

## FIRST PERSON

# First person – Ajay Singh

First Person is a series of interviews with the first authors of a selection of papers published in Journal of Cell Science, helping early-career researchers promote themselves alongside their papers. Ajay Singh is first author on ‘Local DNA synthesis is critical for DNA repair during oocyte maturation’, published in JCS. Ajay is a postdoc in the lab of Dr H. B. D. Prasada Rao at the National Institute of Animal Biotechnology, Hyderabad, India, investigating the quality of and lifespan-determining factors of mature oocytes in mammals.

### How would you explain the main findings of your paper in lay terms?

Oogenesis begins in the female fetus, and the oocytes progress up to diplotene and undergo arrest before birth, called the dictyate stage. Moreover, oocytes remain in the same stage until puberty. After puberty, small clutches of eggs go through a complex maturation process during each reproductive cycle called oocyte maturation. The quality of mature oocytes is crucial for full-term pregnancies and high-quality oocytes are a prerequisite of almost all assisted reproductive technologies (ART). Our study found that ~20% of unperturbed oocytes experienced DNA damage during maturation due to hyper-reactive oxygen species (ROS). Furthermore, we have demonstrated that the DNA synthesis machinery is present during oocyte maturation and dynamically recruited to sites of DNA damage. The absence of DNA synthesis hinders oocyte maturation, supervised by the spindle assembly checkpoint (SAC). Collectively, our findings highlight the importance of DNA synthesis to maintain the oocyte quality during maturation.

### Were there any specific challenges associated with this project? If so, how did you overcome them?

Working with porcine oocytes and their cytological methods was difficult. I spent a great deal of time optimizing the fixation and immunostaining protocols. It was gratifying to visualize DNA synthesis for the first time in porcine oocytes.

### When doing the research, did you have a particular result or ‘eureka’ moment that has stuck with you?

Yes, when we found that almost all oocytes were stuck at MI-like stage in the etoposide plus aphidicolin treatment group.

### Why did you choose Journal of Cell Science for your paper?

Publishing in JCS enables us to reach all cell and developmental biology audiences. It also gives more impact to our findings.

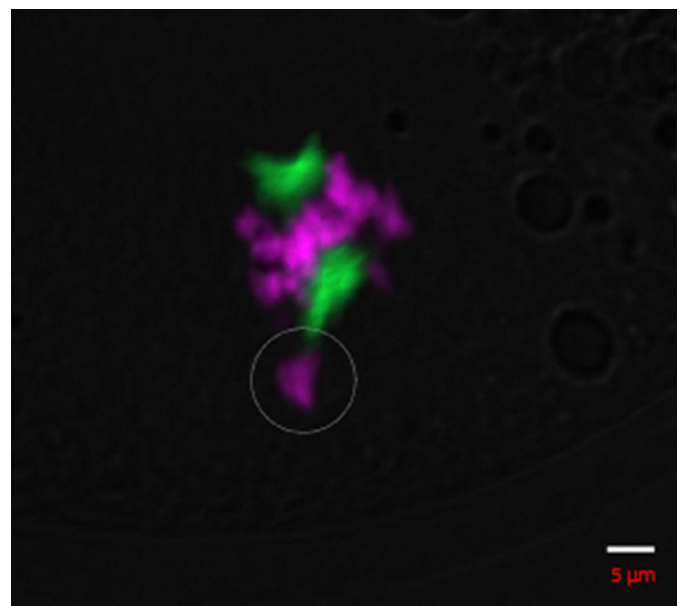
### What motivated you to pursue a career in science, and what have been the most interesting moments on the path that led you to where you are now?

My father is the motivation behind my scientific journey. Being a farmer, he always encouraged me to work with nature. Therefore, since childhood, I have always been curious and liked the biological sciences.

Ajay Singh's contact details: National Institute of Animal Biotechnology, Hyderabad, India.  
E-mail: [ajaybt31@gmail.com](mailto:ajaybt31@gmail.com)



Ajay Singh



**Pig oocyte showing MI arrest with chromosome mislocalization.** Oocyte is immunostained for chromatin (violet) and the spindle (green).

**Who are your role models in science? Why?**

Dr. H. B. D. Prasada Rao, of course. I have learned a lot from him. He is a very meticulous person who tries to give the best training to his students.

**What's next for you?**

I hope to stay in academia. I would love to teach and carry out research in an independent lab in future.

**Tell us something interesting about yourself that wouldn't be on your CV**

If not working in lab, I love to play and watch cricket!

**Reference**

Singh, A. K., Kumar, S. L., Beniwal, R., Mohanty, A., Kushwaha, B. and Rao, H. B. D. P. (2021). Local DNA synthesis is critical for DNA repair during oocyte maturation. *J. Cell Sci.* **134**, jcs257774. doi:10.1242/jcs.257774