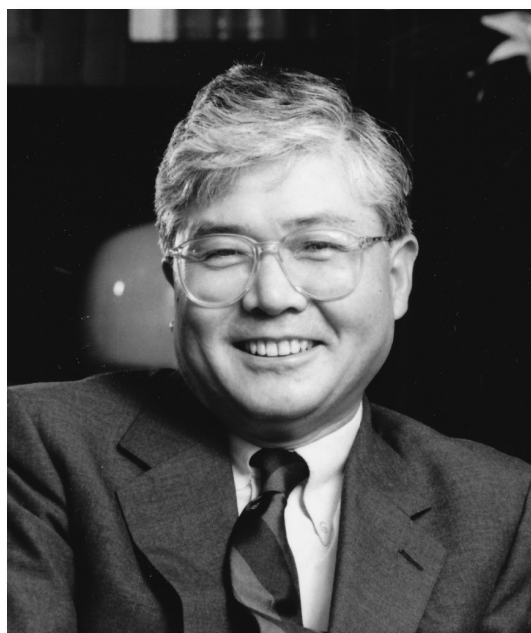


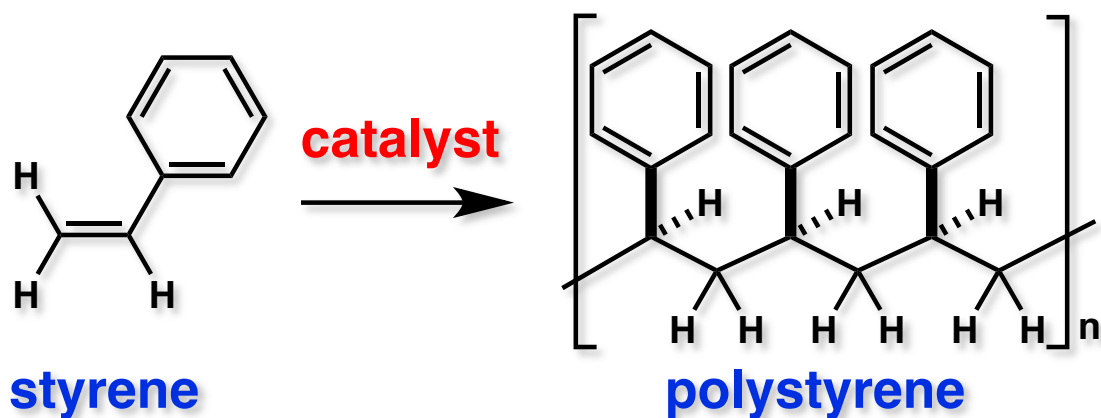
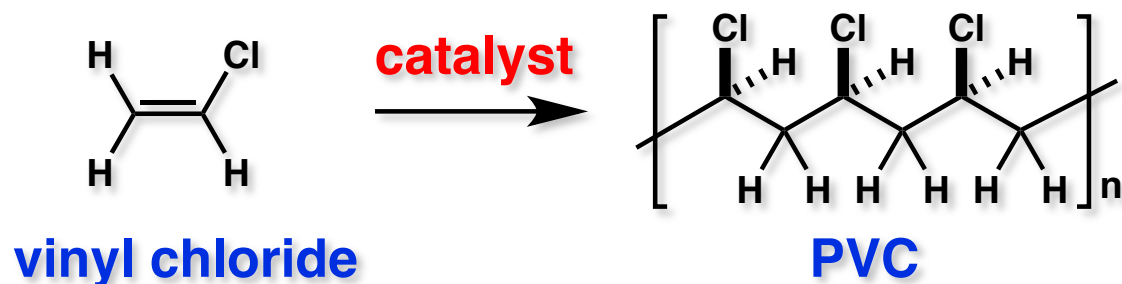
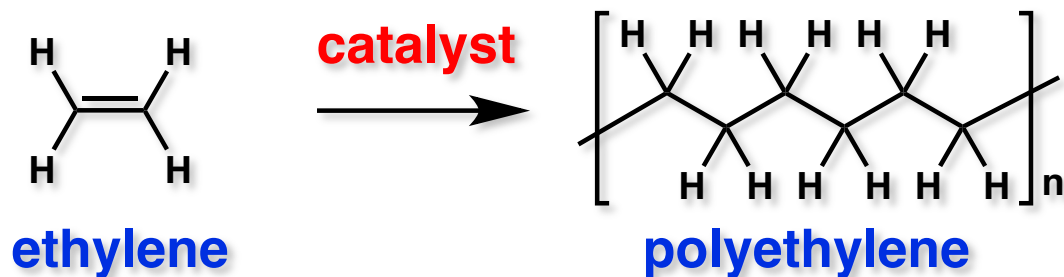
*Symposium Honoring Professor Yoshito Kishi*  
*August 23, 2025*

# Professor Kishi and Me



**Tohru Fukuyama**  
Professor Emeritus  
University of Tokyo

# When I was a senior-high student:



**Polymer  
Chemistry**

?!

1966



# Learned the Pheromone Chemistry

I want to be  
your student!



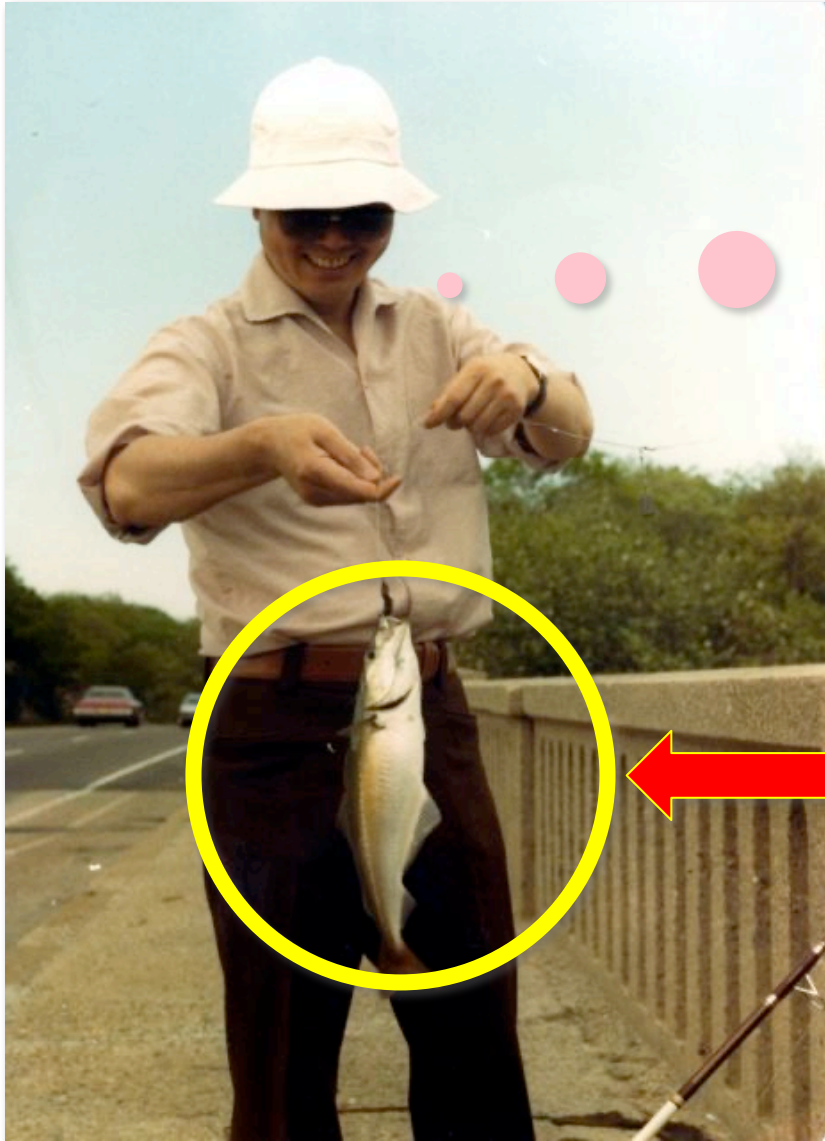
**Prof. Katsura Munakata**  
**Pesticide Chemistry**  
**Nagoya University**



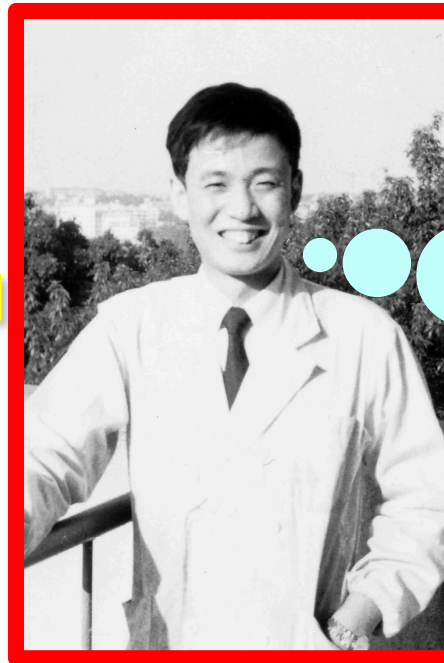
**Immediately decided  
to go to  
Nagoya University**

**1966**

# Biggest Turning Point in My Life!



**If you join my  
group, your future  
will be rosy...**

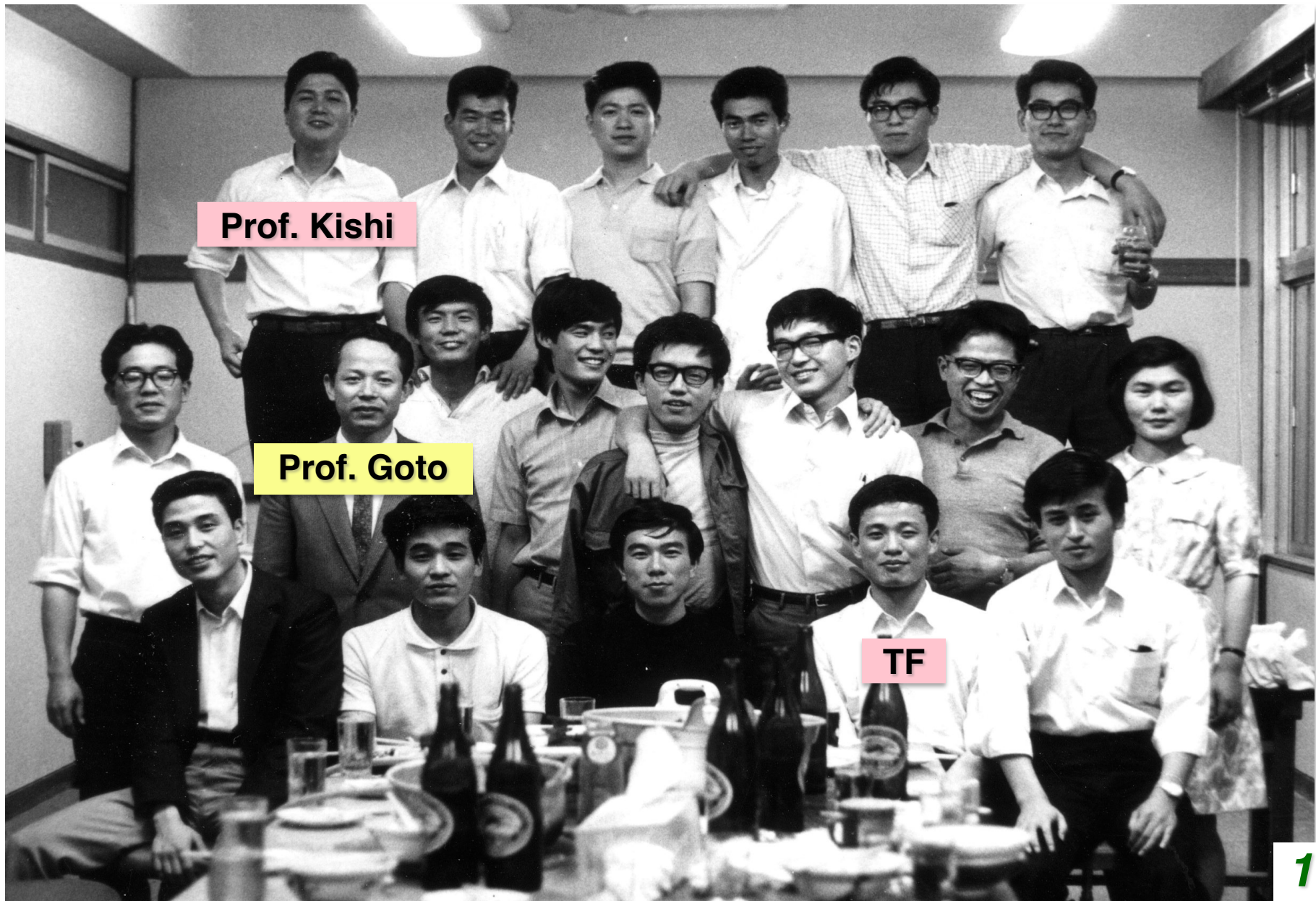


**I've never  
seen such an  
overconfident  
person!**

**1969**



# Welcome Party in 1970



1970

# What Dr. Kishi told me when I was an undergrad student:



Don't call me,  
"Kishi-sensei."

