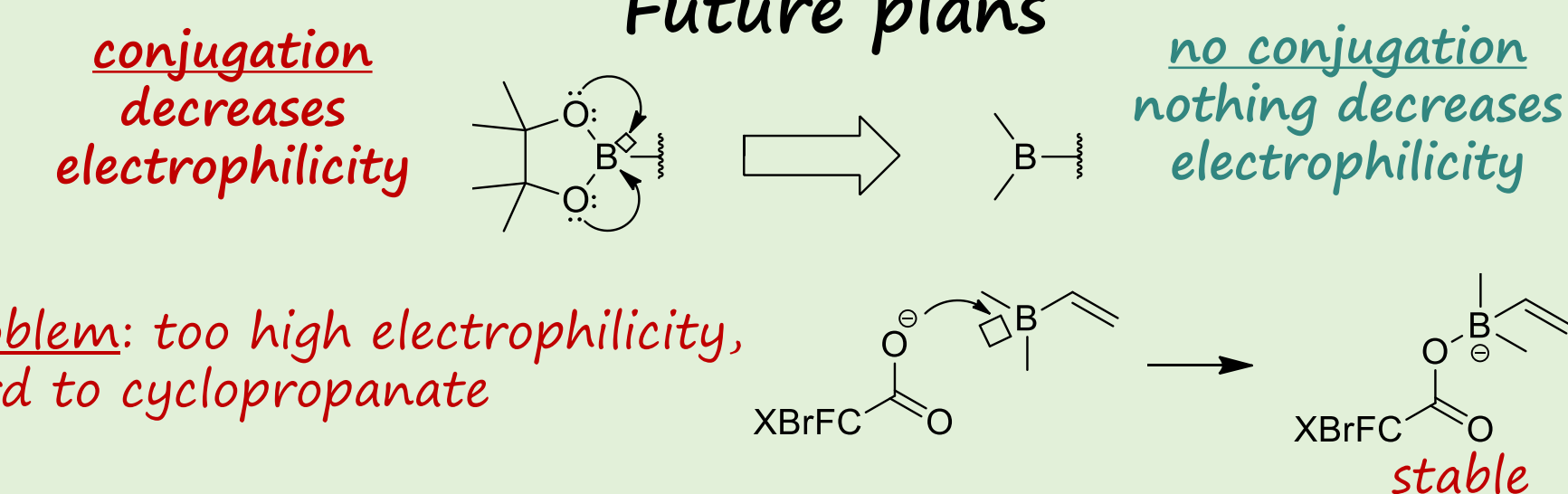
### Future plans



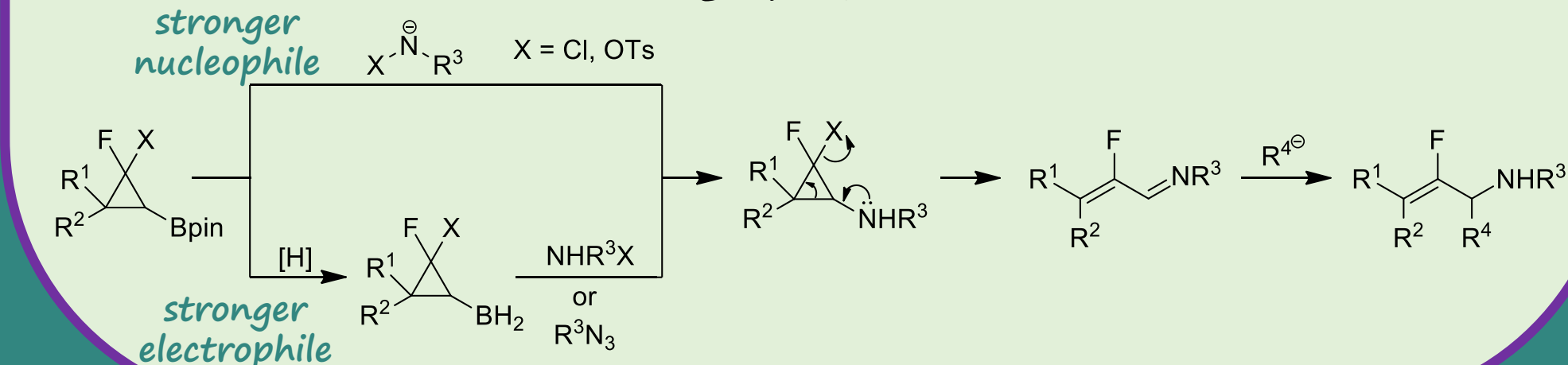
## Method 1



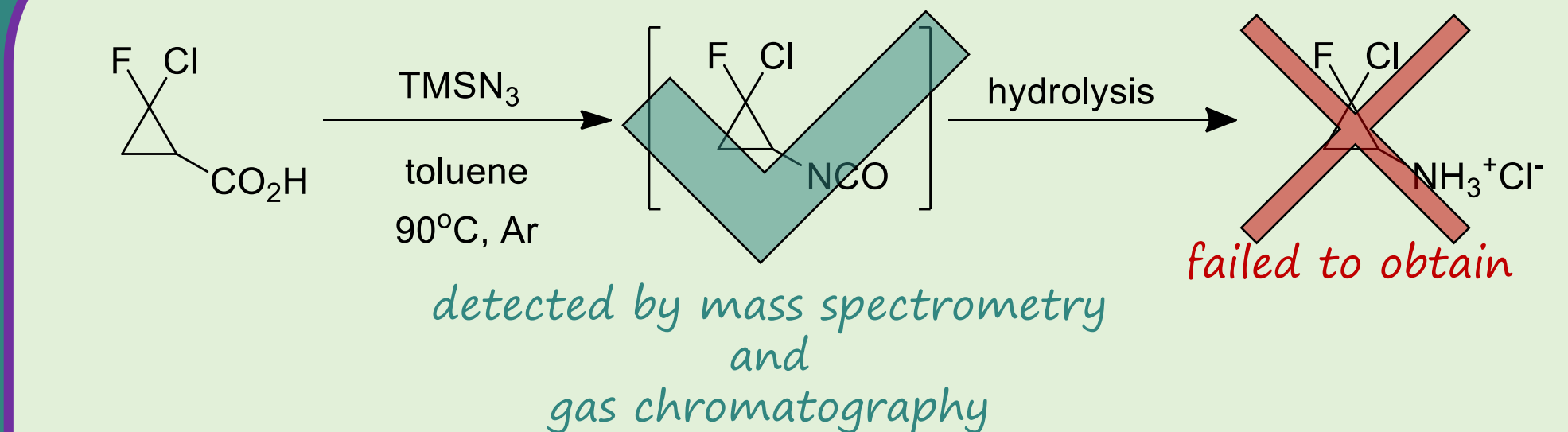
## Future plans



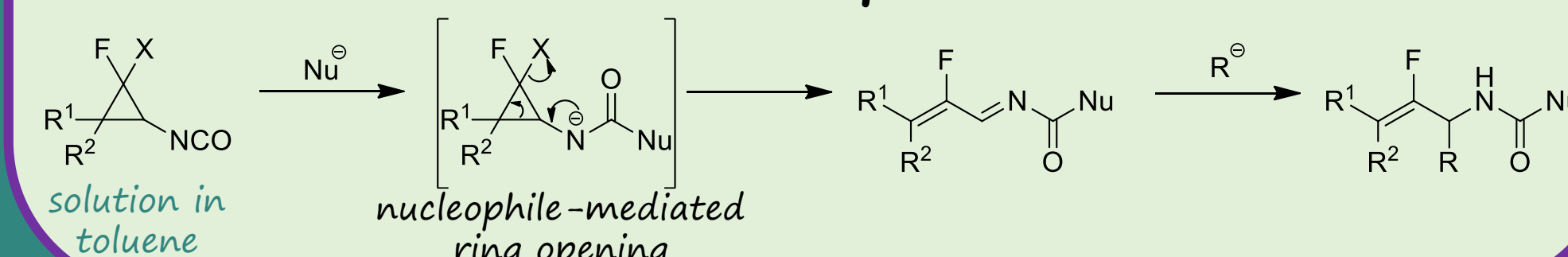
### Solution



## Method 2



### Future plans



## Results

- We suggested new way to the synthesis of fluoroalkene-based peptidomimetics
- We revealed that electrophilicity of Bpin group is not big enough to react with azide
- We detected the formation of isocyanate in the reaction of acid with TMSN<sub>3</sub>

