Double-Stranded RNA: The Enigmatic Helix

Brenda Bass
Distinguished Professor, Biochemistry

CURRENT RESEARCH

Recoding genetic information by RNA editing

An essential feature of living organisms is double-stranded DNA, the double-helical molecule that stores our genetic information. Despite the abundance of knowledge we have about the DNA double-helix, we know much less about another double-helix, double-stranded RNA (dsRNA). Dr. Brenda Bass, Distinguished Professor of Biochemistry at the University of Utah School of Medicine, has spent most of her career uncovering the functions of this enigmatic molecule.

Viruses have long been known to produce dsRNA, and when dsRNA binding proteins (dsRBPs) in our bodies bind viral dsRNA they send an SOS that initiates an immune response to fight the infection. For many years it was thought that animals, including humans, did not make their own dsRNA. However, over the past 15 years Dr. Bass and her laboratory have discovered thousands of dsRNAs in many different cells, including those of the human brain and the small worm called *Caenorhabditis elegans*. The existence of this dsRNA raises two questions: What are the functions of dsRNA in our cells, and how do our cells tell the difference between our dsRNA and that from a virus? Research in Dr. Bass' laboratory revolves around these two questions.

Dr. Bass is motivated by discovery; she explains that she would "rather tackle a mystery that others have been unable to solve, than make a contribution to an established field." Therefore, by pursuing the unexpected in the hopes of expanding the boundaries of knowledge and creating new fields, Dr. Bass impacts society by enhancing the rate of scientific progress. Early in her career, as a graduate student, she discovered that certain RNA molecules, or ribozymes, could catalyze reactions using the same principle...

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AFFILIATION

University of Utah

EDUCATION

- B.A., in Chemistry, 1977 , Colorado College
- Ph.D., in Chemistry, 1985 , University of Colorado, Boulder

AWARDS

- Pew Scholars Award, 1990-1994
- David and Lucile Packard Fellowship, 1991-1996
- American Academy of Arts & Sciences (elected member, 2007 - present
- AAAS fellow (elected), 2011 - present
- National Academy of Sciences (elected member), 2015 - present

RESEARCH AREAS

Health & Wellness, Longevity, Immortality Research

FUNDING REQUEST

Your contributions will support the continued research of Dr. Brenda Bass, of the University of Utah School of Medicine, as she uncovers biological roles of double-stranded RNA. Donations will fund the necessary $26K/year required for each graduate student stipend, $36-50K/year required for each postdoctoral salary, $1000/person/month for lab supplies, and additional support will enable the purchase of equipment. Join in aiding the process of discovery to ensure that science makes strides in the basic biology that underlies life itself.