Stanford

Upinder Singh

Professor of Medicine (Infectious Diseases & Geographic Medicine) and of Microbiology and Immunology

Medicine - Infectious Diseases

CLINICAL OFFICES

- **Infectious Disease Clinic**

  300 Pasteur Dr Rm L134

  Lane Bldg MC 5107

  Stanford, CA 94305

  Tel (650) 723-4045 **Fax** (650) 725-8418

Bio

CLINICAL FOCUS

- Infectious Disease
- Infectious Diseases

ACADEMIC APPOINTMENTS

- Professor, Medicine - Infectious Diseases
- Professor, Microbiology & Immunology
- Member, Bio-X
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Associate Chair, Faculty Development, Department of Medicine, (2020- present)
- Division Chief, Infectious Diseases and Geographic Medicine, (2010- present)
- Fellowship Co-Director, Division of Infectious Diseases, (2008-2013)

HONORS AND AWARDS

- Member, ASCI (2010)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Fellow, Center for Innovation in Global Health, Stanford University (2015 - present)

PROFESSIONAL EDUCATION

- Medical Education: Ohio State University College of Medicine Registrar (1992) OH
- Board Certification: Infectious Disease, American Board of Internal Medicine (2018)

- Residency: University of Virginia Health System (1995) VA
- Fellowship: University of Virginia School of Medicine (1998) VA
- Internship: University of Virginia Health System (1993) VA
- BS, Ohio State University , Biochemistry (1987)
- MD, Ohio State University , Medicine (1992)

COMMUNITY AND INTERNATIONAL WORK

- Investigating E. histolytica genetic diversity, Bangladesh and Georgia

LINKS

- Singh lab website: http://singhlab.stanford.edu/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Dr Singh studies the molecular basis of pathogenesis of a medically important parasite, Entamoeba histolytica. The work is aimed at understanding the virulence determinants that E. histolytica utilizes in causing invasive colonic and hepatic disease. Using a combination of genetic and genomic approaches we are identifying novel mechanisms that the parasite has developed for invading the human host. Additionally, we study the epidemiological trends of of amebic infection, with the goal of identifying a parasite molecular signature that correlates with invasive potential.

CLINICAL TRIALS

- Oral Camostat Compared With Standard Supportive Care in Mild-Moderate COVID-19 Patients, Recruiting
- Oral Favipiravir Compared to Placebo in Subjects With Mild COVID-19, Recruiting
- COVID-19 Outpatient Pragmatic Platform Study (COPPS) - Master Protocol, Not Recruiting
- Single-Blind Study of a Single Dose of Peginterferon Lambda-1a Compared With Placebo in Outpatients With Mild COVID-19, Not Recruiting

Teaching

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Daniela Lozano Amado, Monica Mendes Kangussu Marcolino, Christopher Yip

Postdoctoral Research Mentor

Daniela Lozano Amado, Monica Mendes Kangussu Marcolino, Christopher Yip

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Medicine (Masters Program)
- Microbiology and Immunology (Phd Program)

Publications

PUBLICATIONS

- **Patients with uncomplicated COVID-19 have long-term persistent symptoms and functional impairment similar to patients with severe COVID-19: a cautionary tale during a global pandemic.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
  Jacobson, K. B., Rao, M., Bonilla, H., Subramanian, A., Hack, I., Madrigal, M., Singh, U., Jagannathan, P., Grant, P.
  2021

- **Identification of oligo-adenylated small RNAs in the parasite Entamoeba and a potential role for small RNA control.** *BMC genomics*
  Zhang, H., Ehrenkaufer, G. M., Hall, N., Singh, U.
  2020; 21 (1): 879

- **Development of a CRISPR/Cas9 system in Entamoeba histolytica: proof of concept.** *International journal for parasitology*
  Kangussu-Marcolino, M. M., Morgado, P., Manna, D., Yee, H., Singh, U.
  2020

- **Identification of anisomycin, prodigiosin and obatoclax as compounds with broad-spectrum anti-parasitic activity** *PLOS NEGLECTED TROPICAL DISEASES*
  Ehrenkaufer, G., Li, P., Stebbins, E. E., Kangussu-Marcolino, M. M., Debnath, A., White, C., Moser, M. S., DeRisi, J., Gisselberg, J., Yeh, E., Wang, S. C., Company, A., Monti, et al
  2020; 14 (3)

- **Entamoeba stage conversion: progress and new insights.** *Current opinion in microbiology*
  Manna, D., Ehrenkaufer, G. M., Lozano-Amado, D., Singh, U.
  2020; 58: 62–68

