Stanford

Peter Sarnow

Burt and Marion Avery Professor of Immunology

Microbiology & Immunology

Curriculum Vitae available Online

Bio

ACADEMIC APPOINTMENTS

- Professor, Microbiology & Immunology
- Member, Bio-X
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Stanford Cancer Institute

ADMINISTRATIVE APPOINTMENTS

- Director of Graduate Program, Dept. Microbiology and Immunology, Stanford University School of Medicine, (2002- present)
- Member of the Committee on Graduate Studies, Stanford University, (2001-2004)
- Member of School of Medicine Awards Committee, Stanford University School of Medicine, (2005- present)
- Chair, Dept. of Microbiology & Immunology, Stanford University School of Medicine, (2010-2017)

HONORS AND AWARDS

- Predoctoral Fellowship, Studienstiftung des Deutschen Volkes (1979-1982)
- Postdoctoral Fellowship, Deutsche Forschungsgemeinschaft (1982-1985)
- Faculty Research Award, American Cancer Society (1992-1997)
- Editor, Virology (2003-present)
- The Sidney and Skippy Frank Prize, Institute for Immunity, Transplantation and Infection, Stanford University (2006)
- Merit Award, National Institutes of Health (2009-2019)
- Elected, Fellow of the American Association for the Advancement of Science (2010)
- Cozzarelli Prize, Proceedings of the National Academy of Sciences (2011)
- Elected, Fellow of the American Society of Microbiology (2011)
- NIH Director's Transformative R01 (T-R01) Program Award, National Institutes of Health (2011-2016)
- Investigator, Chan Zuckerberg BioHub (2017-present)
- Elected, Member of the National Academy of Sciences (2020)

PROFESSIONAL EDUCATION

- Ph.D., SUNY at Stony Brook , Molecular Virology (1982)
- B.S., University of Konstanz , Molecular Genetics (1979)

LINKS

- Sarnow Lab Website: https://med.stanford.edu/sarnowlab.html

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Our laboratory has been been studying the mechanism by which a liver-specific microRNA, miR-122, regulates the amplification of the hepatitis C virus (HCV) genome in cultured cells. Specifically, we have found that miR-122 interacts with the 5' end of the viral RNA and is essential for viral replication. Consequently, sequestration of miR-122 by antisense-oligonucleotides results in rapid loss of viral RNA. We are currently examining the mechanism by which miR-122 helps HCV RNA replication and are searching for cellular targets of miR-122 and their regulation by miR-122. These lines of investigations will lead to new insights how these small noncoding RNAs regulate expression of cellular and viral mRNAs and may point to new venues for antiviral therapeutics against HCV.

In a second line of investigation, we are studying the unusual mechanism of translation initiation by internal ribosome entry in certain viral (i.e. HCV, picornavirsues and some insect viruses) and cellular mRNA molecules. In the conventional scanning mechanism of translation initiation, which operates on most mRNA molecules, 40S subunits are recruited at or near the 5' end of the mRNA. Subsequently, the 40S ribosomal subunits are predicted to scan the mRNA in a 5' to 3' direction until the first AUG codon is encountered as start site for protein synthesis. However, certain viral and cellular mRNAs, notably encoding proto-oncogenes and regulatory genes, contain long 5' noncoding regions with multiple AUG codons. Thus, the translation initiation rate in these mRNAs is predicted to be low according to the scanning model; alternatively, other translation initiation mechanisms may operate to ensure efficient translation. Indeed, some of such mRNAs with long leaders contain internal ribosome entry sites which can bind ribosomes directly. Much of our work has been focussing on the mechanism and prevalence of internal ribosome binding. Specifically, we are addressing the following questions: Which cellular and viral mRNAs can be translated by internal ribosome binding? What are the cellular gene products that mediate internal ribosome binding? Is internal initiation regulated in the cell? What is the molecular basis for designating a given AUG codon as start site codon?

