

ANNA MARIE PYLE

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Yale University and Howard Hughes Medical Institute
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A. FIELDS OF SPECIALIZATION:

Structure and function of large RNA molecules: ribozymes, introns, lncRNAs and viral RNA; Mechanisms of RNA-stimulated helicases and signaling enzymes; Small molecule targeting of RNA structure.

B. ACADEMIC TRAINING:

1986-1990 Ph.D., Chemistry, Columbia University
1981-1985 B.A., Chemistry, *magna cum laude*, Princeton University
1983-1985 Program Certificate in Science Policy, Woodrow Wilson School of Princeton University

C. POSITIONS:

Yale University, Molecular, Cellular and Developmental Biology and Chemistry, Sterling Professor (2018-present)
Yale University, Molecular, Cellular and Developmental Biology and Chemistry, William Edward Gilbert Professor (2010-2018)
Yale University, Molecular Biophysics and Biochemistry, Professor (2002-2010)
Howard Hughes Medical Institute, Investigator (1997-present)
Columbia University, Biochemistry and Molecular Biophysics, Professor (2001-2002); Associate Professor, Tenure (1997-2001); Assistant Professor (1992-1997)
University of Colorado, Postdoc research with Dr. Thomas R. Cech. Jane Coffin Childs Fellow (1990-1992)
Columbia University, Graduate research with Dr. Jacqueline K. Barton. New transition metal complexes for recognition of double-stranded DNA (1986-1989)

D. HONORS:

Awards and Distinguished Fellowships:

Sterling Professor of Molecular, Cellular and Developmental Biology, Yale University (2018)
Novartis Lecture, University of Pennsylvania (2018)
Gomberg Lecture, University of Michigan (2018)
Jerry A. Weisbach Memorial Lecture, Rockefeller University (2018)
Blavatnik Fund for Innovation Award, New Haven (2017, 2018 and 2019)
Plenary Lecturer, ASBMB Annual Meeting, San Diego, CA (2016)
Elected Member, Connecticut Association of Science and Engineering (2016)
Keynote Speaker, Keystone Meeting on Positive-Strand Viruses (2016)
Green Lectureship in Enzymology, University of Wisconsin, Madison (2016)
Distinguished Lecturer, Frontiers in Chemistry, Case Western Reserve University (2013)
Michael Gait Award and Lectureship, Cambridge University (2013)
R. Gaurth Hansen Lecturer, Utah State University (2012)
Stupka Memorial Lecturer, Iowa State University (2011)
Distinguished Visitor, European Molecular Biology Laboratory, Heidelberg (2011)
Karl Friedrich Bonhoeffer Lecturer in Biophysics, Max Planck Institute Göttingen (2011)
Fellow of the American Association for the Advancement of Science (2007)
Endowed Chair, The William Edward Gilbert Professorship, Yale University (2005)
Member of the American Academy of Arts and Sciences (2005)
Mayor's Award for Excellence in Science and Technology, New York (2002)
Investigator, Howard Hughes Medical Institute (1997-present)
NSF National Young Investigator Award (1994-1999)
Beckman Young Investigator (1994-1996)
Searle Scholars Award (1993-1996)
Irma T. Hirschl and Monique Weill-Caulier Career Scientist Award (1992-1997)
Jane Coffin Childs Memorial Fund Postdoctoral Fellowship (1990-1992)
Pegram Award, Columbia University (1989)
J. Malcolm Miller Teaching Award, Columbia University (1986)

E. PROFESSIONAL ASSOCIATIONS AND ACTIVITIES:

University Service:

