



OCRID Newsletter



Faculty Spotlight:

RUDRA CHANNAPPANAVAR, PH.D.

PIONEERING RESEARCH IN SARS-COV-2 INDUCED LUNG PATHOLOGY

Dr. Rudra Channappanavar, an OCRID Center Investigator at OSU's College of Veterinary Medicine, recently secured significant NIH funding for two projects aimed at addressing SARS-CoV-2-induced lung pathology.

R01 Grant: ERK1/2 Pathway in SARS-CoV-2 Response With \$2.3M from the NIH/NHLBI, Dr. Channappanavar's study explores ERK1/2 signaling's role in lung inflammation, focusing on therapies that suppress excessive inflammation and enhance antiviral defenses.

R21 Grant: TRAF6 Signaling and Immune Regulation Funded by the NIH/NIAID, this \$365,000 project investigates myeloid cell-specific TRAF6 signaling to combat lung inflammation in SARS-CoV-2 infections, aiming to develop new protective strategies.

OCRID's Mentorship and Support: Since joining OSU in 2021, Dr. Channappanavar has leveraged OCRID's mentoring, with contributions from Drs. Lin Liu, Susan Kovats, and Clinton Jones, who reviewed his drafts, enabling his research success. With the support of \$340,000 from OCRID Phase II funding, he generated essential preliminary data to secure NIH grants.

OCRID's infrastructure and support have been vital to advancing Dr. Channappanavar's work, underscoring the center's commitment to innovative research and mentorship in respiratory disease prevention.

A Message from the Director

In this issue of OCRID Newsletter, we highlight the success of two investigators, Drs. Rudra Channappanavar and Xufang Deng who joined OCRID as part of institutional new faculty line commitments to the CoBRE program in recent years. Dr. Channappanavar has been awarded both NIH R01 and R21 grants while Dr. Deng secured three USDA grants and published a research paper in Science.

As part of our efforts to sustain the center and its cores beyond CoBRE funding, we launched the "OCRID core technology series" to showcase core new technologies and increased core outreach activities including developing and distributing core pamphlets to the participating institutions. Additionally, we submitted a white paper to the university administration advocating for potential legislative funding to support OCRID core facilities.

Continuing our focus on advancing program project grants, we submitted a 1 million application for a team-science supplement grant to support research on long COVID. Although we recognize the challenges ahead of us, we remain optimistic about OCRID's future.

Lin Liu, Ph.D., FAPS
OCRID Director



OCRID Center Investigator Achievements!

OCRID investigators have received over \$200 million in total grant dollars and over 1,500 publications since our inception in 2013!

Welcome to OCRID!

We are thrilled to welcome the following new team members.



REED HOLYOAK, DVM, PH.D.
Regents Professor of Veterinary Medicine

Dr. G. Reed Holyoak is a Regents professor and Bullock Equine Reproduction Endowed Professor at the Department of Veterinary Clinical Sciences, OSU's College of Veterinary Medicine. With degrees from Brigham Young, Washington State, and the University of Kentucky, he is also a Diplomate of the American College of Theriogenologists. Dr. Holyoak has published extensively on equine, bovine, and canine reproduction, and his research focuses on reproductive infectious diseases and assisted reproductive technologies. Known internationally, he has provided training in China, Thailand, and Ireland, fostering global collaborations.



MAYARA MAGGIOLI, DVM, PH.D.
Assistant Professor of Veterinary Pathobiology

Dr. Mayara F. Maggioli earned her DVM and MS degrees from Federal University of Goiás (Brazil) and her Ph.D. from Iowa State University. She is an Assistant Professor at the Department of Veterinary Pathobiology in the College of Veterinary Medicine at OSU. Dr. Maggioli's research focuses on host responses to infections, disease biomarkers and correlates of protection to bacterial and viral infections of livestock with translational relevance, aiming to advance disease prevention and control strategies and to promote health.

Faculty Spotlight Cont.:

RAKHI RAJAN, PH.D.