Teaching

COURSES

2023-24

- Principles of Biological Technologies: MI 215 (Spr)

2022-23

- Principles of Biological Technologies: MI 215 (Win)

2021-22

- Principles of Biological Technologies: MI 215 (Win)

2020-21

- Principles of Biological Technologies: MI 215 (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Isabel Delwel

Postdoctoral Faculty Sponsor

Qian Cao, Kuan Ting Liu

Doctoral Dissertation Advisor (AC)

Elysse Grossi-Soyster

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Microbiology and Immunology (Phd Program)

Publications

PUBLICATIONS

- **Virus-derived circular RNAs populate hepatitis C virus-infected cells.** *Proceedings of the National Academy of Sciences of the United States of America*
  Cao, Q. M., Boonchuen, P., Chen, T., Lei, S., Somboonwiwat, K., Sarnow, P.
  2024; 121 (7): e2313002121

- **Impact of a patient-derived hepatitis C viral RNA genome with a mutated microRNA binding site.** *PLoS pathogens*
  Mata, M. n., Neben, S. n., Majzoub, K. n., Carette, J. n., Ramanathan, M. n., Khavari, P. A., Sarnow, P. n.
  2019; 15 (5): e1007467

- **Precursor microRNA-122 inhibits synthesis of Insig1 isoform mRNA by modulating polyadenylation site usage** *RNA*
  Norman, K. L., Chen, T., Zeiner, G., Sarnow, P.
  2017; 23 (12): 1886–93

- **Trans-kingdom mimicry underlies ribosome customization by a poxvirus kinase** *NATURE*
  Jha, S., Rollins, M. G., Fuchs, G., Procter, D. J., Hall, E. A., Cozzolino, K., Sarnow, P., Savas, J. N., Walsh, D.
  2017; 546 (7660): 651-+

- **Making the Mark: The Role of Adenosine Modifications in the Life Cycle of RNA Viruses.** *Cell host & microbe*
  Gonzales-van Horn, S. R., Sarnow, P.
  2017; 21 (6): 661-669

- **"Escape from Transcriptional Shutoff during Poliovirus Infection: NF-kappa B-Responsive Genes I kappa Ba and A20" (vol 85, pg 10101, 2011)** *JOURNAL OF VIROLOGY*
  Doukas, T., Sarnow, P.
  2017; 91 (9)

- **A transfer-RNA-derived small RNA regulates ribosome biogenesis.** *Nature*
  Kim, H. K., Fuchs, G. n., Wang, S. n., Wei, W. n., Zhang, Y. n., Park, H. n., Roy-Chaudhuri, B. n., Li, P. n., Xu, J. n., Chu, K. n., Zhang, F. n., Chua, M. S., So, et al
  2017; 552 (7683): 57–62

- **Unraveling the Mysterious Interactions Between Hepatitis C Virus RNA and Liver-Specific MicroRNA-122.** *Annual review of virology*
  Sarnow, P., Sagan, S. M.
  2016; 3 (1): 309-332

- **Variant enterovirus A71 found in immune-suppressed patient binds to heparan sulfate and exhibits neurotropism in B-cell-depleted mice.** *Cell reports*
  Weng, K., Tee, H. K., Tseligka, E. D., Cagno, V., Mathez, G., Rosset, S., Nagamine, C. M., Sarnow, P., Kirkegaard, K., Tapparel, C.
  2023; 42 (4): 112389

- **Subversion of a protein-microRNA signaling pathway by hepatitis C virus.** *Proceedings of the National Academy of Sciences of the United States of America*
  Cao, Q. M., Sarnow, P.
  2023; 120 (4): e2220406120

- **Loquacious modulates flaviviral RNA replication in mosquito cells.** *PLoS pathogens*
  Shivaprasad, S., Weng, K. F., Ooi, Y. S., Belk, J., Carette, J. E., Flynn, R., Sarnow, P.
  2022; 18 (4): e1010163

