

# CURRICULUM VITAE

**Name:** Zhen Huang

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Ph.D., Professor of Chemistry & Chemical Biology, Department of Chemistry & Department of Biology, Georgia State University, P.O. Box 4098, Atlanta, GA 30302; Phone: (404) 413-5535 (O); Email: [Huang@gsu.edu](mailto:Huang@gsu.edu); Website: <http://chemistry.gsu.edu/faculty/Huang/>

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**Personal:** Born in 1964; Married with two children.

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## I. Educational & Professional Experience:

**2009-present** Full Professor, Department of Chemistry, Georgia State University, Atlanta, GA  
**2004 - 2008** Associate Professor, Department of Chemistry, Georgia State University, Atlanta, GA  
**2003 - 2004** Associate Professor, Department of Chemistry, Brooklyn College, CUNY, NY  
**1998 - 2003** Assistant Professor, Department of Chemistry, Brooklyn College, CUNY, NY  
**1994 - 1998** Post-doctoral Fellow, Department of Genetics, Harvard Medical School, Boston, MA (Adviser: Prof. Jack W. Szostak)  
**1988 - 1994** Ph.D., Bio-organic Chemistry, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland (Adviser: Prof. Steven A. Benner)  
**1984 - 1987** M.S., Organic Chemistry, Peking University, Beijing, China (Adviser: Prof. Zhong Wen)  
**1980 - 1984** B.S., Analytical Chemistry, Sichuan University, China (Adviser: Prof. Sulin Chen)

## II. Other Experience and Professional Memberships

1997 - 1998 President, Chinese Association of Biological Chemistry (ABC), Boston  
2002 - 2004 Co-Chair, Younger Chemist Club of American Chemical Society (ACS)  
1994 - present Member, American Chemical Society  
1997 - present Member of Sino-American Pharmaceutical Professionals Association (SAPA)  
2000 - present Member, Chinese American Chemical Society  
2007 - present President, The Chinese-American Chemistry & Chemical Biology Professors Association (CAPA)

## III. Awards and Other Professional Activities

2000 PSC-CUNY Research Award (#62392-00-31)  
2000 New Research Dimension Award  
2001 PSC-CUNY Research Award (#63193-00-32)  
2001 CUNY Collaborative Research Program Award (#92918-0008)  
2002 Groundwork CUNY Program Award (#24208-0405)  
2004 NIH Research Award (GM069703)  
2005 NIH Research Award (AI058051)  
2005 NSF Research Grant (NSF0517092)  
2005 SECEBT Research Award (CC423095)  
2008 Outstanding Faculty Achievement Award, Georgia State University  
2008 Distinguished Cancer Clinicians and Scientists Award, Georgia Cancer Coalition, State of Georgia  
2008 CAPA Distinguished Faculty Award  
2008 Outstanding Faculty Scholarship Award, Georgia State University College of Arts and Sciences

## IV. Publications (selected from 48 peer-reviewed publications)

21. Jia Sheng, Abdalla Hassan, Zhen Huang\*, "Synthesis of the First Tellurium-Derivatized Oligonucleotides for Structural and Functional Studies", *Chemistry - A European Journal*, **2009**, in press.
20. Abdalla E. A. Hassan, Jia Sheng, Jiansheng Jiang, Wen Zhang, and Zhen Huang\*, "Synthesis and Crystallographic Analysis of 5-Se-Thymidine DNAs", *Organic Letter*, **2009**, *11*, 2503-2506. (This

paper is highlighted as a featured article by Chemical & Engineering News, vol. 87, no. 23, p. 51 on June 8, 2009).

