Stanford

Elisabetta Viani Puglisi

Associate Professor (Research) of Structural Biology

Bio

ACADEMIC APPOINTMENTS

- Associate Professor (Research), Structural Biology
- Member, Bio-X

HONORS AND AWARDS

- Fellowship for University Research, European Economic Community (1988)
- Fellowhip for University Research, Italian Pharmacy Consurtium (1989-1990)
- Graduate Fellowship, Italian Ministry of Education and Scientific Research (1991-1993)

PROFESSIONAL EDUCATION

- Ph.D., University of Brescia, Italy , Microbiology (1994)
- Dott., University of Parma, Italy , Chemistry (1989)
- Laurea, University of Parma, Italy , Chemistry (1985)

COMMUNITY AND INTERNATIONAL WORK

- ISBMR, 14th Course: Future of Molecular Biophysics, 7-17 May 2016, Erice-Sicily, Italy
- ISBMR, 13th Course: Future of Biophysics and Structural Biology, 31 Jul-9 Aug 2014, Erice-Sicily, Italy
- ISBMR, 12th Course: Future of Biophysics, 9-19 June 2013, Erice-Sicily, Italy
- ISBMR, 11th Course: Frontiers of Biophysics and Structural Biology, 11-21 June 2012, Erice-Sicily, Italy
- Int'l School of Biological Magnetic Resonance, 10th Course, 22 June-2 July 2010, Erice-Sicily, Italy
- Int'l School of Biological Magnetic Resonance, 9th Course, 22 June-2 July 2009, Erice-Sicily, Italy

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Viral infections and subsequent host response depend on multiple RNA-protein interaction. My research focuses on the structural and functional characterization of RNA-protein complexes involved in viral infection. Current research aims to understand how the Human Immunodeficiency Virus (HIV) initiates its replication upon host infection. We use NMR spectroscopy and x-ray crystallography to study the structure of the initiation complex, formed by a host tRNA and HIV genomic RNA, coupled with biochemical and biophysical methods to understand functional properties. The goal of this research is to gain a molecular view of HIV replication initiation, and use this information to develop new therapeutic approaches to combat HIV.

Publications

PUBLICATIONS

- **Conserved long-range interactions are required for stable folding of orthoflaviviral genomic RNA.** *Nucleic acids research*
  Palo, M. Z., Ha, B., Lapointe, C. P., Alvarado, C., Janetzko, J., Carette, J. E., Puglisi, J. D., Puglisi, E. V.
  2025; 53 (11)

- **Long-range RNA interactions in flavivirus replication**
  Palo, M. Z., Ha, B., Lapointe, C., Alvarado, C., Puglisi, J. D., Puglisi, E.
  CELL PRESS.2024: 85A

- **Role of human PABPC1 in canonical and viral translation initiation**
  Lim, K., Palo, M. Z., Puglisi, J. D., Puglisi, E.
  CELL PRESS.2024: 362A

- **Impacts of HIV-1 5′ UTR structure on mRNA translation initiation**
  Stackhouse, C. I., Jackson, L. N., Alvarado, C., Grosely, R., Puglisi, J. D., Puglisi, E.
  CELL PRESS.2024: 360A-361A

- **Human immunodeficiency virus 1 5'-leader mutations in plasma viruses before and after the development of reverse transcriptase inhibitor-resistance mutations.** *The Journal of general virology*
  Nouhin, J., Tzou, P. L., Rhee, S., Sahoo, M. K., Pinsky, B. A., Krupkin, M., Puglisi, J. D., Puglisi, E. V., Shafer, R. W.
  2023; 104 (10)

- **Pressure pushes tRNALys3 into excited conformational states.** *Proceedings of the National Academy of Sciences of the United States of America*
  Wang, J., Koduru, T., Harish, B., McCallum, S. A., Larsen, K. P., Patel, K. S., Peters, E. V., Gillilan, R. E., Puglisi, E. V., Puglisi, J. D., Makhatadze, G., Royer, C. A.
  2023; 120 (26): e2215556120