- **The NAD+ Responsive Transcription Factor ERM-BP Functions Downstream of Cellular Aggregation and Is an Early Regulator of Development and Heat Shock Response in Entamoeba.** *Frontiers in cellular and infection microbiology*
  Manna, D., Lozano-Amado, D., Ehrenkaufer, G., Singh, U.
  2020; 10: 363

- **Interferon-gamma release assay for accurate detection of SARS-CoV-2 T cell response.** *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*
  Murugesan, K., Jagannathan, P., Pham, T. D., Pandey, S., Bonilla, H. F., Jacobson, K., Parsonnet, J., Andrews, J. R., Weiskopf, D., Sette, A., Pinsky, B. A., Singh, U., Banaei, et al
  2020

- **Proinflammatory IgG Fc structures in patients with severe COVID-19** *Nature Immunology*
  Chakraborty, S., Gonzales, J., Edwards, K., Mallajosyulla, V., Buzzanco, A. S., Sherwood, R., Buffone, C., Kathale, N., Providenza, S., Xie, M. M., Andrews, J. R., Blish, C. A., Singh, et al
  2020

- **Identification of anisomycin, prodigiosin and obatoclax as compounds with broad-spectrum anti-parasitic activity.** *PLoS neglected tropical diseases*
  Ehrenkaufer, G., Li, P., Stebbins, E. E., Kangussu-Marcolino, M. M., Debnath, A., White, C. V., Moser, M. S., DeRisi, J., Gisselberg, J., Yeh, E., Wang, S. C., Company, A. H., Monti, et al
  2020; 14 (3): e0008150

- **Characterization of extracellular vesicles from Entamoeba histolytica identifies roles in intercellular communication that regulates parasite growth and development.** *Infection and immunity*
  Sharma, M., Morgado, P., Zhang, H., Ehrenkaufer, G., Manna, D., Singh, U.
  2020

- **Identification of plicamycin, TG02, panobinostat, lestaurtinib, and GDC-0084 as promising compounds for the treatment of central nervous system infections caused by the free-living amebae Naegleria, Acanthamoeba and Balamuthia.** *International journal for parasitology. Drugs and drug resistance*
  Kangussu-Marcolino, M. M., Ehrenkaufer, G. M., Chen, E., Debnath, A., Singh, U.
  2019; 11: 80–94

- **Functional Characterization of Entamoeba histolytica Argonaute Proteins Reveals a Repetitive DR-Rich Motif Region That Controls Nuclear Localization.** *mSphere*
  Zhang, H., Tran, V., Manna, D., Ehrenkaufer, G., Singh, U.
  2019; 4 (5)

- **Drug treatment algorithms for water-borne parasitic pathogens**
  Singh, U.
  AMER CHEMICAL SOC.2019

- **Nuclear Factor Y (NF-Y) Modulates Encystation in Entamoeba via Stage-Specific Expression of the NF-YB and NF-YC Subunits.** *mBio*
  Manna, D., Singh, U.
  2019; 10 (3)

- **An NAD+-dependent novel transcription factor controls stage conversion in Entamoeba.** *eLife*
  Manna, D., Lentz, C. S., Ehrenkaufer, G. M., Suresh, S., Bhat, A., Singh, U.
  2018; 7

- **Supporting Research Career Development of Physician-Scientists** *JOURNAL OF INFECTIOUS DISEASES*
  Singh, U.
  2018; 218: S36–S39

- **High-Throughput Screening of Entamoeba Identifies Compounds Which Target Both Life Cycle Stages and Which Are Effective Against Metronidazole Resistant Parasites** *FRONTIERS IN CELLULAR AND INFECTION MICROBIOLOGY*
  Ehrenkaufer, G. M., Suresh, S., Solow-Cordero, D., Singh, U.
  2018; 8

- **Policy Recommendations for Optimizing the Infectious Diseases Physician-Scientist Workforce.** *The Journal of infectious diseases*
  Singh, U., Levy, J., Armstrong, W., Bedimo, R., Creech, C. B., Lautenbach, E., Popovich, K. J., Snowden, J., Vyas, J. M., Infectious Diseases Society of America, H. M.
  2018; 218 (suppl_1): S49–S54

- **High-Throughput Screening of Entamoeba Identifies Compounds Which Target Both Life Cycle Stages and Which Are Effective Against Metronidazole Resistant Parasites.** *Frontiers in cellular and infection microbiology*
  Ehrenkaufer, G. M., Suresh, S., Solow-Cordero, D., Singh, U.
  2018; 8: 276