19. Jozef Salon, Jiansheng Jiang, Jia Sheng, Oksana O. Gerlits, Zhen Huang\*, "Derivatization of DNAs with Selenium at 6-Position of Guanine for Function and Crystal Structure Studies", *Nucleic Acids Research*, **2008**, 36, 7009-7018.
18. Julianne Caton-Williams and Zhen Huang\*, "Synthesis of Colored 4-Selenothymidine Triphosphate and its DNA Polymerase Incorporation into DNAs for Visualization, Structure and Function Studies", *Angewandte Chemie Int. Ed.*, **2008**, 47, 1723-1725.
17. Jia Sheng, Abodalla E.A. Hassan & Zhen Huang\*, "Telluride-Mediated Elimination and Novel Synthesis of 2',3'-Didehydro-2',3'-dideoxynucleosides (d4Ns)", *Journal of Organic Chemistry*, **2008**, 73, 3725-3729.
16. Jozef Salon, Jia Sheng, Jiansheng Jiang, Guexiong Chen, Julianne Caton-Williams, Zhen Huang\*, "Oxygen Replacement with Selenium at the Thymidine 4-position for the Se-Base-Pairing and Crystal Structure Studies", *Journal of American Chemical Society*, **2007**, 129, 4862-4863.
15. Jiansheng Jiang, Jia Sheng, Nicolas Carrasco, and Zhen Huang\*, "Selenium Derivatization of Nucleic Acids for Crystallography", *Nucleic Acids Research*, **2007**, 35, 477-485.
14. Jia Sheng, Jiansheng Jiang, Jozef Salon, and Zhen Huang\*, "Synthesis of a 2'-Se-Thymidine Phosphoramidite and Its Incorporation into Oligonucleotides for Crystal Structure Study", *Organic Letter*, **2007**, 9, 749-752.
13. Nicolas Carrasco, Julianne Canton-Williams, Gary Brandt, Siming Wang, and Zhen Huang\*, "Efficient Enzymatic Synthesis of Phosphoroselenoate RNA Using Adenosine 5'-( $\alpha$ -P-seleno)triphosphate", *Angew. Chem.* 2006, 118, 100-103; *Angewandte Chemie Int. Ed.*, **2006**, 45, 94-97.
12. Gianina Logan,<sup>#</sup> Charity Igunbor,<sup>#</sup> (#equal contribution), Gue-Xiong Chen, Hays Davis, Arlyne Simon, Jozef Salon, Zhen Huang\*, "A Novel and Simple Strategy for Incorporation, Protection, and Deprotection of Selenium Functionality", *Synlett*, **2006**, 10, 1554-1559.
11. Gary Brandt, Nicolas Carrasco, and Zhen Huang\*, "RNA Substrate Cleavage Catalyzed by Phosphoroselenoate Hammerhead Ribozymes Transcribed Using 5'-( $\alpha$ -P-Seleno)Triphosphates", *Biochemistry*, **2006**, 45, 8972-8977.
10. Jozef Salon, Guexiong Chen, Yoani Portilla, Markus W. Germann, and Zhen Huang\*, "Synthesis of a Novel 2'-Se-uridine Phosphoramidite and Its Incorporation into Oligonucleotides for Structure Study", *Organic Letter*, **2005**, 7, 5645-5648.
9. Nicolas Carrasco and Zhen Huang\*, "Enzymatic Synthesis of Phosphoroselenoate DNA using Thymidine 5'-( $\alpha$ -P-Seleno)-triphosphate and DNA Polymerase for X-ray Crystallography using MAD", *Journal of American Chemical Society*, **2004**, 126, 448-449.
8. Nicolas Carrasco, Yuri Buzin, Elizabeth Tyson, Elizer Halpert, and Zhen Huang\*, "Selenium derivatization and crystallization of DNA and RNA oligonucleotides for X-ray crystallography using multiple anomalous dispersion", *Nucleic Acids Research*, **2004**, 32, 1638-1646.
7. Yuri Buzin, Nicolas Carrasco, and Zhen Huang\*, "Synthesis of Selenium-Derivatized Cytidine and Oligonucleotides for X-ray Crystallography Using MAD", *Organic Letter*, **2004**, 6, 1099-1102.
6. Mohammed Alsaïdi, Elina Lum, and Zhen Huang\*, "Direct Detection of a Specific Cellular mRNA on Functionalized Microplate", *ChemBioChem*, **2004**, 5, 1136-1139.
5. Zhen Huang,\* and Mohammed Alsaïdi, "Selective Labeling and Detection of Specific mRNA in a Total RNA Sample", *Analytical Biochemistry*, **2003**, 322, 269-274.
4. Zhen Huang\*, and Jack W. Szostak, "Selective Labeling of RNA in an RNA Mixture", *Analytical Biochemistry*, **2003**, 315, 129-133.
3. Zhen Huang,\* and Jack W. Szostak, "Evolution of Aptamers with a New Specificity and New Secondary Structures from an ATP Aptamer", *RNA*, **2003**, 9, 1461-1468.
2. Quan Du, Nicolas Carrasco, Marianna Teplova, Christopher J. Wilds, Martin Egli, and Zhen Huang,\* "Internal Derivatization of Oligonucleotides with Selenium for X-ray Crystallography Using MAD", *Journal of American Chemical Society*, **2002**, 124, 24-25.
1. Nicolas Carrasco, Dov Ginsburg, Quan Du, and Zhen Huang,\* "Synthesis of Selenium-Derivatized Nucleosides and Oligonucleotides for X-ray Crystallography", *Nucleosides, Nucleotides, & Nucleic Acids*, **2001**, 20, 1723-1734.