- **HIV-1 5'-Leader Mutations in Plasma Viruses Before and After the Development of Reverse Transcriptase Inhibitor-Resistance Mutations.** *medRxiv : the preprint server for health sciences*
  Nouhin, J., Tzou, P., Rhee, S., Sahoo, M. K., Pinsky, B. A., Krupkin, M. A., Puglisi, J. D., Puglisi, E. V., Shafer, R. W.
  2023

- **Uncovering translation roadblocks during the development of a synthetic tRNA.** *Nucleic acids research*
  Prabhakar, A., Krahn, N., Zhang, J., Vargas-Rodriguez, O., Krupkin, M., Fu, Z., Acosta-Reyes, F. J., Ge, X., Choi, J., Crnkovic, A., Ehrenberg, M., Puglisi, E. V., Soll, et al
  2022

- **High-resolution view of HIV-1 reverse transcriptase initiation complexes and inhibition by NNRTI drugs.** *Nature communications*
  Ha, B., Larsen, K. P., Zhang, J., Fu, Z., Montabana, E., Jackson, L. N., Chen, D., Puglisi, E. V.
  2021; 12 (1): 2500

- **Advances in understanding the initiation of HIV-1 reverse transcription.** *Current opinion in structural biology*
  Krupkin, M. n., Jackson, L. N., Ha, B. n., Puglisi, E. V.
  2020; 65: 175–83

- **Distinct Conformational States Underlie Pausing during Initiation of HIV-1 Reverse Transcription.** *Journal of molecular biology*
  Larsen, K. P., Choi, J. n., Jackson, L. N., Kappel, K. n., Zhang, J. n., Ha, B. n., Chen, D. H., Puglisi, E. V.
  2020

- **Relating Structure and Dynamics in RNA Biology.** *Cold Spring Harbor perspectives in biology*
  Larsen, K. P., Choi, J., Prabhakar, A., Puglisi, E. V., Puglisi, J. D.
  2019; 11 (7)

- **Expanding single-molecule fluorescence spectroscopy to capture complexity in biology.** *Current opinion in structural biology*
  Choi, J., Grosely, R., Puglisi, E. V., Puglisi, J. D.
  2019

