

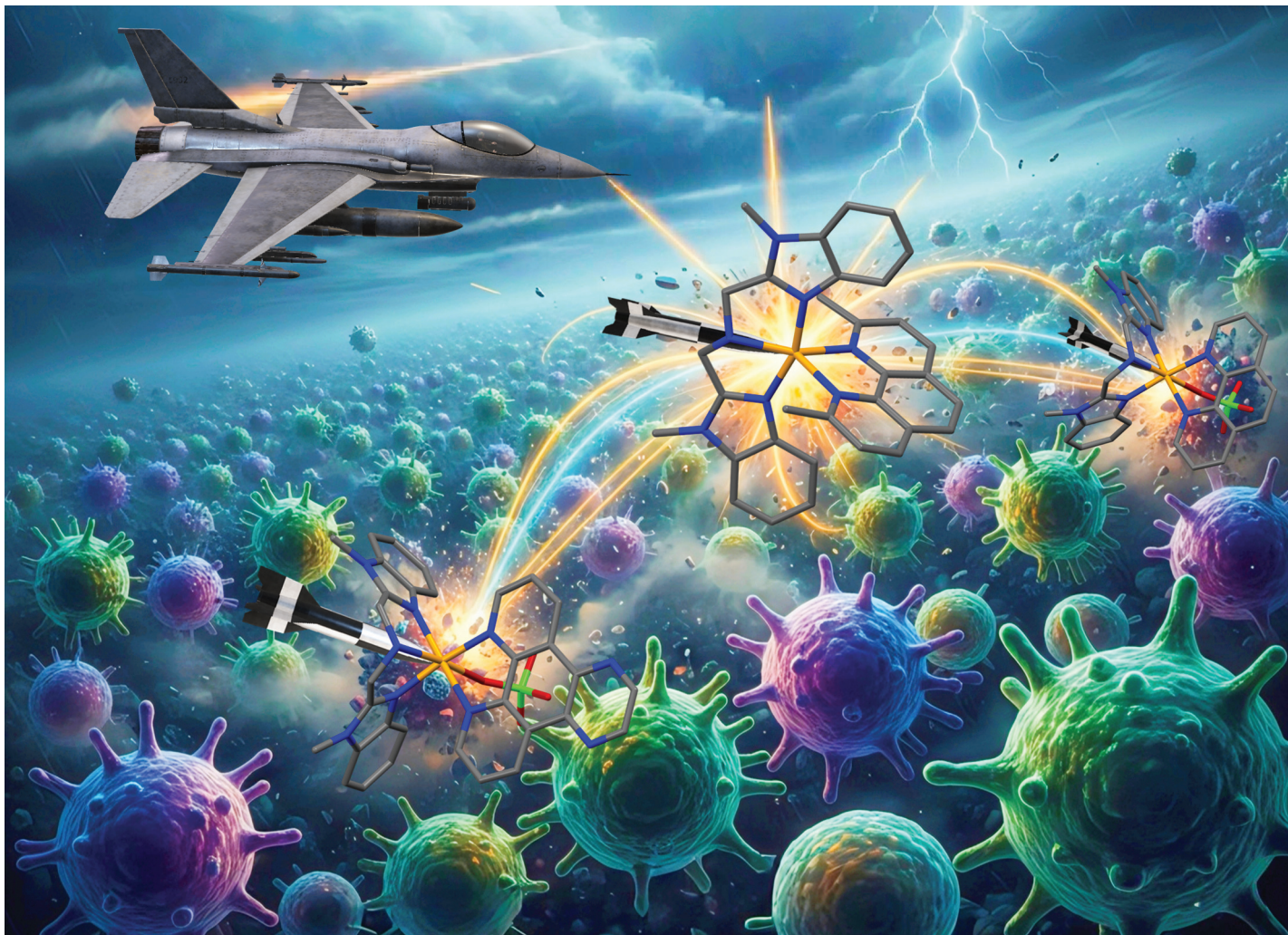
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Showcasing research from Professor S. Maji's laboratory, Department of Chemistry, Indian Institute of Technology Hyderabad, Kandi, Sangareddy, 502 284, Telangana, INDIA.

Comprehensive design and synthesis of methyl-substituted benzimidazole-based mononuclear copper(II) complexes and evaluation of DNA cleavage and ROS-induced apoptosis

Over the past few decades, despite substantial advances in medical research, cancer-related mortality has continued to rise. Here we report on the synthesis of four heteroleptic Cu(II) complexes incorporating mixed ligand systems. All complexes were thoroughly characterized using appropriate analytical and spectroscopic techniques. Their interactions with DNA, along with their cytotoxic activities, were systematically evaluated in human breast cancer (MCF-7) and triple-negative breast cancer (MDA-MB-231) cell lines. The results demonstrate that these Cu(II) complexes exhibit promising biological activity, highlighting their potential as cost-effective, non-platinum, transition-metal-based chemotherapeutic candidates that may overcome key limitations associated with conventional anticancer drugs.

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