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IIIT-Delhi unveils AI platform for discovering molecules that promote healthy ageing

04 December 2024 | News

An AI-based platform redefining ageing research and therapeutic discovery



A team of researchers from Indraprastha Institute of Information Technology Delhi (IIIT-Delhi) has developed AgeXtend, a groundbreaking artificial intelligence (AI)-based platform that is set to transform the search for molecules promoting healthy ageing.

Published in the journal Nature Aging, this research represents a significant step forward in understanding and addressing the biological mechanisms of aging.

AgeXtend is a multimodal geroprotector prediction platform that leverages bioactivity data from known geroprotectors to identify new molecules with the potential to slow aging. The platform encompasses advanced AI modules capable of predicting geroprotective potential, evaluating toxicity, and identifying target proteins and mechanisms of action. This comprehensive approach ensures both accuracy and safety in the discovery process.

The research demonstrated AgeXtend's remarkable ability to identify the longevity-enhancing effects of well-known compounds such as metformin and taurine, even when these molecules were excluded from the training data. AgeXtend further screened approximately 1.1 billion compounds, uncovering numerous promising candidates that were validated through rigorous experiments on yeast, Caenorhabditis elegans, and human cell models.

The study also explored natural metabolites from the human microbiome and their role in regulating cellular senescence. This underscores AgeXtend’s versatility and potential to uncover previously unknown mechanisms driving ageing.

“AgeXtend bridges the gap between artificial intelligence and biology, enabling us to not only predict potential anti-aging molecules but also understand how they work,” said Dr Gaurav Ahuja, senior researcher and co-author of the study. “This platform has immense potential to unlock new pathways for therapeutic interventions in aging and age-related diseases.”