## V. Patent Publications:

7. Zhen Huang, Title: "RNA Selective Detection and Quantitation using RNA Chip and Plate", **2008**, US Utility Patent Application, 7,354,716.
6. Zhen Huang and Jia Sheng, Title: "Telluride-Mediated Elimination and Novel Synthesis of 2',3'-Dideoxy-2',3'-dideoxynucleosides (d4Ns)", **2008**, 61/038,439 (pending).
5. Zhen Huang, Title: "Incorporation of 4-Se-Thymidine into Oligonucleotides", **2006**, US Provisional Patent Application, pending (60/871,598).
4. Zhen Huang, Title: "RNA Selective Detection and Quantitation using RNA Chip and Plate", **2006**, Europe Patent Application, 04780049.5-2402 (pending).
3. Zhen Huang, Title: "RNA Selective Detection and Quantitation using RNA Chip and Plate", **2006**, Australia Patent Application (pending).
2. Zhen Huang, Title: "Synthesis of Selenium-Derivatized Nucleosides, Nucleotides, Phosphoramidites, Triphosphates and Nucleic Acids", **2002**, US Patent Application, 10/104,995 (pending).
1. Zhen Huang and Jack W. Szostak, Title: "A Simple and Efficient Method to Label and Modify 3'-Termini of RNA Using DNA Polymerase and a Synthetic Template with Defined Overhung Nucleotides", **2001**, US Patent, US 6,238,865.

## VI. PDB X-ray crystal Structure Deposition:

9. Jia Sheng, **Zhen Huang\***, "Crystal Structure of Tellurium Derivatized DNA, G(dU<sub>Se</sub>)G(<sup>5-Se</sup>dU)ACAC at 1.40 Å Resolution", **2008**, PDB ID: 3FA1.
8. Jiansheng Jiang, Jia Sheng, Abodalla E.A. Hassan, **Zhen Huang\***, "Structure of DNA Octamer G(dU<sub>Se</sub>)G(<sup>5-Se</sup>dU)ACAC at 1.50 Å Resolution", **2007**, PDB ID: 3BM0.
7. Jiansheng Jiang, Oksana Gerlits, **Zhen Huang\***, "Ternary Structure of Se-DNA/RNA/RNase H, at 1.80 Å Resolution", **2007**, PDB ID: 2R7Y.
6. Jiansheng Jiang, Jia Sheng, **Zhen Huang\***, "Structure of DNA Octamer G(dU<sub>Se</sub>)G(<sup>Se</sup>T)ACAC at 1.50 Å Resolution", November, **2006**, PDB ID: 2NSK.
5. Jiansheng Jiang, Jia Sheng, **Zhen Huang\***, "Structure of DNA Octamer G(T<sub>Se</sub>)GTACAC at 1.40 Å Resolution", July, **2006**, PDB ID: 2HC7.
4. Jiansheng Jiang, **Zhen Huang\***, "Structure of DNA Octamer G(dU<sub>Se</sub>)G(dU<sub>Br</sub>)ACAC at 1.50 Å Resolution", May, **2006**, PDB ID: 2DLJ.
3. Jiansheng Jiang, **Zhen Huang\***, "Structure of DNA Octamer G(dU<sub>Se</sub>)G(dU<sub>Br</sub>)ACAC Binding to Ba Cation at 1.60 Å Resolution", May, **2006**, PDB ID: 2GPX.
2. Jiansheng Jiang, Jia Sheng, **Zhen Huang\***, "Structure of DNA Octamer GTG(dU<sub>Br</sub>)ACAC at 1.80 Å Resolution", May, **2006**, PDB ID: 2H05.
1. **Zhen Huang\***, Nicolas Carrasco, Jiansheng Jiang, "Structure of DNA Octamer G(dU<sub>Se</sub>)GTACAC at 1.28 Å Resolution", April, **2006**, PDB ID: 1Z7I.

