

**NITheCS Colloquium**  
**Monday, 31 January 2022, 16h00 – 17h00**  
Prof Özlem Taştan Bishop (RU)

**“Two intermittently linked aspects of modern computational drug discovery:  
allostery and missense mutations”**



## ABSTRACT

The history of using medicine to prevent and treat human diseases is as old as humanity. While many severe pandemics have devastated the human population, accumulation of years of knowledge have formed the basis of modern drug discovery.

Today, drug research and development is a multidisciplinary field with many successes. However, it also faces challenges over the long development stages, with drugs failing at clinical trial stages and even once the drug is marketed, eg drug toxicity in certain populations or drug resistance. Hence, it is crucial to use well-designed criteria in the early drug development stages.

Here, we argue that incorporation of two intermittently linked biological phenomena, allostery and mutations, into the early computational drug discovery stages would help to reduce the attrition risk in later stages of the process. This talk will provide examples of our current research on these phenomena and introduce computational pipelines we have been developing in the Research Unit.

## BIOGRAPHY

Özlem is full professor in structural bioinformatics at Rhodes University.

She received her BSc degree in Physics from Boğaziçi University, Istanbul, Turkey. Then she moved to the Department of Molecular Biology and Genetics for her MSc degree. She obtained her PhD from Max-Planck Institute for Molecular Genetics and Free University, Berlin, Germany in 2003. While doing her PhD, Özlem gained interest in structural biology, and during her postdoctoral positions (Texas University, USA; UWC and UP) she gained experience in structural bioinformatics and structural biology.

In 2009, Özlem joined Rhodes University where she established the Research Unit in Bioinformatics in 2013.

Özlem's broad research interest is structural bioinformatics and its applications to drug design and development. Her recent interest is in the allosteric mechanisms of proteins and understanding the effects of nonsynonymous single nucleotide variations on protein structure and function to decode the underlying causes of many inherited diseases, uncover drug resistance mechanisms and investigate drug sensitivity issues in certain populations for precision medicine purposes. She has published over 80 research articles.

She was co-founder and the first president of the SA Society for Bioinformatics (SASBi) (Sep 2012 – Oct 2014), and mentor to the SASBi Student Society (Oct 2014 – Sep 2016). Özlem has received numerous fellowships and awards.

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