Budget Advisory Committee, Yale University (2013-2020)
Chair, Committee for Design and Construction of the Yale Science Building (2014-2019)
Quantitative Biology Strategic Planning Committee, Yale University (2018)
Yale University Science Strategy Committee (2016-2018)
Faculty Resource Committee, Yale University (2014-2018)
Presidential Search Committee, Yale University (2012)
Yale Committee on Cooperative Research (2012-2015)
Physical Sciences Advisory and Tenure Appointments Committee; Yale University (2011-2013)
FASTAP Committee for restructuring of the Yale tenure system (2007-2010)
Advisory Board, Yale West Campus Institute for Systems Biology (2009-2013)
Divisional Director for Biological Sciences, Yale University (2004-2008)
Biological Sciences Advisory and Tenure Appointments Committee; Yale University (2003-2008)
Executive Committee for the Yale Molecular Virology Program (2007-2012)
Member: Yale Molecular Virology Program (2007-present)
Member: Yale Cancer Center (2006-present)
Yale Medical School Strategic Planning Committee (2005)
Yale BSAC Subcommittee on Computational Biology (2004)
Yale Wilbur Cross Medalist Selection Committee (Fall 2004-2008)
Search Committee for the Dean of Columbia Medical School (2002)
Dean's Committee on Strategic Planning for Columbia Health Sciences (2001)
Committee for Selection of Louisa Gross Horwitz Prize Awardees (2000-2002)

External Scientific Activities and Service:

Helmholtz Institute for RNA-based Infection Research (HIRI), Würzburg, Advisory Board (2021-present)
Max Planck Institute for Biophysical Chemistry, Göttingen, Advisory Board (2019-present)
Telluride Science Research Center Advisory Board (2019-present)
RADD Pharmaceuticals, Scientific Advisory Board (2020-present)
Arrakis Therapeutics, Scientific Advisory Board (2016-present)
President, RNA Society (2019-2021)
Vice-Chair, Brookhaven National Laboratory Science and Technology Steering Committee (2013-present)
National Synchrotron Light Source II Biological Beamline Advisory Team (2009-present)
Chair, NIH Study Section MSFA (2014-2016); Member, NIH Study Section MSFE (2010-2013)
American Society for Biochem. & Molecular Biology (ASBMB) Nominating Committee (2010-2013)
Member, NIH Study Section MGB (2004-2007)

Editorial Boards and Editorial Service:

Editor (with David Christianson), *Methods in Enzymology* (2013-present)
Board of Reviewing Editors, *eLife* (2017-2020)
Editorial Board Member, *The RNA Journal* (1998-2005, 2019-present)
Associate Editor, *Journal of Molecular Biology* (2019-present); Editorial Board Member (2007-2018)
Editor: *Current Opinion Structural Biology* (2006) **Vol 16;** (2011) **Vol 21;** (2016) **Vol 36**
Editorial Board, *Nucleic Acids Research* (1995-2005)

Meeting Organization:

Telluride Meeting, Co-founder and Co-organizer (2014, 2016 and 2018)
Keystone Meeting on Structural Biology of Cellular Processes, Co-Organizer (2012)
American Society of Biochemistry & Molecular Biology Annual Meeting, Co-Organizer (2008)
Nucleic Acids Gordon Conference, Organizer (2004, 2021)
FASEB Helicase Meeting, Chair (2003); Co-Chair (2001); Nucleic Acid Enzymes Meeting, Chair (2002).
Proteins that Bind RNA (Meeting Series Founder and Organizer, 1998 and 2001)
RNA Society Meeting, Co-Organizer (1998, 2015, 2021)

Memberships:

American Society for Microbiology (ASM)
American Society for Biochemistry and Molecular Biology (ASBMB)

American Association for the Advancement of Science (AAAS)
American Chemical Society (ACS)
The RNA Society
The Biophysical Society

F. TEACHING:

Professor in Charge: "Molecular Biology", MCDB 200; Yale University, 2012-present.
Professor in Charge: "Biochemical and Biophysical Approaches in Molecular and Cell Biology", Yale University, 2011-2015.
Founder and Professor in Charge: "Macromolecular Interactions & Dynamic Properties", Yale University, 2004-2011.
Contributing Lecturer and co-founder: "Enzyme Mechanisms", Yale University, 2004.
Contributing Lecturer and co-founder: "Macromolecular Structure and Biophysical Analysis", Yale University, 2004- 2010.
Professor in Charge: "Structure and Chemistry of Proteins and Nucleic Acids" Yale University, 2003.
Contributing lecturer: "Eukaryotic Molecular Biology" Yale University; 2004.
Founder and lecturer: "Structure and Function of Nucleic Acids", Columbia University, 1994-2002
Contributing lecturer: "Advanced Eukaryotic Molecular Genetics", Columbia University, 1996-2002.
Contributing lecturer: "Eukaryotic Molecular Biology" and "Biochemistry", Columbia University, 1992-2002.