OK, I will call you,  
"Kishi-san."



1970

# What Dr. Kishi told me when I was an undergrad student:



**Don't you ever ask me  
such an easy question!!**

**(In my heart)  
I will never ask you  
a question again!**



**1970**

# What Dr. Kishi told me when I was an undergrad student:



Why don't you do this reaction?

I know a similar reaction in literature, but it didn't give a good result.

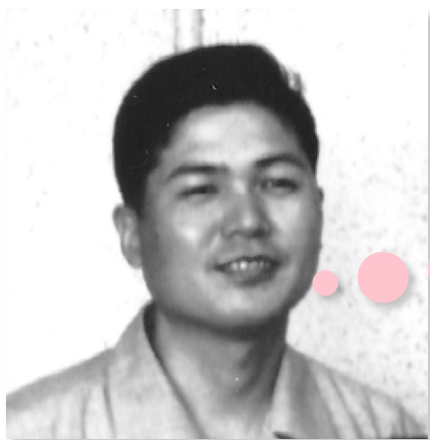


How do you know the results without doing it by yourself?!

1970



# What Dr. Kishi told me when I was an undergrad student:



It took 10 years before I became truly interested in organic chemistry.

**(In my heart)**

No wonder why I am not very much interested in it yet.



1970

# Tamed Like a Chimpanzee?



**At lunch time, Dr. Kishi often gave me a banana.**

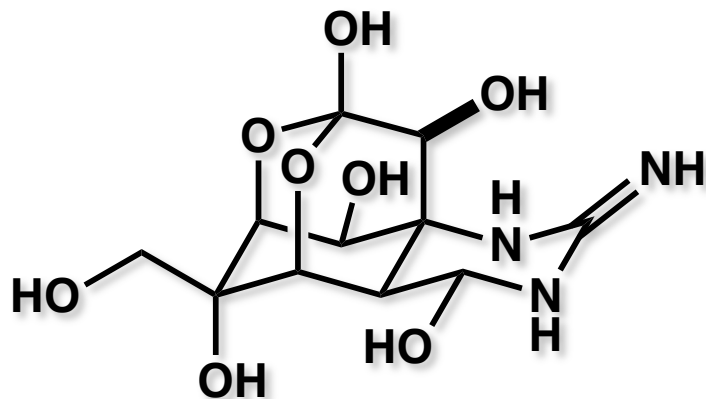
**I must  
obey him...**



**1970**



# Joined the Tetrodotoxin Team



**Tetrodotoxin**

**Potent Neurotoxin  
(Inhibitor of Na<sup>+</sup> Channel)**

**1970**

# It took 70 minutes one way for commuting:



Slept on a floor of  
a storage room

- Slept in a sleeping bag on Mon, Wed, and Fri.
- After sleeping for 4-5 hours, washed my face and resumed experiments w/o eating breakfast.
- Worked until 22:10 on Tue, Thu, and Sat, to catch the last train at Nagoya Station.

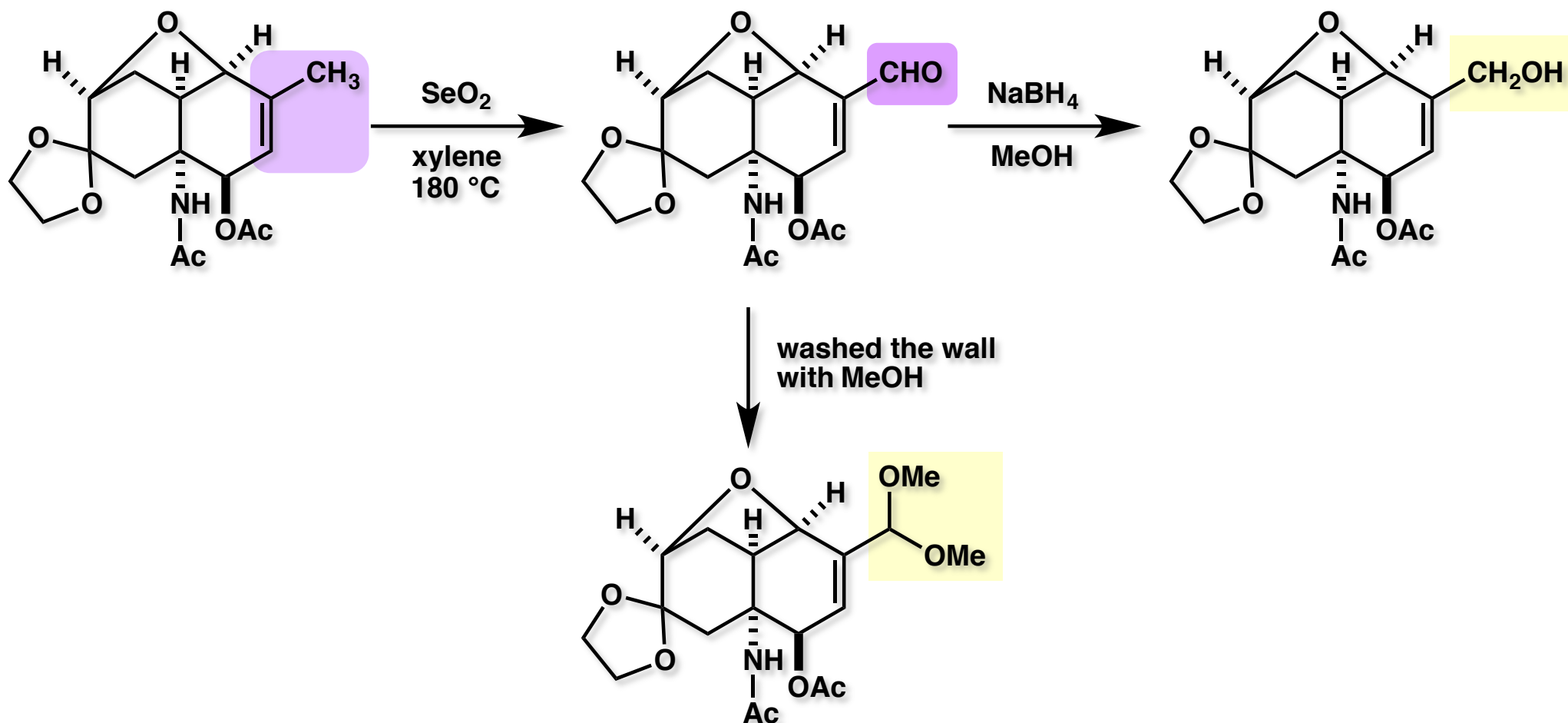
# Dr. Kishi's Working Hours: 9 to 24

- Before going home, he asked me to do this and that.
- He never failed to say, “Don’t push yourself too hard.”
- How many times did I see **sunrise** by doing what he asked me to do?



1970-2

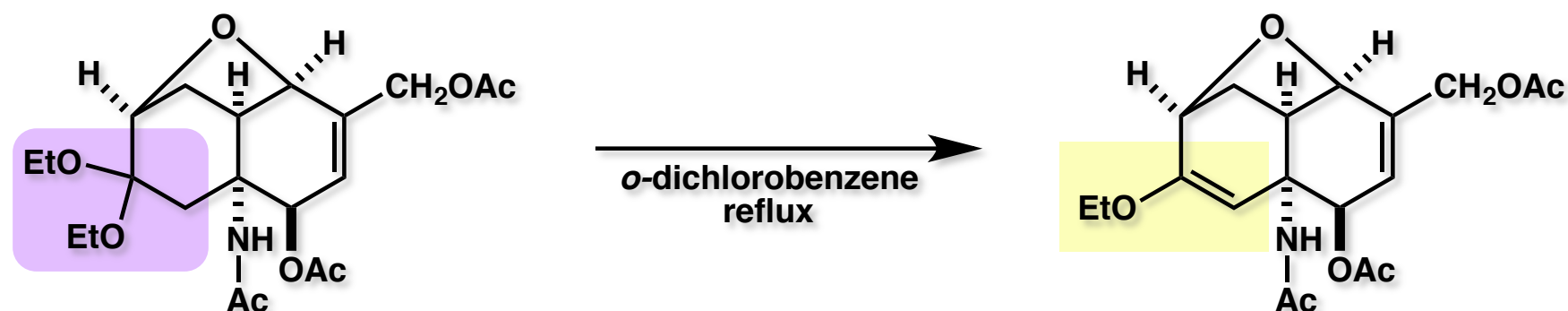
# Failure during TTX Synthesis - 1



**Reduction of the aldehyde did not proceed at all!**

**1971**

# Failure during TTX Synthesis - 2



**Elimination of EtOH did not occur at all on large scale!**

**I passed the *o*-dichlorobenzene through an active alumina column to remove water.**

**1971**

# Another Story during TTX Synthesis

While I don't remember what reaction I did, I told Dr. Kishi that the reaction did not work.



He got angry and said, "The reaction should have worked!"

I was wondering why he got so angry.

Years later, he told me that he did the experiment secretly on Sunday before asking me to do the same.

