Zahra-Soheila Soheili

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Biography

Zahra-Soheila Soheili, is an associate professor of molecular and cell biology at the National Institute of Genetic Engineering and Biotechnology (NIGEB), Tehran, Iran. Her research focuses on retinal cell biology, gene therapy, and age-related macular degeneration

Next-Gen Strategies for Vision: Decoding, Targeting, and Regenerating the Retina

Abstract:

Retinal degenerative diseases—including neovascular age-related macular degeneration (nAMD), diabetic retinopathy (DR), glaucoma, and retinitis pigmentosa (RP)—are major global causes of vision loss. Current therapies, such as anti-VEGF treatments, face limitations due to biological complexity, treatment resistance, and delivery challenges. Our research integrates systems biology, molecular engineering, and gene therapy to address these gaps. We identify key molecular hubs and pathways, develop next-generation anti-angiogenic agents (hinge-truncated sFLT01), and design novel peptide-based gene delivery system (MiRGD) that enhances targeting and biocompatibility. Additionally, we explore optogenetic tools, ER stress modulation, and retinal regeneration strategies to advance therapeutic options. Our multidisciplinary approach offers promising avenues for safer, more effective treatments and deepens the understanding of retinal disease mechanisms.