BIOCHEMISTRY RESEARCHER APPLYING NSF GRANT TO IMPROVE GENE EDITING TECHNOLOGY

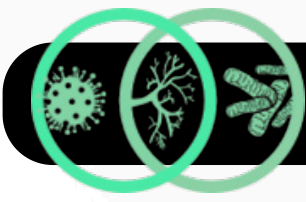
Dr. Rakhi Rajan, an OCRID Pilot Project Leader and biochemistry researcher at the University of Oklahoma, is advancing the frontier of gene-editing technology with her NSF-funded research. Her project addresses the challenge of stabilizing CRISPR-Cas proteins, key tools in gene editing, by investigating their structural and functional properties under diverse conditions. By integrating protein engineering and computational modeling, Dr. Rajan aims to enhance the precision and efficiency of these proteins, enabling wider applications in medicine, agriculture, and industry.

"This research tackles fundamental issues in gene editing, ensuring these tools are not only effective but also reliable in complex environments," Dr. Rajan explained. Her work could lead to breakthroughs in treating genetic disorders and developing disease-resistant crops, underscoring the transformative potential of biochemistry and molecular biology.

The project also emphasizes mentorship and training, preparing the next generation of scientists to explore innovative solutions in molecular engineering. For more details, visit [OU News](#).

OCRID Shines at the 9th National IDeA Symposium of Biomedical Research Excellence

OCRID showcased its leadership at the 9th National IDeA Symposium of Biomedical Research Excellence (NISBRE), where Dr. Lin Liu co-chaired the Infectious Diseases II session. Drs. Xufang Deng and Avishek Mitra presented their innovative research, with Dr. Deng receiving a Scientific Presentation Award for his exceptional work. Dr. Liu emphasized OCRID's dedication to advancing respiratory and infectious disease research, and the center's contributions to NISBRE highlight its role in scientific excellence. OCRID continues to foster collaboration and provide valuable insights in the field.



Faculty Spotlight Cont.:

XUFANG DENG, PH.D.

GROUNDBREAKING COVID-19 RESEARCH BY DR. XUFANG DENG FEATURED IN SCIENCE

Dr. Xufang Deng of OSU's College of Veterinary Medicine has gained international acclaim for his groundbreaking COVID-19 research, recently published in Science. Dr. Deng's study focuses on a novel PLpro inhibitor, a potential antiviral therapy for SARS-CoV-2. This innovative treatment demonstrated the ability to reduce viral loads and alleviate severe lung damage in preclinical models, representing a significant step forward in the fight against COVID-19.

Dr. Deng's achievement highlights the strength of OSU's One Health approach, emphasizing interdisciplinary collaboration to address critical health challenges. His work reflects the combined efforts of OSU researchers across fields, from veterinary medicine to molecular biology, reinforcing the university's commitment to advancing global health.

The development of a PLpro inhibitor not only enhances understanding of SARS-CoV-2 but also provides a foundation for creating therapies against future coronavirus outbreaks. OCRID is proud to celebrate Dr. Deng's success, which exemplifies innovation, collaboration, and scientific excellence. For more details, read the full article [here](#).

YU FENG, PH.D.

CHEMICAL ENGINEERING RESEARCHERS STUDY USE OF AI TO MITIGATE VIRAL TRANSMISSION IN SCHOOLS

Dr. Yu Feng, an OCRID Pilot Project Leader and associate professor at Oklahoma State University, leads groundbreaking research to combat airborne viral transmission in schools. Using advanced AI and airflow modeling, his team optimizes HVAC systems to improve air quality and lower costs. Funded by the National Science Foundation, this project also engages K-12 students and explores real-time infection risk monitoring. Dr. Feng's interdisciplinary approach may influence public health policies and building designs. Learn more [here](#).

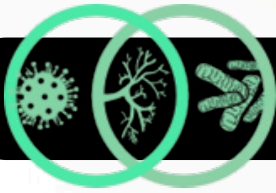
OCRID'S 11TH ANNUAL RESEARCH SYMPOSIUM: A DAY OF INSIGHT, INNOVATION, AND COLLABORATION

The Oklahoma Center for Respiratory and Infectious Diseases (OCRID) hosted its 11th Annual Research Symposium on April 4, 2024, at Meditations Event Center in Stillwater, OK. This one-day symposium showcased the cutting-edge research efforts of OCRID investigators, highlighting advances in respiratory and infectious diseases. Attendees explored innovative projects, networked with peers, and gained insight from distinguished keynote speakers.

