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EDUCATION

YALE UNIVERSITY New Haven, CT
Postdoctoral Fellow 1988-1991
Research Topic: NMR of 5S Ribosomal RNA Fragments
Postdoctoral Fellowship--American Cancer Society. (7/88-6/90)

THE JOHNS HOPKINS UNIVERSITY Baltimore, MD
Ph.D. in Chemistry 1988
M.A. in Chemistry 1984
Dissertation Research: "Single Base Bulges in Small RNA Hairpins Can Enhance Intercalation of Ethidium"
Dissertation Fellowship--American Association of University Women. (7/86-6/87)
Ada Sinz Hill Fellowship--awarded by the Chemistry Dept. at JHU (6/83-6/86)
Roseman Award--Chemistry Department at JHU (1987)

DARTMOUTH COLLEGE Hanover, NH
A.B. in Chemistry (cum laude) 1977

PROFESSIONAL APPOINTMENTS

Bryn Mawr College Bryn Mawr, PA
Chair, Department of Chemistry 1999-2005, 2007-9/2005-
Full Professor 9/2005-
Associate Professor of Chemistry 1998-2005
Assistant Professor of Chemistry 1991-1998
Teaching Responsibilities in General Chemistry and Biochemistry

Visiting Research Scientist, The Scripps Research Institute 1998
Visiting Scientist, NIAID, National Institutes of Health Fall 2002
Visiting Professor, Université de Lomé, Faculté des Sciences Spring 2003

Chemist--U. S. Environmental Protection Agency (1977-1978).
Volunteer--U. S. Peace Corps, Togo, West Africa. Chemistry and Physics Teacher (1978-1981).
Trainer of new Peace Corps Volunteers, Togo, West Africa (1981, 1982).

CURRENT RESEARCH

Characterization of a biologically important RNA-protein interaction using biochemical, molecular biological, biophysical, and thermodynamic methods. The system is the yeast

L30e ribosomal protein which binds to its own RNA transcript and inhibits splicing. We are interested in characterizing the RNA and protein features which contribute to this molecular recognition event.

SUPPORTED RESEARCH

PA. State Tobacco Settlement Award *Bending the K-Turn RNA Motif*, Jan. – Dec. 2007, \$10,000

Visiting Scientist Award—(ICSU-TWAS-UNESCO)—Jan. 2004 in Molecular Biology at the Université de Lomé. Refunded Dec. 2005-Jan. 2006.

The Women's International Science Collaboration Program (WISC funded by AAAS/NSF) –“ Isolation and Characterization of an Anti-Fungal Plant Metabolite from Togo” (with Professor Koffi Tozo, Université de Lomé) Spring, 2003 \$5000.

Andrew W. Mellon New Directions Fellowships for Teachers-Scholars--"Malaria and Plant Biochemistry in the Laboratory and Classroom" (Sabbatical Support 2002-3). Additional support from the Marion Bridgman Slusser Fund for the Sciences.

National Institutes of Health-AREA Grant 6/2001-2004. "The L30 Complex: Protein Mutagenesis and RNA Bending" (\$142,000/3 years).

National Science Foundation -- MUE (Multi-User Equipment) Acquisition of a circular dichroism spectropolarimeter. 1998 (PI Rob Fairman, Haverford College Biology Dept., Co-PIs Julio DePaula, Haverford Chemistry, Karin Akerfeldt, Haverford Biology, Susan White)

National Science Foundation -CAREER Grant 6/96-5/01. "Dissection of an RNA Protein Interaction Involved in Repression of Splicing" (\$280,000/5 yrs, No-cost extension for 2 years).

National Science Foundation-POWRE Grant 1/98-12/98. "Dissecting an RNA-Protein Interaction" (\$52,885/1 yr)

PROPOSALS NOT FUNDED

The L30e Protein and the Kink-Turn RNA Structural Motif—submitted to NIH AREA (R15) May, 2004

A Kink-Turn RNA Regulatory Motif—submitted to NSF July, 2005.

PUBLICATIONS

1. Kean, J., White, S., and Draper, D. (1985) Detection of High-Affinity Intercalator Sites in a Ribosomal RNA Fragment by the Affinity Cleavage Intercalator Methidiumpropyl-EDTA-Iron(II). *Biochemistry*, **24**, 5062-5070.
2. White, S. and Draper, D. (1987) Single Base Bulges in Small RNA Hairpins Enhance Ethidium Binding and Promote an Allosteric Transition. *Nucleic Acids Research*, **15**, 4049-4063.