- **Cross-species microRNA transmission modulates flavivirus growth in mosquitoes.** *Trends in parasitology*
  Shivaprasad, S., Sarnow, P.
  2022

- **An evolutionarily acquired microRNA shapes development of mammalian cortical projections.** *Proceedings of the National Academy of Sciences of the United States of America*
  Diaz, J. L., Siththanandan, V. B., Lu, V., Gonzalez-Nava, N., Pasquina, L., MacDonald, J. L., Woodworth, M. B., Ozkan, A., Nair, R., He, Z., Sahni, V., Sarnow, P., Palmer, et al
  2020
- **The tale of two flaviviruses: subversion of host pathways by RNA shapes in dengue and hepatitis C viral RNA genomes.** *Current opinion in microbiology*
  Shivaprasad, S., Sarnow, P.
  2020; 59: 79–85
- **Host-derived circular RNAs display proviral activities in Hepatitis C virus-infected cells.** *PLoS pathogens*
  Chen, T. C., Tallo-Parra, M. n., Cao, Q. M., Kadener, S. n., Böttcher, R. n., Pérez-Vilaró, G. n., Boonchuen, P. n., Somboonwiwat, K. n., Díez, J. n., Sarnow, P. n.
  2020; 16 (8): e1008346
- **An RNA-centric dissection of host complexes controlling flavivirus infection.** *Nature microbiology*
  Ooi, Y. S., Majzoub, K., Flynn, R. A., Mata, M. A., Diep, J., Li, J. K., van Buuren, N., Rumachik, N., Johnson, A. G., Puschnik, A. S., Marceau, C. D., Mlera, L., Grabowski, et al
  2019
- **Impact of a patient-derived hepatitis C viral RNA genome with a mutated microRNA binding site** *PLOS PATHOGENS*
  Mata, M., Neben, S., Majzoub, K., Carette, J., Ramanathan, M., Khavari, P. A., Sarnow, P.
  2019; 15 (5)
- **Enterovirus pathogenesis requires the host methyltransferase SETD3.** *Nature microbiology*
  Diep, J. n., Ooi, Y. S., Wilkinson, A. W., Peters, C. E., Foy, E. n., Johnson, J. R., Zengel, J. n., Ding, S. n., Weng, K. F., Laufman, O. n., Jang, G. n., Xu, J. n., Young, et al
  2019
- **microRNAs Refine Cortical Projection Neuron Subtype during Mammalian Development**
  Siththanandan, V., Diaz, J., Lu, V., Gonzalez-Nava, N., Pasquina, L., MacDonald, J., Woodworth, M., Sahni, V., Sarnow, P., Palmer, T., Macklis, J., Tharin, S.
  WILEY.2018: S276–S277
- **A transfer RNA derived small RNA affects translation in rapidly dividing cells and a target for hepatocellular carcinoma**
  Kim, H., Fuchs, G., Wang, S., Wei, W., Zhang, Y., Park, H., Roy-Chaudhuri, B., Li, P., Xu, J., Chu, K., Zhang, F., Chua, M., So, et al
  AMER ASSOC CANCER RESEARCH.2018
- **Genetic dissection of Flaviviridae host factors through genome-scale CRISPR screens** *NATURE*
  Marceau, C. D., Puschnik, A. S., Majzoub, K., Ooi, Y. S., Brewer, S. M., Fuchs, G., Swaminathan, K., Mata, M. A., Elias, J. E., Sarnow, P., Carette, J. E.
  2016; 535 (7610): 159-?
- **cis-Acting RNA elements in the hepatitis C virus RNA genome** *VIRUS RESEARCH*
  Sagan, S. M., Chahal, J., Sarnow, P.
  2015; 206: 90-98
- **Supporting Role for GTPase Rab27a in Hepatitis C Virus RNA Replication through a Novel miR-122-Mediated Effect.** *PLoS pathogens*
  Chen, T., Hsieh, C., Sarnow, P.
  2015; 11 (8)
- **Supporting Role for GTPase Rab27a in Hepatitis C Virus RNA Replication through a Novel miR-122-Mediated Effect** *PLOS PATHOGENS*
  Chen, T., Hsieh, C., Sarnow, P.
  2015; 11 (8)
- **Interaction of Host Cell microRNAs with the HCV RNA Genome during Infection of Liver Cells** *SEMINARS IN LIVER DISEASE*
  Sedano, C. D., Sarnow, P.
  2015; 35 (1): 75-80
- **Kinetic pathway of 40S ribosomal subunit recruitment to hepatitis C virus internal ribosome entry site.** *Proceedings of the National Academy of Sciences of the United States of America*
  Fuchs, G., Petrov, A. N., Marceau, C. D., Popov, L. M., Chen, J., O'Leary, S. E., Wang, R., Carette, J. E., Sarnow, P., Puglisi, J. D.
  2015; 112 (2): 319-325