Associate Director Dr. Tom Oomens opened the symposium, followed by remarks from OSU Vice President for Research Kenneth Sewell and a director's report by Dr. Lin Liu, setting the stage for a dynamic day of scientific exchange. Three keynote speakers headlined the event: Dr. James Heath from the Institute for Systems Biology in Seattle, Dr. Jay Kolls from Tulane University, and Dr. Barry Stripp from Cedars-Sinai Medical Center, each offering deep insights into immune responses, cellular mechanisms, and disease modeling in respiratory health.

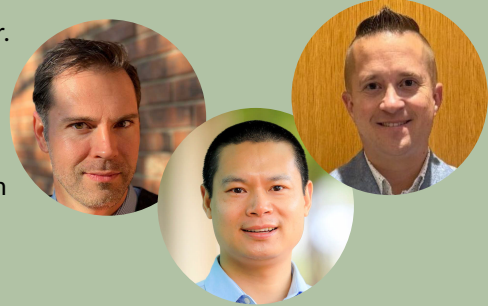
In addition to the keynote addresses, the symposium featured three research sessions with presentations by OCRID investigators and affiliates on topics ranging from SARS-CoV-2 pathology to innovative therapeutics. Attendees also had the opportunity to engage in poster sessions showcasing undergraduate, graduate, and postdoctoral research, with a competitive element that offered cash prizes for top entries.

The symposium concluded with core facility updates, closing remarks, and an awards presentation. This year's poster competition honored outstanding research presentations across categories. Mandi Roe received both Best Overall and Best Post-Doctoral Fellow awards, while Best Graduate Student went to Stephen Kotey and Abigail Williams in a tie. The Best Undergraduate award was presented to Jacob Lieberman. These achievements highlight OCRID's dedication to fostering exceptional research across all levels.



OCRID FACULTY HONORED WITH EXCELLENCE IN RESEARCH MENTORING AWARD

Three OCRID faculty members, Dr. Joshua Butcher, Dr. Yong Cheng, and Dr. Matthew Cabeen—were honored with the 2024 Excellence in Research Mentoring Award for their outstanding dedication to undergraduate mentorship. Dr. Butcher, recognized for his personalized mentorship, supports students toward professional success. Dr. Cheng's guidance in molecular biology has inspired many to pursue research careers. Dr. Cabeen emphasizes mutual respect, guiding students to achieve their academic goals. This award highlights the positive impact of mentorship in fostering future scientific leaders and advancing OCRID's mission.



UNIVERSITY OF OKLAHOMA RESEARCHERS CONTRIBUTE TO FEDERAL INITIATIVE TRACKING ANIBIOTIC RESISTANCE

Dr. Valentin Rybenkov, an OCRID Center Investigator, and Dr. Helen Zgurskaya from the University of Oklahoma are contributing to the federal "DARTS" initiative led by Harvard. Funded by ARPA-H, the project aims to tackle antibiotic resistance by studying bacterial survival mechanisms. Dr. Rybenkov's team focuses on drug efflux and permeation in resistant bacteria, leveraging advanced imaging and AI tools. This collaborative effort involves 25 teams and offers valuable training for students in cutting-edge methodologies. Learn more [here](#).

OCRID FACULTY AMONG WINNERS OF THE OSU 2023 UNIVERSITY AWARDS

Dr. Jennifer Rudd and Dr. Glenn Zhang, both OCRID Center Investigators, were honored in Oklahoma State University's 2023 awards. Dr. Rudd received the Advising Excellence Award; the Outreach Faculty Excellence Award; and the Regents Distinguished Teaching Award for her impactful advising, outreach, teaching and research in veterinary medicine. Dr. Zhang was appointed to Regents Professor for his outstanding contributions to immunology and animal health. Both faculty members exemplify excellence in education and innovation, furthering OSU's mission of service and scholarship. For more details on their achievements and other honorees, visit [OSU News](#).

FALL SEMINAR REVIEW

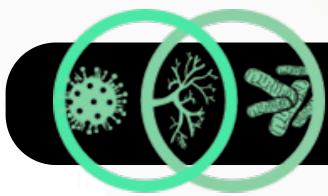
OCRID FALL SEMINAR SERIES: FOSTERING COLLABORATION THROUGH DIVERSE EXPERTISE

OCRID's Fall Seminar Series brings a diverse range of research talent to our center, fostering valuable opportunities for collaboration and advancing scientific knowledge. This season, we welcome speakers from various institutions, including leaders in Long COVID research, tuberculosis, zoonotic diseases, and more.