3. Draper, D., White, S., and Kean, J. (1988) Preparation of Specific rRNA Fragments. *Methods in Enzymology: Ribosomes*, **164**, Noller, H.F., Moldave, K. eds. (Academic Press, San Diego) 221-237.
4. White, S. and Draper, D. (1989) Effects of Single-Base Bulges on Intercalator Binding to Small RNA and DNA Hairpins and a Ribosomal RNA Fragment. *Biochemistry*, **28**, 1892-1897.
5. Szewczak, A. A., White, S. A., Gewirth, D. T., and Moore, P. B. (1990) On the Use of T7 RNA Polymerase Transcripts for Physical Investigation. *Nucleic Acids Research*, **18**, 4139-4142.
6. White, S. A., Huang, A., Nilges, M., Brünger, A. T., and Moore, P. B. (1992) An NMR Analysis of Helix I from the 5S RNA of *Escherichia coli* , *Biochemistry*, **31**, 1610-1621. Coordinates deposited in Brookhaven National Laboratory Protein Data Base June 23, 1993 as 1ELH. Structure appears in *Biochemistry*, 2nd edition (1995), Voet and Voet, p. 985.
7. White, S. A., Li, H., and Rauch, M. A., (1995) Thermodynamic and Mutational Analysis of an RNA Purine Loop Protein Binding Site , *Journal of Biomolecular Structure and Dynamics*, **13**, 285-299. (Cited 9 times June, 2010)
8. Li, H., Dalal, S., Kohler, J., Vilardell, J., and White, S. A., (1995) Characterization of the pre-mRNA Binding Site for Yeast Ribosomal Protein L32: The Importance of a Purine-Rich Internal Loop, *Journal of Molecular Biology*, **250** (4), 447-459. (Cited 26 times June, 2010)
9. Susan A. White and Hu Li, (1995) Specificity of Binding of *Saccharomyces cerevisiae* Ribosomal Protein L32 to Model RNAs, *Symposia on RNA Biology: I. RNA-Protein Interactions* held Oct. 1995 at Research Triangle Park, NC and published in *Nucleic Acids Symposium Series No. 33* pp. 11-12.
10. Susan A. White and Hu Li, (1996) Yeast Ribosomal Protein L32 Recognizes an RNA G:U Juxtaposition, *RNA*, **2**, 226-234. (Cited 16 times, June, 2010)
11. Hu Li and Susan A. White, (1997) RNA Aptamers for Yeast Ribosomal Protein L32 have a Conserved Purine-rich Internal Loop, *RNA*, **3**, 245-254. (Cited 16 times June, 2010)
12. Hongyuan Mao, Susan A. White, and James R. Williamson (1999), "Structure of the Yeast RPL30-autoregulatory RNA Complex Revealing a Novel Loop-loop Recognition Motif", *Nature Structure Biology*, **6**, 1139-1147. (Cited 84 times June, 2010)
13. Susan A. White, Valerie Shipilov, Hongyuan Mao, and James R. Williamson, (1999), Identifying critical residues at the yeast ribosomal protein L30 RNA interface, *Symposia on RNA Biology III. RNA, Tool and Target* held Oct. 1999 at Research Triangle Park, NC and published in *Nucleic Acids Symposium Series No. 41* pp. 4-7.
14. Valerie Shipilov and Susan A. White (2000) "A Conserved Asparagine Makes an Essential Contact to an RNA Adenosine or Cytidine", *Journal of Biomolecular Structure and Dynamics*, *Conversation* **11**, 75-79.

15. Chao JA, Prasad GS, White SA, Stout CD, Williamson JR (2003). "Inherent protein structural flexibility at the RNA-binding interface of L30e" *J Mol Biol.* **326**, 999-1004. (Cited 16 times, June 2010).
16. Susan A. White, Margaret Hoeger, James J. Schweppe, Amanda Shillingford, Valerie Shipilov, and Jennifer Zarutskie, (2004) "Internal Loop Mutations in the Ribosomal Protein L30 Binding Site of the Yeast L30 RNA Transcript" *RNA*, **10**, 369-377. (Cited 9 times June, 2010)
17. Susan A. White, Book Review on Gene Cloning Principles and Applications, *BAMBED* **36**, 170 (2008).
18. James J. Schweppe , Chaitanya Jain, and Susan A. White (2009) Compensatory Mutations in the L30e Kink-Turn RNA-Protein Complex, *Biochimica et Biophysica Acta (BBA)- Gene Regulatory Mechanisms*, **1789**, 469-476.
19. Adam Cassano, Pamela Higgins, Bruce Heyden, and Susan White, "Higher Order Structure of Nucleic Acids", Section 17, pp. 67-70 in Foundations of Biochemistry by Jennifer Loertscher and Vicky Minderhout, 1st edition, published by Pacific Crest, 2009. (2nd edition Section 18).

