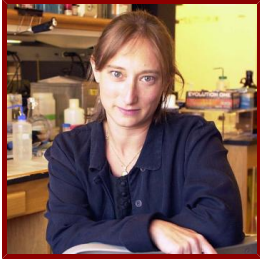


Stanford



Judith Frydman

Donald Kennedy Chair in the School of Humanities and Sciences and Professor of Genetics
Biology

Bio

ACADEMIC APPOINTMENTS

- Professor, Biology
- Professor, Genetics
- Member, Bio-X
- Member, Stanford Cancer Institute
- Faculty Fellow, Stanford ChEM-H
- Member, Wu Tsai Neurosciences Institute

PROGRAM AFFILIATIONS

- Center for Latin American Studies

LINKS

- Lab Website: <http://www.stanford.edu/group/frydman>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

The long term goal of our research is to understand how proteins fold in living cells. My lab uses a multidisciplinary approach to address fundamental questions about molecular chaperones, protein folding and degradation. In addition to basic mechanistic principles, we aim to define how impairment of cellular folding and quality control are linked to disease, including cancer and neurodegenerative diseases and examine whether reengineering chaperone networks can provide therapeutic strategies.

Teaching

COURSES

2019-20

- Biochemistry & Molecular Biology: BIO 83 (Win)
- Proteostasis: guarding the proteome in health and disease: BIOS 287 (Aut)

2018-19

- Advance Molecular Biology: Epigenetics and Proteostasis: BIO 104, BIO 200 (Win)

2016-17

- Advanced Molecular Biology: BIO 104, BIO 200 (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

David Armenta, Yiwen Chen, Joel Francis, Andrew McKay, Yanyan Zhao

Postdoctoral Faculty Sponsor

Ranen Aviner, Yasmine Baktash, Ching Chieh Chou, Miranda Collier, Patrick Dolan, Rebekah Gullberg, Jae Ho Lee, Antonio Limatola, Fabian Morales Polanco, Natalia Moreira Barbosa, Pragma Mukherjee, Kelly Rainbolt, Piere Rodriguez Aliaga, Kevin Stein

Doctoral Dissertation Advisor (AC)

Mauricio Aguilar Rangel, Kevin Goncalves, Korbin Kleczko, Vincent Mastro, Ivana Serrano Lachapel, Shizuka Yamada

Doctoral (Program)

Mauricio Aguilar Rangel, Korbin Kleczko, Vincent Mastro, Ivana Serrano Lachapel

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biology (School of Humanities and Sciences) (Phd Program)
- Biophysics (Phd Program)
- Cancer Biology (Phd Program)

Publications

PUBLICATIONS

- **THE CHAPERONIN TRIC/CCT ASSOCIATES WITH PREFOLDIN THROUGH A CONSERVED ELECTROSTATIC INTERFACE ESSENTIAL FOR CELLULAR PROTEOSTASIS**
Gestaut, D., Roh, S., Ma, B., Pintile, G., Joachimiak, L., Leitner, A., Walzthoeni, T., Aebersold, R., Chiu, W., Frydman, J.
WILEY.2019: 44
- **Dual Role of Ribosome-Binding Domain of NAC as a Potent Suppressor of Protein Aggregation and Aging-Related Proteinopathies** *MOLECULAR CELL*
Shen, K., Gamerding, M., Chan, R., Gense, K., Martin, E. M., Sachs, N., Knight, P. D., Schloemer, R., Calabrese, A. N., Stewart, K. L., Leienhecker, L., Baghel, A., Radford, et al
2019; 74 (4): 729-+
- **The Chaperonin TRiC/CCT Associates with Prefoldin through a Conserved Electrostatic Interface Essential for Cellular Proteostasis** *CELL*
Gestaut, D., Roh, S., Ma, B., Pintilie, G., Joachimiak, L. A., Leitner, A., Walzthoeni, T., Aebersold, R., Chiu, W., Frydman, J.
2019; 177 (3): 751-+
- **The ATP-powered gymnastics of TRiC/CCT: an asymmetric protein folding machine with a symmetric origin story.** *Current opinion in structural biology*
Gestaut, D., Limatola, A., Joachimiak, L., Frydman, J.
2019; 55: 50-58
- **The ATP-powered gymnastics of TRiC/CCT: an asymmetric protein folding machine with a symmetric origin story** *CURRENT OPINION IN STRUCTURAL BIOLOGY*
Gestaut, D., Limatola, A., Joachimiak, L., Frydman, J.
2019; 55: 50-58
- **Proteostasis in Viral Infection: Unfolding the Complex Virus-Chaperone Interplay.** *Cold Spring Harbor perspectives in biology*
Aviner, R., Frydman, J.
2019
- **Zika Virus Dependence on Host Hsp70 Provides a Protective Strategy against Infection and Disease.** *Cell reports*
Taguwa, S., Yeh, M., Rainbolt, T. K., Nayak, A., Shao, H., Gestwicki, J. E., Andino, R., Frydman, J.
2019; 26 (4): 906

