

Dinshaw J. PATEL (cv)

Member and Abby Rockefeller Mauzé Chair in Experimental Therapeutics
Structural Biology Program
Memorial Sloan-Kettering Cancer Center
1275 York Avenue
New York, NY, 10065, USA

Phone (office): 1-212-639-7207

Phone (cell): 1-914-980-0896

FAX: 1-212-717-3066

Email: pateld@mskcc.org

Web site: <http://www.mskcc.org/mskcc/html/10829.cfm>

Date and Place of Birth:

April 25, 1942; Mumbai, India

Citizen:

USA

Education

1961 B.Sc. University of Mumbai, Mumbai, India. Chemistry

1963 M.S. California Institute of Technology, Pasadena, CA. Chemistry

1968 PhD. New York University, New York, NY. Chemistry

Postdoctoral Training:

1967 New York Univ. Medical School New York, NY. Biochemistry.

1968 - 1969 AT&T Bell Laboratories, Murray Hill, NJ. Biophysics.

Appointments:

1970 - 1984 Member of Technical Staff, Polymer Chemistry Department,
AT&T Bell Laboratories, Murray Hill, NJ

1984 - 1992 Professor of Biochemistry & Molecular Biophysics,
College of Physicians & Surgeons, Columbia University, New York, NY

1992 - Member, Structural Biology Program
Memorial Sloan-Kettering Cancer Center (MSKCC), New York, New York

1994 - Professor, Graduate Program in Biochemistry & Structural Biology,
Weill School of Medical Sciences, Cornell University, New York, NY

Honors:

1961 - 1963 Jamshejee N. Tata Fellow

1983 AT&T Bell Laboratories Distinguished Technical Staff Award

1992 - Abby Rockefeller Mauzé Chair in Experimental Therapeutics (MSKCC)

1997 Distinguished Alumnus Award, New York University

1997 - 1999 Harvey Society (Vice-President 97-98; President 98-99)

2009 Member, National Academy of Sciences, USA

2013 NIH Directors Transformative R01 Award (with Thomas Tuschl and Uwe Ohler)

2014 Member, American Academy of Arts and Sciences, USA

2014 2014 FEZANA Jamshed and Shirin Guzdar Excellence in Profession Award

Named/Plenary Lectureships (since 2010)

2010 John D. Roberts Lecture, California Institute of Technology, Pasadena, CA

2011 Keystone Symposium on RNA Silencing, Monterey, CA

2011 C. C. Tan Lecture, Fudan University, Shanghai, China

2012	IAS Distinguished Lecture, Hong Kong Univ. of Science & Tech., Hong Kong, China
2013	Epigenetics Symposium, University of Michigan, Ann Arbor, MI
2013	NCI Eminent Lecture, Center for Cancer Research, National Cancer Institute, USA
2014	Kiran Mazumdar Shaw Lecture, Inst. Bioinform. & Applied Biotech., Bangalore, India
2014	Dean's Lecture, Virginia Commonwealth University, Richmond, VA
2014	Master Forum Lecture, Chinese Academy of Medical Sciences, Beijing, China
2014	Cell Press Lab Links Epigenetics Symposium, Beijing, China
2014	IUBMB International Conference, Academia Sinica, Taipei, Taiwan
2014	Shanghai Structural Biology Network Meeting, Shanghai, China

External Review Committees:

1984 -	National Institutes of Health, Bethesda, MD
	• Member, Molecular and Cellular Biophysics Study Section (84-88)
	• National Cancer Institute, Board of Scientific Counselors-B (00-05)
1989 - 1996	Howard Hughes Medical Institute, Chevy Chase, MD
	• Member, Scientific Review Board - Structural Biology (89-92)
	• Member, Medical Advisory Board (93-96)
2009 -	Scientific Advisory Board, European Institute of Chemistry & Biology, Bordeaux, France
2010 - 2011	Scientific Advisory Board, Epinova, GlaxoSmithKline, Stevenage, United Kingdom
2011-	Scientific Advisory Board, Institute for Research in Biomedicine, Barcelona, Spain