G. PATENTS:

1. U.S. PATENT #5,872,241 "Multiple Component RNA Catalysts and Uses Thereof". Filed January 25, 1995. Awarded to Anna Marie Pyle and William Michels, February 16, 1999.
2. Patent pending #20160046943: "Interferon Production Using Short RNA Duplexes". Filed September 14, 2015 by Anna Marie Pyle, Andrew S. Kohlway and Dahai Luo.
3. International Patent pending #PCT/US18/39738: "Improved Reverse Transcriptase and Methods of Use". Filed June 27, 2018 by Anna Marie Pyle and Chen Zhao.
4. Provisional application pending #62/687,606: "Combination Treatments Using RIG-I Agonists". Filed June 20, 2018 by Anna Marie Pyle, Akiko Iwasaki, Olga Fedorova, Xiaodong Jiang.
5. Provisional application pending #62/743,387: "RIG-I Agonists and Methods of Using Same". Filed October 9, 2018 by Anna Marie Pyle, Akiko Iwasaki.
6. Provisional application pending # 62/743,369: "Combination Treatments Using RIG-I Agonists". Filed June 20, 2018 by Anna Marie Pyle, Akiko Iwasaki, Olga Fedorova, Xiaodong Jiang.
7. Provisional application pending # 62/622,287: "Compositions and Methods for Inhibiting Group II Intron RNA". Filed January 2, 2018 by Anna Marie Pyle, Olga Fedorova, Eric Gunnar Jagdmann, Michael Van Zandt, Lin Yuan, Albert DeBerardinis.

H. PUBLICATIONS:

196. "Comprehensive in-vivo secondary structure of the SARS-CoV-2 genome reveals novel regulatory motifs and mechanisms", Nicholas C. Huston, Han Wan, Rafael de Cesaris Araujo Tavares, Craig Wilen and Anna Marie Pyle, *Mol Cell*. (2021) [Epub ahead of print]. PMID: 33444546.
195. "Structural optimization of polymeric carriers to enhance the immunostimulatory activity of molecularly defined RIG-I agonists", ME Jacobson, KW Becker, LE Pastora, RB Fletcher, KA Collins, Olga Fedorova, CL Duvall, Anna Marie Pyle and JT Wilson, *ACS Cent Sci*. (2020) **6**, 2008-2022. PMID: 33274278.
194. "The global and local distribution of RNA structure throughout the SARS-CoV-2 genome", Rafael de Cesaris Araujo Tavares, Gandhar Mahadeshwar, Nicholas C. Huston and Anna Marie Pyle, *J Virol*. (2020) [Online ahead of print]. PMID: 33268519.
193. "Comprehensive in-vivo secondary structure of the SARS-CoV-2 genome reveals novel regulatory motifs and mechanisms", Nicholas C. Huston, Han Wan, Rafael de Cesaris Araujo Tavares, Craig Wilen and Anna Marie Pyle, *bioRxiv* (2020) [Preprint]. PMID: 32676598.