(all peer-reviewed except #3, #9, #13, #14, #17, #19)

RECENT ABSTRACTS

11. Susan A. White and Valerie Shipilov, "Mutating Residues at the RNA-Protein Interface: The Yeast Ribosomal L30 System", Talk presented at the Eleventh Conversation in Biomolecular Structure and Dynamics and abstract published in *J. Biomolecular Structure and Dynamics*, **16**, p. 1362. June 1999.

RECENT POSTERS PRESENTED

White, S., Hoeger, M., Olofsson, B., and Shipilov, V., "Probing the RNA Binding Site for Yeast Ribosomal Protein L32" Presented at Proteins that Bind RNA in Avalon, NJ, May 3-8, 1998 and Biopolymers Gordon Conference, Newport, RI, June, 1998.

Susan White, "Biochemistry of RNA-Protein Interactions: Teaching and Research" presented at NSF CAREER grant awardees conference, Washington, D. C., Jan. 10-12, 1999.

Susan A. White and Valerie Shipilov "An RNA-Protein Interaction: The L30 Autoregulatory System in Yeast" presented at the Biopolymers Gordon Conference in Newport RI, July 1999.

Student Posters presented at St. Joseph's University/ Sigma Xi Meeting, April 28, 2000.

With Fanta Ceesay "The Effect of Hydrogen Bonding and Base Stacking on the Binding Affinity of L30 Protein to RNA"

With Daria Babushok "RNA-Protein Interactions: Configurational Changes in the Internal Loop of L30 RNA upon Binding L30 Protein"

With Mimi Lin " The Binding Affinity of the L30 Yeast upon the S29A Protein Mutation"

Koffi Tozo and Susan White "Clonage du gène de la protéine ribosomale rpl30 dans 2 vecteurs d'expression" presented at the 2ème Journées Scientifiques de Lomé du 27 au 31 Mai 2002.

Susan White, Valerie Shipilov, Cheryl Selah, James Schweppe, Esi Nkyekyer "Exploring an RNA: Protein Interaction: Mutating the Yeast L30 RNA and Protein" presented at the Biopolymers Gordon Conference, Newport, RI, June, 2002.

Susan White, Cheryl Selah, James Schweppe, Marla McConnell "Mutational Analysis of the L30e RNA-Protein Interaction " presented at the Biopolymers Gordon Conference, Newport, RI, June, 2004.

RECENT INVITED TALKS

“Why is an RNA Internal Loop Attractive for Protein Binding?: The Yeast L32 System”, Philadelphia Area Nucleic Acids Group, Thomas Jefferson University, 9/97.

Chemistry Department, The Johns Hopkins University, Baltimore, MD, 9/97.

“Why is an RNA Internal Loop Attractive for Protein Binding?: The Yeast L32 System” University of Connecticut Medical School, April, 1998.

"Delving into an RNA-Protein Interface" Department of Molecular Biology and Biochemistry, Wesleyan University, Middletown, CT. 3/99.

"Bending Backwards for RNA", HHMI summer program, Bryn Mawr College, 6/99.

"Exploring an RNA-Protein Interaction" Chemistry Dept., Haverford College, 9/99, Bryn Mawr College, 10/99.

"Exploring an RNA-Protein Interface" Department of Biochemistry and Molecular Biophysics, Columbia University, College of Physicians and Surgeons, 5/00.

“An RNA Odyssey” COURS Keynote Speaker—Central Ohio Undergraduate Research Symposium hosted by The Chemistry Department of Kenyon College, 11/01.

“Biochemistry that Matters: Malaria and Medicinal Plants” Mellon New Directions Fellows Conference, Wellesley College, June, 2002.

“Intérahions ARN/Protéines” Laboratoire de Biochimie et de Biologie Moléculaire, FAST, Université d'Abomey Calavi, Benin, West Africa, 2/2003

“Intérahions ARN/Protéines et Biologie Moléculaire” Laboratoire de Physiologie Animale, Faculté des Sciences, Université de Lomé, Togo, West Africa, 5/2003

“Ribosomal Protein L30: From Yeast to Malaria (and back)” Chemistry Department Colloquium, February 27, 2004

“Protein-RNA Recognition: Yeast Ribosomal Protein L30e Suppressors and Kink-turn RNA Mutants” Susan White, Jim Schweppe, and Cheryl Selah Talk and Poster presented at the 14th Conversation, Albany June, 2005 J. Biomol. Struc. Dyn. **22**(6) p. 831.

