

*Biographical Sketch***Sunhee Choi**

Professor of Chemistry and Biochemistry  
 Department of Chemistry  
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*Education*

Ph.D. Chemistry, 1982: Princeton University, Princeton, NJ.: Thesis Advisor: Professor Thomas G. Spiro.  
 Thesis Title: Resonance Raman Spectroscopy of Heme Complexes and Proteins  
 M.S. Chemistry, 1975 : Korean Adv. Inst. of Sci, Seoul, Korea.:Thesis Advisor: Professor Mu Shik Jhon  
 Thesis Title: Physical Properties of Water in Hydrogel  
 B.S. Chemistry, 1973 : Seoul National University, Seoul, Korea.

*Positions*

1987-present: Professor of Chemistry, Middlebury College.  
 Teaching: Physical-, General-, Food-, Art-, Chemistry, Instrumental Laboratories.  
 Research: Kinetic and Mechanistic Studies on the Anticancer Activity of Pt(IV) Complexes.  
 March-August, 2003: Visiting Professor, Chemistry, University of Utah.  
 1986-1987: Postdoctoral Associate, Department of Biochemistry, University of Vermont.  
 Research: Total Internal Reflection Fluorescence Spectroscopy for enzyme kinetics.  
 1982-1986: Research Scientist, Colgate-Palmolive Company, Piscataway, NJ.  
 Research: Development of detergents for use in cold water.

*Awards, Honors and, Affiliations,*

2005 Vermont Professor of the Year awarded by the Carnegie Foundation for the Advancement of Teaching and the Council for Advancement and Support of Education.  
 Outstanding Poster Award, The 10th International Conference on Bioinorganic Chemistry,  
 Poster 181T, Florence, Italy, Aug. 26-31, 2001.  
 Outstanding Poster Award, The 8th Int. Symp. Platinum and other Metal Coordination Compounds in Cancer  
 Chemotherapy, Poster 4.P10, Oxford, UK, Mar 28-31, 1999.  
 Colgate Presidential Award, Colgate-Palmolive Company, 1985.  
 Exxon Research Fellowship, Princeton University, 1982.  
 Best Chemist Award, Seoul National University, 1973.

Member: American Chemical Society,  
 Iota Sigma Pi:National Honor Society for Women in Chemistry,  
 Council on Undergraduate Research

*Patents*

"Detergent Composition for Improved Oily Soil Removal Capability"; U.S. Patent #4,725,377, **1988**.

*Invited Speak*

Mechanistic Study of Pt(IV) Anticancer Complexes  
 Department of Chemistry, Vassar College, March 31, 2006.  
 Department of Chemistry, Hamilton College, Feb. 3, 2006  
 Department of Chemistry, Univ. Toronto at Mississauga, Jan. 17, 2006  
 Department of Chemistry, Univ. Utah, May 20, 2003.  
 Department of Pharmacology, Univ. of Vermont, Nov. 11, 2002.  
 Department of Chemistry, Williams College, Sept. 27, 2002.  
 Department of Chemistry, Welsley College, April 12, 2000.  
 Cum Laude Speech, Phillips Academy at Exeter, June 8, 2002.

**Major Research Grants** (Total: \$629,000)

- NSF-RUI (CHE-0450060) 3/1/05-6/30/08 (\$200,000) "Mechanism and Kinetics of Oxidation of Guanosine Derivatives by Pt(IV) Complexes"
- Vt Genetics Network 6/1/05-5/31/06 (\$50,916) "Mechanism of Oxidation of DNA by Pt(IV) Complexes"
- Vt Genetics Network (#1003) 5/15/04-6/30/04 (\$10,000) "Mechanism of Oxidation of 8-Oxo-G by Pt(IV) Complexes"
- ACS-PRF (37874-B3) 7/02-6/05 (\$50,000) "Mechanism of Oxidation of DNA by Pt(IV) Complexes"
- Vt Genetics Network (#3038) 6/02-8/03 (\$20,000) "Mechanism of Oxidation of DNA by Pt(IV) Complexes"
- NIH-AREA (1R15 CA82145-01) 7/99-6/03 (\$101,920) "Mechanistic Study of Pt(IV) Anticancer Complexes"
- NIH-AREA (1R15 CA67217-01A1) 6/96-5/99 (\$122,197) "Mechanistic Study of Pt(IV) Anticancer Complexes"
- ACS-PRF (28563-B3) 6/95-8/98 (\$ 25,000) "Kinetic and Mechanistic Studies on the Antitumor Activity of Pt(IV) Complexes"
- NSF-VT EPSCoR 6/94-9/94 (\$ 5,844) "Kinetic and Mechanistic Studies on the Interaction of Pt(IV) Coordination Complexes with DNA"
- ACS-PRF (24270-B3) 6/91-8/94 (\$ 20,000) "Spectroscopic Studies on Stereochemistry and Coordination Behavior of Nickel Porphyrins"
- NSF/VT EPSCoR 6/91-8/91 (\$5,170) "Interaction of Cytochrome c with Phospholipids: Calorimetric and Spectroscopic Studies"
- Research Corporation 6/89-8/91 (\$ 18,000) "Effect of Cholesterol on the Interaction of Calcium with Phospholipids"