192. "Single-cell longitudinal analysis of SARS-CoV-2 infection in human bronchial epithelial cells", NG Ravindra, MM Alfajaro, V Gasque, J Wei, RB Filler, Nicholas C. Huston, Han Wan, K Szigeti-Buck, B Wang, RR Montgomery, SC Eisenbarth, A Williams, Anna Marie Pyle, Akiko Iwasaki, TL Horvath, EF Foxman, D van Dijk. Craig B. Wilen, *bioRxiv* (2020) [Preprint]. PMID: 32511382.
191. "Visualizing group II intron dynamics between the first and second steps of splicing", Jacopo Manigrasso, Isabel Chillon, Vito Genna, Srinivas Somarowthu, Anna Marie Pyle, Marco De Vivo and Marco Marcia, *Nat Commun.* (2020) 11, 2837. PMID: 32503992.
190. "Sequencing and structure probing of long RNAs using MarathonRT: A next-generation reverse transcriptase", Li-Tao Guo, Rebecca L. Adams, Han Wan, Nicholas Huston, Olga Potapova, Sara Olson, Christian.M. Gallardo, Brenton R. Graveley, Bruce E. Torbett and Anna Marie Pyle, *J Mol Biol.* (2020) 432, 3338-3352. PMID: 32259542.
189. "Small-Molecule antagonists of the RIG-I Innate Immune Receptor", David C. Rawling, G. Erik Jagdmann Jr., Olga Potapova and Anna Marie Pyle, *ACS Chem Biol.* (2020) 15, 311-317. PMID: 31944652.
188. "RIG-I recognition of RNA targets: The influence of terminal base-pair sequence and overhangs on affinity and signaling", Xiaoming Ren, Melissa M. Linehan, Akiko Awasaki and Anna Marie Pyle, *Cell Reports* (2019) 29, 3807-3815. PMID: 31851914.
187. "RNA Binding Activates RIG-I by Releasing an Autorepressed Signaling Domain", Thayne Dickey, Bo Song and Anna Marie Pyle. *Science Advances* (2019), 5, eaax3641. PMID: 31616790.
186. "Intratatumoral delivery of RIG-I agonist SLR14 induces robust antitumor responses", Xiaodong Jiang, Viswanathan Muthusamy, Olga Fedorova, Daniel J. Kim, Marcus Bosenberg, Anna Marie Pyle, and Akiko Iwasaki, *Journal of Experimental Medicine* (2019) 216, 2854-2868. PMID: 31601678.
185. "Discovery of N-Substituted 3-Amino-4-(3-boronopropyl)pyrrolidine-3-carboxylic Acids as Highly Potent Third-Generation Inhibitors of Human Arginase I and II", Michael C. Van Zandt, G. Erik Jagdmann, Darren L. Whitehouse, Min Ji, Jennifer Savoy, Olga Potapova, Alexandra Cousido-Siah, Andre Mitschler, Eduardo I. Howard, Anna Marie Pyle, Alberto D. Podjarny, *J Med Chem.* (2019) 62, 8164-8177. PMID: 31408339.
184. "Sensitive detection of structural features and rearrangements in long, structured RNA molecules", Rebecca L. Adams, Nicholas C. Huston, Rafael C. Tavares and Anna Marie Pyle, *Methods Enzymol.* (2019) 623, 249-289. PMID: 31239050.
183. "Phylogenetic analysis with improved parameters reveals conservation in lncRNA structures", Rafael C. Tavares, Anna Marie Pyle and Srinivas Somarowthu, *J Mol Biol.* (2019) 431, 1592-1603. PMID: 30890332.
182. "RIG-I selectively discriminates against 5'-monophosphate RNA", Xiaoming Ren, Melissa M. Linehan, Akiko Iwasaki and Anna Marie Pyle, *Cell Rep.* (2019) 26, 2019-2027. PMID: 30784585.
181. "Small molecules that target group II introns are potent antifungal agents", Olga Fedorova, G. Erik Jagdmann Jr., Rebecca L. Adams, Lin Yuan, Michael C. Van Zandt and Anna Marie Pyle, *Nat Chem Biol.* (2018) 14, 1073-1078. PMID: 30323219.
180. "Therapeutically active RIG-I agonist induces immunogenic tumor cell killing in breast cancers", David L. Elion, Max E. Jacobson, Donna J. Hicks, Bushra Rahman, Violeta Sanchez, Paula I. Gonzalez-Ericsson, Olga Fedorova, Anna Marie Pyle, John T. Wilson and Rebecca S. Cook, *Cancer Res.* (2018) 78, 6183-6195. PMID: 30224377.
179. "Regional Differences in Airway Epithelial Cells Reveal Tradeoff between Defense against Oxidative Stress and Defense against Rhinovirus", Valia T. Mihaylova, Yong Kong, Olga Fedorova, Lokesh

Sharma, Charles S. Dela Cruz, Anna Marie Pyle, Akiko Iwasaki and Ellen F. Foxman, *Cell Rep.* (2018) 24, 3000-3007. PMID: 30208323.