Seminar Highlights:

- Steven Deeks, MD (University of California, San Francisco) – "Long COVID and Long Everything: Towards Understanding the Mechanism and the Search for a Cure"
- Amy Barczak, MD (Harvard University) – "Fixing a Hole: Repairing the Mtb-Damaged Phagosome"
- Jürgen A. Richt, DVM, PhD (Kansas State University) – "H5N1 Clade 2.3.4.4b Virus Infections in Livestock"
- James Burke, PhD (University of Florida) – "Reprogramming of Cellular RNA Biology in Response to Viral Infection"
- Matthew Kelly, MD, MPH (Duke University) – "Shifting the Paradigm for Respiratory Infection Prevention: Towards Rationally Designed Nasal Probiotics"

Each seminar offers OCRID investigators the opportunity to gain insights into cutting-edge research, strengthen interdisciplinary collaborations, and apply new ideas to their own work. A heartfelt thank you to all our speakers for contributing their expertise to advance our mission.



UPCOMING OCRID ACTIVITIES:

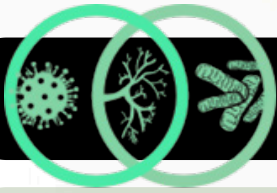
1/22/2025	Unlocking Research Potential: OCRID Core Services and Technologies Presenters: Myron Hinsdale, Rudra Channappanavar, Alexandra Ford, and Lin Liu	
1/29/2025	OCRID Core Technologies Series: Single Cell RNA sequencing presented by 10x Genomics	Hosted by: OCRID MBGC
2/12/2025	Daniel Wozniak, Ph.D. - Professor of Microbial Infection & Immunity and Microbiology at The Ohio State University <i>"Polymicrobial interactions during chronic infections"</i>	Hosted by: Marianna Patrauchan
2/26/2025	Yong Cheng, Ph.D. - Asst. Professor of Biochemistry & Molecular Biology at OSU TBN	Hosted by: Lin Liu
3/5/2025	Xufang Deng, Ph.D. - Asst. Professor of Physiological Sciences at OSU <i>"Investigating the inflammation dynamics and viral persistence in SARS-CoV-2-infected mice"</i>	Hosted by: Tom Oomens
3/12/2025	Sathish Venkatachalem, Ph.D. - Assoc. Professor of Pharmaceutical Sciences at North Dakota State University <i>"Sex Differences in Asthma: A Play of Estrogen in the Airway"</i>	Hosted by: Rudra Channappanavar
3/19/2025	Sunil More, Ph.D. - Asst. Professor of Veterinary Pathobiology at OSU TBN	Hosted by: Lin Liu
3/26/2025	Diego Diel, DVM, MD, Ph.D. - Assoc. Professor of Population Medicine and Diagnostic Sciences at Cornell University <i>"Infection dynamics and pathogenesis of HPAI H5N1 infection in mammals"</i>	Hosted by: Xufang Deng
4/08/2025	OCRID 12th Annual Research Symposium Hosted at Meditations in Stillwater	
4/23/2025	Hasina Outtz Reed, M.D., Ph.D. - Asst. Professor of Pulmonary Critical Care Medicine at Weill Cornell University TBN	Hosted by: Lin Liu
4/30/2025	Lundberg-Kienlen Lecture: Jonathan Kropski, M.D. - Assoc. Professor of Medicine, Allergy, Pulmonary and Critical Care at Vanderbilt University <i>"Lung Epithelial Dysfunction in Pulmonary Fibrosis"</i>	Hosted by: Lin Liu

OCRID AWARDED 2 NEW PILOT PROJECTS THIS YEAR!

We had excellent proposals this year and were excited to be able to fund two new projects. We look forward to seeing these projects develop and wish the PIs continued success.

Non-tuberculous Mycobacterial Infection in Cystic Fibrosis Ferret Model – Yong Cheng, Ph.D, The Department of Biochemistry and Molecular Biology, The College Agriculture, Oklahoma State University

This project focuses on developing a cystic fibrosis (CF) ferret model to study Mycobacterium abscessus lung infections, which are increasingly common and challenging to treat in CF patients. Preliminary data show that M. abscessus disrupts macrophage function in CF airways. The project will further investigate the impact of this infection on lung health and immune response in CF ferrets, advancing our understanding of M. abscessus infections and potential treatments for CF-related lung disease.