## What we learned

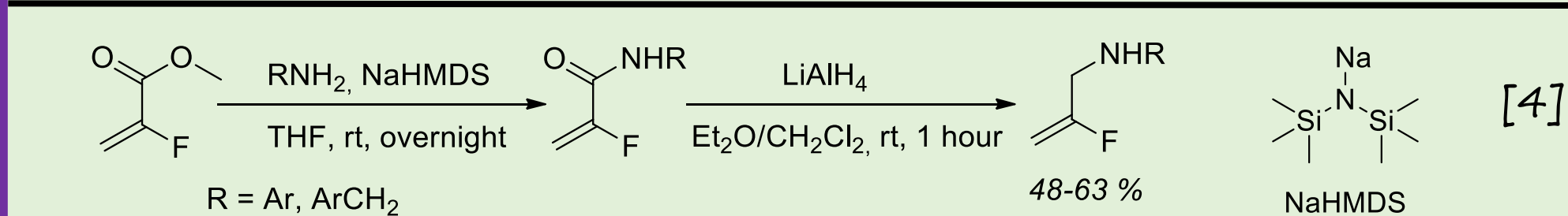
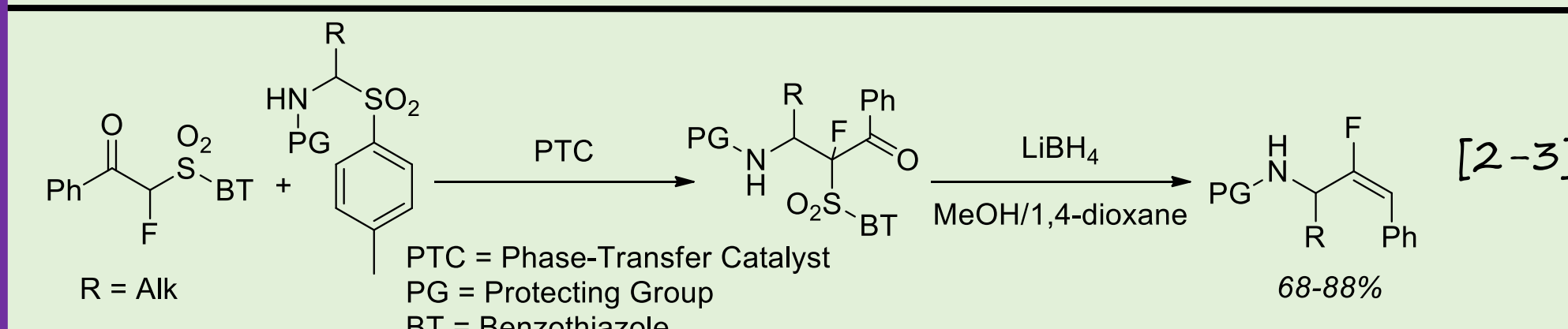
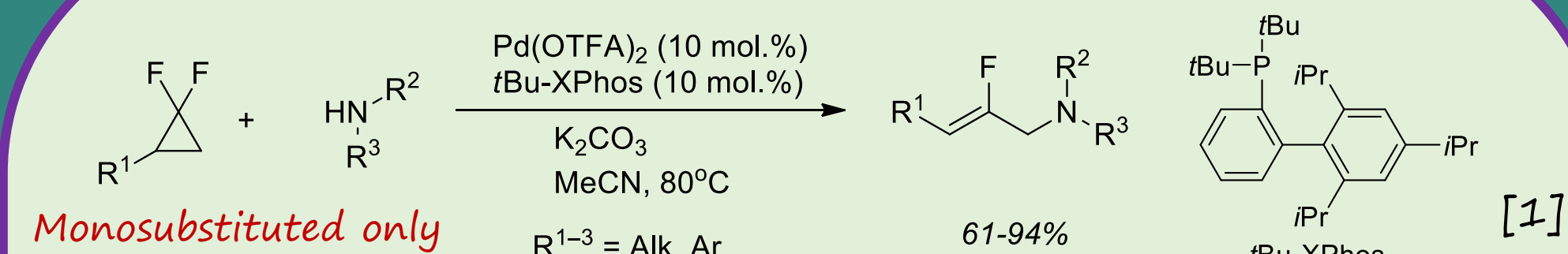
- To use NMR and mass-spectrometry methods to identify compounds and their structure
- To purify obtained products by distillation, column chromatography, extraction and evaporation
- To perform reactions under an inert atmosphere and work with vacuum

## Acknowledgements

- Prof. S. E. Semenov – for giving us an opportunity to engage in the scientific work.
- Dr. M. A. Novikov – for his endless patience and valuable advice.
- Dr. R. A. Novikov – for registering NMR spectra.
- A. Y. Bobrova, A. K. Zaytsev – for their never-ending hope and optimism.



## Literature methods



### Disadvantages:

- High price
- Low substrate scope
- Inability to make cyclic structure

### Bibliography:

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