



Peter Sarnow

Professor of Microbiology and 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 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, picornaviruses 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

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)

2019-20

- Principles of Biological Technologies: MI 215 (Win)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Qian Cao

Doctoral Dissertation Advisor (AC)

Elysse Grossi-Soyster

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Microbiology and Immunology (Phd Program)

Publications

PUBLICATIONS

- **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
- **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., Somboonwivat, 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 BMP2 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., Haghghat, L., Fuchs, G., Januszyn, 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.
2009; 122 (9): 1441-1451
- **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.
2009; 16 (2): 144-150
- **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
- **How viruses avoid stress** *CELL HOST & MICROBE*
Schutz, S., Sarnow, P.
2007; 2 (5): 284-285
- **Inhibition of U snRNP assembly by a virus-encoded proteinase** *GENES & DEVELOPMENT*
Almstead, L. L., Sarnow, P.
2007; 21 (9): 1086-1097
- **MicroRNAs: expression, avoidance and subversion by vertebrate viruses** *NATURE REVIEWS MICROBIOLOGY*
Sarnow, P., Jopling, C. L., Norman, K. L., Schutz, S., Wehner, K. A.
2006; 4 (9): 651-659
- **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.
COLD SPRING HARBOR LAB PRESS, PUBLICATIONS DEPT.2006: 369-376
- **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.
2005; 309 (5740): 1577-1581
- **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.
2005; 19 (4): 445-452
- **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*
Ying, L., Lau, A., Sarnow, P., RABINOVITCH, M.
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*
Spahn, C. M., Jan, E., Mulder, A., Grassucci, R. A., Sarnow, P., Frank, J.
2004; 118 (4): 465-475
- **Translation inhibition during the induction of apoptosis: RNA or protein degradation?** *Focused Meeting of the Biochemical-Society*
Bushell, M., Stoneley, M., Sarnow, P., Willis, A. E.
PORTLAND PRESS LTD.2004: 606–610
- **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.
2004; 78 (12): 6313-6321
- **Preferential translation of internal ribosome entry site-containing mRNAs during the mitotic cycle in mammalian cells** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Qin, X. L., Sarnow, P.
2004; 279 (14): 13721-13728
- **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.
2003; 100 (26): 15410-15415
- **Enterovirus 71 contains a type IRES element that functions when eukaryotic initiation factor eIF4G is cleaved** *VIROLOGY*
Thompson, S. R., Sarnow, P.
2003; 315 (1): 259-266
- **Viral internal ribosome entry site elements: Novel ribosome-RNA complexes and roles in viral pathogenesis** *JOURNAL OF VIROLOGY*
Sarnow, P.
2003; 77 (5): 2801-2806
- **Factorless ribosome assembly on the internal ribosome entry site of cricket paralysis virus** *JOURNAL OF MOLECULAR BIOLOGY*
Jan, E., Sarnow, P.
2002; 324 (5): 889-902
- **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*
Kong, L. K., Sarnow, P.
2002; 76 (24): 12457-12462
- **Inhibition of nuclear import and alteration of nuclear pore complex composition by rhinovirus** *JOURNAL OF VIROLOGY*
Gustin, K. E., Sarnow, P.
2002; 76 (17): 8787-8796
- **Hijacking the translation apparatus by RNA viruses** *JOURNAL OF CELL BIOLOGY*
Bushell, M., Sarnow, P.
2002; 158 (3): 395-399
- **Ribosomal proteins mediate the hepatitis C virus IRES-HeLa 40S interaction** *RNA-A PUBLICATION OF THE RNA SOCIETY*
Otto, G. A., Lukavsky, P. J., Lancaster, A. M., Sarnow, P., Puglisi, J. D.
2002; 8 (7): 913-923
- **Determinants of hepatitis C translational initiation in vitro, in cultured cells and mice** *MOLECULAR THERAPY*
McCaffrey, A. P., Hashi, K., Meuse, L., Shen, S. L., Lancaster, A. M., Lukavsky, P. J., Sarnow, P., Kay, M. A.
2002; 5 (6): 676-684