## VII. Research Supports as PI (approximately \$3.8 million in total research grants, including ongoing and completed research supports; the collaborative and equipment fundings are not included here)

8. Project Title: "Atom-specific Selenium Derivatization of Nucleic Acids for Crystallization and Structure Studies"  
Type: Research Award (MCB-0824837) funded by National Science Foundation  
Total Award: \$980,000 (12/01/2008-11/30/2013, including supplement) as Principal Investigator
7. Project Title: "Distinguished Cancer Clinicians and Scientists Program of Georgia Cancer Coalition"  
Type: Research Award from Georgia Cancer Coalition  
Total Award: \$500,000 (direct cost, 09/01/2008-08/31/2013) as Principal Investigator
6. Project Title: "New Paradigm of Nucleic Acids Engineered with Selenium"  
Type: Research Award (CHE-0750235) funded by National Science Foundation  
Total Award: \$570,000 (09/01/2008-08/31/2011, including supplement) as Principal Investigator
5. Project Title: "*Bacillus anthracis* Detection with RNA Microchip",  
Type: Research Award (AI058051), National Institute of Allergy and Infectious Diseases

- Total Award: \$398,700 (07/01/2005-06/30/2009, NIH, NIAID) as Principal Investigator
4. Project Title: "Systematic Derivatization of Nucleic Acids with Selenium for X-ray Crystallography"  
 Type: Research Award (NSF, MCB-0517092), National Science Foundation  
 Total Award: \$510,000 (12/01/2005-11/30/2008, including supplement) as Principal Investigator
3. Project Title: "Se-Derivatization of Functional RNAs for Structure Study"  
 Type: Research Award (GM069703), National Institutes of General Medical Sciences  
 Total Award: \$217,000 (1/01/2004-12/31/2006, NIH, NIGMS) as Principal Investigator
2. Project Title: "Direct Quantification of Gene Expression"  
 Type: Research Award (external), New Research Dimension, Inc.  
 Total Award: \$200,000 (10/31/1999-11/1/2002, NRD) Principal Investigator
1. Other 11 smaller grants, as Principal Investigator, with a total of approximately \$400,000

### VIII. Professional Meeting and Presentation Activities:

1. Organizer or co-organizer of 18 international, national and local professional conferences since 2000 (including ACS symposia and CAPA symposia).
2. 72 Oral & poster presentations in international, national & local professional conferences since 1997 (including ACS meetings, Gordon Research Conferences, and Sina-US Chemistry Professors Conferences).
3. 76 invited colloquia and seminar research presentations in research universities and institutes since 1997

### IX. Services to Department, College, University and Professional Societies:

#### A. Chemistry Department Committees at Georgia State University:

Co-area Advisor of Organic Chemistry Division	2008 -
Committee Member of Admissions Committee	2007 -
Leading Organizer of Preparation of the Chemistry Safety Manual	2007 -
Departmental Equipment Grant Preparation (PI)	2006
Participation in Departmental External Evaluation	2006
The Organizer of In-state Graduate Student Recruiting Program	2006 -
Inviting Seminar Speakers for Departmental Seminar	2005 -
Participated in Faculty Recruitment	2005 -
Participated in Recruiting Graduate Students	2004 -
Recruiting Undergraduate Students to Scientific Research	2004 -
Thesis Committees for M.S. Students	2004 -
Dissertation Committees for Ph.D. Students	2004 -