Personnel Statement

I received my PhD in Chemistry from New York University (NYU) in 1968 for research in the photochemistry. I decided next to shift the emphasis of my research to the life sciences and hence completed postdoctoral training (one year) in Biochemistry at NYU School of Medicine followed by postdoctoral training (two years) in Biophysics at AT&T Bell Laboratories. I was next promoted to permanent Member of Technical Staff at Bell Labs and spent the next 15 years undertaking NMR-based studies of the structure and dynamics of cyclic peptides, proteins and nucleic acids. I moved to Columbia University Medical School in 2004 as a tenured Professor of Biochemistry and Molecular Biophysics where my group spent the next 8 years doing NMR-based research on DNA mismatches, bulges and junctions, on DNA triplexes and G-quadruplexes, and drug-DNA complexes. I was recruited in 1992 as a tenured Member to the Cellular Biochemistry and Biophysics Program at the Memorial Sloan-Kettering Cancer Center to set up a Structural Biology component to the program. My group's research during the 1990s focused on NMR-based studies of covalent chiral carcinogen-DNA adducts, and complexes of antibiotics and peptides with natural and *in vitro* selected RNA targets.

My laboratory began to increasingly use x-ray crystallography starting around 2000 with the emphasis initially on RNA-mediated gene regulation. My group determined the higher order architectures of compact riboswitch sensing domains bound to amino acids, metabolites and ions, as well as elucidated how RNA containing only four nucleotides could generate pockets capable of recognizing specific ligands and discriminating against closely-related analogs. In the RNA silencing area, my group made fundamental discoveries over the next decade related to the structural biology of Argonaute proteins and their complexes with guide DNA and target RNAs, thereby providing mechanistic insights into the nucleation, propagation and cleavage steps of Ago-mediated cleavage of mRNA [collaboration with Thomas Tuschl (Rockefeller) and David Bartel (MIT)]. More recently, my group extended its research to Dicer proteins where we identified a phosphate-binding pocket in human Dicer [collaboration with Narry Kim (Seoul National University)] an inside-out non-canonical pathway of dsRNA cleavage by budding yeast Dicer, in contrast with to an outside-in pathway for Dicer's cleavage activity in higher eukaryotes [collaboration with David Bartel (MIT)]. My group's efforts also focused on structure determination of disease-related protein-RNA complexes, thereby defining the principles underlying the specificity of intermolecular recognition and the role of protein dimerization in facilitating complex formation [collaboration with Thomas Tuschl (Rockefeller)].

In 2005 my group initiated a comprehensive research program in epigenetic regulation focused on understanding the diversity of mechanisms for site- and state-specific readout of histone marks by writer, reader and eraser protein modules. Initial efforts with single effector modules were expanded over

time to multivalent readout at the histone peptide and nucleosomal level [collaboration with David Allis (Rockefeller)]. These studies were extended to the identification of small molecules that targeted effector pockets with high affinity and specificity, and elucidation of the role of histone chaperones and chromatin remodelers in epigenetic regulation. My group initiated our research on DNA methylation mark-mediated epigenetic regulation in 2010 by focusing our structural studies on a pair of DNMT1-DNA complexes, whereby we established how a combination of autoinhibitory and productive mechanisms ensured the high fidelity of DNMT1-mediated maintenance DNA methylation. This research was next extended to studies that provided mechanistic insights into plant proteins that mediate the role of polymerases pol-IV and pol-V in RNA-directed DNA methylation in *A. thaliana* [collaboration with Steve Jacobsen (UCLA)]. More recently, structure-function studies have provided the molecular basis underlying the process whereby CHG DNA methylation in *A. thaliana* is controlled by the H3K9 methylation mark through a self-reinforcing loop between DNA methyltransferase CMT3 and H3K9 histone methyltransferase KRYPTONITE [collaboration with Steve Jacobsen (UCLA)].

My group initiated a structural biology program in 2003 on lipid transfer proteins that acquire and release neutral glycosphingolipids and charged phosphosphingolipids during lipid intermembrane transfer and presentation processes. Our studies established the molecular basis underlying differentiation of neutral from charged lipids by their respective head group recognition centers, and defined the alignment of one or both lipid chains within a molded-to-fit hydrophobic tunnel, thereby supporting a cleft-like gating mechanism, whereby lipid chains sequentially entered and departed the tunnel in the membrane-associated state [collaboration with Rhoderick Brown (Hormel Institute)].