- **Regulation of internal ribosomal entry site-mediated translation by phosphorylation of the translation initiation factor eIF2 alpha** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Fernandez, J., Yaman, I., Sarnow, P., Snider, M. D., Hatzoglou, M.
2002; 277 (21): 19198-19205
- **New ways of initiating translation in eukaryotes?** *MOLECULAR AND CELLULAR BIOLOGY*
Schneider, R., Agol, V. I., Andino, R., Bayard, F., Cavener, D. R., Chappell, S. A., Chen, J. J., Darlix, J. L., Dasgupta, A., Donze, O., DUNCAN, R., Elroy-Stein, O., Farabaugh, et al
2001; 21 (23): 8238-8241
- **Internal initiation in *Saccharomyces cerevisiae* mediated by an initiator tRNA/eIF2-independent internal ribosome entry site element** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Thompson, S. R., Gulyas, K. D., Sarnow, P.
2001; 98 (23): 12972-12977
- **Internal ribosome entry sites in eukaryotic mRNA molecules** *GENES & DEVELOPMENT*
Hellen, C. U., Sarnow, P.
2001; 15 (13): 1593-1612
- **Global and specific translational regulation in the genomic response of *Saccharomyces cerevisiae* to a rapid transfer from a fermentable to a nonfermentable carbon source** *MOLECULAR AND CELLULAR BIOLOGY*
Kuhn, K. M., DeRisi, J. L., Brown, P. O., Sarnow, P.
2001; 21 (3): 916-927
- **Effects of poliovirus infection on nucleo-cytoplasmic trafficking and nuclear pore complex composition** *EMBO JOURNAL*
Gustin, K. E., Sarnow, P.
2001; 20 (1-2): 240-249
- **Initiator Met-tRNA-independent translation mediated by an internal ribosome entry site element in cricket paralysis virus-like insect viruses** *COLD SPRING HARBOR SYMPOSIA ON QUANTITATIVE BIOLOGY*
Jan, E., Thompson, S. R., Wilson, J. E., Pestova, T. V., Hellen, C. U., Sarnow, P.
2001; 66: 285-292
- **Structural and functional investigation of the hepatitis C virus IRES.** *Nucleic acids research. Supplement (2001)*
Puglisi, J. D., Kim, I., Lukavsky, P., Otto, G., Lancaster, A., Sarnow, P.
2001: 263-?
- **Structures of two RNA domains essential for hepatitis C virus internal ribosome entry site function** *NATURE STRUCTURAL BIOLOGY*
Lukavsky, P. J., Otto, G. A., Lancaster, A. M., Sarnow, P., Puglisi, J. D.
2000; 7 (12): 1105-1110
- **Distinct mRNAs that encode La autoantigen are differentially expressed and contain internal ribosome entry sites** *JOURNAL OF BIOLOGICAL CHEMISTRY*
Carter, M. S., Sarnow, P.
2000; 275 (36): 28301-28307
- **Initiation of protein synthesis from the A site of the ribosome** *CELL*
Wilson, J. E., Pestova, T. V., Hellen, C. U., Sarnow, P.
2000; 102 (4): 511-520
- **Regulation of host cell translation by viruses and effects on cell function** *CURRENT OPINION IN MICROBIOLOGY*
Thompson, S. R., Sarnow, P.
2000; 3 (4): 366-370
- **Naturally occurring dicistronic cricket paralysis virus RNA is regulated by two internal ribosome entry sites** *MOLECULAR AND CELLULAR BIOLOGY*
Wilson, J. E., Powell, M. J., Hoover, S. E., Sarnow, P.
2000; 20 (14): 4990-4999
- **Identification of eukaryotic mRNAs that are translated at reduced cap binding complex eIF4F concentrations using a cDNA microarray** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Johannes, G., Carter, M. S., Eisen, M. B., Brown, P. O., Sarnow, P.

