BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
SUSAN ADAMS WHITE	Professor
eRA COMMONS USER NAME (credential, e.g., agency login) sadamswhite	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
Dartmouth College, Hanover, NH	AB	06/77	Chemistry
The Johns Hopkins University, Baltimore, MD	MA	05/84	Chemistry
The Johns Hopkins University, Baltimore, MD	Ph.D	05/88	Chemistry
Yale University	postdoctoral	05/88-08/91	Chemistry

Please refer to the application instructions in order to complete sections A, B, C, and D of the Biographical Sketch.

A. Personal Statement

Research Experience

Starting in the early 1990s, my laboratory has focused on characterizing the interactions between ribosomal protein L30 from yeast, L30e, and its messenger RNA. Using T7 RNA polymerase run-off transcripts, we found that the L30 binding site could be made as small as 36 nucleotides. Structure mapping experiments confirmed the stem-loop-stem structure, but indicated that the 2+5 loop was not completely unstructured. Interestingly, thermodynamic experiments showed that the purine-rich wild type loop destabilized the L30 RNA compared to a base-paired control, but the denaturing transition was much more cooperative than that of other loops. In two papers, we explored the internal loop RNA sequence requirements for protein binding and found that the two GA juxtapositions were necessary and limited variability was tolerated at other positions. During a sabbatical with Dr. Jamie Williamson at the TSRI, I made numerous protein mutations and screened them for RNA binding. Shortly afterwards, we published the NMR structure of the L30 RNA-protein complex that showed protein binding centered on a severely kinked RNA. At this time, high-resolution ribosome structures revealed similarly kinked RNA structures bound to proteins. These kinked ribosomal RNAs shared some sequences similarities with the L30 RNA and suggested that the tandem GA pairs were stacked on to the end of one helix, termed the non-canonical helix. At the end of my TSRI sabbatical, I grew some L30 protein crystals that were the starting point for a paper on the flexibility of the L30 protein's RNA binding interface. Back at Bryn Mawr College, I continued work on protein mutants, but that work developed slowly. With graduate student Jim Schweppe and in collaboration with Dr. Chaitanya Jain at the University of Miami, we developed a bacterial screen to find L30 protein mutations that compensate for L30 RNA mutations with weakened wild type L30 protein binding.

During the last several years, my laboratory has become interested in the magnesium-induced transition between "open" and kinked L30 RNA structures. To this end, we have cloned the L30 Kink turn sequence into a P4-P6 Group I Intron construct developed by Inoue and shown that the hydrodynamic mobility of such constructs depends on the presence of magnesium ions and the kink turn sequence. We entered into a collaboration

with Dr. Mike Fried, University of Kentucky who ran preliminary sedimentation velocity experiments and Dr. Rob Fairman at Haverford College whose technician has repeated and extended this initial observation.

Unfortunately, the last several years have not been as scientifically productive as I would have liked for two reasons. My term as Chair has lasted the better part of 10 years and during this time my teaching duties were decreased marginally to 2 courses each semester. Secondly, the immigration of my husband and his children from Africa, and their various health problems, demanded much of my attention. I plan to spend the summer and fall of my 2011 sabbatical in the laboratory of Dr. Eric Wickstrom, at Thomas Jefferson University and I no longer be Chair of Chemistry on my return to Bryn Mawr College. If all goes well, I will also have a sabbatical semester to spend at TJU during the final year of my grant.

Supervision of Students

Bryn Mawr College enrolls 1300 young women as undergraduates and many of these are interested in studying science. Typically, the department graduates about 15 chemistry majors per year and most of these students conduct at least one year of independent research. My laboratory generally attracts several students each academic year and during the summer, some are supported by College stipends. A generous gift from an alumna has made it possible for students to start research after their freshman year, but we will soon exhaust these funds. A portion of the budget request will be stipend support for undergraduate research. Recent graduates from my laboratory often attend graduate school or work as laboratory technicians before continuing their education. The three most recent graduates are attending Harvard University Mithila Rajagopal in Dr. Dan Kahne's Laboratory) and the University of Michigan (Catharine Eichhorn, in Dr. Hashim Al-Hashimi's Laboratory and Shauna Bennett, in Dr. Michael Imperiale's Laboratory). During my career at Bryn Mawr, I have supervised 47 undergraduates and 8 graduate students in my laboratory.

Bryn Mawr College also enrolls about 10 students in our Chemistry graduate program and most of these students earn Ph.Ds. Baskim Kokona has recently enrolled in our program and has elected to do research in my laboratory. He has a wealth of biophysical and protein experience acquired as a research assistant in the laboratory of Professor Rob Fairman at Haverford College. I generally find that young undergraduates can best start preparing DNAs, RNAs, and proteins and then work with more senior undergraduate, graduate students, or myself doing biophysical experiments. Extremely motivated undergraduates eventually learn to do their experiments independently. Bash has already successfully worked with two of my undergraduates to produce the preliminary sedimentation data. Support for a graduate stipend is included in the budget. Typically, new students start with a summer boot camp, where I work very closely with them on basic techniques such as bacterial growth, protein purification, and gel electrophoresis. We hold weekly meetings to discuss laboratory results and journal articles related to RNA. Students work on oral presentation skills during group meetings, and participate in seminars about ethics and science careers. They also present posters in an annual science wide poster session. We take advantage of our scientifically rich Philadelphia location by participating in poster sessions at Haverford, St. Joe's, Temple, or Thomas Jefferson University. Graduate students are encouraged to present their work in local and regional meetings and publication in peer-reviewed journals before graduation is expected.

B. Positions and Honors

Positions

Bryn Mawr College — Bryn Mawr, PA
Chair, Department of Chemistry — 1999-2005, 2007-2011
Full Professor — 9/2005-present
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
Visiting Scientist, Thomas Jefferson University, Biochemistry Dept. — 6/11-12/11

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).

Honors

DARTMOUTH COLLEGE A.B. in Chemistry (cum laude)

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)

Postdoctoral Fellowship--American Cancer Society. (7/88-6/90)

National Science Foundation Research Opportunities for Women--Research Planning Grant 1/92. "Structural Study of an RNA-Protein Interaction: The Mom mRNA-Com Protein System" ($18,000/18 months)

National Institutes of Health-AREA Grant 6/1993-1996. "Biophysical Study of a Regulatory RNA Purine-Rich Loop" ($91,000/3 years).

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

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

Andrew W. Mellon New Directions Fellowships for Teachers-Scholars--"Malaria and Plant Biochemistry in the Laboratory and Classroom" (Sabbatical Support 2002-2003). Additional support from the Marion Bridgman Slusser Fund for the Sciences.

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.

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

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

AAAS Fellowship Finalist—April, 2011

C. Selected Peer-reviewed Publications (chronological order)

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. PMID: 8579788

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. PMID: 7616567

Susan A. White and Hu Li, (1996) Yeast Ribosomal Protein L32 Recognizes an RNA G:U Juxtaposition, RNA, **2**, 226-234. PMID: 8608446.

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. PMID: 9056762.

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. PMID:10581556

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. PMID 12589748

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. PMID:14970382

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. PMCID: PMC2743985

D. Research Support

None in the last three years.