More recently, my group has turned its attention to the field of pattern recognition receptors that sense double-stranded nucleic acids in the cytosol, thereby triggering a cascade of events that activate the innate immune response. Our efforts have focused on cGAS, the metazoan sensor of cytosolic dsDNA, the second messenger cGAMP and the adaptor STING [collaboration with Thomas Tuschl (Rockefeller) and Winfried Barchet (University Hospital-Bonn)]. Our structural studies identified cGAMP, produced by DNA-activated cGAS from GTP and ATP, to be c[G(2',5')pA(3',5')p], that contained an unanticipated 2',5' linkage at the GpA step. Our research was next extended to STING activation by cGAMP and targeting by the anti-viral agent DMXAA.

Select Publications: (2003 to present; out of over 475 papers and reviews)

2003

Ye, K., Malinina, L. & Patel, D. J. (2003). Recognition of siRNA by a viral suppressor of RNA silencing. **Nature** 426, 874-878.

2004

Ma, J.-B., Ye, K. & Patel, D. J. (2004). Structural basis for overhang-specific small interfering RNA recognition by the PAZ domain. **Nature** 429, 318-322.

Malinina, L., Malakhova, M. L., Teplov, A., Brown, R. E. & Patel, D. J. (2004). Structural basis for glycosphingolipid transfer specificity. **Nature** 430, 1048-1053.

2005

Ma, J. B., Yuan, Y. R., Meister, G., Pei, Y., Tuschl, T. & Patel, D. J. (2005). Structural basis for 5'-end-specific recognition of the guide RNA strand by the *A. fugu* PIWI protein. **Nature** 434, 666-670.

Serganov, A., Keiper, S., Malinina, L., Tereschko, V., Skripkin, E., Hobartner, C., Polonskaia, A., Phan, A. T., Wombacher, R., Micura, R., Dauter, Z., Jaschke, A. & Patel, D. J. (2005). Structural basis for Diels-Alder ribozyme catalyzed carbon-carbon bond formation. **Nat. Struct. Mol. Biol.** 12, 218-224.

Phan, A. T., Kuryavyi, V., Gaw, H. Y. & Patel, D. J. (2005). Targeting anticancer drugs to a parallel-stranded snapback G-quadruplex formed by five-guanine tracts of the human c-myc promoter. **Nat. Chem. Biol.** 1, 167-173.

Yuan, Y. R., Ma, J. B., Kuryavyi, V., Pei, Y., Zhadina, M., Meister, G., Chen, H. Y., Dauter, Z., Tuschl, T. & Patel, D. J. (2005). Crystal structure of *Aquifex aeolicus* Argonaute, a site-specific DNA-guided endoribonuclease, provides insights into RISC-mediated mRNA cleavage. **Mol. Cell** 19, 405-419.

2006

Serganov, A., Polonskaia, A., Phan, A. T., Breaker, R. R. & Patel, D. J. (2006). Structural basis for gene regulation by a riboswitch that senses thiamine pyrophosphate. **Nature** 441, 1167-1171.

Li, H., Ilin, S., Wang, W. K., Wysocka, J., Allis, C. D. & Patel, D. J. (2006). Molecular basis for site-specific readout of H3 lysine 4 trimethylation by the BPTF PHD finger. **Nature** 442, 91-95.

Teplova, M., Yuan, Y. R., Phan, A. T., Malinina, L., Ilin, S., Teplov, A. & Patel, D. J. (2006). Structural basis for recognition and sequestration of UUU_{OH} 3'-termini of nascent mRNA polymerase III transcripts by La autoantigen. **Mol. Cell** 21, 75-85.

Rechko, O., Malinina, L., Cheng, Y., Kuryavyi, V., Broyde, S., Geacintov, N. & Patel, D. J. (2006). Stepwise translocation of Dpo4 polymerase during error-free bypass of oxoG lesion. **PLoS Biology** 4, 25-42.

Ruthenberg, A. J., Wang, W., Graybosch, D. M., Li, H., Allis, C. D., Patel, D. J. & Verdine, G. L. (2006). Histone H3 lysine 4 methylation state recognition and presentation by the WDR5 module of the MLL1 complex. **Nat. Struct. Mol. Biol.** 13, 704-712.

Malinina, L., Malakhova, M. L., Kanack, A. T., Brown, R. E. & Patel, D. J. (2006). The liganding mode of glycolipid transfer protein is controlled by glycolipid acyl structure. **PLoS Biology** 4, 1996-2011.

