



My Academic Career

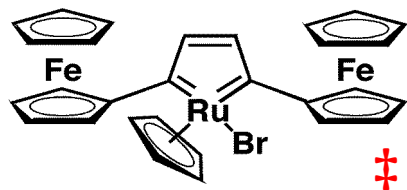
Nagoya University
Department of Chemistry

Yasuyuki Yamada

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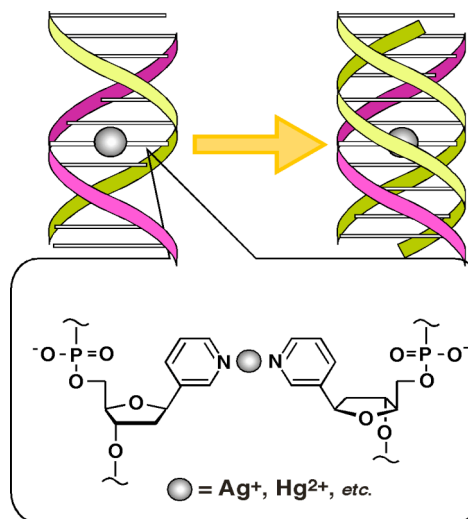
Research in the University of Tokyo

(1997. 4 – 1998. 3) for bachelor's degree
Organosilicon chemistry
Prof. Renji Okazaki
(Organoheteroatom chemistry lab.)



(1998. 4 – 2000. 3) for master's degree
Organometallic polymer
Prof. Hiroshi Nishihara
(Inorganic chemistry lab.)

(2000. 4 – 2003. 3) for doctor's degree
Artificial metallo-DNA
Prof. Mitsuhiro Shionoya
(Bioinorganic chemistry lab.)





Way to an Academic Position

Academic position

- (I) Be an assistant professor just after graduation
(Direct path)
- (II) Be a postdoctoral fellow or go to a company
(Indirect path)

Postdoctoral fellow

(sometimes considered as 'A Period for Training')

- (i) Limited-term job
- (ii) A good chance to expand your background.
 - to learn some new techniques.
 - to change your research field.

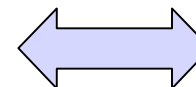
My Thoughts about Searching for a Post-Doc Position

In Japan or **Abroad** (USA, Europe, etc.) ??

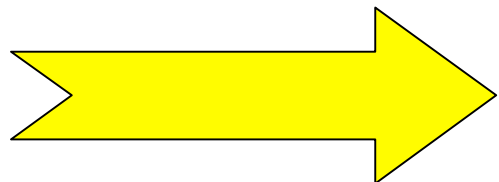
Key words I decided on

- Peptide chemistry
- Medicinal chemistry

- Organic synthesis
- **Young professor**



Big guy



**Information
resources**

Internet
Papers
Magazines
Lectures

How I Applied for a Foreign Post-Doc Position

Found an article about a young professor (C&E news)

Jean A Chmielewski (Purdue University)

- Drug discovery
- Drug delivery systems
- Bio-nanotechnology

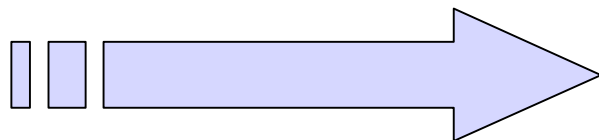
based on peptide chemistry

Got more information

From Prof. Hisakazu Mihara (Tokyo Institute of Technology)