- **Dissecting noncoding and pathogen RNA-protein interactomes** *RNA-A PUBLICATION OF THE RNA SOCIETY*
  Flynn, R. A., Martin, L., Spitale, R. C., Do, B. T., Sagan, S. M., Zarnegar, B., Qu, K., Khavari, P. A., Quake, S. R., Sarnow, P., Chang, H. Y.
  2015; 21 (1): 135-143

- **Hepatitis C Virus Subverts Liver-Specific miR-122 to Protect the Viral Genome from Exoribonuclease Xrn2.** *Cell host & microbe*
  Sedano, C. D., Sarnow, P.
  2014; 16 (2): 257-264

- **Reduced BMPR2 expression induces GM-CSF translation and macrophage recruitment in humans and mice to exacerbate pulmonary hypertension.** *journal of experimental medicine*
  Sawada, H., Saito, T., Nickel, N. P., Alastalo, T., Glotzbach, J. P., Chan, R., Haghighat, L., Fuchs, G., Januszyk, M., Cao, A., Lai, Y., Perez, V. d., Kim, et al
  2014; 211 (2): 263-280

- **Enhancement of hepatitis C viral RNA abundance by precursor miR-122 molecules** *RNA-A PUBLICATION OF THE RNA SOCIETY*
  Cox, E. M., Sagan, S. M., Mortimer, S. A., Doudna, J. A., Sarnow, P.
  2013; 19 (12): 1825-1832

- **Molecular biology. RNAi, Antiviral after all.** *Science*
  Sagan, S. M., Sarnow, P.
  2013; 342 (6155): 207-208

- **Modulation of GB Virus B RNA Abundance by MicroRNA-122: Dependence on and Escape from MicroRNA-122 Restriction.** *Journal of virology*
  Sagan, S. M., Sarnow, P., Wilson, J. A.
  2013; 87 (13): 7338-7347

- **Reduced DEAF1 function during type 1 diabetes inhibits translation in lymph node stromal cells by suppressing Eif4g3.** *Journal of molecular cell biology*
  Yip, L., Creusot, R. J., Pager, C. T., Sarnow, P., Fathman, C. G.
  2013; 5 (2): 99-110

- **Reduced DEAF1 function during type 1 diabetes inhibits translation in lymph node stromal cells by suppressing Eif4g3** *JOURNAL OF MOLECULAR CELL BIOLOGY*
  Yip, L., Creusot, R. J., Pager, C. T., Sarnow, P., Fathman, C. G.
  2013; 5 (2): 99-110

- **Modulation of hepatitis C virus RNA abundance and virus release by dispersion of processing bodies and enrichment of stress granules.** *Virology*
  Pager, C. T., Schütz, S., Abraham, T. M., Luo, G., Sarnow, P.
  2013; 435 (2): 472-484