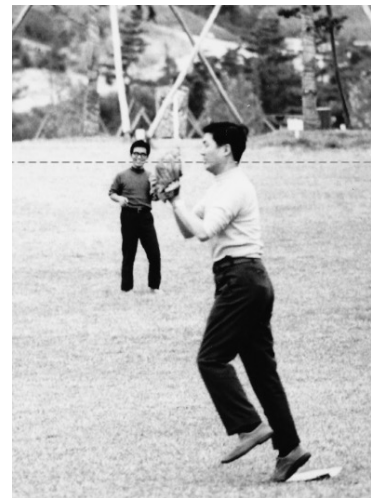
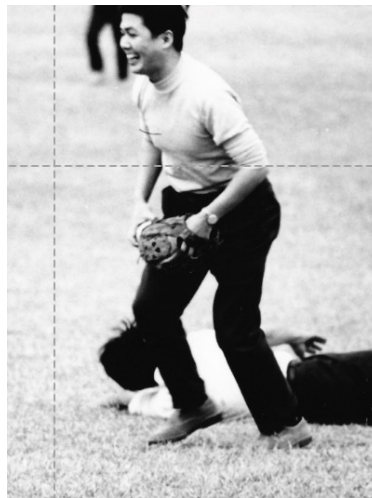
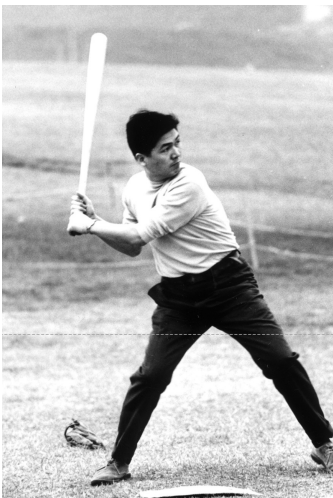


1971



# Dr. Kishi and Softball

- Although he was a very good baseball player, he was too lazy to run and used a “DR (**designated runner**).”
- He used to say, “A poor baseball player does not make a good chemist.”



1971

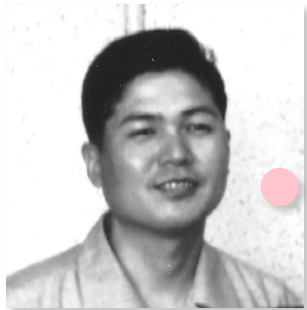
**Although it was such a harsh life,  
I never felt like I was forced to work.  
I was filled with the excitement of  
doing cutting-edge research.**



**1972**

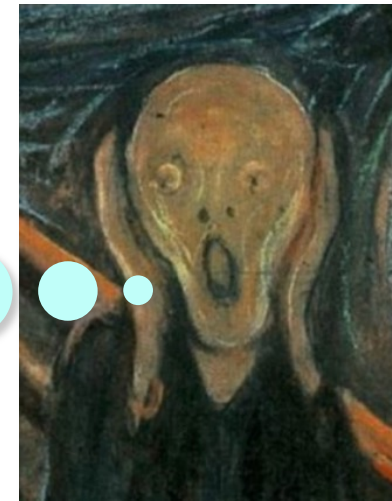


# Totally Unexpected News in 1972



Fukuyama-kun,  
starting this summer I  
will be a visiting  
professor at Harvard  
for a year. Would you  
like to come with me?

This means "***I must  
go with him.***" I have  
never left my home  
in my life...



1972

# My days were numbered: Plane crash...



@Nagoya Station

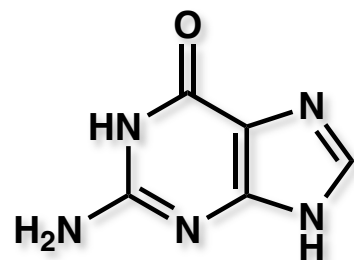
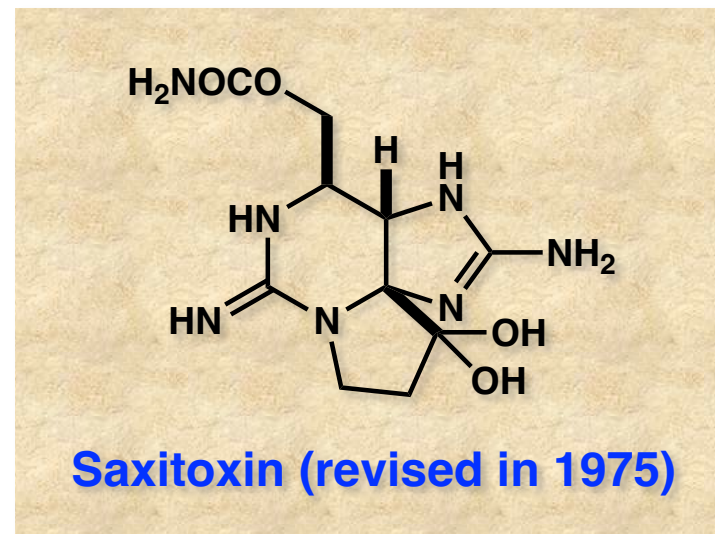
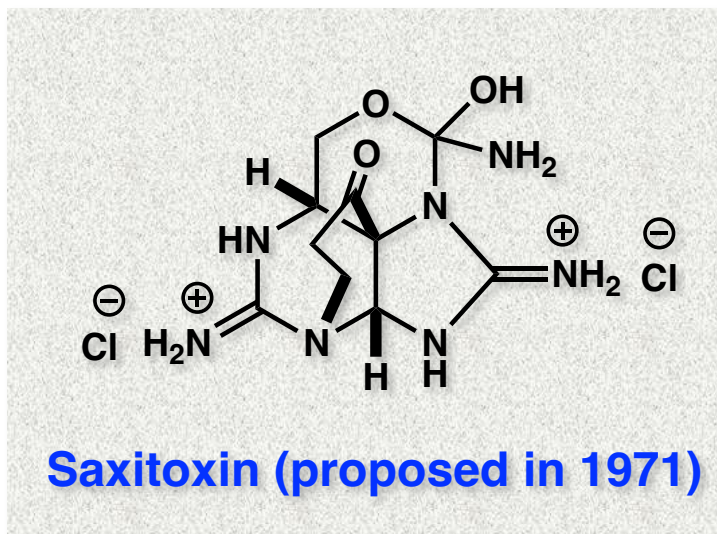
**Years later Dr. Kishi told me that he took me to Harvard so that I could receive a Ph.D. degree from Prof. Woodward.**



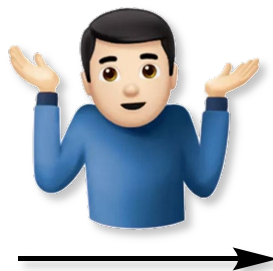
Prof. Woodward

**1972**

# Dr. Kishi: Let's start total synthesis of saxitoxin!



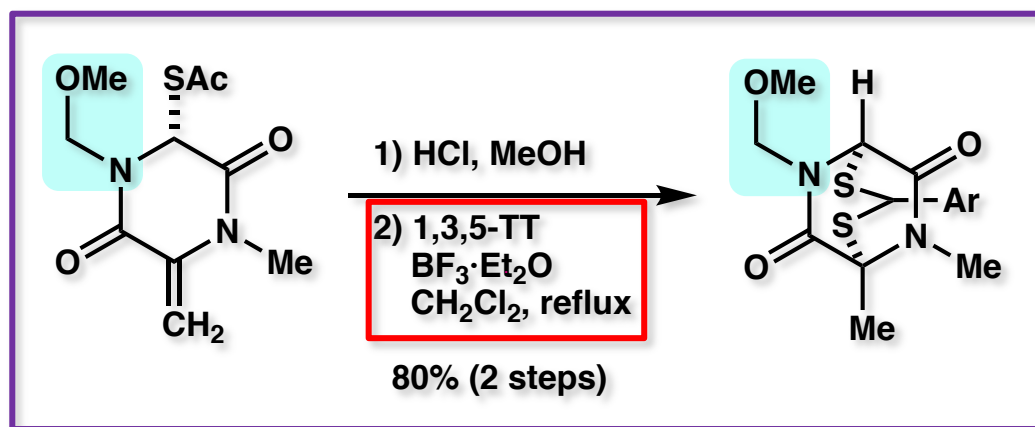
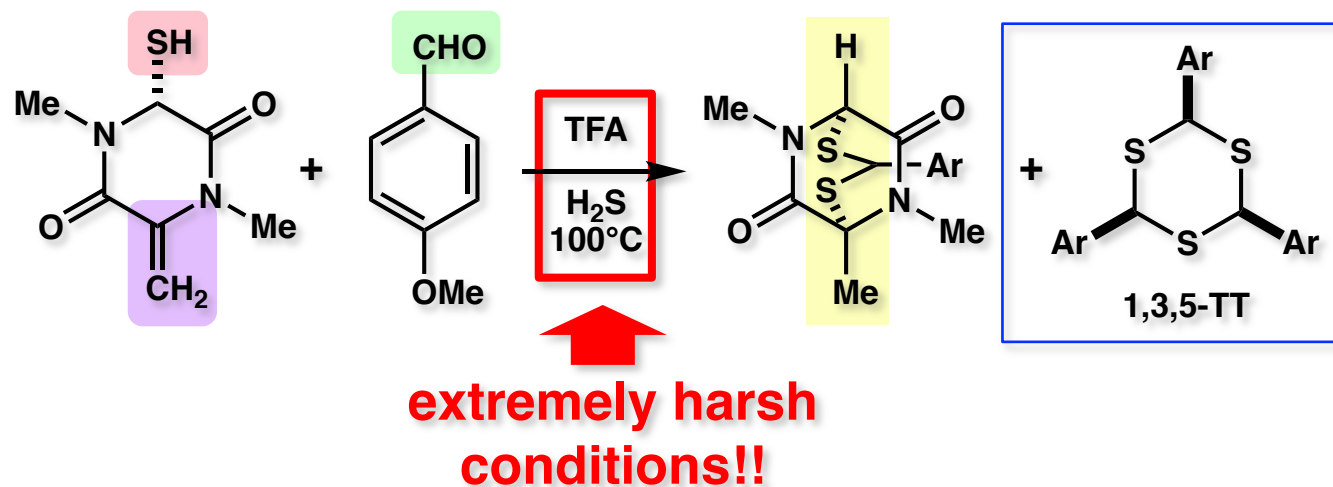
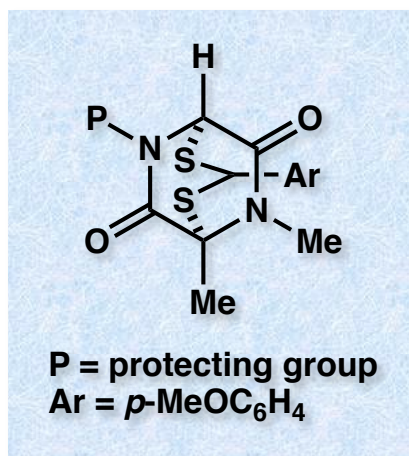
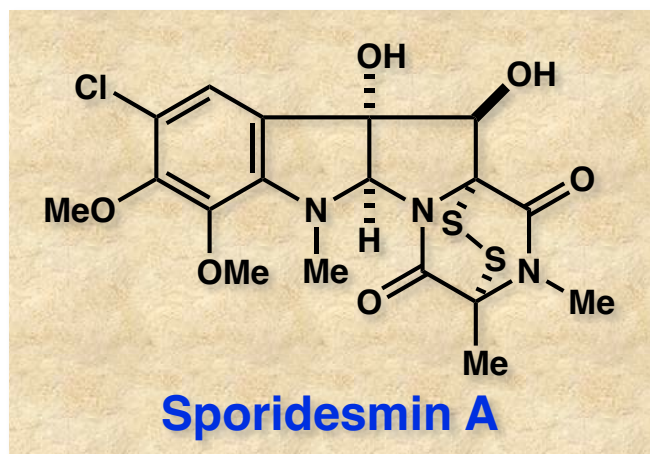
almost a rock  
(0.1 mg/ml DMSO) 😊💧



Dr. Kishi's Proposed Structure  
(I don't remember...)