- **Development of RNA Interference Trigger-Mediated Gene Silencing in Entamoeba invadens.** *Infection and immunity*
  Suresh, S., Ehrenkaufer, G., Zhang, H., Singh, U.
  2016; 84 (4): 964-975

- **Technical advances in trigger-induced RNA interference gene silencing in the parasite Entamoeba histolytica** *INTERNATIONAL JOURNAL FOR PARASITOLOGY*
  Khalil, M. I., Foda, B. M., Suresh, S., Singh, U.
  2016; 46 (3): 205-212

- **biology: RNA interference, drug discovery, and gut microbiome.** *F1000Research*
  Morgado, P., Manna, D., Singh, U.
  2016; 5: 2578-?

- **Dimethylated H3K27 Is a Repressive Epigenetic Histone Mark in the Protist Entamoeba histolytica and Is Significantly Enriched in Genes Silenced via the RNAi Pathway** *JOURNAL OF BIOLOGICAL CHEMISTRY*
  Foda, B. M., Singh, U.
  2015; 290 (34): 21114-21130

- **High Throughput Sequencing of Entamoeba 27nt Small RNA Population Reveals Role in Permanent Gene Silencing But No Effect on Regulating Gene Expression Changes during Stage Conversion, Oxidative, or Heat Shock Stress** *PLOS ONE*
  Zhang, H., Ehrenkaufer, G. M., Manna, D., Hall, N., Singh, U.
  2015; 10 (8)

- **A Single RNaseIII Domain Protein from Entamoeba histolytica Has dsRNA Cleavage Activity and Can Help Mediate RNAi Gene Silencing in a Heterologous System** *PLOS ONE*
  Pompey, J. M., Foda, B., Singh, U.
  2015; 10 (7)

- **Entamoeba histolytica rhomboid protease 1 has a role in migration and motility as validated by two independent genetic approaches** *EXPERIMENTAL PARASITOLOGY*
  Rastew, E., Morf, L., Singh, U.
  2015; 154: 33-42

- **Dimethylated H3K27 Is a Repressive Epigenetic Histone Mark in the Protist Entamoeba histolytica and Is Significantly Enriched in Genes Silenced via the RNAi Pathway.** *The Journal of biological chemistry*
  Foda, B. M., Singh, U.
  2015; 290 (34): 21114–30

- **High Throughput Sequencing of Entamoeba 27nt Small RNA Population Reveals Role in Permanent Gene Silencing But No Effect on Regulating Gene Expression Changes during Stage Conversion, Oxidative, or Heat Shock Stress.** *PloS one*
  Zhang, H., Ehrenkaufer, G. M., Manna, D., Hall, N., Singh, U.
  2015; 10 (8)
- **Regulation of gene expression in the protozoan parasite Entamoeba invadens: identification of core promoter elements and promoters with stage-specific expression patterns** *INTERNATIONAL JOURNAL FOR PARASITOLOGY*
  Manna, D., Ehrenkaufer, G. M., Singh, U.
  2014; 44 (11): 837-845
- **Regulation of gene expression in the protozoan parasite Entamoeba invadens: identification of core promoter elements and promoters with stage-specific expression patterns.** *International journal for parasitology*
  Manna, D., Ehrenkaufer, G. M., Singh, U.
  2014; 44 (11): 837-845
- **RNAi Pathway Genes Are Resistant to Small RNA Mediated Gene Silencing in the Protozoan Parasite Entamoeba histolytica** *PLOS ONE*
  Pompey, J. M., Morf, L., Singh, U.
  2014; 9 (9)
- **Destabilization domain approach adapted for regulated protein expression in the protozoan parasite Entamoeba histolytica.** *International journal for parasitology*
  Liu, Y., Singh, U.
  2014; 44 (10): 729-735
- **RNAi pathway genes are resistant to small RNA mediated gene silencing in the protozoan parasite Entamoeba histolytica.** *PloS one*
  Pompey, J. M., Morf, L., Singh, U.
  2014; 9 (9)
- **Robust gene silencing mediated by antisense small RNAs in the pathogenic protist Entamoeba histolytica.** *Nucleic acids research*
  Morf, L., Pearson, R. J., Wang, A. S., Singh, U.
  2013; 41 (20): 9424-9437
- **Regulation of H2O2 Stress-responsive Genes through a Novel Transcription Factor in the Protozoan Pathogen Entamoeba histolytica** *JOURNAL OF BIOLOGICAL CHEMISTRY*
  Pearson, R. J., Morf, L., Singh, U.
  2013; 288 (6): 4462-4474
- **Small RNA pyrosequencing in the protozoan parasite Entamoeba histolytica reveals strain-specific small RNAs that target virulence genes** *BMC GENOMICS*
  Zhang, H., Ehrenkaufer, G. M., Hall, N., Singh, U.
  2013; 14
- **Distinct Distal Gut Microbiome Diversity and Composition in Healthy Children from Bangladesh and the United States** *PLOS ONE*
  Lin, A., Bik, E. M., Costello, E. K., Dethlefsen, L., Haque, R., Relman, D. A., Singh, U.
  2013; 8 (1)
- **Distinct distal gut microbiome diversity and composition in healthy children from Bangladesh and the United States.** *PloS one*
  Lin, A., Bik, E. M., Costello, E. K., Dethlefsen, L., Haque, R., Relman, D. A., Singh, U.
  2013; 8 (1)
- **The genome and transcriptome of the enteric parasite Entamoeba invadens, a model for encystation** *GENOME BIOLOGY*
  Ehrenkaufer, G. M., Weedall, G. D., Williams, D., Lorenzi, H. A., Caler, E., Hall, N., Singh, U.
  2013; 14 (7)
- **The genome and transcriptome of the enteric parasite Entamoeba invadens, a model for encystation.** *Genome biology*
  Ehrenkaufer, G. M., Weedall, G. D., Williams, D., Lorenzi, H. A., Caler, E., Hall, N., Singh, U.
  2013; 14 (7): R77
- **Oxidative stress resistance genes contribute to the pathogenic potential of the anaerobic protozoan parasite, Entamoeba histolytica** *INTERNATIONAL JOURNAL FOR PARASITOLOGY*
  Rastew, E., Vicente, J. B., Singh, U.