- **Modulation of hepatitis C virus RNA abundance and virus release by dispersion of processing bodies and enrichment of stress granules** *VIROLOGY*
  Pager, C. T., Schuetz, S., Abraham, T. M., Luo, G., Sarnow, P.
  2013; 435 (2): 472-484

- **Protection of the hepatitis C viral RNA genome and modulation of polyadenylation site usage in Insig1 mRNA by liver-specific pre- and mature microRNA 122** *8th Annual Meeting of the Oligonucleotide-Therapeutics-Society*
  Sarnow, P., Machlin, E., Sagan, S.
  MARY ANN LIEBERT INC.2012: A8–A9

- **Combating Hepatitis C Virus by Targeting MicroRNA-122 Using Locked Nucleic Acids** *CURRENT GENE THERAPY*
  Machlin, E. S., Sarnow, P., Sagan, S. M.
  2012; 12 (4): 301-306

- **Reduced BMPR2 Increases GM-CSF mRNA Translation by Inhibiting eIF2 alpha Mediated Stress Granule Formation and Propensity to Pulmonary Vascular Disease** *Scientific Sessions of the American-Heart-Association/Resuscitation Science Symposium*
  Sawada, H., Alastalo, T., Glotzbach, J. P., Chan, R., Fuchs, G., Januszyk, M., Lai, Y., Perez, V. D., Saito, T., Spiekerkoetter, E., Wang, L., Gurtner, G. C., Sarnow, et al
  LIPPINCOTT WILLIAMS & WILKINS.2011

- **Escape from Transcriptional Shutoff during Poliovirus Infection: NF-kappa B-Responsive Genes I kappa Ba and A20** *JOURNAL OF VIROLOGY*
  Doukas, T., Sarnow, P.
  2011; 85 (19): 10101-10108

- **Proteomic Analysis of Ribosomes: Translational Control of mRNA Populations by Glycogen Synthase GYS1** *JOURNAL OF MOLECULAR BIOLOGY*
  Fuchs, G., Diges, C., Kohlstaedt, L. A., Wehner, K. A., Sarnow, P.
  2011; 410 (1): 118-130
- **Masking the 5 ' terminal nucleotides of the hepatitis C virus genome by an unconventional microRNA-target RNA complex** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Machlin, E. S., Sarnow, P., Sagan, S. M.
  2011; 108 (8): 3193-3198
- **RNA Virus Harnesses MicroRNAs to Seize Host Translation Control** *CELL HOST & MICROBE*
  Abraham, T. M., Sarnow, P.
  2011; 9 (1): 5-7
- **Herpes Simplex Virus is Akt-ing in translational control** *GENES & DEVELOPMENT*
  Norman, K. L., Sarnow, P.
  2010; 24 (23): 2583-2586
- **Hepatitis C Virus Core-Derived Peptides Inhibit Genotype 1b Viral Genome Replication via Interaction with DDX3X** *PLOS ONE*
  Sun, C., Pager, C. T., Luo, G., Sarnow, P., Cate, J. H.
  2010; 5 (9)
- **Plasmacytoid dendritic cells as guardians in hepatitis C virus-infected liver** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Sagan, S. M., Sarnow, P.
  2010; 107 (17): 7625-7626
- **OGFOD1, a Novel Modulator of Eukaryotic Translation Initiation Factor 2 alpha Phosphorylation and the Cellular Response to Stress** *MOLECULAR AND CELLULAR BIOLOGY*
  Wehner, K. A., Schuetz, S., Sarnow, P.
  2010; 30 (8): 2006-2016
- **Stable Formation of Compositionally Unique Stress Granules in Virus-Infected Cells** *JOURNAL OF VIROLOGY*
  Piotrowska, J., Hansen, S. J., Park, N., Jamka, K., Sarnow, P., Gustin, K. E.
  2010; 84 (7): 3654-3665
- **Hepatitis C virus' Achilles' heel - dependence on liver-specific microRNA miR-122** *CELL RESEARCH*
  Norman, K. L., Sarnow, P.
  2010; 20 (3): 247-249
- **Temperature Protects Insect Cells from Infection by Cricket Paralysis Virus** *JOURNAL OF VIROLOGY*
  Cevallos, R. C., Sarnow, P.
  2010; 84 (3): 1652-1655
- **Six RNA Viruses and Forty-One Hosts: Viral Small RNAs and Modulation of Small RNA Repertoires in Vertebrate and Invertebrate Systems** *PLOS PATHOGENS*
  Parameswaran, P., Sklan, E., Wilkins, C., Burgon, T., Samuel, M. A., Lu, R., Ansel, K. M., Heissmeyer, V., Einav, S., Jackson, W., Doukas, T., Paranjape, S., Polacek, et al
  2010; 6 (2)
- **Modulation of Hepatitis C Virus RNA Abundance and the Isoprenoid Biosynthesis Pathway by MicroRNA miR-122 Involves Distinct Mechanisms** *JOURNAL OF VIROLOGY*
  Norman, K. L., Sarnow, P.
  2010; 84 (1): 666-670
- **The Imd Pathway Is Involved in Antiviral Immune Responses in Drosophila** *PLOS ONE*
  Costa, A., Jan, E., Sarnow, P., Schneider, D.
  2009; 4 (10)
- **LC3-mediated fibronectin mRNA translation induces fibrosarcoma growth by increasing connective tissue growth factor** *JOURNAL OF CELL SCIENCE*
  Ying, L., Lau, A., Alvira, C. M., West, R., Cann, G. M., Zhou, B., Kinnear, C., Jan, E., Sarnow, P., van de Rijn, M., Rabinovitch, M.