178. "microRNA-122 amplifies hepatitis C virus translation by shaping the structure of the internal ribosomal entry site", Philipp Schult, Hanna Roth, Rebecca L. Adams, Caroline Mas, Lionel Imbert, Christian Orlik, Alessia Ruggieri, Anna Marie Pyle and Volker Lohmann, *Nat Commun.* (2018) 9, 2613. PMID: 29973597.
177. "A minimal RNA ligand for potent RIG-I activation in living mice", Melissa M. Linehan, Thayne H. Dickey, Emanuela S. Molinari, Megan E. Fitzgerald, Olga Potapova, Akiko Iwasaki and Anna Marie Pyle, *Sci. Adv.* (2018) 4, E1701854. PMID: 29492454.
176. "Environmentally triggerable retinoic acid-inducible gene I agonists using synthetic polymer overhangs", CR Palmer, ME Jacobson, Olga Fedorova, Anna Marie Pyle and John T. Wilson, *Bioconjug Chem.* (2018) 29, 742-747. PMID: 29350913.
175. "An ultra-processive, accurate reverse transcriptase encoded by a metazoan group II intron", Chen Zhao, Fei Liu and Anna Marie Pyle, *RNA.* (2018) 24, 183-195. PMID: 29109157.
174. "NS3 from HCV strain JFH-1 is an unusually robust helicase that is primed to bind and unwind viral RNA", Ting Zhou, Xiaoming Ren, Rebecca L. Adams and Anna Marie Pyle, *J. Virol.* (2017) 92, 01253-17. PMID: 29070684.
173. "The SMAD3 transcription factor binds complex RNA structures with high affinity", Thayne H. Dickey and Anna Marie Pyle, *Nucleic Acids Res.* (2017) 45, 11980-11988. PMID: 29036649.
172. "Structural basis for IL-1 α recognition by a modified DNA aptamer that specifically inhibits IL-1 α signaling", Xiaoming Ren, Amy D. Gelinis, Ira von Carlowitz, Nebojsa Janjic and Anna Marie Pyle, *Nat Commun.* (2017) 8, 810. PMID: 28993621.
171. "The group II intron maturase: a reverse transcriptase and splicing factor go hand in hand", Chen Zhao and Anna Marie Pyle, *Curr Opin Struct Biol.* (2017) 47, 30-39. PMID: 28528306.
170. "Functional RNA structures throughout the Hepatitis C Virus genome", Rebecca L. Adams, Nathan Pirakitikulr and Anna Marie Pyle, *Curr Opin Virol.* (2017) 24, 79-86. PMID: 28511116.
169. "Structural insights into the mechanism of group II intron splicing", Chen Zhao and Anna Marie Pyle, *Trends Biochem Sci.* (2017) 42, 470-482. PMID: 28438387.
168. "Selective RNA targeting and regulated signaling by RIG-I is controlled by coordination of RNA and ATP binding", Megan E. Fitzgerald, David C. Rawling, Olga Potapova, Xiaoming Ren, Andrew Kohlway and Anna Marie Pyle, *Nucleic Acids Res.* (2017) 45, 1442-1454. PMID: 28180316.
167. "Opportunities and challenges in RNA structural modeling and design", Tamar Schlick and Anna Marie Pyle, *Biophys J.* (2017) 113, 282-289. PMID: 28162235.
166. "Visualizing the secondary and tertiary architectural domains of lncRNA RepA", Fei Liu, Srinivas Somarowthu and Anna Marie Pyle, *Nature Chemical Biology* (2017) 13, 282-289. PMID: 28068310.
165. "Inverted repeat Alu elements in the human lincRNA-p21 adopt a conserved secondary structure that regulates RNA function", Isabel Chillon and Anna Marie Pyle, *Nucleic Acids Res.* (2016) 44, 9462-9471. PMID: 27378782.
164. "Group II intron self-splicing", Anna Marie Pyle, *Annu Rev Biophys.* (2016) 45, 183-205. PMID: 27391926.
163. "Transcriptome analysis of human cumulus cells reveals hypoxia as the main determinant of follicular senescence", Emanuela Molinari, Bar Haim, Anna Marie Pyle and Pasquale Patrizio, *Mol Hum Reprod.* (2016) 22, 866-876. PMID: 27268410.