- 1999; 96 (23): 13118-13123
- **Functional coupling between replication and packaging of poliovirus replicon RNA** *JOURNAL OF VIROLOGY*
Nugent, C. I., Johnson, K. L., Sarnow, P., Kirkegaard, K.
1999; 73 (1): 427-435
 - **Cap-independent polysomal association of natural mRNAs encoding c-myc, BiP, and eIF4G conferred by internal ribosome entry sites** *RNA-A PUBLICATION OF THE RNA SOCIETY*
Johannes, G., Sarnow, P.
1998; 4 (12): 1500-1513
 - **Viral ribonucleoprotein complex formation and nucleolar-cytoplasmic relocation of nucleolin in poliovirus-infected cells** *JOURNAL OF VIROLOGY*
Waggoner, S., Sarnow, P.
1998; 72 (8): 6699-6709
 - **Internal ribosome entry sites tests with circular mRNAs.** *Methods in molecular biology (Clifton, N.J.)*
Chen, C. Y., Sarnow, P.
1998; 77: 355-363
 - **In vitro selection of a 7-methyl-guanosine binding RNA that inhibits translation of capped mRNA molecules** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Haller, A. A., Sarnow, P.
1997; 94 (16): 8521-8526
 - **Location of the internal ribosome entry site in the 5' non-coding region of the immunoglobulin heavy-chain binding protein (BiP) mRNA: Evidence for specific RNA-protein interactions** *NUCLEIC ACIDS RESEARCH*
Yang, Q., Sarnow, P.
1997; 25 (14): 2800-2807
 - **Starting at the beginning, middle, and end: Translation initiation in eukaryotes** *CELL*
Sachs, A. B., Sarnow, P., Hentze, M. W.
1997; 89 (6): 831-838
 - **Translation-competent extracts from *Saccharomyces cerevisiae*: Effects of L-A RNA, 5' cap, and 3' poly(A) tail on translational efficiency of mRNAs** *METHODS-A COMPANION TO METHODS IN ENZYMOLOGY*
Iizuka, N., Sarnow, P.
1997; 11 (4): 353-360
 - **Evidence for involvement of trans-acting factors in selection of the AUG start codon during eukaryotic translational initiation** *MOLECULAR AND CELLULAR BIOLOGY*
McBratney, S., Sarnow, P.
1996; 16 (7): 3523-3534
 - **INITIATION OF PROTEIN-SYNTHESIS BY THE EUKARYOTIC TRANSLATIONAL APPARATUS ON CIRCULAR RNAs** *SCIENCE*
Chen, C. Y., Sarnow, P.
1995; 268 (5209): 415-417
 - **Cap-independent translation and internal initiation of translation in eukaryotic cellular mRNA molecules** *CAP-INDEPENDENT TRANSLATION*
Iizuka, N., Chen, C., Yang, Q., Johannes, G., Sarnow, P.
1995; 203: 155-177
 - **A CONSERVED HELICAL ELEMENT IS ESSENTIAL FOR INTERNAL INITIATION OF TRANSLATION OF HEPATITIS-C VIRUS-RNA** *JOURNAL OF VIROLOGY*
Wang, C. Y., Sarnow, P., Siddiqui, A.
1994; 68 (11): 7301-7307
 - **CAP-DEPENDENT AND CAP-INDEPENDENT TRANSLATION BY INTERNAL INITIATION OF MESSENGER-RNAs IN CELL-EXTRACTS PREPARED FROM *SACCHAROMYCES-CEREVISIAE*** *MOLECULAR AND CELLULAR BIOLOGY*
Iizuka, N., NAJITA, L., Franzusoff, A., Sarnow, P.
1994; 14 (11): 7322-7330

- **Internal initiation of translation.** *Current opinion in cell biology*
McBratney, S., Chen, C. Y., Sarnow, P.
1993; 5 (6): 961-965
- **Internal initiation of translation** *CURRENT OPINION IN CELL BIOLOGY*
McBratney, S., Chen, C. Y., Sarnow, P.
1993; 5 (6): 961-965
- **BIOCHEMICAL AND GENETIC-EVIDENCE FOR A PSEUDOKNOT STRUCTURE AT THE 3' TERMINUS OF THE POLIOVIRUS RNA GENOME AND ITS ROLE IN VIRAL-RNA AMPLIFICATION** *JOURNAL OF VIROLOGY*
Jacobson, S. J., Konings, D. A., Sarnow, P.
1993; 67 (6): 2961-2971
- **TRANSLATION OF HUMAN HEPATITIS-C VIRUS-RNA IN CULTURED-CELLS IS MEDIATED BY AN INTERNAL RIBOSOME-BINDING MECHANISM** *JOURNAL OF VIROLOGY*
Wang, C. Y., Sarnow, P., Siddiqui, A.
1993; 67 (6): 3338-3344
- **Gene regulation: translational initiation by internal ribosome binding.** *Current opinion in genetics & development*
Oh, S. K., Sarnow, P.
1993; 3 (2): 295-300
- **TRANSLATION INITIATION BY INTERNAL RIBOSOME BINDING OF EUKARYOTIC MESSENGER-RNA MOLECULES** *International Conference on the Translational Apparatus*
Chen, C. Y., Macejak, D. G., Oh, S. K., Sarnow, P.
PLENUM PRESS DIV PLENUM PUBLISHING CORP.1993: 229-240
- **TRANSLATIONAL ENHANCEMENT OF THE POLIOVIRUS 5' NONCODING REGION MEDIATED BY VIRUS-ENCODED POLYPEPTIDE-2A** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Hambidge, S. J., Sarnow, P.
1992; 89 (21): 10272-10276
- **HOMEOTIC GENE ANTENNAPEDIA MESSENGER-RNA CONTAINS 5'-NONCODING SEQUENCES THAT CONFER TRANSLATIONAL INITIATION BY INTERNAL RIBOSOME BINDING** *GENES & DEVELOPMENT*
Oh, S. K., Scott, M. P., Sarnow, P.
1992; 6 (9): 1643-1653
- **ASSOCIATION OF HEAT-SHOCK PROTEIN-70 WITH ENTEROVIRUS CAPSID PRECURSOR P1 IN INFECTED HUMAN-CELLS** *JOURNAL OF VIROLOGY*
Macejak, D. G., Sarnow, P.
1992; 66 (3): 1520-1527
- **TERMINAL 7-METHYL-GUANOSINE CAP STRUCTURE ON THE NORMALLY UNCAPPED 5' NONCODING REGION OF POLIOVIRUS MESSENGER-RNA INHIBITS ITS TRANSLATION IN MAMMALIAN-CELLS** *JOURNAL OF VIROLOGY*
Hambidge, S. J., Sarnow, P.
1991; 65 (11): 6312-6315
- **INTERNAL INITIATION OF TRANSLATION MEDIATED BY THE 5' LEADER OF A CELLULAR MESSENGER-RNA** *NATURE*
Macejak, D. G., Sarnow, P.
1991; 353 (6339): 90-94
- **3 POLIOVIRUS 2B MUTANTS EXHIBIT NONCOMPLEMENTABLE DEFECTS IN VIRAL-RNA AMPLIFICATION AND DISPLAY DOSAGE-DEPENDENT DOMINANCE OVER WILD-TYPE POLIOVIRUS** *JOURNAL OF VIROLOGY*
Johnson, K. L., Sarnow, P.
1991; 65 (8): 4341-4349
- **AN RNA HAIRPIN AT THE EXTREME 5' END OF THE POLIOVIRUS RNA GENOME MODULATES VIRAL TRANSLATION IN HUMAN-CELLS** *JOURNAL OF VIROLOGY*
Simoes, E. A., Sarnow, P.
1991; 65 (2): 913-921

