

RNA

A PUBLICATION OF THE RNA SOCIETY

VOL. 14, NO. 4



APRIL 2008

CONTENTS

Review

- Hammerhead redux: Does the new structure fit the old biochemical data? 605
Jennifer A. Nelson and Olke C. Uhlenbeck

Bioinformatics

- Assessing the fraction of short-distance tandem splice sites under purifying selection 616
Michael Hiller, Karol Szafranski, Rileen Sinha, Klaus Huse, Swetlana Nikolajewa, Philip Rosenstiel, Stefan Schreiber, Rolf Backofen, and Matthias Platzer
- KnotSeeker: Heuristic pseudoknot detection in long RNA sequences 630
Jana Sperschneider and Amitava Datta

Reports

- Decreased aminoacylation in pathology-related mutants of mitochondrial tRNA^{Tyr} is associated with structural perturbations in tRNA architecture 641
Luc Bonnefond, Catherine Florentz, Richard Giegé, and Joëlle Rudinger-Thirion
- Functional importance of individual rRNA 2'-O-ribose methylations revealed by high-resolution phenotyping 649
Jonathan Esguerra, Jonas Warringer, and Anders Blomberg
- Observed versus predicted structure of fluorescent self-quenching reporter molecules (SQRM): Caveats with respect to the use of "stem-loop" oligonucleotides as probes for mRNA folding 657
Vikram Pattanayak, Lida K. Gifford, Ponzy Lu, and Alan M. Gewirtz
- Evidence that tRNA modifying enzymes are important in vivo targets for 5-fluorouracil in yeast 666
Marie Gustavsson and Hans Ronne

Articles

- Ligand-dependent folding of the three-way junction in the purine riboswitch 675
Colby D Stoddard, Sunny D. Gilbert, and Robert T. Batey

(continued)

Cover Illustration: Crystal structure of an *E. coli* Thi-box riboswitch bound to benfotiamine (Protein Data Bank code: 2hoo; Nucleic Acid Database code: ur0103; Edwards, T.E. and Ferré-D'Amaré, A.R. 2006. Crystal structures of the Thi-box riboswitch bound to thiamine pyrophosphate analogs reveal adaptive RNA-small molecule recognition. *Structure* **14**: 1459–1468). Image details: RNA: ribbon-plate representation, A—red, U—magenta, G—green, C—blue; Ca ions, benfotiamine: space-filling representation. The image was generated with the Accelrys Discovery Studio Visualizer. Cover image provided by the Jena Library of Biological Macromolecules—JenaLib (www.fli-leibniz.de/IMAGE.html).

Contents (continued)

Confirmation of a second natural preQ ₁ aptamer class in Streptococcaceae bacteria <i>Michelle M. Meyer, Adam Roth, Stephanie M. Chervin, George A. Garcia, and Ronald R. Breaker</i>	685 ^{OA}
Structure–function analysis of vaccinia virus mRNA cap (guanine-N7) methyltransferase <i>Sushuang Zheng and Stewart Shuman</i>	696
General, rapid, and transcription-dependent fragmentation of nucleolar antigens in <i>S. cerevisiae</i> mRNA export mutants <i>Rune Thomsen, Cyril Saguez, Tommy Nasser, and Torben Heick Jensen</i>	706
Comparative genomic analysis of T-box regulatory systems in bacteria <i>Alexey G. Vitreschak, Andrei A. Mironov, Vassily A. Lyubetsky, and Mikhail S. Gelfand</i>	717
Role of SLV in SLI substrate recognition by the <i>Neurospora VS</i> ribozyme <i>Patricia Bouchard, Julie Lacroix-Labonté, Geneviève Desjardins, Philippe Lampron, Véronique Lisi, Sébastien Lemieux, François Major, and Pascale Legault</i>	736
Two distinct structural elements of 5S rRNA are needed for its import into human mitochondria <i>Alexandre Smirnov, Ivan Tarassov, Anne-Marie Mager-Heckel, Michel Letzelter, Robert P. Martin, Igor A. Krasheninnikov, and Nina Entelis</i>	749
Spliced leader <i>trans</i> -splicing in the nematode <i>Trichinella spiralis</i> uses highly polymorphic, noncanonical spliced leaders <i>Jonathan Pettitt, Berndt Müller, Ian Stansfield, and Bernadette Connolly</i>	760
Translational repression during chronic hypoxia is dependent on glucose levels <i>Jeff D. Thomas, Lizalynn M. Dias, and Gregg J. Johannes</i>	771
pH-dependent structural changes of helix 69 from <i>Escherichia coli</i> 23S ribosomal RNA <i>Sanjaya C. Abeysirigunawardena and Christine S. Chow</i>	782
RNA: Instructions for contributors	793