#### B. Service at Brooklyn College:

Deputy Chair of Chemistry Department (Summer)	1999 - 2002
Safety Committee of the Department	1999 - 2003
Organization of Brooklyn College High School Chemistry Day	2000 - 2003
Co-PI of NSF Equipment Grant for NMR Equipment	2000, 2001
Co-PI of NSF Equipment Grant for X-ray diffractometer	2000, 2001
Co-PI of NSF Equipment Grant for Biochemistry Ph.D. Program	2001
Inviting Speakers for Departmental Seminars	1998 - 2004
Curriculum Committee of the Department	1999 - 2004
Equipment Committee of the Department	1999 - 2004
Open-house and Recruitment of Undergraduate Students	1999 - 2004
Recruitment of M.S. Students	1999 - 2004
Recruitment of Ph.D. Students	1999 - 2004
Thesis Committees for M.S. and Ph.D. Students	1999 - 2004
Faculty Advisor of the Pre-Medical Society	2000 - 2004
Faculty Advisor of Asian Student Union	2000 - 2004
Faculty Advisor for Biochemistry Student Club	2000 - 2004

#### C. Committee Responsibilities and Services to the College, University or System

GSU Radiation Safety Committee	2006 -
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GSU Chemical Safety Committee	2007 -
Leading Organizer of Nucleic Acid Club among George Universities	2007 -
Presentations and Promotion of GSU Research Programs	2004 -
Brooklyn College Committee on Admissions	2001 - 2003
Brooklyn College Radiation Safety Committee	2000 - 2004
Faculty Recognition Committee of the College	2000 - 2001
Brooklyn College Library Committee	2000 - 2002
Faculty Council Representative of the College	2002 - 2004
Research Committee of the CUNY	2002 - 2004

## **D. Contributions to Local, State, National, Or International Organizations**

### **A. Service to Professional Associations:**

Lead Organizer for Nucleic Acid Research Symposia, Pacificchem 2010, Chemical Society, to be hold in **2010** in Hawaii.

The Chinese-American Chemistry & Biological Chemistry Professors Associate (CAPA), board member, 2007 - present.

Chair of committee of the CAPA Distinguished Junior Faculty Award, 2007 - 2008.

Symposium Lead Organizer and Session Chair, the one-day symposium of Division of Professional Relations, 234<sup>th</sup> American Chemical Society (ACS) National Meeting, Aug. 19, **2007**, Boston, Massachusetts.

Organizing Symposium: "Proteins, Peptides, Amino Acids, and Enzyme Inhibitors", 231<sup>st</sup> ACS National Meeting, Organic Chemistry Division, March 30, **2006**, Atlanta, Georgia (Organizer and Session Chair).

Co-organizer of Sino-US Chemistry Professors Conference, China, 2005 - present.

Member of Board of Directors, ACS New York Section 2002 - 2004

Co-Chair of Younger Chemists Club (YCC), ACS New York 2002 - 2004  
(Organizing Workshop, Symposium and Other Activities for YCC)

Organizing Symposium: "Progresses of Chinese-American in Academia", 226th ACS National Meeting, Sep. 8, **2003**, New York (Lead Organizer and Symposium Chair).

## **E. Significant Community Participation**

- Judge of Georgia Junior Science and Humanities Symposium, Feb. 2008
- Judge of Science and Engineering Event, 2003
- Lead Organizer, Brooklyn High School Chemistry Day and Annual Friedman Lecture (2000-2003)
- Public Lecture in Faculty Day at Brooklyn College, May 21, 2003

## **F. Meritorious Public Service**

### **A. Reviewer for Granting or Awarding Agency (last 5-years only)**

I have reviewed over 40 proposals for granting and awarding agencies, including National Science Foundation, Ohio Cancer Research Association, Dolphin Awards at CUNY, WISC Program, Austrian Science Fund (FWF), American Chemical Society Petroleum Research Fund.

### **B. Referee for Scholarly Journals (last 5-years only)**

I have reviewed over 70 manuscripts for scholarly journals, including Journal of American Chemical Society, Analytical Biochemistry, Journal of Organic Chemistry, Organic Letter, Biochemistry, Angewandte Chemie, Bioorganic & Medicinal Chemistry Letters, Advanced Synthesis & Catalysis, Rapid Communications in Mass Spectrometry, ChemBioChem, Journal of Photochemistry and Photobiology B: Biology, and Journal Bioorganic and Medicinal Chemistry.