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MOLECULAR
HORIZONS



SEMINAR SERIES 2025

21 October, 4:00 PM AEDT

SPECIAL SEMINAR - 21 Oct, 4:00 PM AEDT

Dr. Alexey Rak

Head of the Center of Excellence in Structural Biology & Biophysics, Sanofi, Paris, France

Dr. Alexey Rak brings a rich background in biology, genetics, and biochemistry to his current role in drug discovery. He earned his Ph.D. in Biochemistry and Biophysics, specializing in protein biosynthesis machinery. His subsequent work at the Max-Planck Institute for Molecular Physiology in Germany, where he advanced from postdoctoral researcher to Group Leader, focused on vesicular membrane trafficking. This research earned him recognition, including the European Young Investigator Award in 2004.



In 2007, Dr. Rak joined Sanofi in Paris, where he has made significant contributions to the field of biomolecular interaction characterization and protein structure determination. His expertise in advanced techniques, particularly cryo-electron microscopy (cryo-EM), has played a key role in lead discovery for challenging protein targets.

Currently, as the Head of the Center of Excellence in Structural Biology and Biophysics at Sanofi, Dr. Rak coordinates structural biology and biophysics initiatives across the organization. His work spans various modalities and therapeutic areas, bridging the gap between academic research and industrial applications in drug discovery.

RATIONAL EVOLUTION: HOW CUTTING-EDGE BIOPHYSICS AND STRUCTURAL BIOLOGY ARE ACCELERATING MODERN DRUG DISCOVERY

The convergence of advanced biophysics and structural biology has transformed drug discovery, dramatically shortening the path from target to clinical candidate using various modalities. This presentation examines how cryo-EM, AI-driven structure prediction, fragment screening, and high-throughput biophysical methods are being integrated to create powerful new discovery platforms. Case studies will illustrate how these approaches overcome traditional bottlenecks, enabling rapid identification and optimization of novel therapeutics. These technologies represent not just incremental improvements, but a fundamental paradigm shift in addressing previously intractable disease targets.