Taverna, S. D., Ilin, S., Rogers, R. S., Tanny, J. C., Lavender, H., Li, H., Baker, L., Boyle, J., Blair, L. P., Chait, B., Patel, D. J., Aitchison, J. D., Tackett, A. J. & Allis, C. D. (2006). Yng1 PHD finger binding to H3 trimethylated at K4 targets promotes NuA3 HAT activity at K14 of H3 and transcription at a subset of targeted ORFs. **Mol. Cell** 24, 785-796.

Zhang, X., Yuan, Y.-R., Pei, Y., Tuschl, T., Patel, D. J. & Chua, N.-H. (2006). Cucumber mosaic virus-encoded 2b suppressor inhibits *Arabidopsis* AGO1 cleavage activity to counter plant defense. **Genes Dev.** 20, 3255-3268.

2007

Serganov, A. & Patel, D. J. (2007). Ribozymes and riboswitches: beyond simple RNA. **Nat. Rev. Genetics** 8, 776-790.

Ruthenberg, A. J., Li, H., Patel, D. J. & Allis, C. D. (2007). Multivalent engagement of chromatin modifications by linked binding modules. **Nat. Rev. Mol. Cell Biol.** 8, 983-994.

Bailor, M. H., Musselman, C., Hansen, A. L., Gulati, K., Patel, D. J. & Al-Hashimi, H. M. (2007). Characterizing the relative orientation and dynamics of RNA A-form helices using NMR residual dipolar couplings. **Nat. Protocols** 2, 1536-1546.

Li, H., Wang, W. K., Fischle, W., Duncan, E. M., Liang, L., Allis, C. D. & Patel, D. J. (2007). Structural basis for lower lysine methylation state-specific readout by MBT repeats and an engineered PHD finger module. **Mol. Cell** 28, 677-691.

Taverna, S. D., Li, H., Ruthenberg, A. J., Allis, C. D. & Patel, D. J. (2007). How chromatin-binding modules interpret histone modifications: Lessons from professional pocket pickers. **Nat. Struct. Mol. Biol.** 14, 1025-1040.

2008

Serganov, A., Huang, L. & Patel, D. J. (2008). Structural insights into amino acid binding and gene control by a lysine riboswitch. **Nature** 455, 1263-1267.

Wang, Y., Sheng, G., Juranek, S., Tuschl, T. & Patel, D. J. (2008a). Structure of the guide-strand-containing Argonaute silencing complex. **Nature** 456, 209-213.

Wang, Y., Li, H., Juranek, S., Sheng, G., Tuschl, T. & Patel, D. J. (2008b). Structure of an argonaute silencing complex with a seed-containing guide DNA and target RNA duplex. **Nature** 456, 921-926.

Teplova, M. & Patel, D. J. (2008). Structural insights into RNA recognition by the alternate splicing regulator muscleblind-like MBNL1. **Nat. Struct. Mol. Biol.** 15, 1343-1351.

2009

Xiao, A., Li, H., Shechter, D., Ahn, S. H., Fabrizio, L., Erajument-Bromage, H., Murakami-Ishibe, S., Wang, B., Tempst, P., Hofmann, K., Patel, D. J., Elledge, S. J. & Allis, C. D. (2009). WSTF regulates the DNA damage response of H2A.X via a novel tyrosine kinase activity. **Nature** 457, 57-62.

Serganov, A., Huang, L. & Patel, D. J. (2009). Coenzyme recognition and gene regulation by a FMN riboswitch. **Nature** 458, 233-237.

Wang, G. G., Song, J., Wang, Z., Dormann, H. L., Casadio, F., Luo, J., Patel, D. J. & Allis, C. D. (2009). Haematopoietic malignancies initiated by dysregulation of a chromatin-binding PHD finger. **Nature** 459, 847-851.

Wang, Y., Juranek, S., Li, H., Sheng, G., Wardle, G. S., Tuschl, T. & Patel, D. J. (2009). Nucleation, propagation and cleavage of target RNAs in argonaute silencing complexes. **Nature** 461, 754-761.

