# Rahail Ashraf, PhD

Khudwani Kashmir India ,7006901514, rraheelashraf@gmail.com

## EDUCATION

Post DOC. **The University of New Mexico, USA** 01/2025-Present
Advisor: Dr. Syed Mubarak

Ph.D. **Indian Institute of Science Education and Research, Tirupati, India** 08/2019--06/2024
Advisor: Dr. Sanjay Kumar

M.Sc. **University of Kashmir, Srinagar** 05/2016--11/2018
Department of Biochemistry

B.Sc. **University of Kashmir, Srinagar** 03/2011--03/2014

## RESEARCH EXPERIENCE

The University of New Mexico, NM, USA **January 2024 – Present, Post Doc fellow**
**Advisor: Dr. SYED Mubarak**

Indian Institute of Science Education and Research, Tirupati, Andhra Pradesh, India**, August 2019 – July 2024, Ph.D. Research**
**Advisor: Dr. Sanjay Kumar**

**Project: Role of altered mitochondrial dynamics in ovarian cancer progression and cancer stem cell maintenance.**

Mitochondrial dysfunction reduces ATP production, increases ROS generation, and causes mitochondrial damage. Mitochondrial morphology (size and shape) is closely associated with these functions. The balanced fusion and fission events sustain the morphology of mitochondria, and thus, when these are imbalanced, several studies noticed dramatic changes in mitochondrial morphology. Imbalanced fusion and fission result in dysfunction of mitochondria leading to many disorders, including cancer. We demonstrated that activating Mfn2 (Mitochondrial fusion regulator) through genetic or pharmacological means leads to increased mitochondrial fusion and decreased generation of reactive oxygen species (ROS) in ovarian cancer cells, which correlates with reduced cell proliferation, invasion, migration, and epithelial-mesenchymal transition (EMT). We observed that increased Mfn2-mediated mitochondrial fusion triggers autophagy by activating AMPK alpha and reducing p-mTOR 2481/2448 and p-Erk signaling, thus suppressing ovarian cancer progression. Notably, we found that increased mitochondrial fusion promotes the remodeling of F-actin, reduces lamellipodia formation, and modulates EMT. Our study revealed that 2-deoxy-D-glucose (2-DG) treatment augments ovarian cancer stemness by upregulating OXPHOS through Mfn1. These findings clearly explain the correlation between Mfn1-induced oxidative phosphorylation and ovarian cancer stem cell maintenance.

## PUBLICATIONS

1. **Ashraf, R.,** Kumar, S. (2022). Mfn2-mediated mitochondrial fusion promotes autophagy and suppresses ovarian cancer progression by reducing ROS through AMPK/mTOR/ERK signaling. ***Cellular and Molecular Life Sciences*.79(11), 573.**

2. Mohapatra, O., Gopu, M., **Ashraf, R**., Easo George, J., Patil, S., Mukherjee, R., Kumar, S., & Mampallil, D. (2024). Spheroids formation in large drops suspended in superhydrophobic paper cones. *Bio microfluidics*, *18*(2), 024107. https://doi.org/10.1063/5.0197807 (**Equal author)**

3. Behera, A., **Ashraf, R.**, Srivastava, A. K., & Kumar, S. (2020). Bioinformatics analysis and verification of molecular targets in ovarian cancer stem-like cells. ***Heliyon*, *6*(9), e04820.**

4. Kumar,S., **Ashraf,R**., & C K, A. (2022): Mitochondrial dynamics regulators: implications for therapeutic intervention in cancer. ***Cell Biology and Toxicology*, *38*(3), 407.**

5. Cherukunnath, A., Davargaon, R. S., **Ashraf, R**., Kamdar, U., Srivastava, A. K., Tripathi, P. P., Chatterjee, N., & Kumar, S. (2022). KLF8 is activated by TGF-β1 via Smad2 and contributes to ovarian cancer progression. ***Journal of CellularBiochemistry*, *123*(5), 921–934.**

6. Thomas, A. R., Swetha, K., C K, A**., Ashraf,R**., Kumar, J., Kumar,S., & Mandal, S. S. (2022). Protein fibril-assisted chiral assembly of gold nanorods. ***Journal of Materials Chemistry. B*, *10*(33), 6360–6371.**

## Manuscripts Under Preparation

1. **Ashraf, R**., Tankay K., Raina M., Kumar S., (2024) Ovarian cancer stem cells have higher mitochondrial fusion and Mfn1 that induces oxidative phosphorylation to promote stemness (**Under review BBA**)

2. **Rahail Ashraf**, Tejan Lodhiya, Manita Raina, Kalpana Tankay, Raju Mukherjee*, Sanjay Kumar* (2025). Altered proteome in ovarian cancer stem-like cells: Profiling of mDivi-1induced proteome and their clinical significance (Under review **Molecular Omics**)

3. RS Davargon, **Rahail Ashraf**, Kalpana Tankay, Manita Raina, Sanjay Kumar* (2023). KLF8 promotes ovarian cancer stemness by modulating autophagy and contributes to drug resistance

## SCHOLARSHIPS AND AWARDS

Junior Research Fellowship-IISER Tirupati, India 2019 - 2021
(0.80million INR)

Senior Research Fellowship-IISER Tirupati, India 2021 - 2024
(1.5millionINR)

Graduate Aptitude Test in Engineering (GATE), HRDG, Govt. of India 2019

CSIR-National Eligibility Test for Junior Research Fellowship (NET-LS) 2017

## PRESENTATIONS

Southwest Regional meeting of the society of Developmental Biology.

Albuquerque, NM, USA(Volunteer)
2025

**Poster Presentations (Best Poster Awards)**

12th India-Japan Science & Technology Conference:(ICFAST-2022) 2022
The International Symposium on "Mitochondria, Cell Death & Human Diseases" 2023
Biology Day IISER Tirupati 2023, Tirupati 2023

## TEACHING AND MENTORSHIP EXPERIENCE

- Teaching Assistant, Basic Lab Course at IISER, India 2020

- Mentored M.S/U. G student

Aparna C.K, Undergraduate Student at IISER, India 2020
Manik, Undergraduate Student at IISER, India 2021
Anjali, Undergraduate Student at IISER, India 2022

### COMMUNITY SERVICE AND SCIENCE OUTREACH

Pueblo Brain Science Neuroscience Workshop, New Mexico. 2025

- **Science Outreach:** Mentored

The IISER Tirupati iGEM 2021 team(Gold Medal) 2021
The IISER Tirupati iGEM 2022 team(Gold Medal) 2022

## RESEARCH AND PROGRAMMING SKILLS

- Confocal microscopy
- HPLC and Protein Biochemistry etc.
- Immunoblotting, PCR
- Flow Cytometry
- FISH-IF
- **Drosophila Brain dissections**

## WEBSITES/ PRESS

LinkedIn

GoogleScholar

## REFEREES

**Dr. Sanjay Kumar,** Ph.D.

Assistant Professor, IISER
Tirupati, AP India
Email:
sanjay@iisertirupati.ac.in

Dr. **Pakala Suresh Babu**, Ph.D.

Associate Professor, Dept. of Biochemistry,
University of Hyderabad, Hyderabad, India.
Email: pakalasb@uohyd.ac.in

Dr. **Shaida Andrabi**, Ph.D.

Assistant professor(Biochemistry),
University of Kashmir, India.
Email: shaida.andrabi@uok.edu.in