^{OA}Open Access paper

Announcement: Changes in publication charges and Open Access charges for members of the RNA Society

As most of our readers are aware, the *RNA* journal is the official publication of the RNA Society. The ongoing partnership between Cold Spring Harbor Laboratory Press and the Society has resulted in making *RNA* a respected and successful international forum for publishing original reports on RNA research in the broadest sense. We are pleased to announce that this success has enabled the Society to substantially reduce the costs associated with publishing in *RNA* for members.

Beginning with papers published in 2008, members of the RNA Society will receive a 50% discount on page charges (\$25 instead of \$50) as well as a 50% discount on the first color figure (\$225 instead of \$450). For those members who wish to have their work immediately accessible to the entire community (Open Access), the charge will be \$1500 (a \$500 savings from the non-member fee). We note that these member savings more than offset the cost of a one-year membership in the Society, which includes a subscription to *RNA* (\$160 for print and online, \$140 for online only). In addition to the benefits in publication costs, members also receive:

- Reduced registration fees for the annual meeting of the Society (more than \$100 savings)
- The RNA Society Newsletter, a forum for disseminating information to members and discussing issues affecting the Society and RNA Science
- Numerous opportunities for students and post-docs to become involved in the Society
- The Directory of Members, available on the Web and in print
- Free job postings on the Society Employment and Careers Web site
- Opportunities to request Travel Fellowship and Meeting Support for RNA-related meetings you are organizing.

If you wish to take advantage of these benefits or are considering publishing in *RNA*, take a moment to start or renew your membership for 2008 (<http://rnasociety.org/membership>). The RNA Society is an interdisciplinary, cohesive intellectual home for those interested in all aspects of RNA Science. We welcome new members from all areas of scientific research and we look forward to sharing the new perspectives they bring to the Society.

In addition to reducing publication costs for members of the RNA Society, beginning in 2008 *RNA* will start to accept Supplementary Material which will be linked to the article published online. Such Supplementary Material will be restricted to long tables of data, lists of genomic and sequence data, or videos. Submitted Supplementary Material such as gels or other simple figures as well as standard tables will not be linked to online articles and must be maintained on the author's Web site. In this regard, Supplementary Material is not intended for completing a manuscript with standard figures or tables. Appropriate Supplementary Material, as discussed above, will be peer-reviewed and must be submitted online at the same time as the manuscript. It cannot be altered after acceptance of the manuscript. Submission of Supplementary Material to the journal is not an alternative to submission to public databases (thus crystal structure coordinates, sequence data, microarray data must be submitted prior to submission to the journal and accession numbers given in the manuscript). Public databases have confidential sections to which passwords give access for editors and referees on request. The context of the files contained in the Supplementary Material should be precisely described at the end of the Material and Methods section in the manuscript and referred to at the appropriate places in the text. The types of files supplied should be clearly indicated (.doc, .xls, .rtf, .mp3, .mpeg, .mov, .wav, ...).

In sum, we believe the changes outlined above will facilitate continued growth of the journal and we thank all authors and reviewers for making *RNA* what it is today.

Evelyn Jabri, CEO, RNA Society
Timothy W. Nilsen, Editor in Chief