Zhao, Q., Rank, G., Tan, Y. T., Li, H., Moritz, R. L., Simpson, R. J., Cerruti, L., Curtis, D. J., Patel, D. J., Allis, C. D., Cunningham, J. M. & Jane, S. M. (2009). PRMT5-mediated methylation of histone H4R3 recruits DNMT3A coupling histone and DNA methylation in gene silencing. **Nat. Struct. Mol. Biol.** 16, 304-311.

Li, H., Motamedi, M., Yip, C. K., Wang, Z., Waqf, T., Patel, D. J. & Moazed, D. (2009). An alpha motif of Tas3 C-terminus mediated RITS cis-spreading and promotes heterochromatin gene silencing. **Mol. Cell** 34, 155-167.

2010

Wang, Z., Song, J., Milne, T. A., Wang, G. G., Li, H., Allis, C. D. & Patel, D. J. (2010). Pro isomerization in MLL1 PHD3-Bromo cassette connects H3K4me3 readout to CYP33 and HDAC-mediated repression. **Cell** 141, 1183-1194.

Tsai, W-W., Wang, Z., Yiu, T. T., Akdemir, K. C., Xia, W., Winter, S., Tsai, C-Y., Shi, X., Schwarzer, D., Plunkett, W., Aronow, B., Gozani, O., Fischle, W., Hung, M. C., Patel, D. J. & Barton, M. C. (2010). TRIM24 links recognition of a non-canonical histone signature to breast cancer. **Nature** 468, 927-932.

Rechkoblit, O., Kolbanovskiy, A., Malinina, L., Geacintov, N. E., Broyde, S. & Patel, D. J. (2010). Y-family polymerase-facilitated mechanism of error-free bypass and semi-targeted mutagenic processing of an aromatic amine lesion. **Nat. Struct. Mol. Biol.** 17, 379-388.

Wang, Y., Ludwig, J., Sheng, G., Juranek, S., Micura, R., Tuschl, T., Hartmann, G. & Patel, D. J. (2010). Structural and functional insights into 5'-ppp-dsRNA pattern recognition by the innate immune receptor RIG-I. **Nat. Struct. Mol. Biol.** 17, 781-787.

Huang, L., Serganov, A. & Patel, D. J. (2010). Structural insights into ligand recognition by a sensing domain of the cooperative glycine riboswitch. **Mol. Cell** 40, 774-786.

2011

Song, J., Rechkoblit, O., Bestor, T. H. & Patel, D. J. (2011). Structure of DNMT1-DNA complex reveals a role for autoinhibition in maintenance DNA methylation. **Science** 331, 1036-1040.

Ruthenburg, A., Li, H., Milne, T., Dou, Y., McGinty, R. K., Yuen, M., Muir, T. W., Patel, D. J. & Allis, C. D. (2011). Recognition of a mononucleosomal histone modification pattern by BPTF via multivalent interactions. **Cell** 145, 692-706.

Weinberg, D., Nakanishi, K., Patel, D. J. & Bartel, D. P. (2011). The inside-out mechanism of Dicers from budding yeasts. **Cell** 146, 262-276.

Xi, Q., Wang, Z., Zaromytidou, A., Zhang, X. H., Chow-Tsang, L-F., Liu, J. X., Kim, H., Monova-Todorova, K., Kaartinen, V., Studer, L., Mark, W., Patel, D. J. & Massague, J. (2011). A poised chromatin platform for Smad access to master regulators. **Cell** 147, 1511-1524.

Park, J. E., Heo, I., Tian, Y., Shimanshu, D., Chang, H., Jee, D., Patel, D. J. & Kim, V. N. (2011). Dicer recognizes the 5'-end of RNA for efficient and accurate cleavage. **Nature** 475, 201-205.

Pikovskaya, O., Polonskaya, A., Patel, D. J. & Serganov, A. (2011). Structural principles of nucleoside selectivity in a 2'-deoxyguanosine. **Nat. Chem. Biol.** 7, 748-755.

Rajakumara, E., Wang, Z., Ma, H., Hu, L., Chen, H., Lin, Y., Guo R., Wu, F., Li, H., Lan, F., Shi, Y., Xu, Y., Patel, D. J. & Shi, Y. (2011a). PHD finger recognition of unmodified histone H3R2 links UHRF1 to regulation of euchromatic gene expression. **Mol Cell** 43, 275-284.

