The Amazing Protein Molecule: 20,000 different biological machines, all in one piece of string.

Billions of years ago, nature invented one of the most important gizmos on earth: the protein molecule. At the miniature scale, a protein is stringy like a necklace, and it contains information by virtue of the order in which the necklace pearls (amino acids) are strung together. Different protein molecules ‘fold’ into different compact ‘ball-of-string’ shapes. And, each different shape performs different biological functions -- breaking down food, converting it to energy, driving the motions in our muscles, converting light to electrical signals in our eyes, etc. Our understanding of the code of protein information → shape → function began nearly 60 years ago with the advent of structural biology and the protein folding problem. I will give some history of our understanding of these amazing gizmos, and describe how we use it in today’s computer-based drug discovery.

Host: Dr. Hue Sun Chan