1972

# Escape from Hell: Nakatsuka-san joined

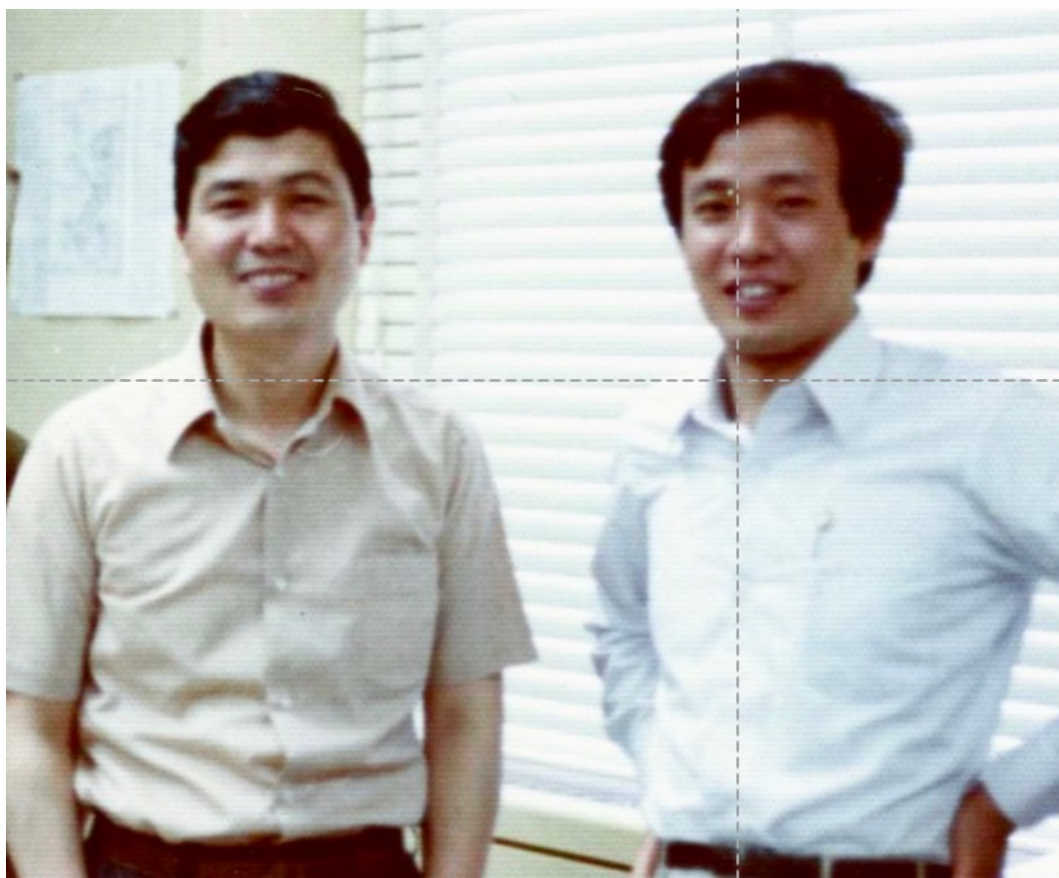


*J. Am. Chem. Soc.*, **95**, 6493 (1973)

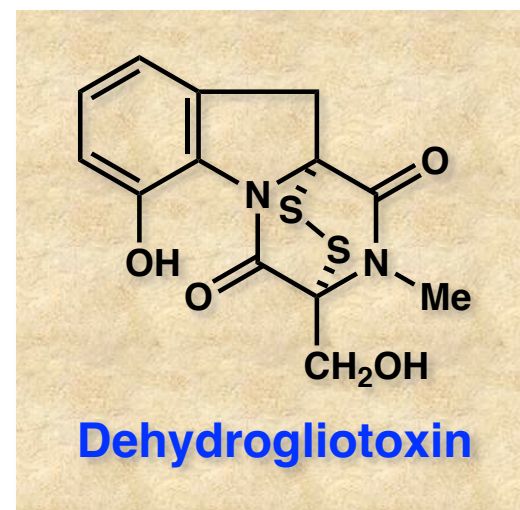
**1972**



# Returned to Japan for one year Dr. Kishi was to become a professor at Harvard in 1974



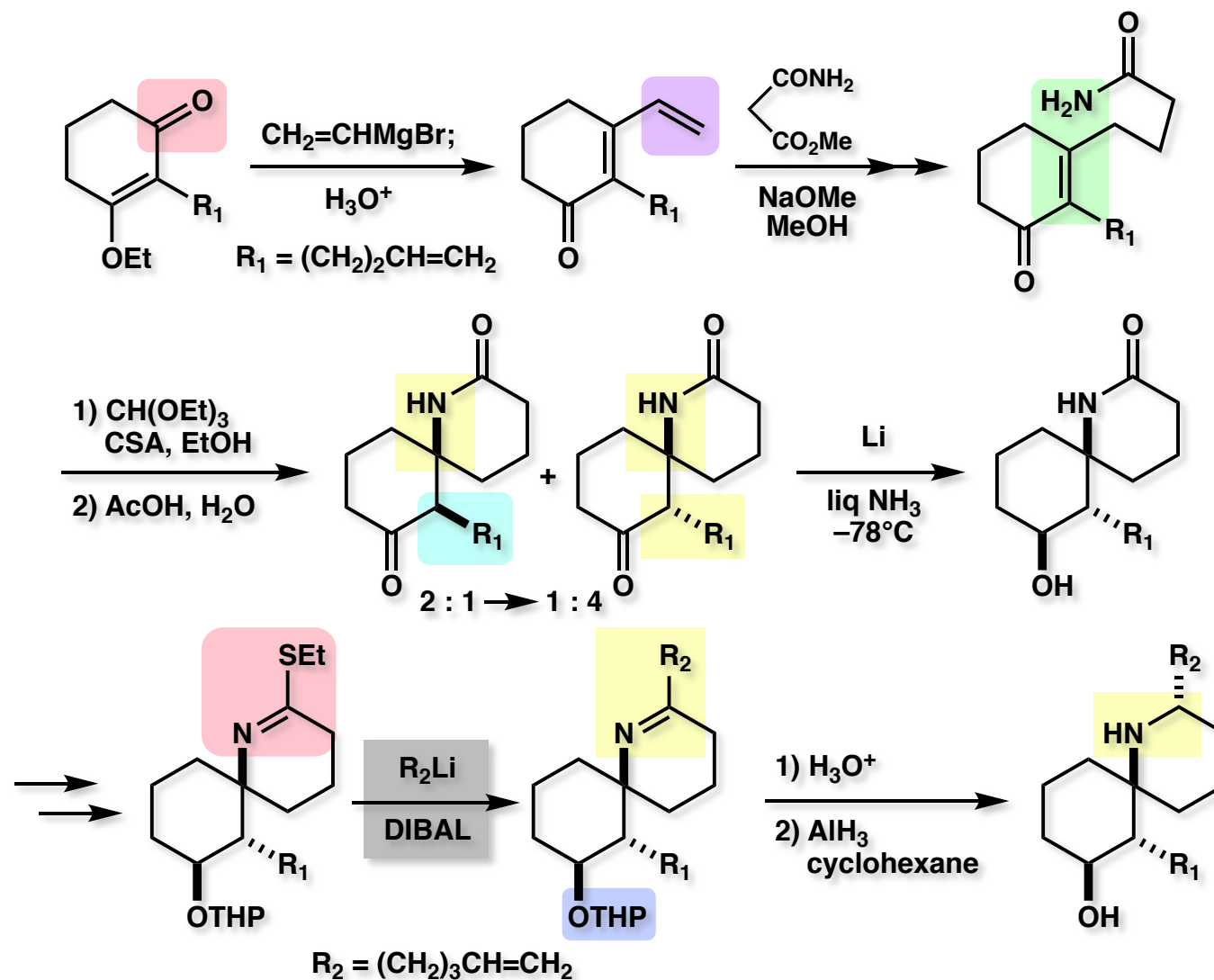
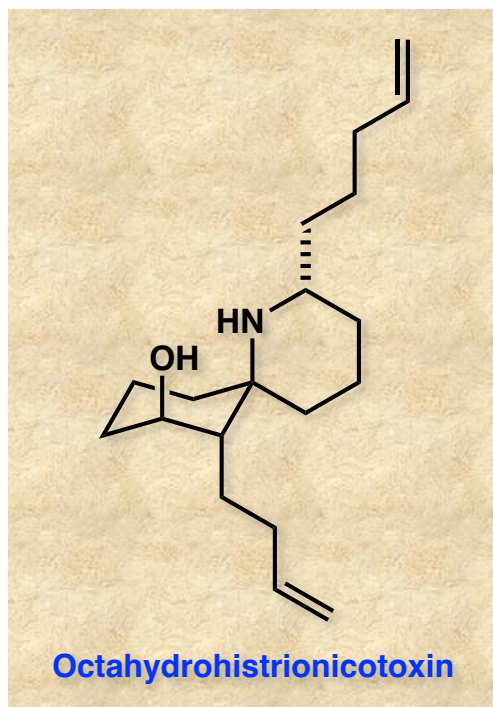
@Conant Lab



*J. Am. Chem. Soc.*, **95**, 6492 (1973)

**1973**

# Octahydrohistrionicotoxin

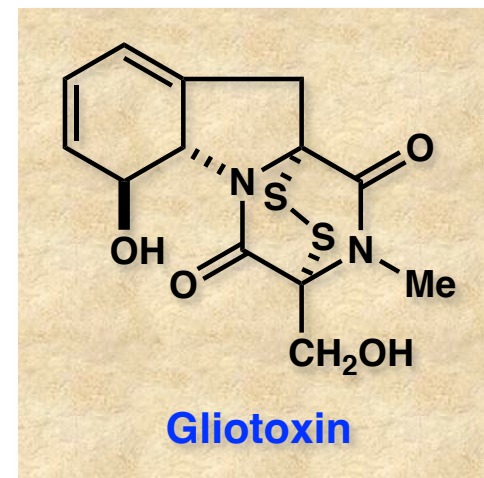


*J. Org. Chem.*, **40**, 2011 (1975)