“Kink-turn RNA Mutants and Yeast Ribosomal Protein L30e Suppressors” Susan A. White, James J. Schweppe, and Cheryl Selah, Marisha Banerji, and Natalee Smith. Symposium on RNA Biology VI: RNA: Tool and Target, Oct. 2005. Talk presented in North Carolina.

“The Yeast L30 Kink Turn RNA-Protein Interaction” Susan A. White, James Schweppe , and Cheryl Selah. Talk and poster presented in San Francisco, CA, April, 2006 Experimental Biology. Abstract published in FASEB J. 20: A932-b.

“Kinky RNA and Flexible Protein: Neither Lock nor Key” October, 2005, Chemistry Department, Ursinus College, Collegeville, PA.

“Kinky RNA and Flexible Protein: Neither Lock nor Key” April , 2006, Chemistry Department, St. Joseph’s University, Philadelphia, PA.

“Curriculum Implementation in the Sciences A Student-Centered Approach: The New ACS General Chemistry Text”—March, 2006 Math Science Partnership of Greater Philadelphia, meeting held at Bryn Mawr. Again—Fall 2006 Ridley High School.

“Catalyzing, Knocking Down, and Kinking: Views from the RNA World” Main Line School Night” April, 2007.

Faculty Panel on Martin Luther King Day, Bryn Mawr College, 1/21/2008.

“From Molecular Biology to NGOs in Togo” International Civic Engagement: NGOs in the Global South, Bryn Mawr College, 1/31/2008

“From Peace Corps Togo to Bryn Mawr College” Talk given to “Dinner with a Stranger” sponsored by International Justice Coalition, a student-led group, May, 2009.

RECENT PROFESSIONAL ACTIVITIES

Panelist for NSF Major Research Instrumentation May, 2002, Washington DC

Participated in 3-day review of Bates College Chemistry Department, Feb. 2002

Editorial Board BAMBED (Biochemistry and Molecular Biology Education) 2006-present—
Review about one article per month.

Question Writer and Reviewer for Biochemistry GRE, ETS, Spring 2007, Spring 2008, Spring 2009

Outside Examiner, Chemistry Department, Swarthmore College, May, 2008

Participant, NSF-funded POGIL Biochemistry Summer Workshop, Seattle, WA July 10-13, 2008 and Minneapolis, MN, July 7-11, 2009

Participant, Teaching Learning Initiative Workshops, Spring, 2009

RECENT BRYN MAWR COMMITTEE MEMBERSHIPS

Graduate Council (1996-9).

Independent Majors (1999-2002)

Chaired Searches for two tenure-track chemists (2000)

Convener of Science Chairs (1999-2001)

Elected Faculty Representative to Board of Trustees (Fall 2001-4)

Steering Group for Science in Society and Keck Postdoctoral Fellow Program (2000-5)

Member of Committee in an Appeal of Non-Tenure, March, 2002.

Member of the Curriculum Committee 2003-2005

Member of Ad Hoc Faculty Survey Committee, Spring 2004

Elected Member of Committee on Academic Priorities 2005-2006

Graduate Council Fall 2006

Elected to Committee on Nominations Fall 2007-2010
Organized and Convened Mellon Group on Africana Studies 2008-9
Assistant Organizer of Tri-Co Mellon Group to discuss Chemistry Curricula 2008-9
Member of Globalization Curriculum Subcommittee, Fall 2009
Chair of the Committee on Nominations, 2009-2010
Member of Advisory Group Convened by Chair of the Faculty, 2009-2010
Member of Quantitative Reasoning Group convened by the Provost, Spring 2010
Elected to Committee on Undergraduate Curriculum 2010-2013

Research Supervision

Undergraduate Chemistry Majors (Post-graduate position)

Ashton Shaffer ('11)

Natalia Mavrogiannis ('11)

Mithila Rajagopal (MA and AB 2010 with Honors '10) Effects of Mg^{2+} Ions on the Kink-Turn Motif of RNA –An Exploration of Biophysical Methods (graduate student, Harvard University)

Amber Moore ('09) “Thermal Denaturation: an investigation of a biophysical assay for distinguishing between kink-turn and non-kink turn RNA. (internships Swaziland and NIH)

Katie Eichhorn '07 “ Specific Contributions to Kink-Turn Stabilization: A Thermodynamic Approach” (graduate student, University of Michigan).