162. "Crystal structures of a group II intron maturase reveal a missing link in spliceosome evolution", Chen Zhao and Anna Marie Pyle, *Nat Struct Mol Biol.* (2016) **23**, 558-565. PMID: 27136328.
161. "Editorial overview: Nucleic acids and their protein complexes", David M. Lilley and Anna Marie Pyle, *Curr Opin Struct Biol.* 2016, 36:vii-viii. PMID: 26948825.
160. "The Coding Region of the HCV Genome Contains a Network of Regulatory RNA Structures", Nathan Pirakitikulr, Andrew Kohlway, Brett D. Lindenbach and Anna Marie Pyle, *Molecular Cell.* (2016) **62**, 111-120. PMID: 26924328.
159. "Challenges in RNA structural modeling and design", Anna Marie Pyle and Tamar Schlick, *J Mol Biol.* (2016) **428**, 733-735. PMID: 26876599.
158. "Crystal structure of group II intron domain 1 reveals a template for RNA assembly", Chen Zhao, K.R. Rajashankar, Marco Marcia and Anna Marie Pyle, *Nature Chemical Biology* (2015) **11**, 967-972. PMID: 26502156.
157. "Establishing the role of ATP for the function of the RIG-I innate immune sensor", David C. Rawling, Megan E. Fitzgerald and Anna Marie Pyle, *Elife* (2015) Sep 15:4, pii: e09391. PMID: 26371557.
156. "Native purification and analysis of long RNAs", Isabel Chillón Gazquez, Marco Marcia, Michal Legiewicz, Fei Liu, Srinivas Somarowthu and Anna Marie Pyle, *Methods Enzymol.* (2015) **558**, 3-37. PMID: 26068736.
155. "HOTAIR forms an intricate and modular secondary structure", Srinivas Somarowthu, Michal Legiewicz, Isabel Chillón Gazquez, Marco Marcia, Fei Liu and Anna Marie Pyle, *Mol Cell* (2015) **58**, 353-361. PMID: 25866246.
154. "Rediscovering RNA", Anna Marie Pyle, *RNA* (2015) **21**, 714-715. PMID: 25780205.
153. "Temperature-dependent innate defense against the common cold virus limits viral replication at warm temperature in mouse airway cells", Ellen F. Foxman, Megan E. Fitzgerald, Bethany R. Wasik, Lin Hou, Hongyu Zhao, Paul E. Turner, Anna Marie Pyle and Akiko Iwasaki, *Proc. Natl. Acad. Sci. USA* (2015) **112**, 827-832. PMID: 25561542.
152. "Looking at LncRNAs with the Ribozyme Toolkit", Anna Marie Pyle, *Mol Cell* (2014) **56**, 13-17. PMID: 25280101.
151. "The RIG-I ATPase core has evolved a functional requirement for allosteric stabilization by the Pincer domain", David Rawling, Andrew Kohlway, Dahai Luo, Steve C. Ding and Anna Marie Pyle, *Nucleic Acids Res.* (2014) **42**, 11601-11611. PMID: 25217590.
150. "The linker region of NS3 plays a critical role in the replication and infectivity of hepatitis C virus", Andrew Kohlway, Nathan Pirakitikulr, Steve C. Ding, Feng Yang, Dahai Luo, Brett D. Lindenbach and Anna Marie Pyle, *J. Virol.* (2014) **88**, 10970-10974. PMID: 24965468.
149. "An evolving arsenal: viral RNA detection by RIG-I-like receptors", Megan E. Fitzgerald, David C. Rawling, Adriana Vela and Anna Marie Pyle, *Curr Opin Microbiol.* (2014) **6**, 76-81. PMID: 24912143.
148. "Parts, assembly and operation of the RIG-I family of motors", David C. Rawling and Anna Marie Pyle, *Curr Opin Struct Biol.* (2014) **25**, 25-33. PMID: 24878341.
147. "Principles of ion recognition in RNA: insights from the group II intron structures", Marco Marcia and Anna Marie Pyle, *RNA* (2014) **4**, 516-527. PMID: 24570483.