Rajakumara, E., Law, J. A., Shimanshu, D. K., Voigt, P., Johnson, L. M., Reinberg, D., Patel, D. J. & Jacobsen, S. E. (2011b). A dual flip out mechanism for 5mC recognition by the *Arabidopsis* SUVH5 SRA domain and its impact on DNA methylation and H3K9 dimethylation *in vivo*. **Genes Dev.** 25, 137-152.

Tian, Y., Simanshu, D. K., Ascano, M., Daiz-Avalos, R., Park, A. Y., Juranek, S. A., Rice, W. J., Yin, Q., Robinson, C. C., Tuechl, T. & Patel, D. J. (2011). Multimeric assembly and biochemical characterization of the Trax-translin endonuclease complex. **Nat. Struct. Mol. Biol.** 18, 658-664.

Iwase, S., Xiang, B., Ghosh, S., Ren, T., Lewis, P. W., Cochrane, J. C., Allis, C. D., Picketts, D. J., Patel, D. J., Li, H. & Shi, Y. (2011). ATRX links atypical histone methylation recognition mechanisms to human mental retardation syndrome. **Nat. Struct. Mol. Biol.** 18, 769-776.

Phan, A. T., Kuryavyy, V., Darnell, J. C., Serganov, A., Majumdar, A., Raslin, T., Polonskaia, A., Chen, C., Clain, D., Darnell, R. B. & Patel, D. J. (2011). Structure-function studies of FMRP RGG peptide recognition of an RNA duplex-quadruplex junction. **Nat. Struct. Mol. Biol.** 18, 796-804.

Teplova, M., Wohlbald, L., Kim, N. Y., Izaurralde, E. & Patel, D. J. (2011). Structure-function studies of nucleocytoplasmic transport of retroviral genomic RNA by mRNA export factor TAP. **Nat. Struct. Mol. Biol.** 18, 990-998.

2012

Song, J., Teplova, M., Ishibe-Murakami, S. & Patel, D. J. (2012). Structural principles underlying DNMT1-mediated DNA methylation. **Science** 335, 709-712.

Kuo, A. J., Song, J., Cheung, P., Ishibe-Murakami, S., Yamazoe, S., Chen, J., Patel, D. J. & Gozani, O. (2012). ORC1 BAH domain links dimethylation of H4K20 to DNA replication licensing and Meier-Gorlin syndrome. **Nature** 484, 115-119.

Ren, A., Rajashankar, K. & Patel, D. J. (2012). Structure of the fluoride riboswitch reveals F⁻ ion encapsulation by Mg²⁺ ions and RNA phosphates. **Nature** 486, 85-89.

Nakanishi, K., Weinberg, D. E., Bartel, D. P. & Patel, D. J. (2012). Structure of yeast Argonaute with guide RNA. **Nature** 486, 368-374.

Kruidenier, L., Chung, C., Cheng, Z., Liddle, J., Bantscheff, M., Bountra, C., Bridges, A., Che, K., Diallo, H., Eberhard, D., Hutchinson, S., Joberty, G., Jones, E., Katso, R., Leveridge, M., Mosley, J., Rowland, P., Ramirez-Molina, C., Schofield, C. J., Sheppard, R., Smith, J. E., Swales, C., Tanner, R., Thomas, P., Tumber, A., Drewes, G., Oppermann, U., Patel, D. J., Lee, K., & Wilson, W. (2012). A selective H3K27 demethylase inhibitor modulates the proinflammatory macrophage response. **Nature** 488, 404-408.

Du, J., Zhong, X., Barnatavichute, Y. V., Stroud, H., Feng, S., Caro, E., Vashisht, A. A., Terragni, J., Tu, J., Hetzel, J., Wohlschlegel, J. A., Pradhan, S., Patel, D. J. & Jacobsen, S. E. (2012). Dual binding of chromomethylase BAH and chromo domains to H3K9me2-containing nucleosomes in the targeting of DNA methylation. **Cell** 157, 167-180.

Elsasser, S. J., Huang, H., Lewis, P. W., Allis, C. D. & Patel, D. J. (2012). DAXX histone chaperone envelops an H3.3/H4 dimer for H3.3-specific recognition. **Nature** 491, 560-565.