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- **Biological basis for restriction of microRNA targets to the 3 ' untranslated region in mammalian mRNAs** *NATURE STRUCTURAL & MOLECULAR BIOLOGY*
  Gu, S., Jin, L., Zhang, F., Sarnow, P., Kay, M. A.
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- **MicroRNA-mediated gene silencing.** *Progress in molecular biology and translational science*
  Pager, C. T., Wehner, K. A., Fuchs, G., Sarnow, P.
  2009; 90: 187-210
- **MicroRNA-Mediated Gene Silencing** *TRANSLATIONAL CONTROL IN HEALTH AND DISEASE*
  Pager, C. T., Wehner, K. A., Fuchs, G., Sarnow, P.
  2009; 90: 187-210
- **Position-dependent function for a tandem microRNA miR-122-binding site located in the hepatitis C virus RNA genome** *CELL HOST & MICROBE*
  Jopling, C. L., Schuetz, S., Sarnow, P.
  2008; 4 (1): 77-85
- **LNA-mediated microRNA silencing in non-human primates** *NATURE*
  Elmen, J., Lindow, M., Schutz, S., Lawrence, M., Petri, A., Obad, S., Lindholm, M., Hedtjarn, M., Hansen, H. F., Berger, U., Gullans, S., Kearney, P., Sarnow, et al
  2008; 452 (7189): 896-U10
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  Schutz, S., Sarnowl, P.
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- **Inhibition of U snRNP assembly by a virus-encoded proteinase** *GENES & DEVELOPMENT*
  Almstead, L. L., Sarnow, P.
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- **MicroRNAs: expression, avoidance and subversion by vertebrate viruses** *NATURE REVIEWS MICROBIOLOGY*
  Sarnow, P., Jopling, C. L., Norman, K. L., Schutz, S., Wehner, K. A.
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- **Polypyrimidine tract binding protein regulates IRES-mediated gene expression during apoptosis** *MOLECULAR CELL*
  Bushell, M., Stoneley, M., Kong, Y. W., Hamilton, T. L., Spriggs, K. A., Dobbyn, H. C., Qin, X., Sarnow, P., Willis, A. E.
  2006; 23 (3): 401-412
- **Initiation factor-independent translation mediated by the hepatitis C virus internal ribosome entry site** *RNA-A PUBLICATION OF THE RNA SOCIETY*
  Lancaster, A. M., Jan, E., Sarnow, P.
  2006; 12 (5): 894-902
- **Modulation of hepatitis C virus RNA by a liver-specific microRNA** *Experimental Biology 2006 Annual Meeting*
  Sarnow, P., Jopling, C., Norman, K., Yi, M. K., Lemon, S.
  FEDERATION AMER SOC EXP BIOL.2006: A1336–A1336
- **Interaction of viruses with the mammalian RNA interference pathway** *VIROLOGY*
  Schuetz, S., Sarnow, P.
  2006; 344 (1): 151-157
- **Positive and negative modulation of viral and cellular mRNAs by liver-specific microRNA miR-122** *71st Cold Spring Harbor Symposium on Quantitative Biology*
  Jopling, C. L., Norman, K. L., Sarnow, P.
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- **Takeover of host ribosomes by divergent IRES elements** *BioScience 2005 Conference*
  Sarnow, P., Cevallos, R. C., Jan, E.
  PORTLAND PRESS LTD.2005: 1479–1482
- **Modulation of hepatitis C virus RNA abundance by a liver-specific microRNA** *SCIENCE*