146. "Dicer-related helicase 3 (DRH-3) forms an obligate dimer for recognizing 22G-RNA", Megan Fitzgerald, Adriana Vela and Anna Marie Pyle, *Nucleic Acids Res.* (2014) **42**, 3919-3930. PMID: 24435798.
145. "Coordinating the party: assembly factors and ribogenesis", Anna Marie Pyle, *Mol Cell.* (2013) **52**, 469-470. PMID: 24267447.
144. "Visualizing the ai5γ group IIB intron", Srinivas Somarowthu, Michal Legiewicz, Kevin S. Keating and Anna Marie Pyle, *Nucleic Acids Res.* (2013) **42**, 1947-1958. PMID: 24203709.
143. "Solving nucleic acid structures by molecular replacement: examples from group II intron studies", Marco Marcia, Elisabeth Humphris-Narayanan, Kevin S. Keating, Srinivas Somarowthu, K. Rajashankar and Anna Marie Pyle, *Acta Crystallogr D Biol Crystallogr.* (2013) **69**, 2174-2185. PMID: 24189228.
142. "Hepatitis C virus RNA replication and virus particle assembly require specific dimerization of the NS4A protein transmembrane domain", Andrew Kohlway, Nathan Pirakitikulr, Francisco N. Barrera, Olga Potapova, Donald M. Engelman, Anna Marie Pyle and Brett D. Lindenbach, *J Virol.* (2013) **88**, 628-642. PMID: 24173222.
141. "Non-coding RNAs: A story of networks and long distance relationships", Marina Ostankovitch and Anna Marie Pyle, *J Mol Biol.* (2013) **425**, 3577-3581. PMID: 23911549.
140. "Defining the functional determinants for RNA surveillance by RIG-I", Andrew Kohlway, Dahai Luo, David C. Rawling, Steve C. Ding and Anna Marie Pyle, *EMBO Rep.* (2013) **14**, 772-779. PMID: 23897087.
139. "Predicted group II intron lineages E and F comprise catalytically active ribozymes", Vivian Nagy, Nathan Parakitikulr, Katherine I. Zhou, Isabel Chillon, Jerome Luo and Anna Marie Pyle, *RNA* (2013) **19**, 1266-1278. PMID: 23882113.
138. "Now on display: a gallery of group II intron structures at different stages of catalysis", Marco Marcia, Srinivas Somarowthu and Anna Marie Pyle, *Mob DNA* (2013) **4**, 14. PMID: 23634971.
137. "Duplex RNA activated ATPases (DRAs): Platforms for RNA sensing signaling and processing", Dahai Luo, Andrew Kohlway and Anna Marie Pyle, *RNA Biol.* (2013) **10**, 111-120. PMID: 23228901.
136. "Visualizing group II intron catalysis through the stages of splicing", Marco Marcia and Anna Marie Pyle, *Cell* (2012) **151**, 497-507. PMID: 23101623.
135. "The thermodynamic basis for viral RNA detection by the RIG-I innate immune sensor", Adriana Vela, Olga Fedorova, Steve O. Ding and Anna Marie Pyle, *J Biol Chem.* (2012) **287**, 42564-42573. PMID: 23055530.
134. "Visualizing the determinants of viral RNA recognition by innate immune sensor RIG-I", Dahai Luo, Andrew Kohlway, Adriana Vela and Anna Marie Pyle, *Structure* (2012) **20**, 1983-1988. PMID: 23022350.
133. "RCrane: semi-automated RNA model building", Kevin S. Keating and Anna Marie Pyle, *Acta Cryst.* (2012) **68**, 985-995. PMID: 22868764.
132. "Molecular mechanics of RNA translocases", Steve C. Ding and Anna Marie Pyle, *Methods Enzymol.* (2012) **511**, 131-147. PMID: 22713318.
131. "The brace for a growing scaffold: Mss116 protein promotes RNA folding by stabilizing an early assembly intermediate", Olga Fedorova and Anna Marie Pyle, *J Mol Biol.* (2012) **422**, 347-365. PMID: 22705286.