2013

Oh, Y-S., Gao, P., Lee, K., Ceglia, I., Zhang, X., Ahn, J-H., Chait, B. T., Patel, D. J., Kim, Y. & Greengard, P. (2013). SMARCA3, a chromatin remodeling factor, is required for p11-dependent antidepressant action. **Cell** 152, 841-843.

Gao, P., Ascano, M., Wu, Y., Barchet, W., Gaffney, B. L., Zillinger, T., Serganov, A., Jones, R. A., Hartmann, G., Tuschl, T. and Patel, D. J. (2013a). Cyclic [G(2',5')pA(3',5')p] is the metazoan second messenger produced by DNA-activated cyclic GMP-AMP synthase. **Cell** 153, 1094-1107.

Gao, P., Ascano, M., Zillinger, T., Wang, Y., Dai, P., Serganov, A. A., Gaffney, B. L., Shuman, S., Jones, R., Deng, L., Hartmann, G., Barchet, W., Tuschl, T. and Patel, D.J. (2013b). Structure-function analysis of STING activation by c[G(2',5')pA(3',5')p] and targeting by DMXAA. **Cell** 154, 748-762.

Shen, J., Xia, Y., Khotskaya, Y. B., Huo, L., Nakanishi, K., Lim, S-O., Du, Y., Wang, Y., Chang, W-C., Chen, C-H., Hsu, J. L., Lam, Y. C., James, B. P., Liu, C-G., Liu, X., Patel, D. J. & Hung, M. C. (2013). EGFR modulates miRNA maturation in response to hypoxia through phosphorylation of Ago2. **Nature** 497, 383-387.

Law, J. A., Du, J., Hale, C. J., Feng, S., Krajewski, K., Strahl, B. D., Patel, D. J. & Jacobsen, S. E. (2013). Polymerase IV occupancy at RNA-directed DNA methylation sites requires SHH1. **Nature** 498, 385-389.

Sun, X-J., Wang, Z., Wang, L., Jiang, Y., Chen, W-Y., Melnick, A., Patel, D. J., Nimer, S. D. & Roeder, R. G. (2013). A stable transcription factor complex nucleated by dimeric AML1-ETO controls leukemogenesis. **Nature** 500, 93-97.

Simanshu, D. K., Kamlekar, R. K., Wijesinghe, D. S., Zou, X., Zhai, X., Mishra, S. K., Molotkovsky, J. G., Malinina, L., Hinchliffe, E. H., Chalfant, C. E., Brown, R. E. & Patel, D. J. (2013a). Nonvesicular trafficking by ceramide-1-phosphate transfer protein regulates eicosanoid production. **Nature** 500, 463-467.

Patel, D. J. and Wang, Z. (2013). A structural perspective of readout of epigenetic posttranslational modifications. **Ann. Rev. Biochem.** 82, 81-118.

Dai, Q., Ren, A., Westholm, J. O., Serganov, A., Patel, D. J. & Lai, E. C. (2013). The BEN domain is a novel sequence-specific DNA binding domain conserved in neural transcriptional repressors. **Genes Dev.** 27, 602-614.

Teplova, M., Hafner, M., Teplov, D., Essig, K., Tuschl, T. and Patel, D. J. (2013). Structure-function studies of STAR family Quaking proteins bound to their *in vivo* RNA target sites. **Genes Dev.** 27, 928-940.

Cai, L., Rothbart, S. B., Lu, R., Xu, B., Tripathy, A., Chen, W-Y., Zheng, D., Patel, D. J., Allis, C. D., Strahl, B. D., Song, J. & Wang, G. (2013). An H3K36me3-containing Tudor motif of polycomb-like proteins mediates PRC2 complex targeting. **Mol. Cell** 49, 571-582.

Simanshu, D. K., Yamaguchi, Y., Park, J-H., Inouye, M. and Patel, D. J. (2013b). Structural insights into mRNA recognition by toxin MazF and its regulation by antitoxin MazE in *B. subtilis*. **Mol. Cell** 52, 447-458.

Nakanishi, K., Ascano, M., Gogakos, T., Ishibi-Murakami, S., Serganov, A. A., Briskin, D., Morozov, P., Tuschl, T. and Patel, D. J. (2013). Eukaryote-specific insertion elements control human ARGONAUTE slicer activity. **Cell Reports** 3, 1893-1900.

2014

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