- **Nascent Polypeptide Domain Topology and Elongation Rate Direct the Cotranslational Hierarchy of Hsp70 and TRiC/CCT.** *Molecular cell*
Stein, K. C., Kriel, A., Frydman, J.
2019
- **Hsp90 shapes protein and RNA evolution to balance trade-offs between protein stability and aggregation** *NATURE COMMUNICATIONS*
Geller, R., Pechmann, S., Acevedo, A., Andino, R., Frydman, J.
2018; 9: 1781
- **Lysosome activation clears aggregates and enhances quiescent neural stem cell activation during aging** *SCIENCE*
Leeman, D. S., Hebestreit, K., Ruetz, T., Webb, A. E., McKay, A., Pollina, E. A., Dulken, B. W., Zhao, X., Yeo, R. W., Ho, T. T., Mahmoudi, S., Devarajan, K., Passegue, et al
2018; 359 (6381): 1277–82
- **Distinct proteostasis circuits cooperate in nuclear and cytoplasmic protein quality control.** *Nature*
Samant, R. S., Livingston, C. M., Sontag, E. M., Frydman, J.
2018; 563 (7731): 407–11
- **Structure and Dynamics of the Huntingtin Exon-1 N-Terminus: A Solution NMR Perspective.** *Journal of the American Chemical Society*
Baiaş, M., Smith, P. E., Shen, K., Joachimiak, L. A., Zerko, S., Kozminski, W., Frydman, J., Frydman, L.
2017; 139 (3): 1168–1176
- **Mechanisms and Functions of Spatial Protein Quality Control.** *Annual review of biochemistry*
Sontag, E. M., Samant, R. S., Frydman, J.
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- **An information theoretic framework reveals a tunable allosteric network in group II chaperonins.** *Nature structural & molecular biology*
Lopez, T., Dalton, K., Tomlinson, A., Pande, V., Frydman, J.
2017; 24 (9): 726–33
- **Control of the structural landscape and neuronal proteotoxicity of mutant Huntingtin by domains flanking the polyQ tract** *ELIFE*
Shen, K., Calamini, B., Fauerbach, J. A., Ma, B., Shahmoradian, S. H., Lachapei, I. L., Chiu, W., Lo, D. C., Frydman, J.
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- **Delayed emergence of subdiffraction-sized mutant huntingtin fibrils following inclusion body formation.** *Quarterly reviews of biophysics*
Sahl, S. J., Lau, L., Vonk, W. I., Weiss, L. E., Frydman, J., Moerner, W. E.
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- **Defining Hsp70 Subnetworks in Dengue Virus Replication Reveals Key Vulnerability in Flavivirus Infection.** *Cell*
Taguwa, S., Maringer, K., Li, X., Bernal-Rubio, D., Rauch, J. N., Gestwicki, J. E., Andino, R., Fernandez-Sesma, A., Frydman, J.
2015; 163 (5): 1108–1123
- **Local slowdown of translation by nonoptimal codons promotes nascent-chain recognition by SRP in vivo.** *Nature structural & molecular biology*
Pechmann, S., Chartron, J. W., Frydman, J.
2014; 21 (12): 1100–1105
- **Local slowdown of translation by nonoptimal codons promotes nascent-chain recognition by SRP in vivo** *NATURE STRUCTURAL & MOLECULAR BIOLOGY*
Pechmann, S., Chartron, J. W., Frydman, J.
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- **The Structural Basis of Substrate Recognition by the Eukaryotic Chaperonin TRiC/CCT** *CELL*
Joachimiak, L. A., Walzthoeni, T., Liu, C. W., Aebersold, R., Frydman, J.
2014; 159 (5): 1042–1055
- **The structural basis of substrate recognition by the eukaryotic chaperonin TRiC/CCT.** *Cell*
Joachimiak, L. A., Walzthoeni, T., Liu, C. W., Aebersold, R., Frydman, J.

2014; 159 (5): 1042-1055

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- **Sorting out the trash: the spatial nature of eukaryotic protein quality control** *CURRENT OPINION IN CELL BIOLOGY*
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- **Spatial sequestration of misfolded proteins by a dynamic chaperone pathway enhances cellular fitness during stress.** *Nature cell biology*
Escusa-Toret, S., Vonk, W. I., Frydman, J.
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- **Principles of cotranslational ubiquitination and quality control at the ribosome.** *Molecular cell*
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- **The Ribosome as a Hub for Protein Quality Control** *MOLECULAR CELL*
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2013; 20 (2): 237-243
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2011; 3 (8)
- **Defining the Specificity of Cotranslationally Acting Chaperones by Systematic Analysis of mRNAs Associated with Ribosome-Nascent Chain Complexes** *PLOS BIOLOGY*

- del Alamo, M., Hogan, D. J., Pechmann, S., Albanese, V., Brown, P. O., Frydman, J.
2011; 9 (7)
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2011; 144 (2): 240-252
 - **A ribosome-anchored chaperone network that facilitates eukaryotic ribosome biogenesis** *JOURNAL OF CELL BIOLOGY*
Albanese, V., Reissmann, S., Frydman, J.
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 - **Mechanism of folding chamber closure in a group II chaperonin** *NATURE*
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 - **The Hsp90 mosaic: a picture emerges** *NATURE STRUCTURAL & MOLECULAR BIOLOGY*
Mayer, M. P., Prodromou, C., Frydman, J.
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 - **Defining the TRiC/CCT interactome links chaperonin function to stabilization of newly made proteins with complex topologies** *NATURE STRUCTURAL & MOLECULAR BIOLOGY*
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 - **Evolutionary constraints on chaperone-mediated folding provide an antiviral approach refractory to development of drug resistance** *GENES & DEVELOPMENT*
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Tam, S., Geller, R., Spiess, C., Frydman, J.
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Stein, K. C., Frydman, J.
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- **A Viral Protein Restricts *Drosophila* RNAi Immunity by Regulating Argonaute Activity and Stability** *CELL HOST & MICROBE*
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