**Instrumentation Grants** (Total: \$27,930)

- NSF-ILI 5/93 (\$ 7,000) "Bomb Calorimetry at Middlebury College"
- NSF-ILI 7/89 (\$ 20,930) "Differential Scanning Calorimeter at Middlebury"

**Other Grants**

Mellon Foundation Career Advancement Award 9/1/04-8/31/05 (\$25,000) Joint with Kerry Kraukstis (P.I. Havery Mudd), Miriam Rossi (Vassar), Laura Wright (Furman) and Bridget Gourley (De Pauw) "Advancing the Careers of Senior Women Chemistry Faculty through a Horizontal Peer Network"

**Publications** (\* denotes Middlebury College Undergraduate Student)

20. Choi, S.; Vastag, L.\*; Leung, C. H.\*; Beard, A. M.\*; Larrabee, J. A. "Kinetics and Mechanism of Oxidation of Guanosine Derivatives by Platinum(IV) Complexes" *Inorg. Chem.*, **2006**, *45*, 10108-10114.
19. Choi, S.; Cooley, R. B.\*; Voutchkova, A.\*; Leung, C. H.\*; Vastag, L.\*; Knowles, D. E.\* "Oxidation of Guanosine Derivatives by a Platinum(IV) Complex: Internal Electron Transfer through Cyclization" *J. Am. Chem. Soc.*, **2005**, *127*, 1773-1781.
18. Choi, S.; Cooley, R. B.\*; Hakemian, A. S.\*; Larrabee, Y. C.; Bunt, R. C.; Maupaus, S. D.; Muller, J. G.; Burrows, C. J. "Mechanism of Two-Electron Oxidation of Deoxyguanosine-5'-Monophosphate by a Platinum(IV) Complex" *J. Am. Chem. Soc.*, **2004**, *126*, 591-598.
17. Choi, S.; Delaney, S.\*; Orbai, L.\*; Padgett, E. J.\*; Hakemian, A. S.\* "A Platinum(IV) Complex Oxidizes Guanine to 8-Oxo-Guanine in DNA and RNA" *Inorg. Chem.*, **2001**, *40*, 5481-5482.
16. Choi, S.; Delaney, S.\*; Jewett, K. J.\*; Orbai, L.\* "Reaction of Platinum(IV) Anticancer Complexes with DNA" *J. Inorg. Biochem.*, **1999**, *74*, 98-98.
15. Choi, S.; Mahalingaiah, S.\*; Delaney, S.\*; Neale, N. R.\*; Masood, S.\* "Substitution and Reduction of Platinum(IV) Complexes by a Nucleotide, Guanosine 5'-Monophosphate (5'-GMP)" *Inorg. Chem.*, **1999**, *38*, 1800-1805.
14. Choi, S.; Filotto, C.\*; Bisanzo, M.\*; Delaney, S.\*; Lagasee, D.\*; Whitworth, J. L.\*; Jusko, A.\*; Li, C.\*; Wood, N. A.\*; Willingham, J.\*; Schwenker, A.\*; Spaulding, K.\* "Reduction and Anticancer Activity of Platinum(IV) Complexes" *Inorg. Chem.*, **1998**, *37*, 2500-2504.
13. Choi, S.; Swanson, J. M.\* "Interaction of cytochrome c with cardiolipin: An Infrared Spectroscopic Study" *Biophys. Chem.*, **1995**, *54*, 271-278.