- **Single-Molecule Fluorescence Applied to Translation** *COLD SPRING HARBOR PERSPECTIVES IN BIOLOGY*
  Prabhakar, A., Puglisi, E., Puglisi, J. D.
  2019; 11 (1)
- **Dynamic Interplay of RNA and Protein in the Human Immunodeficiency Virus-1 Reverse Transcription Initiation Complex** *JOURNAL OF MOLECULAR BIOLOGY*
  Coey, A. T., Larsen, K. P., Choi, J., Barrero, D. J., Puglisi, J. D., Puglisi, E.
  2018; 430 (24): 5137–50
- **De novo computational RNA modeling into cryo-EM maps of large ribonucleoprotein complexes** *NATURE METHODS*
  Kappel, K., Liu, S., Larsen, K. P., Skiniotis, G., Puglisi, E., Puglisi, J. D., Zhou, Z., Zhao, R., Das, R.
  2018; 15 (11): 947-+
- **De novo computational RNA modeling into cryo-EM maps of large ribonucleoprotein complexes.** *Nature methods*
  Kappel, K., Liu, S., Larsen, K. P., Skiniotis, G., Puglisi, E. V., Puglisi, J. D., Zhou, Z. H., Zhao, R., Das, R.
  2018
- **Dynamic Interplay of RNA and Protein in the Human Immunodeficiency Virus-1 Reverse Transcription Initiation Complex.** *Journal of molecular biology*
  Coey, A. T., Larsen, K. P., Choi, J., Barrero, D. J., Puglisi, J. D., Puglisi, E. V.
  2018
- **Single-Molecule Fluorescence Applied to Translation.** *Cold Spring Harbor perspectives in biology*
  Prabhakar, A., Puglisi, E. V., Puglisi, J. D.
  2018
- **Structural Characterization of the HIV-1 Reverse Transcriptase Initiation Complex**
  Larsen, K., Mathiharan, Y., Kappei, K., Coey, A., Chen, D., Madigan, L., Skiniotis, G., Puglisi, J., Puglisi, E.
  CELL PRESS.2018: 193A
- **Architecture of an HIV-1 reverse transcriptase initiation complex.** *Nature*
  Larsen, K. P., Mathiharan, Y. K., Kappel, K. n., Coey, A. T., Chen, D. H., Barrero, D. n., Madigan, L. n., Puglisi, J. D., Skiniotis, G. n., Puglisi, E. V.
  2018
- **Heterogeneous structures formed by conserved RNA sequences within the HIV reverse transcription initiation site** *RNA*
  Coey, A., Larsen, K., Puglisi, J. D., Puglisi, E. V.
  2016; 22 (11): 1689-1698
- **Amino acid sequence repertoire of the bacterial proteome and the occurrence of untranslatable sequences** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Navon, S. P., Kornberg, G., Chen, J., Schwartzman, T., Tsai, A., Puglisi, E. V., Puglisi, J. D., Adir, N.
  2016; 113 (26): 7166-7170
- **Concentric-flow electrokinetic injector enables serial crystallography of ribosome and photosystem II** *NATURE METHODS*
  Sierra, R. G., Gati, C., Laksmono, H., Dao, E. H., Gul, S., Fuller, F., Kern, J., Chatterjee, R., Ibrahim, M., Brewster, A. S., Young, I. D., Michels-Clark, T., Aquila, et al
  2016; 13 (1): 59-?
- **The molecular choreography of protein synthesis: translational control, regulation, and pathways.** *Quarterly reviews of biophysics*
  Chen, J., Choi, J., O'Leary, S. E., Prabhakar, A., Petrov, A., Grosely, R., Puglisi, E. V., Puglisi, J. D.
  2016; 49: e11
- **The Impact of Aminoglycosides on the Dynamics of Translation Elongation** *CELL REPORTS*
  Tsai, A., Uemura, S., Johansson, M., Puglisi, E. V., Marshall, R. A., Aitken, C. E., Korlach, J., Ehrenberg, M., Puglisi, J. D.
  2013; 3 (2): 497-508
- **RNA purification by preparative polyacrylamide gel electrophoresis.** *Methods in enzymology*
  Petrov, A., Wu, T., Puglisi, E. V., Puglisi, J. D.
  2013; 530: 315-330

- **Secondary Structure of the HIV Reverse Transcription Initiation Complex by NMR** *JOURNAL OF MOLECULAR BIOLOGY*
  Puglisi, E. V., Puglisi, J. D.
  2011; 410 (5): 863-874

- **Probing the conformation of human tRNA(3)(Lys) in solution by NMR** *FEBS LETTERS*
  Puglisi, E. V., Puglisi, J. D.
  2007; 581 (27): 5307-5314

- **Rapid purification of RNAs using fast performance liquid chromatography (FPLC)** *RNA-A PUBLICATION OF THE RNA SOCIETY*
  Kim, I., Mckenna, S. A., Puglisi, E. V., Puglisi, J. D.
  2007; 13 (2): 289-294

- **Purification and characterization of transcribed RNAs using gel filtration chromatography** *NATURE PROTOCOLS*
  Mckenna, S. A., Kim, I., Puglisi, E. V., Lindhout, D. A., Aitken, C. E., Marshall, R. A., Puglisi, J. D.
  2007; 2 (12): 3270-3277

- **NMR investigation of HIV reverse transcription initiation** *4th NATO Advanced-Study-Institute on Dynamics, Structure and Function of Biological Macromolecules*
  Puglisi, E. V.
  I O S PRESS.2001: 187–192