2012; 42 (11): 1007-1015

- **A Detoxifying Oxygen Reductase in the Anaerobic Protozoan Entamoeba histolytica** *EUKARYOTIC CELL*
  Vicente, J. B., Vy Tran, V., Pinto, L., Teixeira, M., Singh, U.
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- **Entamoeba histolytica: a snapshot of current research and methods for genetic analysis** *CURRENT OPINION IN MICROBIOLOGY*
  Morf, L., Singh, U.
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  Ehrenkaufer, G. M., Singh, U.
  2012; 184 (1): 59-62
- **Nucleus-localized Antisense Small RNAs with 5 '-Polyphosphate Termini Regulate Long Term Transcriptional Gene Silencing in Entamoeba histolytica G3 Strain** *JOURNAL OF BIOLOGICAL CHEMISTRY*
  Zhang, H., Alramini, H., Vy Tran, V., Singh, U.
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- **Antiparasitic Therapy** *MAYO CLINIC PROCEEDINGS*
  Kappagoda, S., Singh, U., Blackburn, B. G.
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- **RNA interference in Entamoeba histolytica: implications for parasite biology and gene silencing** *FUTURE MICROBIOLOGY*
  Zhang, H., Pompey, J. M., Singh, U.
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- **Approaches to characterizing Entamoeba histolytica transcriptional regulation** *CELLULAR MICROBIOLOGY*
  Pearson, R. J., Singh, U.
  2010; 12 (12): 1681-1690
- **Downregulation of an Entamoeba histolytica Rhomboid Protease Reveals Roles in Regulating Parasite Adhesion and Phagocytosis** *EUKARYOTIC CELL*
  Baxt, L. A., Rastew, E., Bracha, R., Mirelman, D., Singh, U.
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- **Entamoeba histolytica Genomic Analyses** *ANAEROBIC PARASITIC PROTOZOA: GENOMICS AND MOLECULAR BIOLOGY*
  Singh, U., Ehrenkaufer, G. M., Clark, C. G., Johnson, P. J., Adam, R. D.
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- **A developmentally regulated Myb domain protein regulates expression of a subset of stage-specific genes in Entamoeba histolytica** *CELLULAR MICROBIOLOGY*
  Ehrenkaufer, G. M., Hackney, J. A., Singh, U.
  2009; 11 (6): 898-910
- **A Pseudouridine Synthase Homologue Is Critical to Cellular Differentiation in Toxoplasma gondii** *EUKARYOTIC CELL*
  Anderson, M. Z., Brewer, J., Singh, U., Boothroyd, J. C.
  2009; 8 (3): 398-409
- **Short hairpin RNA-mediated knockdown of protein expression in Entamoeba histolytica** *BMC MICROBIOLOGY*
  Linford, A. S., Moreno, H., Good, K. R., Zhang, H., Singh, U., Petri, W. A.
  2009; 9
- **Recent insights into Entamoeba development: Identification of transcriptional networks associated with stage conversion** *INTERNATIONAL JOURNAL FOR PARASITOLOGY*
  Singh, U., Ehrenkaufer, G. M.
  2009; 39 (1): 41-47
- **Entamoeba histolytica modulates a complex repertoire of novel genes in response to oxidative and nitrosative stresses: implications for amebic pathogenesis** *CELLULAR MICROBIOLOGY*
  Vicente, J. B., Ehrenkaufer, G. M., Saraiva, L. M., Teixeira, M., Singh, U.
  2009; 11 (1): 51-69