12. Choi, S.; Phillips, J. A.\*; Ware W. Jr.\*; Wittschieben, C.\* "Magnetic Circular Dichroism Spectroscopic Studies on Stereochemistry and Coordination Behavior of Nickel Porphyrins" *Inorg. Chem.*, **1994**, *33*, 3873-3876.
11. Larrabee, J. A.; Choi, S. "Fourier Transform Infrared Spectroscopy" *Methods in Enzymology, Vol. 226, Metallobiochemistry Part C*, J. F. Riordan and Bert L. Vallee Eds., Academic Press, Inc. New York, **1993**, pp 289 - 305.
10. Choi, S.; Ware, W. Jr.\*; Lauterbach, S. R.\*; Phillips, W. M.\* "Infrared Spectroscopic Studies on the Phosphatidylserine Bilayer Interacting with Calcium Ion: Effect of Cholesterol" *Biochemistry*, **1991**, *30*, 8563.
9. Choi, S.; Phillips, J. A.\*; Ware, W. Jr.\* "Magnetic Circular Dichroism (MCD) Study of Non-Planar Nickel (II) Porphyrins" *J. Inorganic Biochemistry*, **1991**, *43*, 663.
8. Phillips, W. M.\*; Choi, S.; Larrabee, J. A. "Kinetics of Pentaaminenitrocobalt (III) to Pentaaminenitrocobalt (III) Linkage Isomerization, Revisited" *J. Chem. Ed.*, **1990**, *67*, 267.
7. Choi, S.; Larrabee, J. A. "Thermochromic Tetrachlorocuprate(II): An Advanced Integrated Laboratory Experiment" *J. Chem. Ed.*, **1989**, *66*, 774.
6. Choi, S.; Larrabee, J. A. "Two Methods for the Determination of Lead in Brass: Atomic Absorption Spectrometry and Differential Scanning Calorimetry" *J. Chem. Ed.*, **1989**, *66*, 864.
5. Choi, S.; Lee, J. J.; Wei, Y. H.; Spiro, T.G. "Resonance Raman and Electronic Spectra of Heme-a Complexes and Cytochrome Oxidase" *J. Am. Chem. Soc.* **1983**, *105*, 3692.
4. Choi, S.; Spiro, T. G. "Out-of-Plane Deformation Modes in the Resonance Raman Spectra of Metalloporphyrins and Heme Proteins" *J. Am. Chem. Soc.* **1983**, *105*, 3683.
3. Choi, S.; Spiro, T. G.; Langry, K. C.; Smith, K. M.; Budd, D. L.; LaMar, G. N.J. "Structural Correlations and Vinyl Influences in the Resonance Raman Spectra of Protoheme Complexes and Proteins" *Am. Chem. Soc.* **1982**, *104*, 4345.
2. Choi, S.; Spiro, T. G.; Langry, K. C.; Smith, K. M. "Resonance Raman Spectra of Ni(II) Protoporphyrin IX with Deuterated Vinyl Groups" *J. Am. Chem. Soc.* **1982**, *104*, 4337.
1. "Nature of Water in Synthetic Hydrogels III, Dilatometry, Specific Conductivity and Dielectric Relaxation of Poly (2,3-dihydroxypropylmethacrylate)" Choi, S.; Jhon, M. S.; Andrade, J. D. J. *Colloid Interface Sci.* **1977**, *61*, 1.

#### Research Papers\* (\* denotes Middlebury College Undergraduate Student)

"Mechanism and Kinetics of Oxidation of DNA by Pt(IV) Complexes", Choi, S.; Vastag, L.\*; DellaRocca, J. G.; Personick, M. L.; Larrabee, Y. C.; Larrabee, J. A. The Vermont Genetics Network 5th Annual Retreat, Burlington, VT, Aug. 16, 2006.

"Mechanism and Kinetics of Oxidation of DNA by Pt(IV) Complexes", Choi, S.; Vastag, L.\*; Leung, C-H.\*; Beard, A. M.\*; Larrabee, J. A. Gordon Conference, Metals in Medicine, Poster 11, The Queens College, Oxford, UK, July 9-14, 2006.

"Mechanism and Kinetics of Oxidation of Guanosine Derivatives by Pt(IV) Complexes", Choi, S.; Vastag, L.\*; Leung, C-H.\*; Beard, A. M.\* INOR 1503, PACIFICHEM 2005, Honolulu, HA, Dec. 15-20, 2005.

"Mechanism of oxidation of guanosine derivatives by a platinum(IV) complex: Internal electron transfer through cyclization", Choi, S. INOR 740 (Oral Presentation), 229th ACS National Meeting, in San Diego, CA, March 13-17, 2005.

"Mechanism of Oxidation of DNA by Pt(IV) Complexes", Choi, S.; Cooley, R. B.\*; Larrabee, Y. C.; Bunt, R. C. Cynthia J. Burrows, James Muller. The Vermont Genetics Network 2nd Annual Retreat, Burlington, VT, Aug. 13, 2003.