1974

# You can now start your Ph.D. work.

1. "A Stereoselective Decarboxylation of 1,6-Dimethyl-3-(3'-indolyl)-methyl-3-carboxy-2,5-piperazinedione," Y. Kishi, S. Nakatsuka, and T. Fukuyama, *Tetrahedron Lett.*, **12**, 4657 (1971).<sup>Ⓢ</sup>
2. "New Epoxidation with *m*-Chloroperbenzoic Acid at Elevated Temperatures," Y. Kishi, M. Aratani, H. Tanino, T. Fukuyama, T. Goto, S. Inoue, S. Sugiura, and H. Kakoi, *J. Chem. Soc., Chem. Commun.*, 64 (1972).<sup>Ⓢ</sup>
3. "Synthetic Studies on Tetrodotoxin and Related Compounds. III. A Stereospecific Synthesis of an Equivalent of Acetylated Tetrodamine," Y. Kishi, M. Aratani, T. Fukuyama, F. Nakatsubo, T. Goto, S. Inoue, H. Tanino, S. Sugiura, and H. Kakoi, *J. Am. Chem. Soc.*, **94**, 9217 (1972).<sup>Ⓢ</sup>
4. "Synthetic Studies on Tetrodotoxin and Related Compounds. IV. Stereospecific Total Synthesis of *dl*-Tetrodotoxin," Y. Kishi, T. Fukuyama, M. Aratani, F. Nakatsubo, T. Goto, S. Inoue, H. Tanino, S. Sugiura, and H. Kakoi, *J. Am. Chem. Soc.*, **94**, 9219 (1972).<sup>Ⓢ</sup>
5. "A New Method for the Synthesis of Epidithiodiketopiperazines," Y. Kishi, T. Fukuyama, and S. Nakatsuka, *J. Am. Chem. Soc.*, **95**, 6490 (1973).<sup>Ⓢ</sup>
6. "A Total Synthesis of Dehydrogliotoxin," Y. Kishi, T. Fukuyama, and S. Nakatsuka, *J. Am. Chem. Soc.*, **95**, 6492 (1973).<sup>Ⓢ</sup>
7. "A Total Synthesis of *dl*-Sporidesmin A," Y. Kishi, S. Nakatsuka, T. Fukuyama, and M. Havel, *J. Am. Chem. Soc.*, **95**, 6493 (1973).<sup>Ⓢ</sup>
8. "A Total Synthesis of *dl*-Sporidesmin B," S. Nakatsuka, T. Fukuyama, and Y. Kishi, *Tetrahedron Lett.*, **15**, 1549 (1974).<sup>Ⓢ</sup>
9. "X-Ray Structure Determination of 3,6-*p*-Anisylidenedithio-3-ethyl-*N,N'*-dimethylpiperazine-2,5-dione," K. Sasaki, T. Fukuyama, S. Nakatsuka, and Y. Kishi, *J. Chem. Soc., Chem. Commun.*, 542 (1975).<sup>Ⓢ</sup>
10. "Synthetic Studies on Histrionicotoxins. I. A Stereocontrolled Synthesis of *dl*-Perhydrohistrionicotoxin," M. Aratani, L. V. Dunkerton, T. Fukuyama, Y. Kishi, H. Kakoi, S. Sugiura, and S. Inoue, *J. Org. Chem.*, **40**, 2009 (1975).<sup>Ⓢ</sup>
11. "Synthetic Studies on Histrionicotoxins. II. A Practical Synthetic Route to *dl*-Octahydrohistrionicotoxin," T. Fukuyama, L. V. Dunkerton, M. Aratani, and Y. Kishi, *J. Org. Chem.*, **40**, 2011 (1975).<sup>Ⓢ</sup>
12. "A New Synthesis of Epidithiapiperazinedione," T. Fukuyama, S. Nakatsuka, and Y. Kishi, *Tetrahedron Lett.*, **17**, 3393 (1976).<sup>Ⓢ</sup>



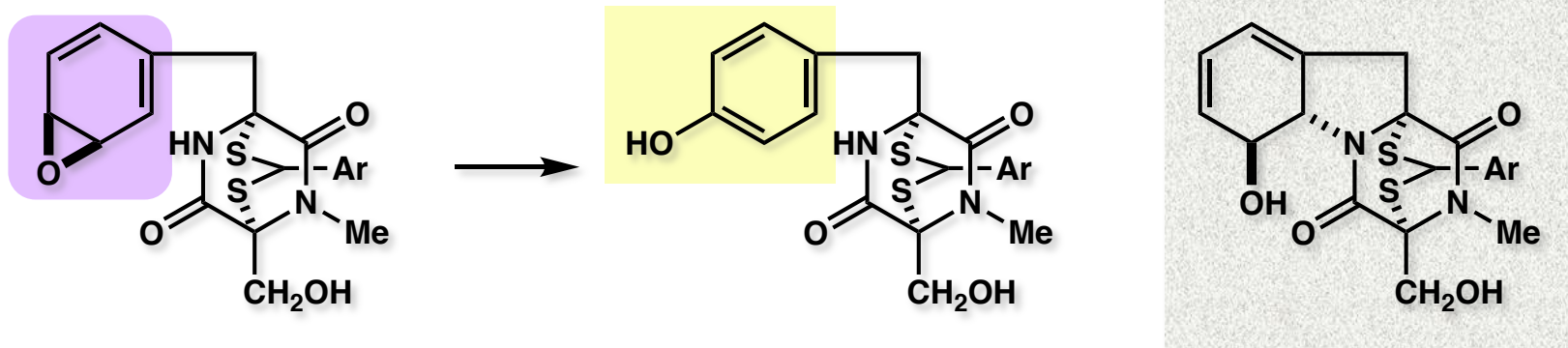
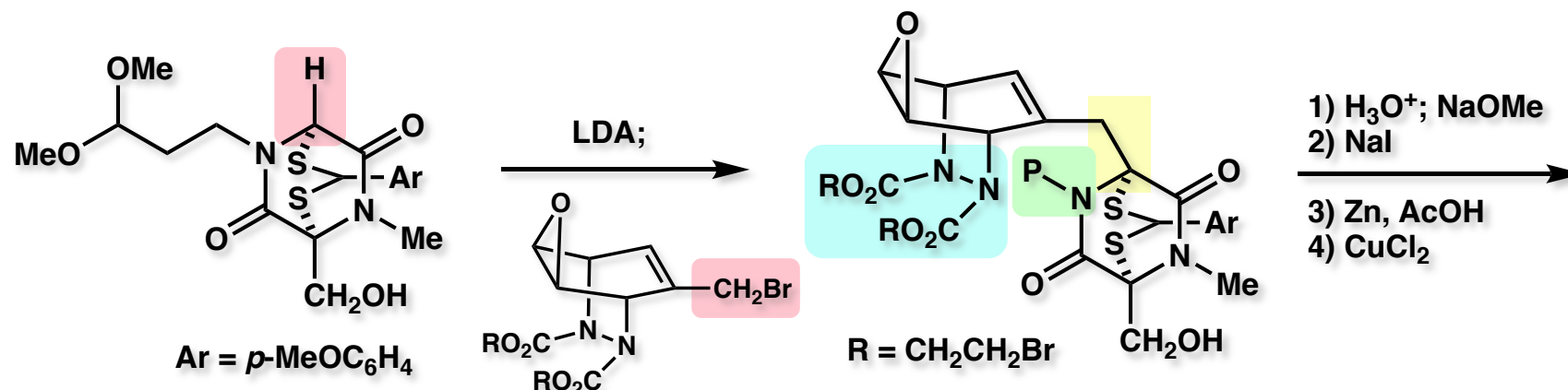
Since you'll be  
our first Ph.D.,  
you must  
complete the  
total synthesis of  
gliotoxin.



**1975**

# Synthetic Studies on Gliotoxin

## - First One Year -



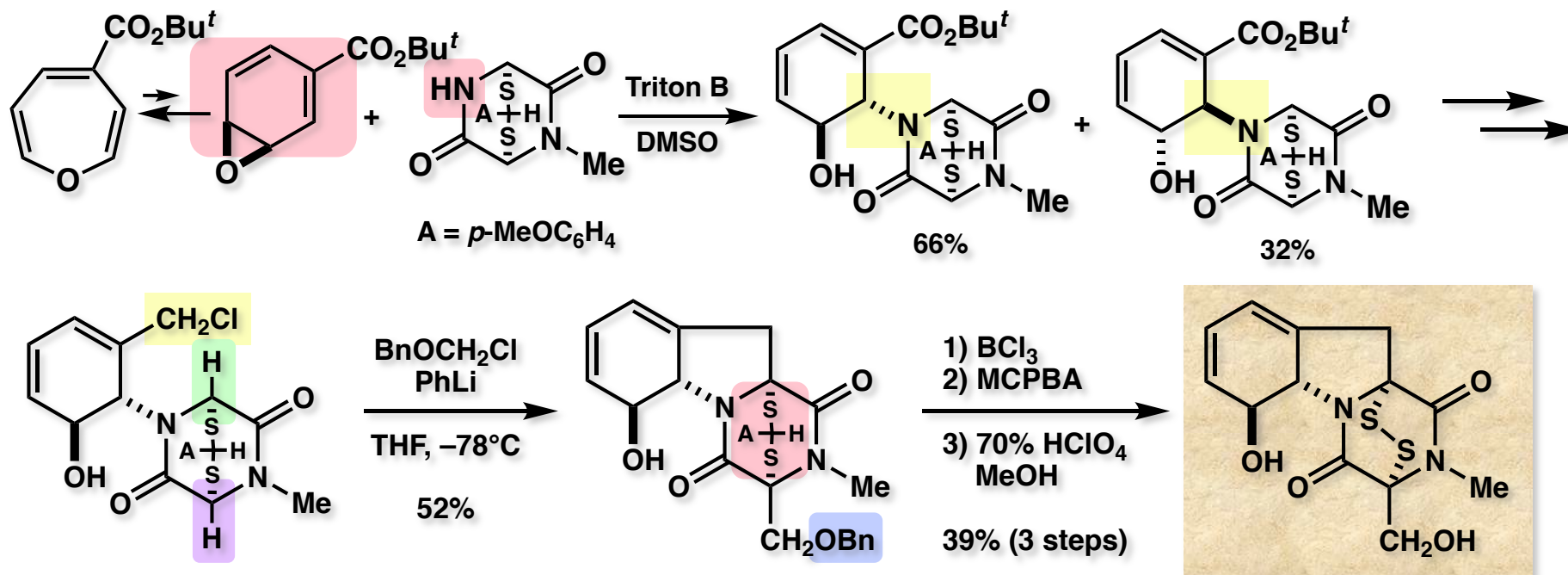
NIH Shift

1975-6

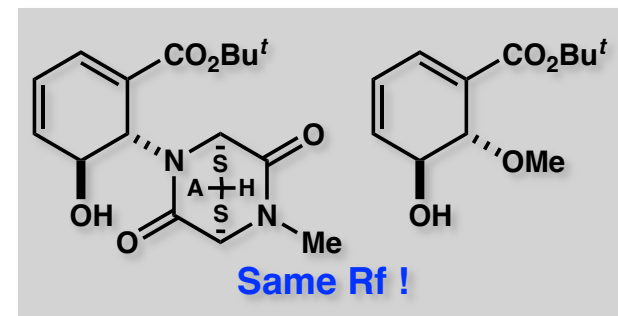
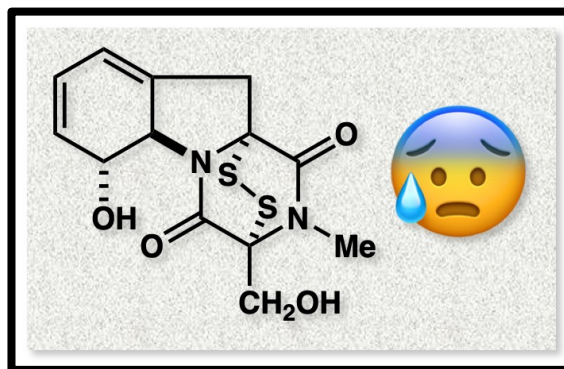


# Synthetic Studies on Gliotoxin

## - Last Six Months -



Did you  
scrutinize  
the reaction  
mixture??