Sent an e-mail

- Curriculum vitae
- Recommendation letter
- My own academic papers



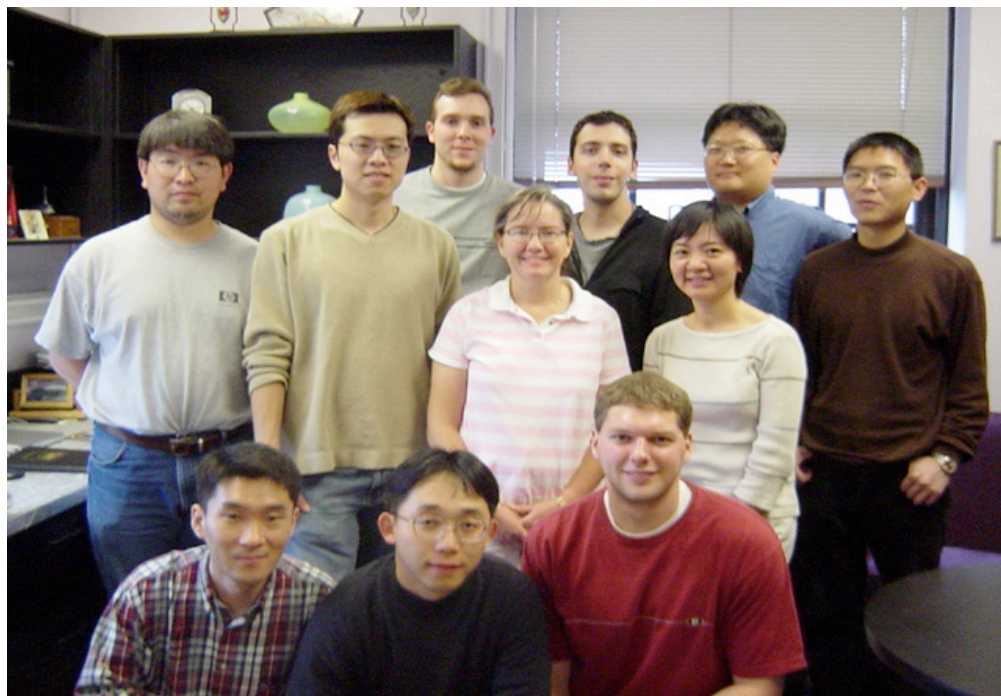
several days

One post-doc position was available.

Introduction of Purdue University

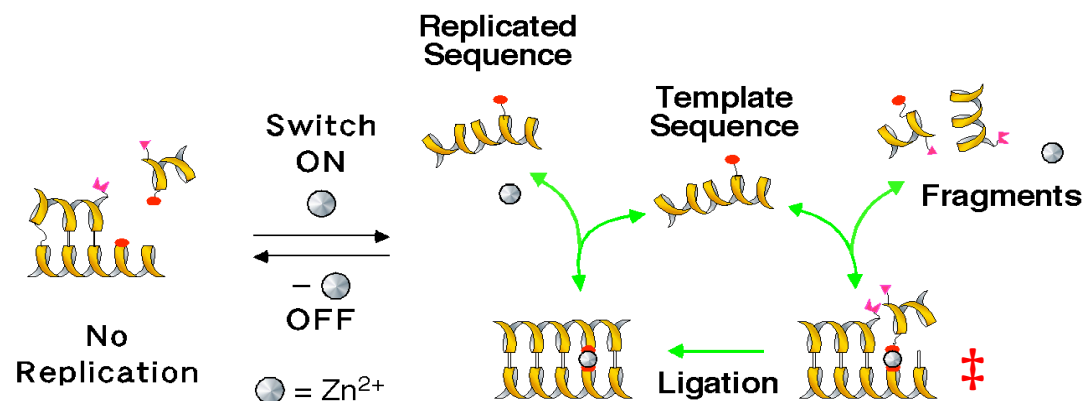


My Activities in Chmielewski Lab



- Lab seminar
- Organic reaction mechanism meeting
- Research report
- Literature report (topics relates to peptide chemistry)

Self-Replicating Peptide System



What was expected?

**Work hard!!
Discussion**



A Way Back to Japan

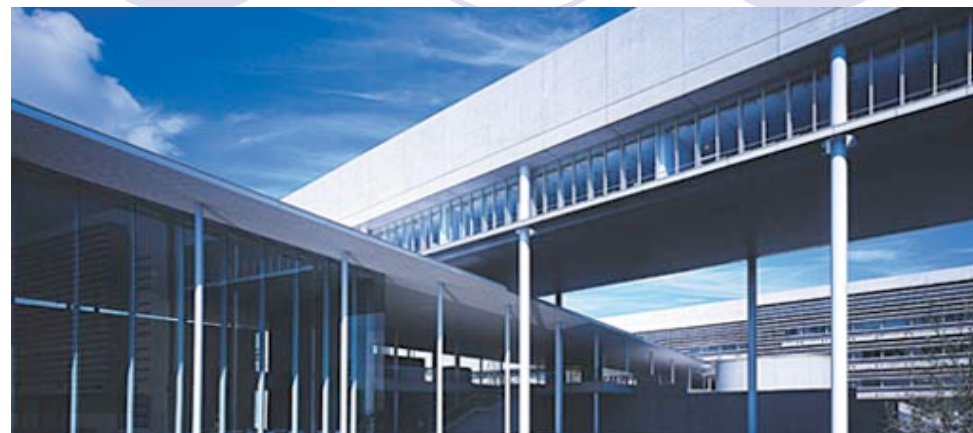
- **An E-mail from Prof. Shionoya**
a limited-term position as an assistant professor was available.
Faculty of **Pharmaceutical Sciences**, Tokyo University of Science
(**Prof. Shin Aoki, Bioorganic Chemistry Lab.**)

Can I survive in the Faculty of Pharmaceutical Sciences?
A good chance to expand my background.