"Mechanism of Oxidation of DNA by Pt(IV) Complexes", Choi, S.; Cooley, R. B.\*; Larrabee, Y. C.; Leung, C-H.\*; Bunt, R. C. Gordon Conference, Inorganic Reaction Mechanism, Poster 13, Ventura, CA, Feb. 16-21, 2003.

"A Platinum(IV) Complex Oxidizes Guanine to 8-Oxo-Guanine in DNA and RNA" Choi, S.; Delaney, S.\*; Orbai, L.\*; Padgett, E. J.\*; Hakemian, A. S.\*; Larrabee, Y. C. The 10th International Conference on Bioinorganic Chemistry, Poster 181T, Florence, Italy, Aug. 26-31, 2001. **Our poster has been awarded as one of top three posters out of 500 posters.**

"Reaction of Platinum(IV) Complexes with DNA" Choi, S.; Delaney, S.\*; Orbai, L.; Padgett, E.\* The 9th Int. Conference on Biol. Inorg. Chem., Poster 98, Minneapolis, Minn., July 11-16, 1999.

"Reaction of Platinum(IV) Complexes with DNA" Choi, S.; Delaney, S.\*; Jewett, K. J.; Orbai, L.\* 8th Int. Symp. Platinum and other Metal Coordination Compounds in Cancer Chemotherapy, Poster 4.P10, Oxford, UK, Mar 28-31, 1999.

**Our poster has been awarded as one of top eight posters out of 100 posters.**

"Reaction of Platinum(IV) Complexes with DNA" Delaney, S.\*; Choi, S. 217th American Chemical Society National Meeting, Poster 620, Anaheim, Ca., Mar 21-25, 1999.

"Reaction of Platinum(IV) Complexes with Guanosine 5'-Monophosphate (5'-GMP): <sup>1</sup>H-NMR Spectroscopic Study" Choi, S.; Mahalingaiah S.\*; Neale, N. R.\*; Delaney, S.\* XXXIII Int. Conf. on Coordination Chemistry, Poster 237b, Florence, Italy, Aug.-Sep., 1998.

"Kinetic and Mechanistic Studies on the Antitumor Activity of Pt(IV) Complexes" Choi, S.; Filotto, C.\*; Bisanzo, M. C.\*; Neale, N. R.\* European Research Conference on Chemistry of Metals in Biological Systems, Poster 73, Tomar, Portugal, May 1997.

"Mechanism of Anticancer Activity of Platinum(IV) Coordination Complexes" Choi, S.; Jusko, A. S.\*; Li, C.\*; Wood, N. A.\*; Schwenker, A.\*; Spaulding, K.\* 1995 International Chemical Congress of Pacific Basin Societies, Inorganic Poster 1020, Honolulu, June 1995.

"A Cyclicvoltammetric Study on the Redox Potential of Pt (IV) Complexes and their Electrochemical Behaviors" Li, C.\*; Choi, S. American Chemical Society 24th Northeast Regional Meeting, Poster 165, Burlington, June 1994.

"Kinetic Characterization of Platinum (IV) Anticancer Compounds" Jusko, A. S.\*; Choi, S. ACS 24th Northeast Regional Meeting, Poster 207, Burlington, June 1994.

"Interaction of Cytochrome c with Cardiolipin : An Infrared Spectroscopic Study" Choi, S.; Swanson, J. M.\* 204<sup>th</sup> ACS National Meeting, August, 1992, Washington D.C.

"Magnetic Circular Dichroism Study of Non-Planar Nickel (II) Porphyrins" Choi, S.; Phillips, J. A.\*; Ware, W. Jr.\* 5<sup>th</sup> ICBIC, August 4-10, 1991, Oxford, England.

"Magnetic Circular Dichroism Study of Non-Planar Nickel (II) Porphyrins" Choi, S.; Phillips, J. A.\*; Ware, W. Jr.\* 21<sup>st</sup> ACS NERM, June 23- 26, 1991, Amherst, MA.

"Effect of Cholesterol on the Thermotropic Properties of Phospholipids" Lauterbach, S. R.\*; Choi, S. 4<sup>th</sup> Natl. Conf. on Undergrad. Res., April, 1990, Schenectady, NY.

"Effect of Cholesterol on the Interaction of Ca<sup>2+</sup> with Phospholipids" Lauterbach, S. R.\*; Phillips, W. M.\*; Choi, S. ACS 20<sup>th</sup> NERM, June, 1990, Potsdam, NY.