**Course: Advance Bio Informatics**

**Module Title: Strategies to identify possible Drug Targets**

**Module No: 131**

First step of drug discovery is to identification of disease-associated targets. Genome sequencing and screening have enhanced opportunities for target identification and lead optimization.

**Drug Targets**

**Structure-based Target Discovery**

It helped in defining the contours of the cognate surfaces of ligands and their protein targets, permitting optimization of their potency and selectivity.

Some drugs that are originated from structure-based approach:

* Dorzolamide
* Captopril
* Imatinib
* Zanamivir

The protein structure contributes in the following fields:

* Target identification from sequence structure homolog recognition.
* Structural genomics and drug targets.
* Identification of ligand binding region
* Identification of hits and leads
* Structure-guided design and screening

Kinase drug discovery & Kinome

**Target Discovery through Cell-based Genetics**

* New drugs are based on target identification.
* It wants the thorough knowledge of the disease processes and characterization of genes.
* Combination of three target discovery will provide the desired result.

**Target Discovery Strategies**

Target discovery strategies based on

* Expression profiling Proteomic approach to identify disease related genes based on differential EP, homology and post translational modification
* Biochemical and cell biological assays - To identify genes and proteins linked with disease pathways
* Cell-based genetics - Leads to the discovery of targets by disturbing gene function in whole organisms, correlation with phenotypes

**Cell-based Genetics**

Cell-based assays may lead to the identification of genes involve in cellular transformation, activation, migration and a host of biological processes relevant to a human disease.

**Genetic-based Target Identification**

* It has some methods:
* Positional Cloning- Laboratory technique used to locate the position of a disease associated gene along the chromosomes.
* Candidate gene approach- To identify complex disease-linked genes through SNP markers.

10 million in HGP and 3 million identified.

**Target class genetic approach**

- Is applied to drug target gene families such as proteases, ion channels and GPCRs.

- 24000 protein coding genes & 2400 DTs

- Best candidate are selected from gene family for genetic analysis.