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Mini Review

## Role of Inhibitors in Controlling the Diseases

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### ABSTRACT

Inhibitors are those particular molecules that have unique properties to control the function of a disease-causing agent. The review sheet discusses the list of inhibitors for every disease and the ideal mechanism to excite the same for a better application and impact. Most of the inhibitors in this report are noncompetitive which means that they can survive and give an efficient result to the disease on its own without the need for an external inhibitor.

**Keywords:** Inhibitors, disease-causing agent, enzymes activity

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### Introduction

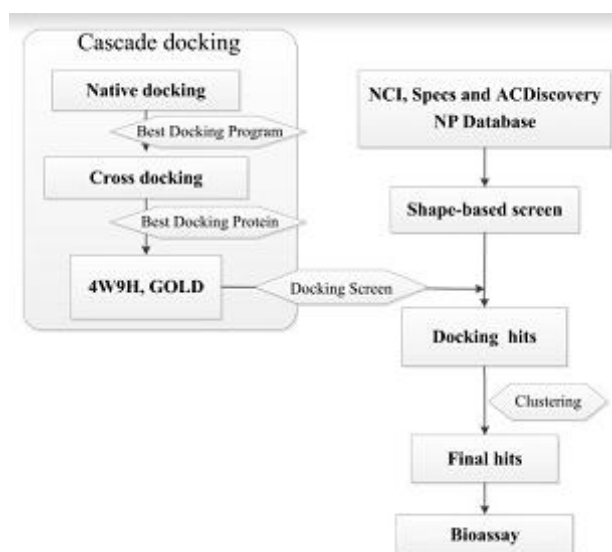
Inhibitors are said to be molecules that establish links with enzymes and block its activity. This is ideal for dealing with metabolic imbalance<sup>1-4</sup>. Inhibitors can be competitive, uncompetitive and mixed. Every inhibitor can cure different diseases. The purpose of this review report is to highlight three major inhibitors to cure cancer, Alzheimer's disease and neuro disorders respectively. The identified inhibitors are found to bind with the agents that cause the disease to the patient's body.

#### Inhibitors for cancer

The biochemical process implies the interaction between proteins. Hypoxia is a condition that can be seen in cases involving stroke and chronic kidney failure. Peptidic inhibitors tend to perform better regarding inhibition and stabilization with the help of the pVHL/HIF-1 $\alpha$  inhibitor<sup>5-8</sup>. There are different docking structures followed to increase efficiency in the repression. The amide group in this inhibitor performs two actions - hydrogen bond donor as well as acceptor<sup>9-13</sup>.

The docking program is the key to efficient inhibition. Cross-docking helps to create a healthy crystal structure that is ideal for the potential inhibitor to act on it and control the functions of the disease-causing agent. The inhibitory activity happens against the pVHL/HIF-1 $\alpha$  interaction

between proteins thereby resulting in better binding<sup>5-8</sup>. There is a need to work on the molecular optimization so that minimal compounds can assure higher potency and also serve as a promising lead compound to control cancer. This discovery of new inhibitors can be allowed to interact utilizing cascade docking and shape based screening methods.



## Inhibitors for Alzheimer's disease

Alzheimer's disease is a progressive neurological disorder that has multiple side effects. So far, there are just two inhibitors used namely acetylcholinesterase inhibitor and N-methyl-D-aspartate receptor<sup>14-19</sup>. The multi-target directed ligands tend to contain multi-functional acetylcholinesterase inhibitors (AChEIs). After a shape-based virtual screening test, it has been observed that T5369186 is a cholinesterase inhibitor that can be used to treat cancer and other degenerative diseases<sup>6</sup>. To see the effectiveness of AChE, in vitro test followed by molecular docking is performed.

Molecular docking method is used to observe the relationships and activities between two or more compounds<sup>5-8,20-24</sup>. The amino chains are assessed here for their interactions. During the test followed by analysis, it was observed that 4-aminoquinoline is the core to create new cholinesterase inhibitors. This inhibitor is already in use to treat Alzheimer's disease. This can be altered with the movement of quinolone to different positions to check the specific location/ core that can create multifunctional AChEIs<sup>6</sup>.

The use of AChEI helps to develop the inhibitory potency, and the molecular design is well structured. Irrespective of the compounds present, AChEI can penetrate deeper and bind with other nano-molecules. Additionally, this inhibitor can to control the inflammatory condition associated with the nervous system and offers better relief thereby creating a normal situation in the affected area. Novel inhibitors are required shortly to control similar such progressive disorders<sup>25-32</sup>.

## Inhibitors for melanoma

To treat skin pigmentation and melanoma, targeting of tyrosinase is performed so far. Melanin is a continuous production process that damages the skin due to exposure to radiation. Tyrosinase acts as an enzyme meant to control melanogenesis. With the widespread presence of melanoma, it is seen that there is an overexpression of tyrosinase<sup>33-40</sup>. This has led to the growth of dopamine which in turn produces dopamine quinone and dopaquinone<sup>5</sup>. Still, there is a need to identify new tyrosinase inhibitors.

For this process, shape-based overlays are used. The rapid overlays align between the molecules and have unique features including hydrophobes, rings, hydrogen bond acceptor and donor. The best way to determine the novel inhibitors for melanoma is to perform virtual screening. This is a natural process, but there are drawbacks as well such as poor availability, poor activity, and selectivity. The virtual screening also determines novel inhibitors that have lower cytotoxicity. The identified tyrosinase inhibitor indexed as 5186-0429 is found to eliminate inflammation and improve the resistance with its kinetic and molecular properties. This inhibitor can act as a quick heal to the case of melanoma<sup>25-29</sup>.

## Inhibitors for heart disease

Another inhibitor/ mediator to protect the cardiac activity of a person is protein kinase C. It is already known that adenosine helps in cardioprotection. To know more about this inhibitor, the signaling mechanism is used, and this mechanism also helps to reveal the properties involved in the control of mitochondria<sup>10</sup>. Adenosine receptor activation can help to translocate protein kinase C isoforms and the latter will in turn bind with caveolin scaffolding. This can eliminate the blockages present in the pathway<sup>10</sup>.

As cardioprotection is influenced by age factors, the success of mitochondrial translocation is still unknown. There is a

need for a natural inhibitor that can induce adenosine and target the right PKC isoforms that can protect from ischemic injury and other cardiac diseases.

## Conclusion

Every inhibitor that is seen in today's health environment has multiple functions. Such inhibitors stand as the foundation to control many diseases including heart, melanoma, Alzheimer's and cancer. This paper has produced a list of inhibitors and the method to discover novel inhibitors that can help achieve a better cure to the disease<sup>5-8</sup>. The excitation, screening, docking, and application vary from one inhibitor to the other, but all the inhibitors above are safe to use to treat the patients and also expect long-term results.

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