About me

Welcome to Mohamed marzouk’s “ モハメド　マルゾーク” website.

My story begins in 2005, when I enrolled in the Faculty of Science at Ain Shams University in Cairo, Egypt. In my first year as an undergraduate, I studied chemistry, physics, mathematics, and biology. Meanwhile, my grandfather died after a long battle with cancer, which was one of the primary reasons I chose biophysics as my B.Sc. major. Since then, I've known that I want to devote my life to cancer research in order to one day help others all over the world in their fight against this fatal disease. In 2009, I graduated as the top biophysics student and the top physics department student, with a graduation project on Intensity-modulated radiation therapy, one of the most advanced types of radiation therapy used to treat cancer (IMRT).

My academic career began in 2010 when the biophysics group in the physics department hired me as a demonstrator to help students with their laboratory work and physics assignments. I started my M.Sc. at Ain Shams University in 2012, where I learned laboratory molecular genetics techniques like PCR and RT-PCR, which improved my understanding of DNA and protein structure and dynamics. I realized at the time that experimental research moves slowly, whereas computational research moves faster. Rather than conducting experimental research, I believed that computational biology could help me realize my dream of assisting millions of cancer patients around the world. As a result, I decided to study computational molecular dynamics for a Ph.D.

The Egypt-Japan Education Partnership (EJEP) awarded me a scholarship in 2019 to begin my Ph.D. at Tokyo Institute of Technology's School of Life Sciences and Technology. In my Ph.D. research, I used parallel cascade selection molecular dynamics (PaCS-MD) in conjunction with the Markov state model (MSM) to further investigate biological slow processes such as binding/unbinding (for protein-DNA and protein-ligand) and open/close for protein binding pockets.

After graduation in 2022, I began working as a postdoctoral researcher in the Molecular Modeling and Simulation (MMS) Team at the National Institute of Quantum Science and Technology (QST) in Chiba, Japan. I am currently working on a project to quantify protein stability and predict the effect of mutations, which has important implications for protein engineering and drug design. Specifically, the effect of addition/deletion mutations and salt bridges double mutations on protein stability was investigated using alchemical transformation and one of the enhanced sampling techniques known as replica exchange with solute tempering (REST) in combination with free-energy perturbation (FEP) to predict the stability indicator free energy difference (ddG).

Away from my academic life, my passion for sports and active living has done wonders for my physical health. On weekends, I enjoy swimming, and I recently began playing tennis, which has been one of my lifelong passions. I am also a fantastic football player who plays once a week with QST institute researchers.