*J. Am. Chem. Soc.*, **98**, 6723 (1976)

1976

# Two-Hour Ph.D. Oral Exam 💧💧



**Prof. Kishi**



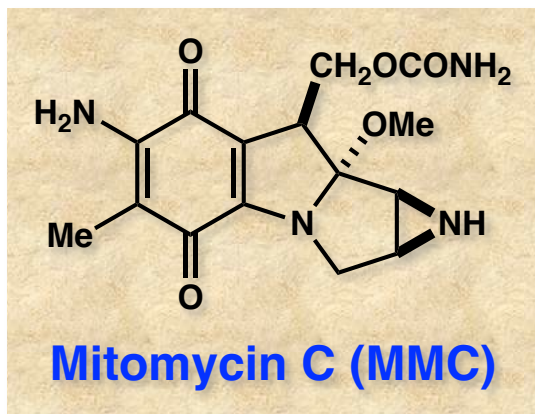
**Prof. Woodward**



**Prof. Corey**

**January 20, 1977**

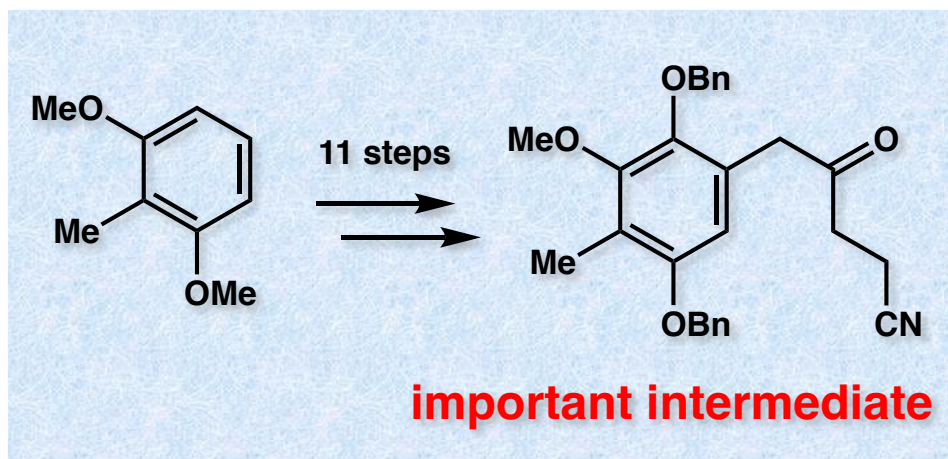
# One day after the Ph.D. oral...



Dr. Kishi: The total synthesis of MMC is not progressing well, so I want you to finish it. Just fill this bottle with the important intermediate and then return to Japan for your wedding. (Three postdocs were working very hard on it.)



YK: 20% Empty  
TF: 80% Full



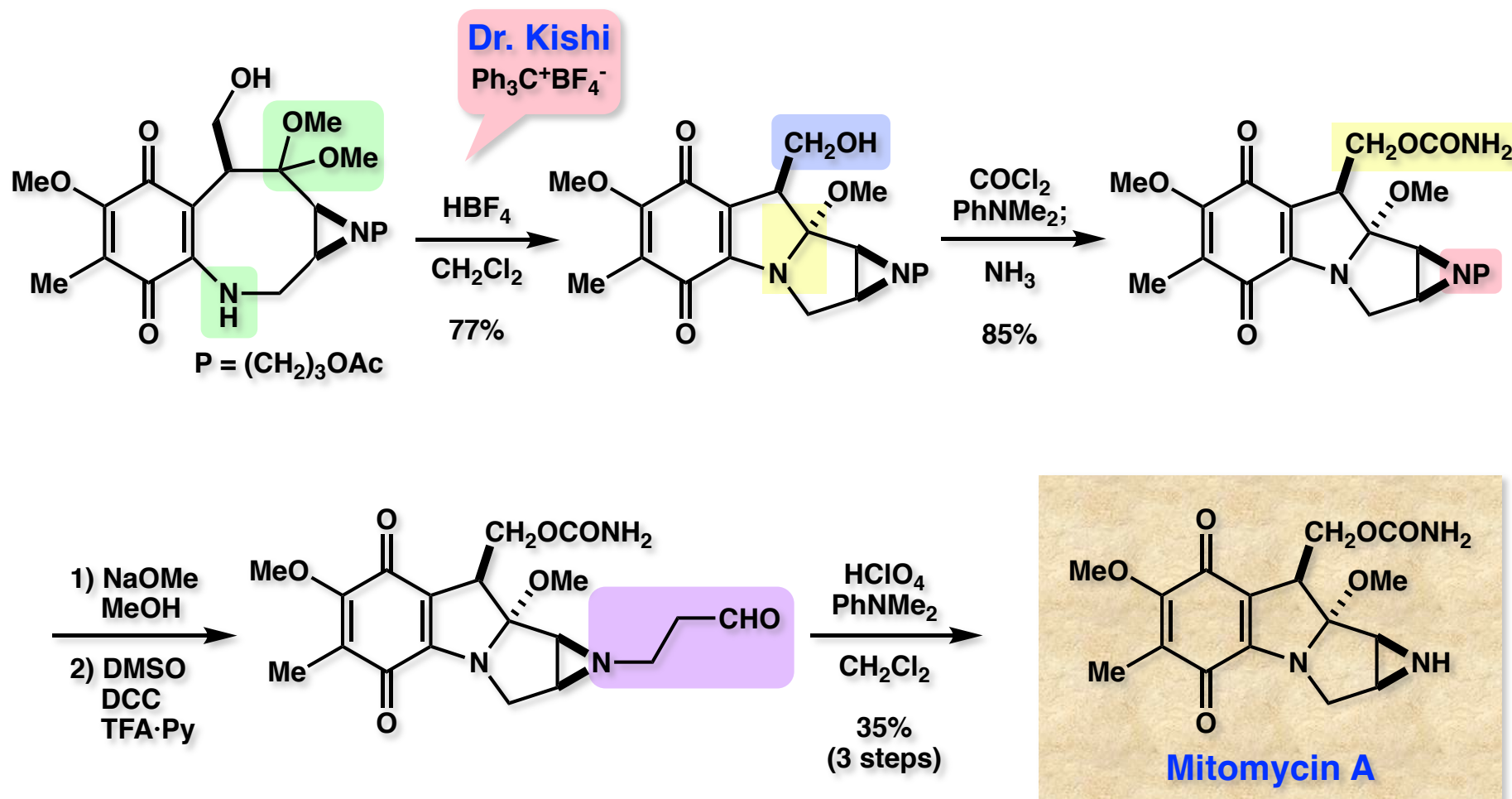
I worked like hell for three weeks without sleeping too much...



Yuri

1977

# The Last Stage of MMC Synthesis

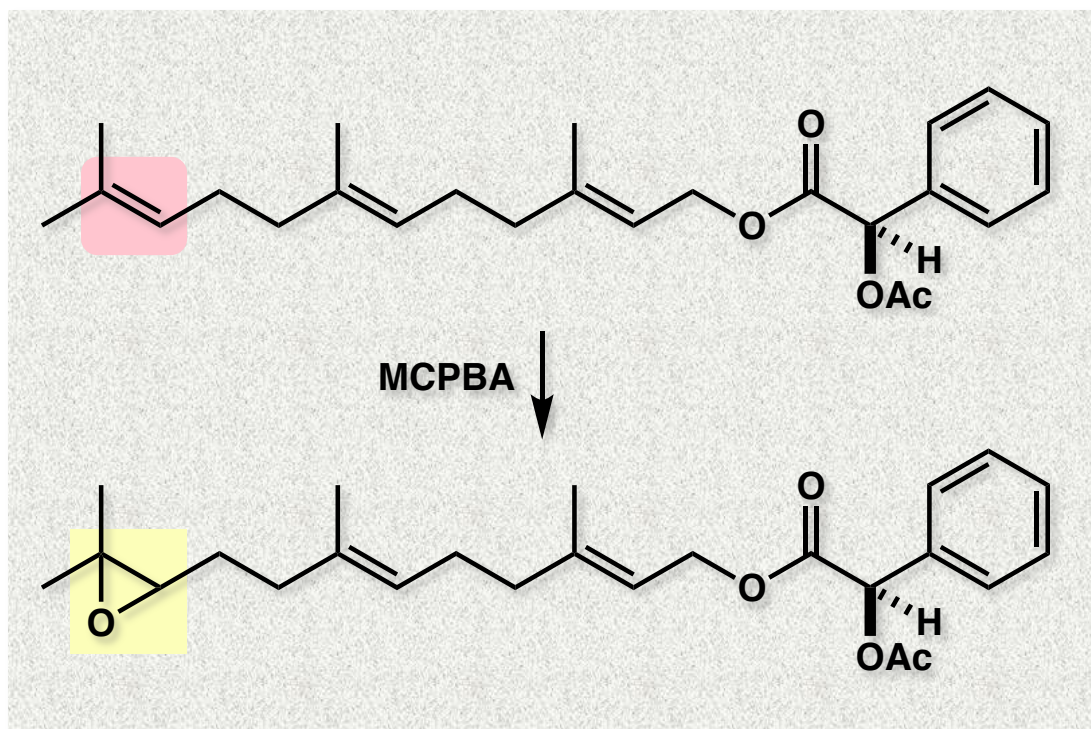


*J. Am. Chem. Soc.*, **99**, 8115 (1977)  
*Tetrahedron Lett.*, **18**, 4295 (1977)

1977

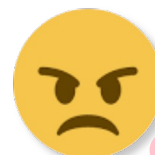


# YK: I want you to work on a secret project.



TF

Almost no  
asymmetric  
induction!  
I would like to  
give up on this  
project.

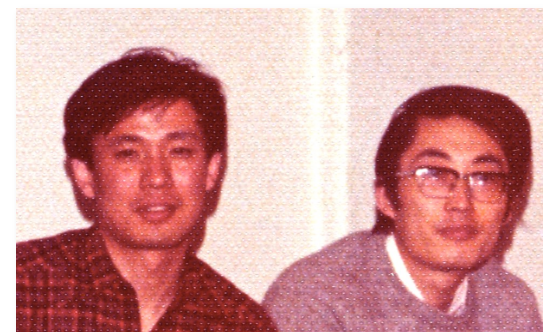
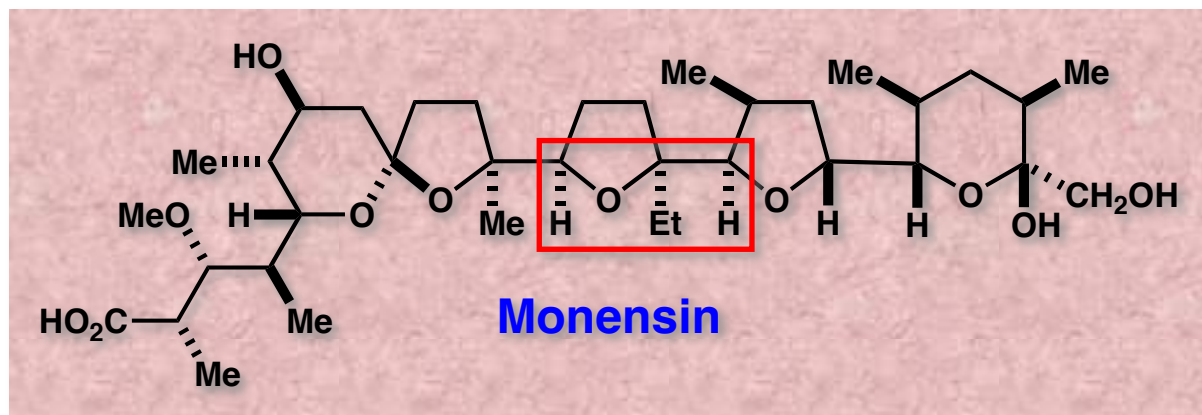
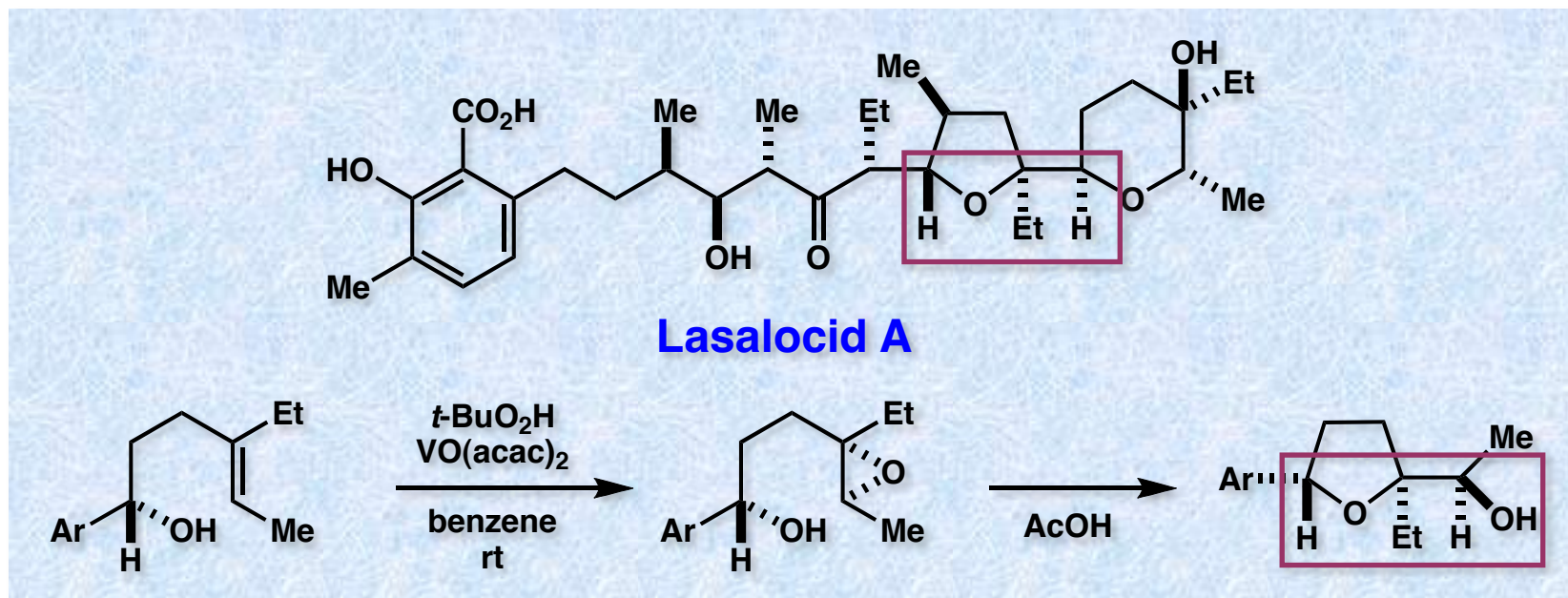