- **Small RNAs with 5 '- Polyphosphate Termini Associate with a Piwi-Related Protein and Regulate Gene Expression in the Single-Celled Eukaryote Entamoeba histolytica** *PLOS PATHOGENS*
  Zhang, H., Ehrenkaufer, G. M., Pompey, J. M., Hackney, J. A., Singh, U.
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- **Transcriptional Regulatory Networks in Entamoeba histolytica** *CURRENT DRUG TARGETS*
  Ehrenkaufer, G. M., Singh, U.
  2008; 9 (11): 931-937
- **New insights into Entamoeba histolytica pathogenesis** *CURRENT OPINION IN INFECTIOUS DISEASES*
  Baxt, L. A., Singh, U.
  2008; 21 (5): 489-494
- **An Entamoeba histolytica rhomboid protease with atypical specificity cleaves a surface lectin involved in phagocytosis and immune evasion** *GENES & DEVELOPMENT*
  Baxt, L. A., Baker, R. P., Singh, U., Urban, S.
  2008; 22 (12): 1636-1646
- **Loss of dsRNA-based gene silencing in Entamoeba histolytica: Implications for approaches to genetic analysis** *EXPERIMENTAL PARASITOLOGY*
  MacFarlane, R. C., Singh, U.
  2008; 119 (2): 296-300
- **Identification of an Entamoeba histolytica serine-, threonine-, and isoleucine-rich protein with roles in adhesion and cytotoxicity** *EUKARYOTIC CELL*
  MacFarlane, R. C., Singh, U.
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- **Trichostatin A effects on gene expression in the protozoan parasite Entamoeba histolytica** *BMC GENOMICS*
  Ehrenkaufer, G. M., Eichinger, D. J., Singh, U.
  2007; 8
- **Identification of developmentally regulated genes in Entamoeba histolytica: insights into mechanisms of stage conversion in a protozoan parasite** *CELLULAR MICROBIOLOGY*
  Ehrenkaufer, G. M., Haque, R., Hackney, J. A., Eichinger, D. J., Singh, U.
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- **Functional characterization of spliceosomal introns and identification of U2, U4, and U5 snRNAs in the deep-branching eukaryote Entamoeba histolytica** *EUKARYOTIC CELL*
  Davis, C. A., Brown, M. P., Singh, U.
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- **Identification of putative transcriptional regulatory networks in Entamoeba histolytica using Bayesian inference** *NUCLEIC ACIDS RESEARCH*
  Hackney, J. A., Ehrenkaufer, G. M., Singh, U.
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- **Growth of the protozoan parasite Entamoeba histolytica in 5-azacytidine has limited effects on parasite gene expression** *BMC GENOMICS*
  Ali, I. K., Ehrenkaufer, G. M., Hackney, J. A., Singh, U.
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- **Structure and content of the Entamoeba histolytica genome** *ADVANCES IN PARASITOLOGY, VOL 65*
  Clark, C. G., Alsmark, U. C., Tazreiter, M., Saito-Nakano, Y., Ali, V., Marion, S., Weber, C., Mukherjee, C., Bruchhaus, I., Tannich, E., Leippe, M., Sicheritz-Ponten, T., Foster, et al
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  MacFarlane, R. C., Singh, U.

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- **Disruption of a locus encoding a nucleolar zinc finger protein decreases tachyzoite-to-bradyzoite differentiation in Toxoplasma gondii** *INFECTION AND IMMUNITY*
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  Macfarlane, R., Bhattacharya, D., Singh, U.
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  Singh, U., Brewer, J. L., Boothroyd, J. C.
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- **Identification and characterization of differentiation mutants in the protozoan parasite Toxoplasma gondii** *MOLECULAR MICROBIOLOGY*
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Petri, W. A., Singh, U.
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