

# Saurabh Raj

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## INTERESTS

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Single molecule biophysics, DNA-protein interactions, Kinetic studies of CRISPR-Cas interactions, Cellular mechanochemistry

## ACADEMIC POSITIONS

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**University of Leipzig** Leipzig, Germany  
*Post-doctoral researcher* May 2017 – Oct 2020

**École Normale Supérieure** Paris, France  
*Post-doctoral researcher* Mar 2013 – May 2017

## EDUCATION

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**The Institute of Photonic Sciences** Castelldefels (Barcelona), Spain  
*PhD in Biophotonics* Oct 2008 – Dec 2012  
• **PhD Thesis:** Mechanochemical study of single living cells and biomolecules combining optical tweezers and Raman spectroscopy

**Cochin University of Science and Technology** Kochi, India  
*5 Years integrated Master of Science in Photonics* 2003 - oi 2008

## INVITED TALKS

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1. **Conference on Biomotors, Virus Assembly, and Nanobiotechnology Applications** - Columbus, Ohio, USA; August, 2017
2. **International Physics of Living Systems Network** - Munich, Germany; July, 2014
3. **Institut de Biologie Physico-Chimique (IBPC)** - Paris, France; January, 2016
4. **Mechanobiology Institute** - Singapore; August, 2012
5. **Division for Biomedical Optics**, Medical University of Innsbruck - Innsbruck, Austria; June, 2011 2011

## SELECTED PUBLICATIONS

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1. S. Rao, **S. Raj**, S. Balint, C. B. Fons, S. Campoy, M. Llagostera and D. Petrov: Single DNA molecule detection in an optical trap using surface-enhanced Raman scattering; *Applied Physics Letters*; 96 (21): (2010)
2. **S. Raj**, M. Marro, M. Wojdyla and D. Petrov: Mechanochemistry of single red blood cells monitored using Raman tweezers; *Biomed. Opt. Express*; 3: (2012)
3. S. Rao, **S. Raj**, B. Cossins, M. Marro, V. Guallar and D. Petrov: Direct observation of single DNA structural alterations at low forces with surface-enhanced Raman scattering; *Biophys. J.*; 104: (2013)
4. **S. Raj**, M. Wojdyla and D. Petrov: Studying single red blood cells under a tunable external force by combining passive microrheology with Raman spectroscopy; *Cell biochemistry and biophysics*; 65: (2013)
5. M. Wojdyla, **S. Raj** and D. Petrov: Absorption spectroscopy of single red blood cells in the presence of mechanical deformations induced by optical traps; *J. Biomed. Opt.*; 17: (2012)
6. M. Wojdyla, **S. Raj** and D. Petrov: Nonequilibrium fluctuations of mechanically stretched single red blood cells detected by optical tweezer; *European Biophysics Journal*; 42: (2013)

7. S.Hodeib, **S. Raj**, M. Manosas, W. Zhang, D. Bagchi, B. Ducos, J.F. Allemand, D. Bensimon and V.Croquette: Single molecule studies of helicases with magnetic tweezers; *Methods*; 105 (2016)
8. S.Hodeib, **S. Raj**, et al.: A mechanistic study of helicases; *Protein Science*; 26 (2017)
9. **S. Raj**, D. Bagchi, J. V. Orero, J. Banroques, N. Kyle Tanner, and V. Croquette: Mechanistic characterization of the DEAD-box RNA helicase Ded1 from yeast as revealed by a novel technique using single-molecule magnetic tweezers; *Nucleic Acids Research*; 47 (2019)
10. J. Kanaan\*, **S. Raj**\*, et al.: UPF1-like helicase grip on nucleic acids dictates processivity; *Nature Comm*; 9 (2018) (\* Equal contribution)