- **OXIDATION REDUCTION SENSITIVE INTERACTION OF A CELLULAR 50-KDA PROTEIN WITH AN RNA HAIRPIN IN THE 5' NONCODING REGION OF THE POLIOVIRUS GENOME** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
NAJITA, L., Sarnow, P.
1990; 87 (15): 5846-5850
- **TRANSLATIONAL REGULATION OF THE IMMUNOGLOBULIN HEAVY-CHAIN BINDING-PROTEIN MESSENGER-RNA** *ENZYME*
Macejak, D. G., Sarnow, P.
1990; 44 (1-4): 310-319
- **EIF-4F-INDEPENDENT TRANSLATION OF POLIOVIRUS RNA AND CELLULAR MESSENGER-RNA ENCODING GLUCOSE-REGULATED PROTEIN 78 IMMUNOGLOBULIN HEAVY-CHAIN BINDING-PROTEIN** *2ND SYMPOSIUM ON POSITIVE STRAND RNA VIRUSES*
Macejak, D. G., Hambidge, S. J., NAJITA, L., Sarnow, P.
AMER SOC MICROBIOLOGY.1990: 152-157
- **POLIOVIRUS GENETICS** *CURRENT TOPICS IN MICROBIOLOGY AND IMMUNOLOGY*
Sarnow, P., Jacobson, S. J., NAJITA, L.
1990; 161: 155-188
- **TRANSLATION OF GLUCOSE-REGULATED PROTEIN-78-IMMUNOGLOBULIN HEAVY-CHAIN BINDING-PROTEIN MESSENGER-RNA IS INCREASED IN POLIOVIRUS-INFECTED CELLS AT A TIME WHEN CAP-DEPENDENT TRANSLATION OF CELLULAR MESSENGER-RNAs IS INHIBITED** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Sarnow, P.
1989; 86 (15): 5795-5799
- **ROLE OF 3'-END SEQUENCES IN INFECTIVITY OF POLIOVIRUS TRANSCRIPTS MADE INVITRO** *JOURNAL OF VIROLOGY*
Sarnow, P.
1989; 63 (1): 467-470
- **GENETIC COMPLEMENTATION AMONG POLIOVIRUS MUTANTS DERIVED FROM AN INFECTIOUS CDNA CLONE** *JOURNAL OF VIROLOGY*
Bernstein, H. D., Sarnow, P., Baltimore, D.
1986; 60 (3): 1040-1049
- **A POLIOVIRUS TEMPERATURE-SENSITIVE RNA-SYNTHESIS MUTANT LOCATED IN A NONCODING REGION OF THE GENOME** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Sarnow, P., Bernstein, H. D., Baltimore, D.
1986; 83 (3): 571-575
- **CHARACTERIZATION OF MONOCLONAL-ANTIBODIES AND POLYCLONAL IMMUNE SERA DIRECTED AGAINST HUMAN CYTOMEGALOVIRUS VIRION PROTEINS** *VIROLOGY*
Nowak, B., Sullivan, C., Sarnow, P., Thomas, R., Bricout, F., Nicolas, J. C., Fleckenstein, B., Levine, A. J.
1984; 132 (2): 325-338
- **ADENOVIRUS EARLY REGION-1B 58,000-DALTON TUMOR-ANTIGEN IS PHYSICALLY ASSOCIATED WITH AN EARLY REGION-4 25,000-DALTON PROTEIN IN PRODUCTIVELY INFECTED-CELLS** *JOURNAL OF VIROLOGY*
Sarnow, P., Hearing, P., Anderson, C. W., Halbert, D. N., Shenk, T., Levine, A. J.
1984; 49 (3): 692-700
- **PHYSICAL MAPPING OF HUMAN CYTOMEGALOVIRUS GENES - IDENTIFICATION OF DNA-SEQUENCES CODING FOR A VIRION PHOSPHOPROTEIN OF 71-KDA AND A VIRAL 65-KDA POLYPEPTIDE** *VIROLOGY*
Nowak, B., Gmeiner, A., Sarnow, P., Levine, A. J., Fleckenstein, B.
1984; 134 (1): 91-102
- **HOST RANGE TEMPERATURE-CONDITIONAL MUTANTS IN THE ADENOVIRUS DNA-BINDING PROTEIN ARE DEFECTIVE IN THE ASSEMBLY OF INFECTIOUS VIRUS** *VIROLOGY*
Nicolas, J. C., Sarnow, P., GIRARD, M., Levine, A. J.
1983; 126 (1): 228-239
- **MONOCLONAL-ANTIBODIES WHICH RECOGNIZE NATIVE AND DENATURED FORMS OF THE ADENOVIRUS DNA-BINDING PROTEIN** *VIROLOGY*
Reich, N. C., Sarnow, P., Duprey, E., Levine, A. J.