- **HIV-1 A-rich RNA loop mimics the tRNA anticodon structure** *NATURE STRUCTURAL BIOLOGY*
  Puglisi, E. V., Puglisi, J. D.
  1998; 5 (12): 1033-1036

- **Structure of a conserved RNA component of the peptidyl transferase centre** *NATURE STRUCTURAL BIOLOGY*
  Puglisi, E. V., Green, R., Noller, H. F., Puglisi, J. D.
  1997; 4 (10): 775-778

- **Structure and function of ribosomal RNA** *International Conference on the Structure and Function of the Ribosome*
  Noller, H. F., Green, R., HEILEK, G., HOFFARTH, V., Huttenhofer, A., Joseph, S., Lee, I., Lieberman, K., Mankin, A., Merryman, C., Powers, T., Puglisi, E. V., Samaha, et al
  CANADIAN SCIENCE PUBLISHING, NRC RESEARCH PRESS.1995: 997–1009

- **NMR ANALYSIS OF TRANSFER-RNA ACCEPTOR STEM MICROHELICES - DISCRIMINATOR BASE CHANGE AFFECTS TRANSFER-RNA CONFORMATION AT THE 3' END** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Puglisi, E. V., Puglisi, J. D., Williamson, J. R., RajBhandary, U. L.
  1994; 91 (24): 11467-11471

- **A MONOCLONAL-ANTIBODY TO THE NH2-TERMINAL SEGMENT OF HUMAN IFN-GAMMA SELECTIVELY INTERFERES WITH THE ANTIPROLIFERATIVE ACTIVITY OF THE LYMPHOKINE** *JOURNAL OF IMMUNOLOGY*
  Caruso, A., Tiberio, L., DERANGO, C., Bonfanti, C., FLAMMINIO, G., Gribaudo, G., Monti, E., Viani, E., Manca, N., Garotta, G., Landolfo, S., Balsari, A., Turano, et al
  1993; 150 (3): 1029-1035

- **Molecular Recognition in Water: New Receptors for Academic Derivatives** *J. Am. Chem. Soc.*
  Rotello, V., Viani E., Deslongchamps G, Murray BA., Rebek J Jr.
  1993: 797-798

- **NATURAL HUMAN-ANTIBODIES TO GAMMA INTERFERON INTERFERE WITH THE IMMUNOMODULATING ACTIVITY OF THE LYMPHOKINE** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Turano, A., Balsari, A., Viani, E., Landolfo, S., Zanoni, L., Gargiulo, F., Caruso, A.
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- **INHIBITION OF THE BIOLOGICAL-ACTIVITY OF HUMAN INTERFERON-GAMMA BY ANTIPEPTIDE ANTIBODIES** *JOURNAL OF INTERFERON RESEARCH*
  Caruso, A., Viani, E., Tiberio, L., Pollara, P., Monti, E., Bonfanti, C., Gao, J., Landolfo, S., Balsari, A., Turano, A.
  1992; 12 (1): 49-54

- **PURIFICATION OF NATURAL HUMAN IFN-GAMMA ANTIBODIES** *IMMUNOLOGY LETTERS*
  Viani, E., FLAMMINIO, G., Caruso, A., Foresti, I., DeFrancesco, M., Pollara, P., Balsari, A., Turano, A.

1991; 30 (1): 53-58

- **NATURAL ANTIBODIES TO IFN-GAMMA IN MAN AND THEIR INCREASE DURING VIRAL-INFECTION** *JOURNAL OF IMMUNOLOGY*

  Caruso, A., Bonfanti, C., Colombrita, D., DeFrancesco, M., DERANGO, C., Foresti, I., Gargiulo, F., Gonzales, R., Gribaudo, G., Landolfo, S., Manca, N., Manni, M., Pirali, et al

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