- **Sent my curriculum vitae with recommendation letters**
- **Telephone interview**
- **Got a call from Prof. Aoki**

Faculty of Pharmaceutical Sciences

Tokyo University of Science
Faculty of Pharmaceutical
Sciences, Noda, Chiba

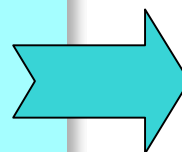


Biology

9 Groups

Chemistry

5 Groups



7 Professors

(3 of them were the licensed pharmacists)

**Environmental
Hygiene**

3 Groups

Healthcare

11 Groups

My job

- Teaching
(Some Organic Chemistry Classes)
- Research in the lab

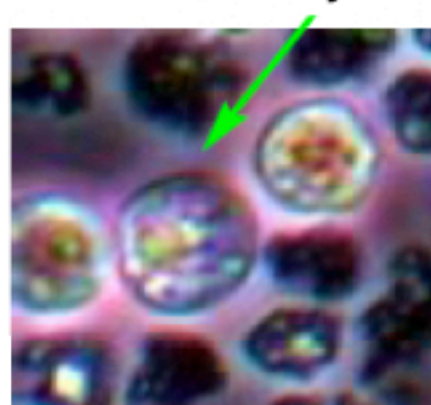
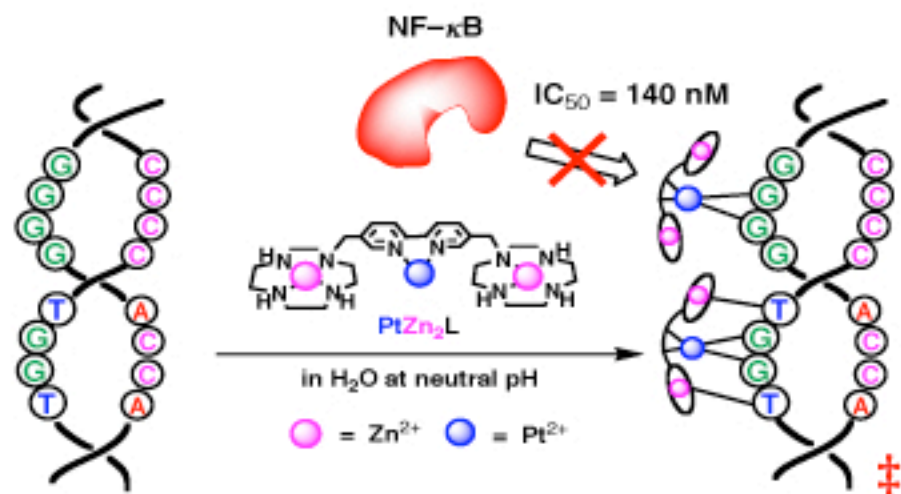


Research in the Bioorganic Chemistry Laboratory



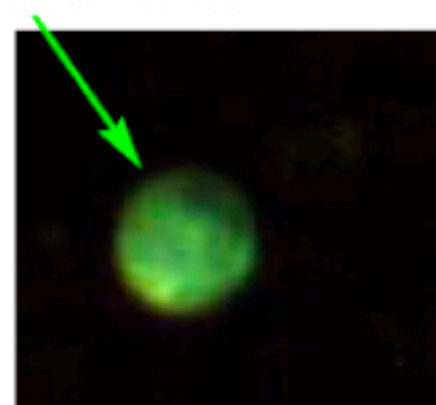
著作権処理の都合により、
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Staining of apoptosis cells
with cyclen derivatives



‡

Phase-contrast image



Fluorescent image



Start a New Research

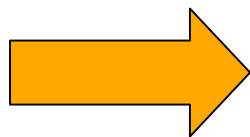
Focused on well-established zinc cyclen chemistry.

Start my original work. Find something new.

Something New, Originality

- New Concept, Function, Structure, *etc.*

Something related to medicinal chemistry was better.

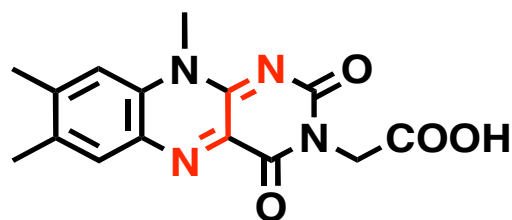


Where should I begin?

