Stanford

# Kacper Rogala

Assistant Professor of Structural Biology and of Chemical and Systems Biology

## Bio

### BIO

Dr. Kacper Rogala is Assistant Professor at Stanford University School of Medicine with a joint appointment between the Department of Structural Biology and the Department of Chemical & Systems Biology. He is also a Leader in the Stanford Cancer Institute.

Kacper was born and raised in Poland, and educated in three wonderful British cities: Oxford, London and Edinburgh, where he studied chemistry of living things, or simply — biochemistry. During his studies, Kacper developed a deep passion for proteins — how they work, what they look like, and how they interact with other proteins and small molecules. This passion led him to pursue a trans-Atlantic postdoc between two Cambridges: one in the UK and one in Massachusetts. As a researcher at MIT, the Whitehead Institute, the Broad Institute, and the MRC Laboratory of Molecular Biology, Kacper began unraveling the mechanisms of nutrient sensing on the surface of lysosomes.

Kacper joined Stanford as an assistant professor in 2022, and together with his team they are leading the charge towards mechanistic understanding of how cells control metabolism in response to nutrients and growth factors, and ways to modulate these activities with chemical probes — for the benefit of patients.

### ACADEMIC APPOINTMENTS

- Assistant Professor, Structural Biology
- Assistant Professor, Chemical and Systems Biology
- Member, Bio-X

### ADMINISTRATIVE APPOINTMENTS

- Leader, Stanford Cancer Institute, (2022- present)

### HONORS AND AWARDS

- The NIH Pathway to Independence Award, National Cancer Institute, MD (2021)
- Margaret and Herman Sokol Postdoctoral Award in Biomedical Research, Whitehead Institute, MA (2020)
- Postdoctoral Research Fellowship Award, Charles A. King Trust, MA (2020)
- Junior Fellowship, Tuberous Sclerosis Association, UK (2018)
- Member, Royal Society of Chemistry, UK (2016)
- College Research Associate, Sidney Sussex College, University of Cambridge, UK (2016)
- Graduate Fellowship, Engineering and Physical Sciences Research Council, UK (2011)
- Best Master of Research Student Prize, University College London, UK (2011)

- Governor's Award for Outstanding Students, Kraków, Poland (2006)

### PROFESSIONAL EDUCATION

- Postdoctoral Fellow, Massachusetts Institute of Technology , Structural and Chemical Biology (2022)
- D.Phil., The University of Oxford , Structural Biology (2016)
- M.Res., University College London , Biophysics (2011)
- B.Sc. (Hons), The University of Edinburgh , Biochemistry (2010)

## Research & Scholarship

### CURRENT RESEARCH AND SCHOLARLY INTERESTS

How are nutrients recognized by their protein sensors? How is their transport across cellular and intracellular membranes regulated? And, how is nutrient sensing integrated with other chemical signals, such as hormones, to determine cellular decisions, especially the decision: to grow or not to grow?

We are a team of structural and chemical biologists aiming to answer these fundamental questions at the level of ångstroms, nanometers, and micrometers. Many proteins in these pathways are deregulated in cancer, and our mission is to first reveal the mechanism of action of these proteins, and then use that knowledge to develop targeted chemical probes to modulate their activity in cells and organisms.

## Teaching

### COURSES

**2022-23**

- Research Seminar: CSB 270 (Spr)

### STANFORD ADVISEES

**Postdoctoral Faculty Sponsor**

Jun Jiang, Maximilian Wranik

### GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biophysics (Phd Program)
- Cancer Biology (Phd Program)
- Chemical and Systems Biology (Phd Program)
- Structural Biology (Phd Program)

## Publications

### PUBLICATIONS

- **Structure of the nutrient-sensing hub GATOR2.** *Nature*
  Valenstein, M. L., Rogala, K. B., Lalgudi, P. V., Brignole, E. J., Gu, X., Saxton, R. A., Chantranupong, L., Kolibius, J., Quast, J. P., Sabatini, D. M.
  2022
- **Structural basis for the docking of mTORC1 on the lysosomal surface.** *Science (New York, N.Y.)*
  Rogala, K. B., Gu, X., Kedir, J. F., Abu-Remaileh, M., Bianchi, L. F., Bottino, A. M., Dueholm, R., Niehaus, A., Overwijn, D., Fils, A. P., Zhou, S. X., Leary, D., Laqtom, et al
  2019; 366 (6464): 468-475
- **Cryo-EM Structure of the Human FLCN-FNIP2-Rag-Ragulator Complex.** *Cell*
  Shen, K., Rogala, K. B., Chou, H. T., Huang, R. K., Yu, Z., Sabatini, D. M.

2019; 179 (6): 1319-1329.e8

- **Architecture of human Rag GTPase heterodimers and their complex with mTORC1.** *Science (New York, N.Y.)*
  Anandapadamanaban, M., Masson, G. R., Perisic, O., Berndt, A., Kaufman, J., Johnson, C. M., Santhanam, B., Rogala, K. B., Sabatini, D. M., Williams, R. L.
  2019; 366 (6462): 203-210
- **Interaction between the Caenorhabditis elegans centriolar protein SAS-5 and microtubules facilitates organelle assembly.** *Molecular biology of the cell*
  Bianchi, S., Rogala, K. B., Dynes, N. J., Hilbert, M., Leidel, S. A., Steinmetz, M. O., Gönczy, P., Vakonakis, I.
  2018; 29 (6): 722-735
- **Cross-linking mass spectrometry identifies new interfaces of Augmin required to localise the #-tubulin ring complex to the mitotic spindle.** *Biology open*
  Chen, J. W., Chen, Z. A., Rogala, K. B., Metz, J., Deane, C. M., Rappsilber, J., Wakefield, J. G.
  2017; 6 (5): 654-663
- **Probing the Solution Structure of I#B Kinase (IKK) Subunit # and Its Interaction with Kaposi Sarcoma-associated Herpes Virus Flice-interacting Protein and IKK Subunit # by EPR Spectroscopy.** *The Journal of biological chemistry*
  Bagnéris, C., Rogala, K. B., Baratchian, M., Zamfir, V., Kunze, M. B., Dagless, S., Pirker, K. F., Collins, M. K., Hall, B. A., Barrett, T. E., Kay, C. W.
  2015; 290 (27): 16539-49
- **Misato Controls Mitotic Microtubule Generation by Stabilizing the TCP-1 Tubulin Chaperone Complex [corrected].** *Current biology : CB*
  Palumbo, V., Pellacani, C., Heesom, K. J., Rogala, K. B., Deane, C. M., Mottier-Pavie, V., Gatti, M., Bonaccorsi, S., Wakefield, J. G.
  2015; 25 (13): 1777-83
- **The Caenorhabditis elegans protein SAS-5 forms large oligomeric assemblies critical for centriole formation.** *eLife*
  Rogala, K. B., Dynes, N. J., Hatzopoulos, G. N., Yan, J., Pong, S. K., Robinson, C. V., Deane, C. M., Gönczy, P., Vakonakis, I.
  2015; 4: e07410
- **Structural analysis of the G-box domain of the microcephaly protein CPAP suggests a role in centriole architecture.** *Structure (London, England : 1993)*
  Hatzopoulos, G. N., Erat, M. C., Cutts, E., Rogala, K. B., Slater, L. M., Stansfeld, P. J., Vakonakis, I.
  2013; 21 (11): 2069-77