

IIIT-Delhi Researchers Unveil AgeXtend: An AI Platform for Discovering Molecules That Promote Healthy Aging

Published in Nature Aging, this cutting-edge study introduces AgeXtend, an AI-based platform redefining aging research and therapeutic discovery.

New Delhi, December 4, 2024 – 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 aging. Published in the prestigious 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.

“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.”*

This groundbreaking work is a result of the collaboration between an exceptional team of researchers, including: Sakshi Arora, Aayushi Mittal, Subhadeep Duari, Sonam Chauhan, Nilesh Kumar Dixit, Sanjay Kumar Mohanty, Arushi Sharma, Saveena Solanki, Anmol Kumar Sharma, Vishakha Gautam, Pushpendra Singh Gahlot, Shiva Satija, Jeet Nanshi, Nikita Kapoor, Lavanya CB, Debarka Sengupta, Parul Mehrotra, Tarini Shankar Ghosh, and Gaurav Ahuja.

PhD Scholar Sakshi Arora, the first author of the study, expressed her excitement about the findings, stating, *“AgeXtend is not just a prediction platform; it is a discovery engine. This work opens new possibilities to explore the biological complexity of aging and find innovative ways to promote health and longevity. It’s an honor to contribute to such transformative research.”*

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 aging.

Led by researchers Sakshi Arora, Aayushi Mittal, Subhadeep Duari, and others, this work reinforces IIIT-Delhi’s leadership in interdisciplinary research and its commitment to addressing global challenges through innovation.

Link to paper - <https://www.nature.com/articles/s43587-024-00763-4>