OCRID NEW PILOT PROJECTS Cont:

Investigating SARS-CoV-2 persistence in a mouse model of Long COVID – Xufang Deng, Ph.D, The Department Physiological Sciences, The College of Veterinary Medicine, Oklahoma State University

This project seeks to develop an animal model to study the mechanisms behind Long COVID, specifically the relationship between prolonged inflammation and SARS-CoV-2 persistence. Using a mouse model with a natural SARS-CoV-2 infection and an inflammation biosensor, researchers will track inflammation over time and examine viral presence across organs. The aims include a comparison of inflammation dynamics relative to influenza A and assess how viral persistence influences sustained inflammation and tissue damage. The project will provide insights into Long COVID's underlying causes and potential treatment targets.

Interferon-Mediated Impairment in Macrophage Antibacterial Activity during SARS-CoV-2 and Klebsiella pneumoniae Co-Infection – Sunil More, Ph.D, The Department of Veterinary Pathobiology, College of Veterinary Medicine, Oklahoma State University

This project is entering year 2 and we look forward to see the progress of this exciting project.

UPCOMING GRANT OPPORTUNITIES:

NIH Notices of Special Interest

NOT-AI-24-081 (expires 11/17/27)
Advancing research needed to develop a universal Influenza vaccine.

NOT-AI-24-082 (expires 01/08/28)
Establishing and utilizing pre-clinical animal models to study post-TB lung disease development.

NOT-AI-24-054 (expires 7/17/27)
Using the Collaborative Cross (CC) mouse model for immunoregulatory and infectious disease research

NOT-AI-24-053 (expires 7/17/27)
Discovery and development of oral small-molecule direct-acting antivirals targeting viruses of pandemic potential

NOT-AI-23-050 (expires 7/17/26)
Advancing biomedical research in pulmonary non-tuberculous mycobacterial (MTN) infections.

NOT-HL-22-004 (expires 9/8/2025)
Pediatric COVID-19 and Respiratory Viral Co-infection

International Society for Infectious Disease

Grant opportunities for early career researchers (within 8 years of PhD or MD)
<https://isid.org/research/isid-research-grants/>

Cystic Fibrosis Foundation

Link to Academic funding opportunities:
<https://www.cff.org/researchers/academic-funding-opportunities#independent-research-funding-opportunities>

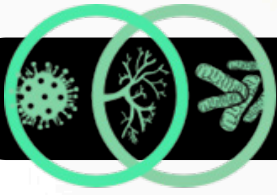
NSF

Link to research grant opportunities:
<https://new.nsf.gov/funding/opportunities>

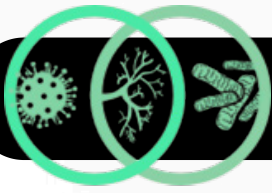
Burroughs Wellcome Fund

Investigators in the pathogenesis of infectious disease PATH (annual award for assistant professors only, by invitation; award closed for 2024).

<https://www.bwffund.org/funding-opportunities/infectious-diseases/investigators-in-the-pathogenesis-of-infectious-disease/>