1983; 128 (2): 480-484

- **ADENOVIRUS E1B-58KD TUMOR-ANTIGEN AND SV40 LARGE TUMOR-ANTIGEN ARE PHYSICALLY ASSOCIATED WITH THE SAME 54 KD CELLULAR PROTEIN IN TRANSFORMED-CELLS** *CELL*

Sarnow, P., Ho, Y. S., Williams, J., Levine, A. J.

1982; 28 (2): 387-394

- **THE REGULATION OF A CELLULAR PROTEIN, P53, IN TRANSFORMED-CELLS AND ITS ASSOCIATION WITH VIRAL TUMOR-ANTIGENS** *HEPATOLOGY*

Levine, A. J., Kaplan, L., Oren, M., Reich, N., Sarnow, P., Sullivan, C., Thomas, R.

1982; 2 (2): S58-S60

- **A MUTATION IN THE ADENOVIRUS TYPE-5 DNA-BINDING PROTEIN THAT FAILS TO AUTO-REGULATE THE PRODUCTION OF THE DNA-BINDING PROTEIN** *VIROLOGY*

Nicolas, J. C., Ingrand, D., Sarnow, P., Levine, A. J.

1982; 122 (2): 481-485

- **A MONOCLONAL-ANTIBODY DETECTING THE ADENOVIRUS TYPE-5 E1B-58KD TUMOR-ANTIGEN - CHARACTERIZATION OF THE E1B-58KD TUMOR-ANTIGEN IN ADENOVIRUS-INFECTED AND ADENOVIRUS-TRANSFORMED CELLS** *VIROLOGY*

Sarnow, P., Sullivan, C. A., Levine, A. J.

1982; 120 (2): 510-517

- **IDENTIFICATION AND CHARACTERIZATION OF AN IMMUNOLOGICALLY CONSERVED ADENOVIRUS EARLY REGION 11,000 MR PROTEIN AND ITS ASSOCIATION WITH THE NUCLEAR MATRIX** *JOURNAL OF MOLECULAR BIOLOGY*

Sarnow, P., Hearing, P., Anderson, C. W., Reich, N., Levine, A. J.

1982; 162 (3): 565-583

- **A HISTONE H4-SPECIFIC METHYLTRANSFERASE - PROPERTIES, SPECIFICITY AND EFFECTS ON NUCLEOSOMAL HISTONES** *BIOCHIMICA ET BIOPHYSICA ACTA*

Sarnow, P., Rasched, I., Knippers, R.

1981; 655 (3): 349-358