RNA Components Play Key Role in Gene Expression Process, Columbia Research Shows

By Suzanne Trimel

Columbia researchers have demonstrated in the laboratory that messenger RNA splicing, part of the process by which genetic information is translated into proteins that make up human cells, begins with a reaction catalyzed by two RNA molecules. The finding adds critical support to the theory that RNA, alone and not the protein, drives this complex process that occurs in the nucleus of all cells.

Professor James L. Manley, a molecular biologist and the J.C. Levis Professor of Life Sciences at Columbia, and Saba Valadkhan, a doctoral candidate in Manley’s laboratory, discovered that a protein-free complex of just two of the RNA components of the “spliceosome,” a massive and dynamic assembly of five small nuclear RNA molecules and more than 50 proteins, catalyzes a reaction that is closely related to the first catalytic step of splicing. This reaction involves U2 and U6, two of the five RNA molecules in the spliceosome.

To test the hypothesis, the researchers undertook a detailed analysis of the chemical and physical basis of the process – in experiments in Manley’s laboratory. The findings were reported on Oct. 18 in Nature magazine.

In the published experiment, the researchers performed the reaction in living cells. They recorded images of the reactions and analyzed the RNA molecules involved in the process. They also showed how the spliceosomes act on real RNA, instead of artificial RNA molecules.

“This is the first time that anyone has shown how real RNA molecules and more than 50 proteins catalyze a reaction that is closely related to the first catalytic step of splicing,” Manley said.

The researchers have been at the center of the Columbia fundraising campaign for a real-world nonprofit organization will be one of the most important areas the fundraising professionals are relatable to. This next step in the fundraising management program is offered through Continuing Education. Pictured are Frank Wolf, dean of Continuing Education, and Daphne Estwick, an assistant dean of Columbia University. The new fundraising management program starts Jan. 22 and includes a total of six eight-week courses. These evening classes are held on Monday or Tuesday, from 6:10 p.m. to 9:00 p.m. Students are expected to take one or more of the courses per session, and may register on or before Jan. 22.

Instructors include high-ranking fundraising professionals from such nonprofit organizations as the Metropolitan Museum of Art, New York Historical Society, Children’s Hospital Foundation at Westchester Medical Center, the Museum of Modern Art as well as professionals from the consulting firms of Myerberg Shaw & Associates and Levy Philanthropic Counsel.

The increased demand for highly skilled development professionals may also be due to the fact that there are more nonprofits now than 10 years ago, said Levy. For example, the New York Business Report stated that the number of nonprofits in New York City alone has jumped from 19,500 in 1990 to approximately 30,000, 2001. Immediately following 9/11, many nonprofits reportedly feared they would have to reduce or cancel scheduled fundraising events. Individual and corporate donors were mostly funneling money into 9/11 funds, especially large donations from agencies like the Red Cross and Salvation Army. But in the closing weeks of 2001, new fundraising efforts appeared to be turning around. During recent gala events, WNYC public radio, the New York Hall of Science and the Metropolitan Museum of Art surpassed fundraising goals. Whether the change is due to the economic improvement in the stock market or whether people are now more in the giving “mode,” charitable giving seems to be on the rise.

“In the past six months, there has been a huge burst, but that will come back,” said Levy. “People are giving money. It’s been written about more, spoken about more — it’s the ‘in thing to do.’

Students can tailor their course of study to fit their personal and professional needs. For instance, an individual working in annual giving who wants to change to planned giving can adjust his or her own course schedule accordingly. Students in the course “Fundraising: The Art of Fundraising” and “Philanthropy: The Science of Money” both need to take courses from experienced fundraisers to those with experience who want to move up the ladder.

“Whether the position is theoretical, they are very practical,” said Daphne Estwick, an assistant dean of Columbia University. “They have the skills that they need to understand how to do it.”

For more information, visit www.columbia.edu/fundraising.

University Senate Requests Budget Transparency on Patent Income

By Thomas Matheison

At its Dec. 14 meeting the University Senate unanimously adopted a resolution asking the administration to “enhance the transparency of the University’s operating budget by capturing major uses of royalty and license income in appropriate line items and supporting schedules, or in other suitable ways.” The Senate also heard reports from the Provost and from law professor Harvey Goldschmid, chairman of the Trustees’ Advisory Committee on Socially Responsible Investing.

Budget Review Committee chairman William Blanter (Ten., HS) presented the resolution and accompanying rationale, which noted the committee’s inability to identify uses for at least $47 million-about one third-of Columbia’s total of $142.6 million of patent income in Fiscal Year 2000 in the University’s Operating Plan and Capital Budget 2001-2002. A clearer understanding of these expenditures, the committee’s report said, is imperative in the current environment of “tightening fiscal controls,” strain and a declining revenue stream from patents.

Goldschmid said his committee, which advises the Senate on ethical issues, has expanded its agenda in its second year, taking up pharmaceutical pricing in the third world, handgun production, executive compensation, and broad issues of human rights, in addition to the environmental and labor issues it focused on last year. He said the committee has also requested a careful study of alternative approaches to socially responsible investing, including negative and positive “screens” on different kind of stocks.

Provost Jonathan Cole, who had provided a scaled-down version of his report to the Senate that has sometimes exceeded 20 pages during the past decade, listed 10 issues that have engaged his attention this year, including pressuring space needs for almost every Columbia unit and possible linkages between in physical planning and Columbia’s annual report to the Division of Special Programs into a School.”

The Senate meets next on Friday, January 1, at 1:15 pm in Schapiro Engineering Aud., Space 386. The meeting is open to the public. More information is available at www.columbia.edu/cu/senate.