**UPCOMING CONFERENCES:**

- **American Society for Virology (ASV), July 14-17, 2025** (Montréal, Quebec, Canada)
 - <https://asv.org/asv2025/>
- **American Society for Microbiology Microbe (ASM MICROBE), June 19-23, 2025** (Los Angeles, CA)
 - <https://asm.org/Events/ASM-Microbe/Home>
- **European Congress of Clinical Microbiology and Infectious Diseases (ESCMID), April 11-15, 2025** (Vienna, Austria)
 - <https://www.eccmid.org/>
- **European Society Working group on Influenza (ESWI) Influenza Conference, Oct 20-23, 2025** (Valencia, Spain)
 - <https://eswiconference.org/>
- **6th ISIRV Respiratory Viruses School, Jan 19-23 2025** (Qatar)
 - <https://www.qu.edu.qa/en-us/conference/ISIRV-respiratory-viruses-2025/About-the-Event/Pages/default.aspx>
- **13th International RSV Symposium (RSV2025), March 12-15, 2025** (Iguazu Falls, Brazil).
 - <https://www.rsv2025.org/>
- **Gordon Conferences**
- **Viruses and Cells. Pathogenesis, Virus-host Interactions and Therapeutics, May 17-19, 2025** (Barcelona, Spain)
 - <https://www.grc.org/viruses-and-cells-grs-conference/2025/>
- **Viruses and Cells. The Biology of Viral Infection: Replication, Host Interactions and Pathogenesis, May 18-23, 2025** (Barcelona, Spain)
 - <https://www.grc.org/viruses-and-cells-conference/2025/>
- **Lung Development, injury and Repair, Promoting Health Across the Lifespan in Developing and Aging Lungs, July 27 - August 1st, 2025** (Lucca, Italy)
 - <https://www.grc.org/lung-development-injury-and-repair-conference/2025/>
- **Lung Development, injury and Repair, Cellular and Global Insights into Lung Health and Disease, July 26 - 27, 2025** (Lucca, Italy)
 - <https://www.grc.org/lung-development-injury-and-repair-conference/2025/>
- **Keystone Conferences**
- **Tuberculosis: Heterogeneity from experimental models to human disease, Feb 16-19, 2025** (Boston, MA)
 - <https://www.keystonesymposia.org/conferences/conference-listing/meeting/B12025>
- **Innate immune memory: mechanisms and consequences (joint meeting with T cell differentiation in tissue microenvironments), Feb 2-5, 2025** (Vancouver, British Columbia, Canada)
 - <https://www.keystonesymposia.org/digital-toolkit/j82025>
- **RNA mediated regulation of immunity: Mechanism, Disease, and Therapeutics, Jan 27-30, 2025** (Keystone, CO)
 - <https://www.keystonesymposia.org/conferences/conference-listing/meeting/J52025>
- **Long Covid and Other Post-Acute Infection Syndromes, Aug 10-13, 2025** (Santa Fe, NM).
 - <https://www.keystonesymposia.org/conferences/conference-listing/meeting/F12026>
- **Myeloid cells: Roles in different Tissue microenvironments, March 3-6, 2025** (Hannover, Germany)
 - <https://www.keystonesymposia.org/conferences/conference-listing/meeting/C22025>



OCRID Core Updates! What is New at MBGC?

We are thrilled to introduce two state-of-the-arts instruments to our facility: the **Illumina NextSeq 2000** and the **Agilent TapeStation 4150**.



Illumina NextSeq 2000:

This high-performance next-generation sequencing (NGS) platform offers unparalleled flexibility, scalability, and high-quality data across a wide range of applications. With this addition, MBGC can now perform sequencing in-house, generating high-quality data for in-depth genomic and transcriptomic analyses. The new platform significantly reduces turnaround times of bulk and single cell RNA sequencing services, enhancing our efficiency.



Agilent TapeStation 4150:

This compact, automated electrophoresis system provides rapid, reproducible and sensitive quality control of nucleic acids. It ensures accurate assessments of DNA and RNA sample integrity and size distribution, streamlining workflows for applications such as NGS and transcriptomics.

Molecular Biology and Genomics Core

We are excited to announce that the former Molecular Biology Core (MBC) has a new name: **Molecular Biology and Genomics Core (MBGC)**, reflecting the expansion of our genomics capabilities. MBGC is a centralized core facility dedicated to providing cutting-edge molecular biology and genomics technologies and expertise to support a wide array of research needs.

Our services range from basic molecular biology techniques to advanced technologies such as **CRISPR**, **single cell RNA sequencing (scRNAseq)**, and **spatial whole transcriptomics**. We offer a comprehensive suite of services, from sample preparation and sequencing to data analysis and interpretation, tailored to assist researchers in exploring complex biological questions.

Explore how MBGC can support your research! Visit [our website](#) for more information.

Immunopathology Core:

We have procured or are in the process of procuring the following equipment for the IPC.

- Tissue Processor
- Leica Microtome
- Tissue Embedding Station
- LICOR ODYSSEY Imager

These equipment are available to use by core investigators and pilot project leaders beginning January 2025.

Animal Models Core:

Below are the updates and equipment that will be available for BSL-3 part of AMC users beginning January 2025.

'Mouse Buxco DSI Whole Plethysmography' to carry out respiratory function test
 Mouse Ox plus- pulse Oximeter for BSL-3 animal studies
 Hematology analyzer for BSL-3 studies