130. "Crystal structure of a group II intron in the pre-catalytic state", Robert T. Chan, Aaron R. Robart, Kanagalaghatta R. Rajashankar, Anna Marie Pyle and Navtej Toor, *Nat Struct Mol Biol.* (2012) **19**, 555-557. PMID: 22484319.
129. "Discrete RNA libraries from pseudo-torsional space", Elisabeth Humphris-Narayanan and Anna Marie Pyle, *J Mol Biol.* (2012) **421**, 6-26. PMID: 22425640.
128. "Structural insights into RNA recognition by RIG-I", Dahai Luo, Steve C. Ding, Adriana Vela, Andrew Kohlway, Brett D. Lindenbach and Anna Marie Pyle, *Cell* (2011) **147**, 409-422. PMID: 22000018.
127. "The molecular interactions that stabilize RNA tertiary structure: RNA motifs, patterns, and networks", Samuel E. Butcher, Anna Marie Pyle, *Acc Chem Res.* (2011) **44**, 1302-1311. PMID: 21899297.
126. "RNA helicases and remodeling proteins", Anna Marie Pyle, *Curr Opin Chem Biol.* (2011) **15**, 636-642. PMID: 21862383.
125. "A new way to see RNA", Kevin S. Keating, Elisabeth L. Humphris and Anna Marie Pyle, *Q Rev Biophys.* (2011) **44**, 433-466. PMID: 21729350.
124. "The ever-growing complexity of nucleic acids: from small DNA and RNA motifs to large molecular assemblies and machines", Anna Marie Pyle and Zippora Shakked, *Curr Opin Struct Biol.* (2011) **21**, 293-295. PMID: 21565486.
123. "Mechanism of Mss116 ATPase Reveals Functional Diversity of DEAD-Box Proteins", Wenxiang. Cao, Maria M. Cowman, Steve Ding, Arnon Henn, Elizabeth R. Middleton, Michael J. Bradley, Elizabeth Rhoades, David D. Hackney, Anna Marie Pyle and Enrique M. De La Cruz, *J Mol Biol.* (2011) **409**, 399-414. PMID: 21501623.
122. "Unmasking the active helicase conformation of NS3 from Hepatitis C virus", Steve C. Ding, Andrew S. Kohlway and Anna Marie Pyle, *J Virol.* (2011) **85**, 4343-4353. PMID: 21325413.
121. "Visualizing ATP-dependent RNA translocation by the NS3 helicase from HCV", Todd C. Appleby, R. Anderson, Olga Fedorova, Anna Marie Pyle, X Liu, Kathy M. Brendza, John R. Somoza, *J Mol Biol.* (2011) **405**, 1139-1153. PMID: 21145896.
120. "The acidic domain of hepatitis C virus NS4A contributes to RNA replication and virus particle assembly", T. Phan, Andrew Kohlway, Peniel Dimberu, Anna Marie Pyle and Brett D. Lindenbach, *J Virol.* (2011) **85**, 1193-1204. PMID: 21047963.
119. "Single-molecule analysis of Mss116-mediated group II intron folding", Krishanthi S. Karunatilaka, Amanda Solem, Anna Marie Pyle and David Rueda, *Nature* (2010) **467**, 935-939. PMID: 20944626.
118. "Touching RNA", Anna Marie Pyle, *The Scientist* (2010) **24**, 34-39.
117. "Dual roles for the Mss116 cofactor during splicing of the ai5 γ group II intron", Nora Zingler, Amanda Solem and Anna Marie Pyle, *Nucleic Acids Res.* (2010) **38**, 6602-6609. PMID: 20554854.
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