

# Looking Deep into the Cell to Find the Cause of Disease

**Cell Research  
and other ERC-funded Projects at Koç University**



PROFESSOR FIRAT-KARALAR AND RESEARCH STUDENTS  
AT THE CYTOSKELETON RESEARCH LAB.

*There are about 60 trillion cells in the human body. The most important two functions for a living cell is firstly its ability to understand, transfer and react to signals from other cells and its environment, i.e., its ability to communicate. The second most important function is its ability to divide and multiply, crucially necessary for the growth and repair of all living tissue. The so-called*

*centrosome at the heart of each cell controls some of the main mechanisms of cell communication and cell division. The centrosome is an organelle that forms thin, hair-like cellular extensions that are responsible for cellular communication and movement. The central focus of our work is understanding how centrosomes and cilia are assembled, maintained and dynamically altered during cell cycle, as well as elucidating what goes*

*awry in diseases associated with abnormalities in centrosome/cilium complex.*

*The centrosome consists of a pair of centrioles and surrounding pericentriolar material. Many vertebrate cells also have an array of granules, termed centriolar satellites, that localize around the centrosome. Structural and numerical centrosome*



**Elif Nur Fırat-Karalar**  
ASSISTANT PROFESSOR OF  
MOLECULAR BIOLOGY AND GENETICS

Director of the Koç University  
Cytoskeleton Research Lab

Dr. Fırat-Karalar graduated from Bilkent University in 2004 and joined the laboratory of Professor Matthew Welch at the University of California, Berkeley for her doctoral studies. Her Ph.D. work

focused on the functional and biochemical characterization of new actin-binding proteins that function in neuritogenesis. She then did her postdoctoral studies in the laboratory of Tim Stearns at Stanford University from 2010 to 2014, where her work focused on centrosome and cilia biology. She started her own research group at the Department of Molecular Biology and Genetics at Koç University in June 2014. Dr. Fırat-Karalar's work has won the 2015 L'Oréal-UNESCO For Women in Science Award and is supported by a Starting Grant from the European Research Council.