Shauna Bennett '07 “Electrophoretic studies of the L30e RNA kink-turn motif and its variants” (Internship Program at The National Institutes of Health, Graduate Student , U. Michigan)

Marisha Banerji '06 “Thermodynamic Properties of L30e RNA secondary structure motifs” (graduate student, University of Connecticut)

Marla McConnell '04 “Investigations of the Interactions of *S. cerevisiae* and *T. celer* Ribosomal L30 Protein with the Yeast RNA Transcript, Using Filter Binding, Band Shift, and Fluorescence Assays” (graduate student in Materials Science at UPenn, Ph. D. 2010).

Sarah Ledoux '03 “Determining the Binding Constants of a Serine to Alanine Mutant *Saccharomyces cerevisiae* and Wild Type *Thermococcus celer* L30 Protein to Model RNA” (Graduate School Northwestern University PhD 2009, PostDoc UCSF-Chris Guthrie)

Sharrine Wittkopp '01 Honors Thesis & ACS Award Winner to Senior Chemist "Purifying the L30 Protein and Examining an L30 Mutant, K28A"(Glaxo Smith-Kline)

Angela Gupta '01 "The Production and Purification of the L30-E57D, and the Binding to its RNA" (Technician Merck then Med School Temple U.)

Mimi Lin '00 The Binding Affinity of the L30 Yeast upon the S29A Protein Mutation" (Technician NIH)

Fanta Ceesay '00 "The Effect of Hydrogen Bonding and Base Stacking on the Binding Affinity of L30 Protein to RNA"

Ginger Stringer '00 "Polyacrylamide Coelectrophoresis (PACE) Analysis of RNA-Protein Interactions"

Daria Babushok '00 Marshall Fellow, Honors Thesis, ACS Award to Senior Chemist
"RNA-Protein Interactions: Configurational Changes in the Internal Loop of L30 RNA upon Binding L30 Protein" (MD/Ph. D. UPenn)

Beatrix Olofsson '98 (Medical School--Allegheny)
"The Regulation of Splicing in Yeast Ribosomal Protein L32: Searching for a Termolecular Complex" & "An Investigation of rRNA Interactions with the Ribosomal Protein L32"

David Zebian '98 (Temple Medical School)

Shannon Blaney '98 (Tulane Public Health, Peace Corps)

Giao Le ('03) (Lab Technician Temple U then Med. School Ireland)

Esi Nyekyer ('03) (Lab Technician Thomas Jefferson then Yale Med School)

Jennifer Treweek ('03)

Jami Fukui ('04)

Layla Abdulhay ('04)

Natalee Smith ('08) (Graduate School in Chemistry, U. of Delaware)

Julia Lewis ('09) and Mithila Rajogolapan ('10)

Ashton Shaffer ('11) and Clarah Lelei ('12)

Elena Brunner, ('13)

Ali Raeber ('14)

Graduate Students (Post-graduate position)

Cheryl Selah

M. A. Thesis Fall, 2001 "Characterization of *Saccharomyces cerevisiae* Ribosomal Protein L30 through Mutational Analysis"

Ph. D Thesis May 2007 "The Further Characterization Of *Saccharomyces cerevisiae* Ribosomal Protein L30 and its Interaction With The *RPL30* Transcript through Mutational Analysis, Circular Dichroism, and Fluorescence Methods"

Jim Schweppe

M. A. May, 2001

Ph. D. Dec. 2005 "Characterization of the *Saccharomyces cerevisiae* ribosomal protein L30 using an in vivo two-plasmid genetic screen"

Margaret Hoeger (Teaching Chemistry and Biology, American School, Frankfurt Germany)

M. A. Thesis October 1998

"Probing the Internal Loop of the L30 Transcript Using CMCT and DMS on a Mimic of the Transcript JZ-74"

Hu Li (Associate Scientist--Smith-Kline Beecham)

Ph. D. May, 1996 "An RNA-Protein Interaction: Binding of Model RNAs and High-Affinity Ligands to Yeast Ribosomal Protein L32"

M. A. Thesis May 1993 "Synthesis and Characterization of Mini-L32 RNA"

Ian Brooks

Ph. D. May 1996

"A Biophysical Characterization of the Ribosomal Protein L32 and its Interaction with a Shortened Form of its m-RNA, MiniL32"

Rosemary Puplampu M. A. Thesis (May 1993)

"*In vitro* Production Mu-1 mom mRNA Transcripts from Linear JM105[pLW9Apr DNA and the Overproduction, Overexpression, Isolation and Purification of the Mu-1 com protein from C600 [pLW40] Ap^r [pcI850]Km^r".

Anthony Bevivino (Supervised Biology Research-1992) (U. Penn. Ph.D program)