YK

If you don't like  
it so much, let's  
try the total  
synthesis of  
monensin after  
solving the  
following  
problem.

1977

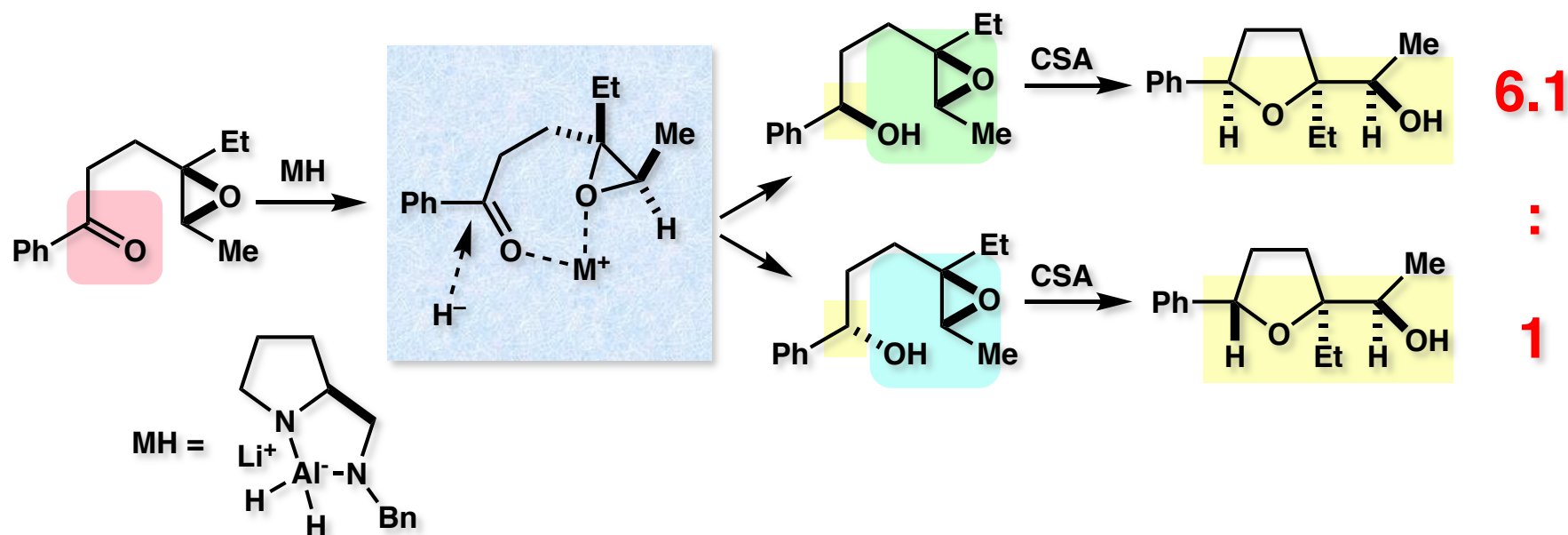
# Total Synthesis of Monensin



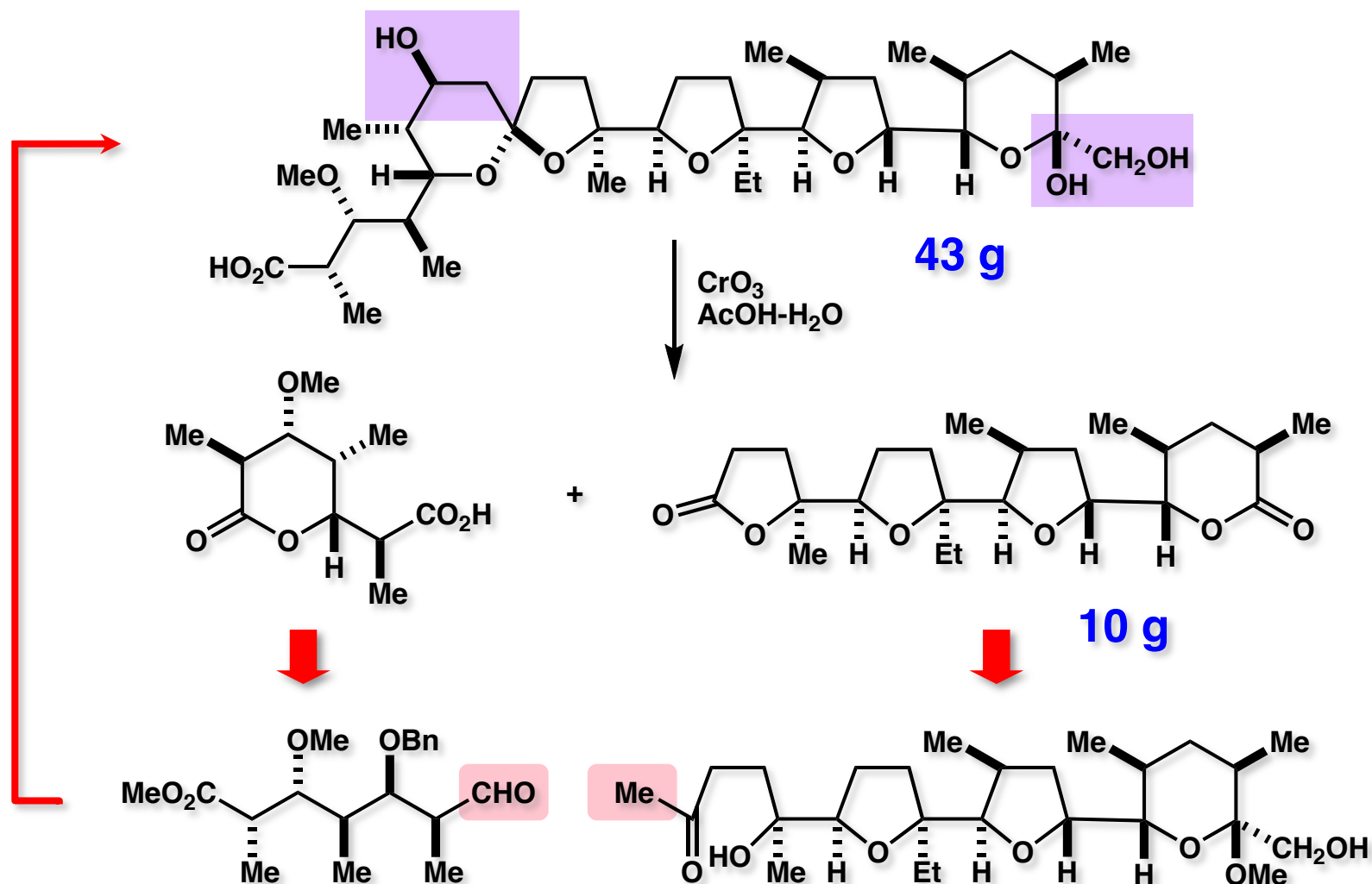
Dr. Nakata

1977-8

# Solved the Problem in a Week



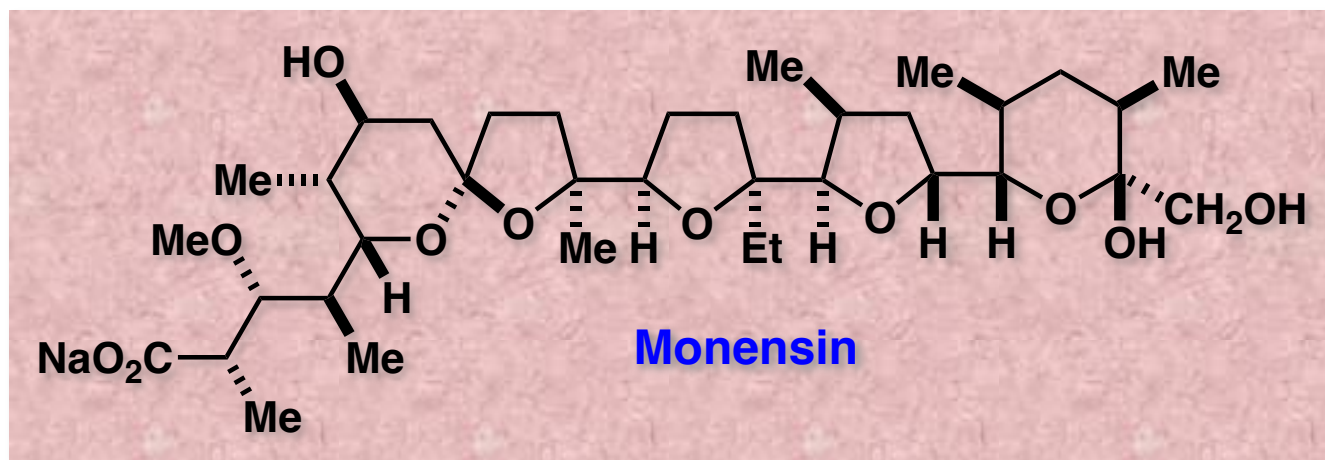
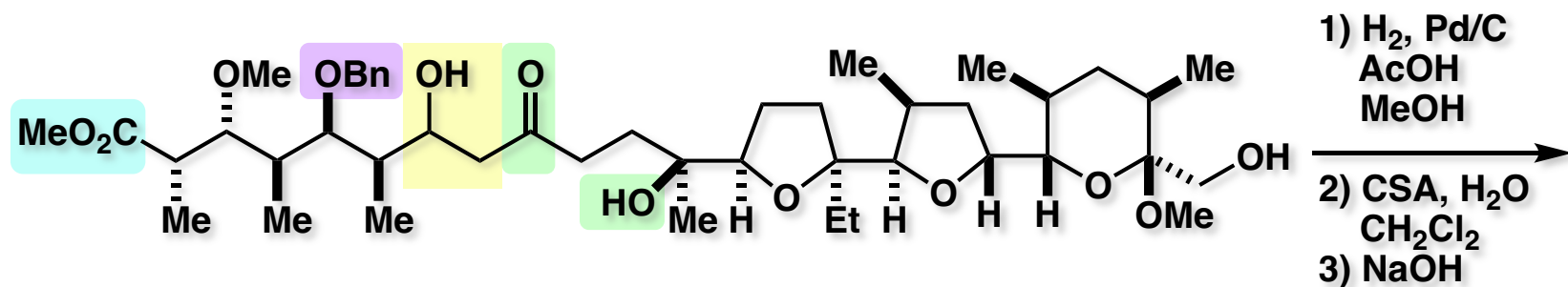
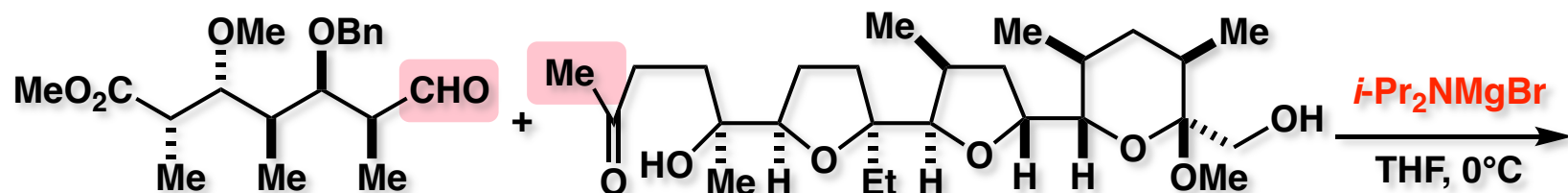
# Reconstruction of Monensin



