Treatment of Type II Diabetes using Combinational Herbal Compounds

R.Priya, K.Vijayalashmi, T.Jayalakshmi

Abstract: Diabetes is the common disorder found in case of metabolic disfunction leads to high blood glucose level in our body. Type two polygenic diseases are that the most typical type of polygenic disease. If we have type 2 diabetes our body does not use insulin properly. This is called insulin resistance. At first, our pancreas makes extra insulin to make up for it. But, over time it’s not able to carry on and cannot create enough internal secretion to stay your blood sugar at traditional levels. In order to cure Type II diabetes we have identified the gene responsible for the insulin resistance gene from the genomic information resource database. The gene is further analysed and docked with the four herbal components and checked its minimum energy value for further studies.

This will be the combination drug and using Nano medicine which will be the target drug delivery towards the target gene which stimulates the activity of the insulin resistant gene Since its targets towards the gene it will be considered as the gene therapy and new combinatorial medicine, here Bioinformatics, combinatorial chemistry, pharmacology, Nano medicine play a vital role in treatment of diabetes.

Type II diabetes is the high risk of day to day life, so considering these facts the gene responsible for diabetes is identified and diagnosis of DNA is done used molecular techniques and mutated treatment.

In this gene is identified for further project, suitable drug targets is identified and targeted towards the type II diabetes.

Keywords: Type 2 Diabetes, Insulin Secretions, Target drug deliver

I. INTRODUCTION

People with kind two polygenic disorders will still build endocrine, however their cells have some extent of endocrine resistance. Long-term complications from high glucose embody cardiovascular disease, strokes, diabetic retinopathy which might lead to aneityy, renal disorder, and poor blood flow within the limbs which can lead to amputations[1],[3],[5].

A. Causes of Type II Diabetes:

As per the medicinal news the scientist says Type 2 diabetes is being renamed as an invulnerable framework disease rather than just a metabolic issue, said a maker of another examination circulated in Nature prescription in the week,. the discoveries of which may prompt new diabetes medications that objective the safe framework as opposed to attempting to control glucose.

The scientists accept that hypoglycemic operator obstruction, the sign of sort 2 diabetes (dissimilar to type 1 diabetes where it is the insulin-delivering cells that are pulverized), is the aftereffect of B cells and other invulnerable cells assaulting the body's own tissues[7],[9],[11].

This discovery is nothing unaccustomed some natural medication researchers. Treatments that do the items necessary to make the system are hardening sort a pair of polygenic disease for years. The symptoms of diabetes are polyuria, polydipsia, and polyphagia and weight loss. Many folks, however, have no symptoms during the first few years and are diagnosed on routine testing. People with sort a pair of diabetes could seldom gift with hyperosmolar hyperglycaemic state.

II MATERIALS AND METHODS

Identification of the target gene in type II diabetes.

This gene encodes a protein which is phosphorylated by insulin receptor tyrosine kinase. Mutations in this gene are associated with type II diabetes and susceptibility to insulin resistance. [provided by RefSeq, Nov 2009]-NCBI.

A. Selection of herbal drug compounds.

The Four herbal ligands were selected using PUBCHEM database in which the compound which is responsible for reducing the blood glucose are identified by the literature survey and studied the mechanism of action for each compound were taken for drug designing[26],[28],[30]. The selected herbal compounds are Curcuma longa, Syzygium cumini, Gymnema sylvestre, Trigonella foenum graecum

B. Study of gene and its analysis.

Gene analysis is done using GENEVIEWER tool which results in Gene location and the sequence id and number of sequence present in the target gene.

1. Drug designing.

Drug Designing is done using CHEMSKETCH tool to draw and join the four compounds.

2. Molecular docking.

Molecular docking analysis is done using AUTODOCK 4.

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III RESULTS AND DISCUSSION

Fig: 1 Target gene IRS1 is found using NCBI database.

Fig: 2 OMIM entry of the target gene.

**HERBAL COMPOUNDS:**

<table>
<thead>
<tr>
<th>S. NO</th>
<th>Name of the compound</th>
<th>Structures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Curcuma longa</td>
<td><img src="image1" alt="Curcuma longa" /></td>
</tr>
<tr>
<td>2</td>
<td>Gymnema sylvestre</td>
<td><img src="image2" alt="Gymnema sylvestre" /></td>
</tr>
<tr>
<td>3</td>
<td>Syzygium cuminii</td>
<td><img src="image3" alt="Syzygium cuminii" /></td>
</tr>
</tbody>
</table>

4. Trigonella foenum-graecum

Fig 3: Ligand of the four herbal plants.

Fig: 4 gene location identification.

Fig 5: BLAST p result indicates the most similarity search for the target gene.
In order to cure Type II diabetes we have identified the gene responsible for the insulin resistance gene from the genomic information resource database. The gene is further analysed and docked with the four herbal components and checked its minimum energy value for further studies[37],[39],[41]. This will be the combination drug and using Nano medicine which will be the target drug delivery towards the target gene which stimulates the activity of the insulin resistant gene. Since its targets towards the gene it will be considered as the gene therapy and new combinatorial medicine, here Bioinformatics, combinatorial chemistry, pharmacology, Nano medicine play a vital role in treatment of diabetes.

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