Jopling, C. L., Yi, M. K., Lancaster, A. M., Lemon, S. M., Sarnow, P.
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- **Genome-wide RNAi screen reveals a specific sensitivity of IRES-containing RNA viruses to host translation inhibition** *GENES & DEVELOPMENT*
  Cherry, S., Doukas, T., Armknecht, S., Whelan, S., Wang, H., Sarnow, P., Perrimon, N.
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- **Factor-independent assembly of elongation-competent ribosomes by an internal ribosome entry site located in an RNA virus that infects penaeid shrimp** *JOURNAL OF VIROLOGY*
  Cevallos, R. C., Sarnow, P.
  2005; 79 (2): 677-683

- **The arginine rich motif (ARM) in light chain 3 (LC3) of microtubule associated proteins 1A and 1B is required for protein-RNA interaction and mRNA translation** *44th Annual Meeting of the American-Society-for-Cell-Biology*
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  AMER SOC CELL BIOLOGY.2004: 216A–216A

- **Cryo-EM visualization of a viral internal ribosome entry site bound to human ribosomes: The IRES functions as an RNA-Based translation factor** *CELL*
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- **Translation inhibition during the induction of apoptosis: RNA or protein degradation?** *Focused Meeting of the Biochemical-Society*
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- **Proteolytic cleavage of the catalytic subunit of DNA-dependent protein kinase during poliovirus infection** *JOURNAL OF VIROLOGY*
  Graham, K. L., Gustin, K. E., RIVERA, C., Kuyumcu-Martinez, N. M., Choe, S. S., Lloyd, R. E., Sarnow, P., Utz, P. J.
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  Qin, X. L., Sarnow, P.
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- **Divergent tRNA-like element supports initiation, elongation, and termination of protein biosynthesis** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Jan, E., Kinzy, T. G., Sarnow, P.
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- **Enterovirus 71 contains a type IIRES element that functions when eukaryotic initiation factor eIF4G is cleaved** *VIROLOGY*
  Thompson, S. R., Sarnow, P.
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- **Viral internal ribosome entry site elements: Novel ribosome-RNA complexes and roles in viral pathogenesis** *JOURNAL OF VIROLOGY*
  Sarnow, P.
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- **Factorless ribosome assembly on the internal ribosome entry site of cricket paralysis virus** *JOURNAL OF MOLECULAR BIOLOGY*
  Jan, E., Sarnow, P.
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- **Cytoplasmic expression of mRNAs containing the internal ribosome entry site and 3 ' noncoding region of hepatitis C virus: Effects of the 3 ' leader on mRNA translation and mRNA stability** *JOURNAL OF VIROLOGY*
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Bushell, M., Sarnow, P.
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