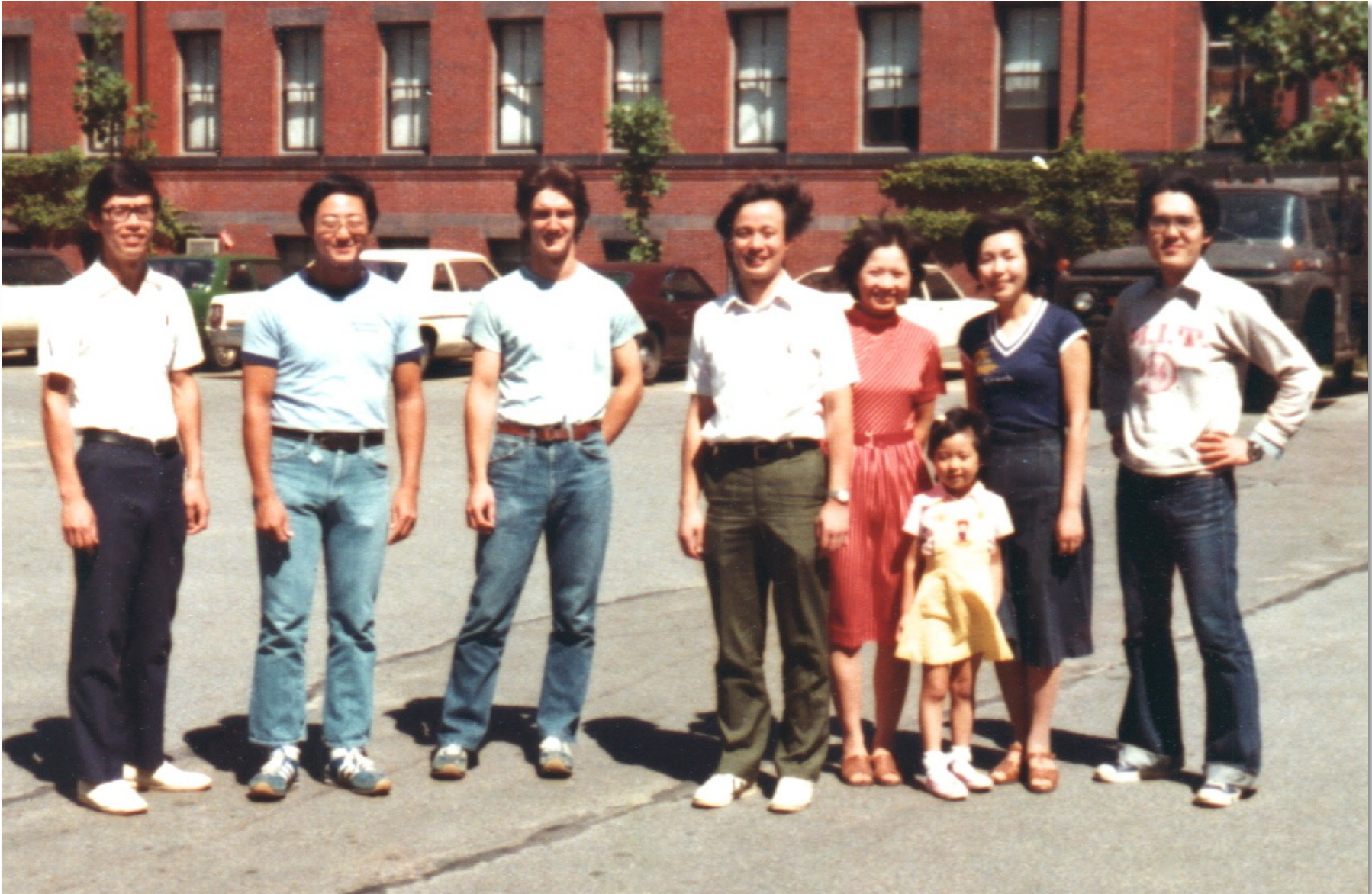
1978



# Reconstruction of Monensin

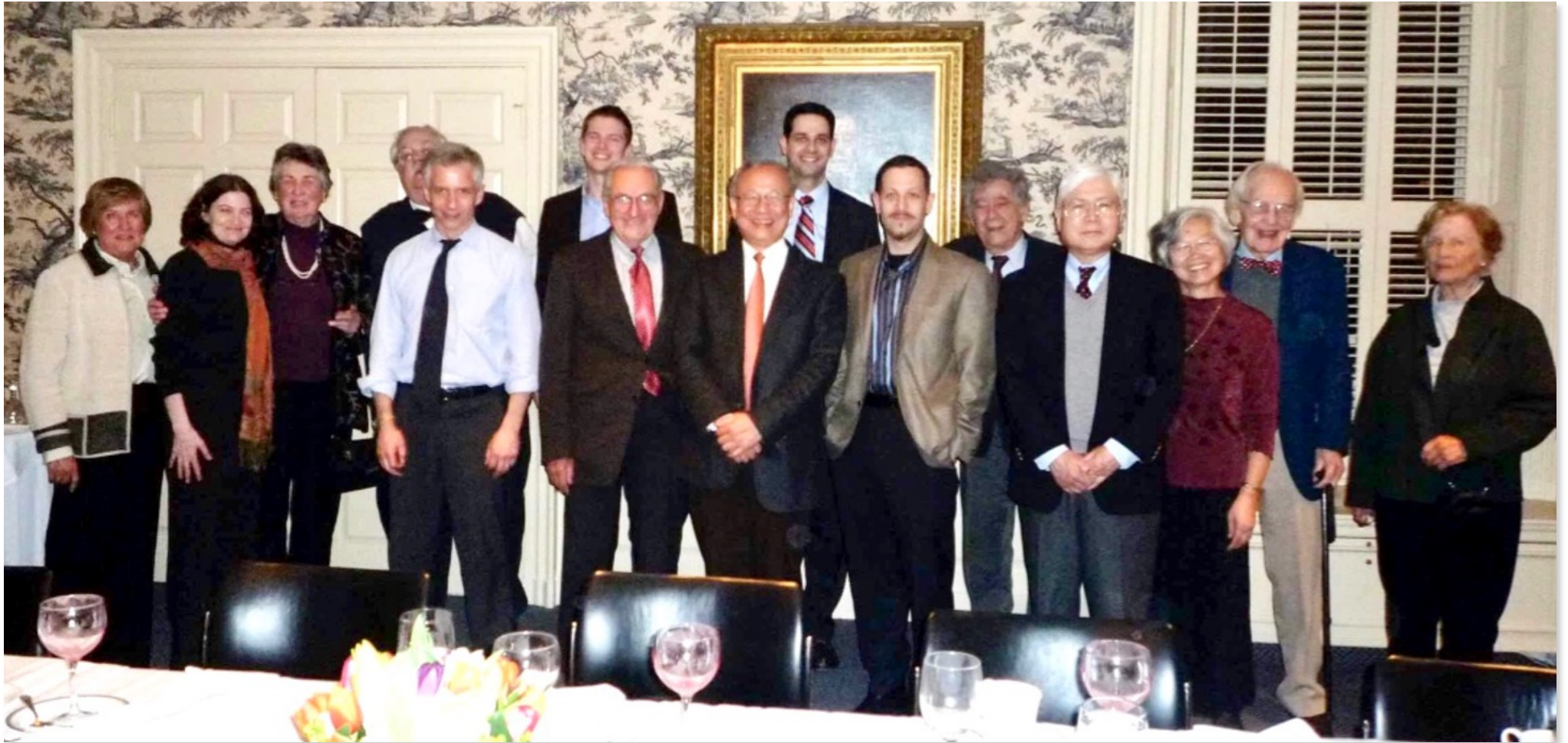


# Goodbye to Harvard – July, 1978





**Dr. Kishi never praised me until April, 2009.**<sup>37</sup>



**Max Tishler Prize Lecture Dinner**

# Second and the Last Comments by Dr. Kishi

福山君:

この3月に東京大学を定年退官されると  
聞きました。貴君の「含窒素天然物の全合成  
研究」に目指された膨大な研究業績は、  
すばらしい一言に尽きます。持論おぼろ  
福山君の全合成には「合成戦略・合成  
反応の体系」と「全合成」が最も融合  
している。加えて、シリル基を用いた  
アミド化反応、有機合成の3つの課題  
であるアミドの選択的アミド化に解答  
を与えたと同時に、君のイソプレノイド  
などの全合成に不可欠な役割を担  
つた。私は、君の全合成にたいして、  
普遍的・創造性を認めるとともに  
業績（芸術性）を感心する。イデオロ

Aを総称 イソプレノイドの全合成は君に  
この偉業だ。

東京大学退官後は、名古屋大学に  
研究室を移されたと理解しています。  
名古屋大学は、福山君の研究生が  
出たところ、多くの思いと希望の  
地であると推察します。福山流を  
貫きつつ、今後研究・教育に邁進  
されることを期待します。

2013. 1. 30

山  
義人

貴君の「含窒素天然物の全合成  
研究」に目指された膨大な研究業績は、  
すばらしい一言に尽きます。

**The vast amount of research achievements  
encompassed in your "Research on the Total  
Synthesis of Nitrogen-Containing Natural Products"  
can only be described as "amazing."**

私は、君の全合成にたいして、  
普遍的・創造性を認めるとともに  
業績（芸術性）を感心する。

**I see an extraordinary imagination, creativity, and  
artistic beauty in your work.**

*Retirement Commemorative Booklet of Prof. Fukuyama, March, 2013*



**Without Dr. Kishi, there is no Fukuyama**

**I am truly grateful to Dr. Kishi for  
guiding me into the wonderful world of  
organic chemistry.**

