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Extended Abstract

Facing Novel Challenges in Neurodegenerative Diseases Drug Discovery: From Small Molecules to Targeted Therapies †

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Neurodegenerative diseases are becoming increasingly prevalent with the aging of the general population. The twentieth century witnessed a significant demographic change in the human population of the industrialized world that is currently followed by a similar shift of life expectancy to upper age ranges in developing countries. The effectiveness of a drug depends on accumulation at the site of action at therapeutic levels. However, challenges such as rapid renal clearance, degradation or non-specific accumulation require drug delivery enabling technologies. Targeted drug delivery is a very promising concept, which still needs improvement for better clinical outcomes. Understanding some of the molecular changes associated to these ubiquitous and widespread diseases has stimulated efforts to develop drugs that specially target key proteins. Protein behavior is scrupulously regulated by a plethora of post-translational modifications (PTMs). It is therefore desirable to develop methods to design rational PTMs to modulate specific protein functions [1–3].

We report different approaches and illustrate their successful implementation in the search for treatment for Parkinson's disease. Computer-assisted design of potent small molecules, together with the development of new carriers, allows a wide range of possibilities for targeted therapies. Knowledge on biochemical processes brings the opportunity to provide treatments that are potentially less toxic and more effective than traditional therapeutic approaches.

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