著作権処理の都合により、
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いただきます

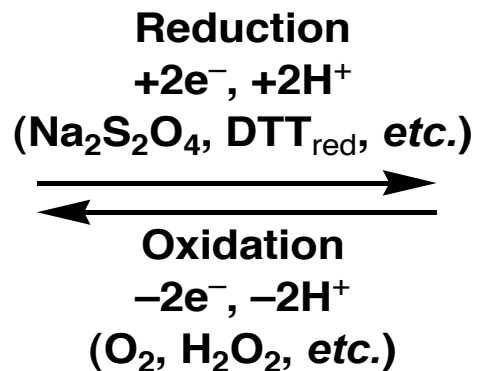
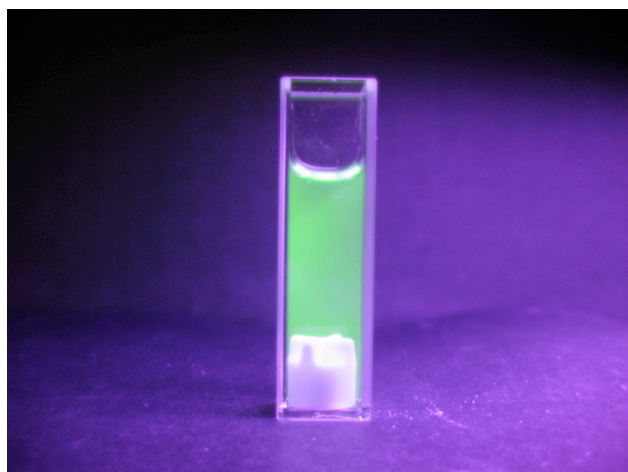
Redox Properties of Flavins (Vitamin B₂) ‡

Oxidized form

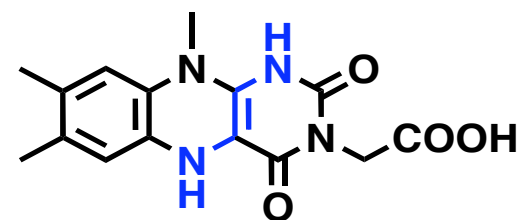


Yellow

Fluorescent ($\Phi_f = 0.16$)

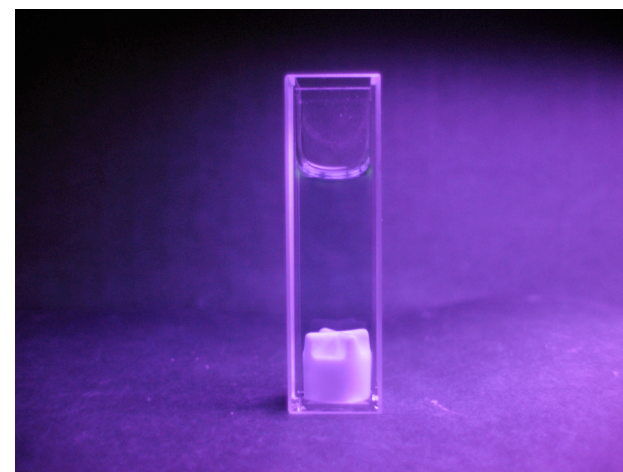


Reduced form



Almost colorless

Non-fluorescent ($\Phi_f \sim 0$)



$E^{0'} = -0.24 \text{ V}$
vs. SHE

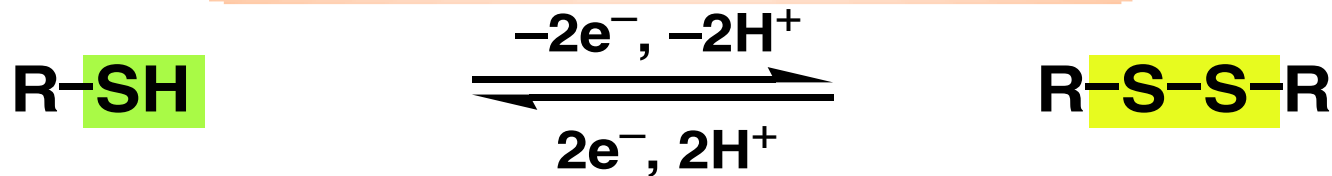
$\lambda_{ex} = 365 \text{ nm}$

Redox Potential in Living Cells

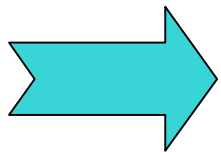
E (Cytosol) = $-0.28 \sim -0.22$ V vs. SHE at pH 7.0

Kept by the redox homeostasis mechanisms.

Thiol–disulfide redox equilibrium



Oxidized flavins can be reduced by thiols.



Flavins can be used for monitoring the redox potential in living cells?

著作権処理の都合上、

この場所に挿入されていた図を省略させていただきます



What Should We Rely on?

Find something new

Knowledge and Experience of

Chemistry

Methodology to make molecules.

to analyze molecules.

to treat molecules.

Our Sword and Shield

Nagoya University



**Trying to find something new
in the Department of Chemistry !**



Acknowledgement

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(Univ. of Tokyo)**