SEQUENCE ME

A NEW FRONTIER OF MEDICINE IN 21st C.E : GEnomic Medicine

sequenceME

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PROBLEM STATEMENT

- In current scenario medicines and treatment are same for a particular disease.
- Still a treatment or medicine cure 50% of the patients and rest suffer.
- High costs of medicines contribute to decreased access to healthcare.
- About 60-90 per cent of healthcare spending by poor people is on prescribed medicines which never benefited them.
- Sixty per cent (499-649 million) of the population in India does not have regular access to essential medicines.
- Even after a lot of expenditure, 60% of the patients fail to get the benefit for from the treatment or medicines (According to NCBI)

SO WHERE THE PROBLEM IS ?

The problem is a patient's body is not getting

- an accurate diagnosis of existing disease.
- targeted treatment strategies
- more focused clinical monitoring

SO WHAT THE SOLUTION IS ?

THE SOLUTION IS

- You 
- Your Genes , your DNA 
- The solution is Genomic Medicine 

PROPOSED SOLUTION :

OUR IDEA

An interactive AI approach towards personalized genomic sequencing and medicine

DOCTOR/ PATIENT

Can use our AI features for sequencing processes to analyze the genomic information and finding personalized cure.

SNP GENE DETECTION FOR POSITION ON GENE, SCAFFOLD NAME, ASSOCIATED DISEASE OF PHENOTYPE, DRUG LINKED TO DISEASE, AND ADVERSE DRUG REACTION ANNOTATION.

CANCER PREDICTION WITH GENE SAMPLE

DNA SEQUENCING TO PROVIDE PRECISE DIAGNOSIS AND MEDICAL TREATMENT SUGGESTIONS

UNIQUE SELLING POINTS

1.

Being one of its kind, SequenceMe would prove to be quite essential and helpful to hospitals worldwide and healthcare researchers in diagnosing patients through DNA and genomic sequencing.

1.

Since, people will genetic disorders would be able to get personalized treatments, it would be a game changer in world of personalized digital healthcare.

1.

The large sets of genomic data could be used for future researches and refrences thereby providing vast real world datasets.

1.

Cancer is a leading cause of death worldwide, accounting for nearly 10 million deaths in 2020 (WHO). However, these can be prevented if it is diagnosed early. Our Cancer Risk Prediction Tool that uses DNA sequencing can play a vital role in this issue.

1.

Despite of some excellent existing softwares, the healthcare facilities are not avaialable at ground level for everyone. People like us could access personalized reports and predictions using SequenceMe easily, instead of spending thousands of money on appointments.

GENOMIC MEDICINE

Fast Large-scale Low-cost

DNA sequencing has propelled genomics into mainstream medicine, driving a revolutionary shift toward precision medicine.

Genomics investigates how a person's biological information can be used to improve their clinical care and health outcomes (eg through effective diagnosis and personalised treatment.

GENOMIC MEDICINE

Goal of precision or genomic medicine is that instead of a “one size fits all” approach by disease type, medicine will be informed by a genetic understanding of the disease.

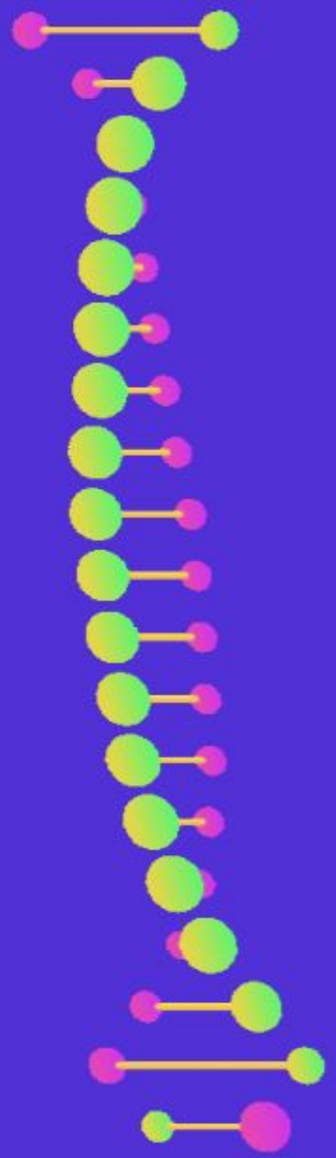
Precision medicine not only involves studying the genome, but also considers factors like where a person lives, what they do, and what their family health history .

Our goal is to develop targeted prevention or treatment approaches with the power of ai algorithms and interactive analyzation low-cost software to help specific individuals stay healthy or get better instead of relying on approaches that are the same for everyone.

GENOMIC SEQUENCE

- 99% genome similar,1% differences causes uniqueness.

- Genome and body relation is like a ingredient and food.



- ATGC bases patterns.

Genomic pattern study tells

- what are we made for.

Proof Of Concept
(How cancer can be cured with genomic AI analysis)

Human has the genomic alterations from generation to generations.

Cancer on the same tissue is not one disease.

CANCER AND GENOME

CANCER alterations called somatic alterations.

genome expresses the disease.

diseases expresses genome

What BOTHERS

- disadvantage of Indian medical department
- the usage of broad-spectrum drugs(current scnerio) .
- attacking the targeted cells but along with it , harms the normal cell
- inviting more diseases.
- Chemotherapy a broad spectrum therapy.

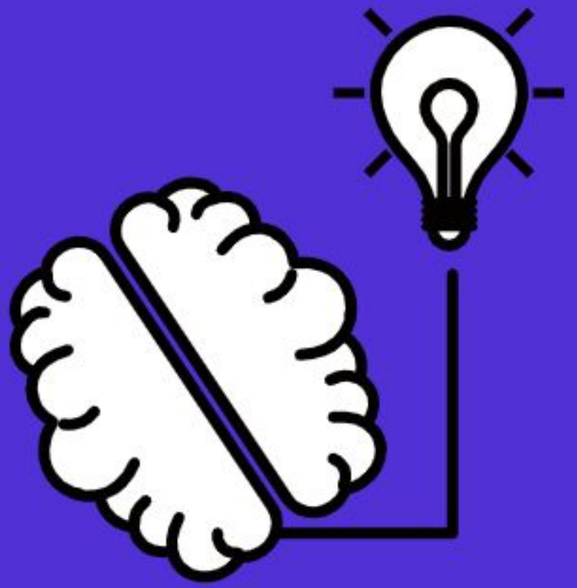
REMEDY

NARROW SPECTRUM TREATMENT

PARP INHIBITOR THERAPY

A breast cancer or ovarian Cancer patient Caring BRCA 1 gene involved in dna repair and genomic instability

genomic drugs attacking the specific cancer cell proteins and killing them.



PARP INHIBITOR DRUGS (The Genomic Medicine)

Olaparib
(Lynparza)

Bevacizumab

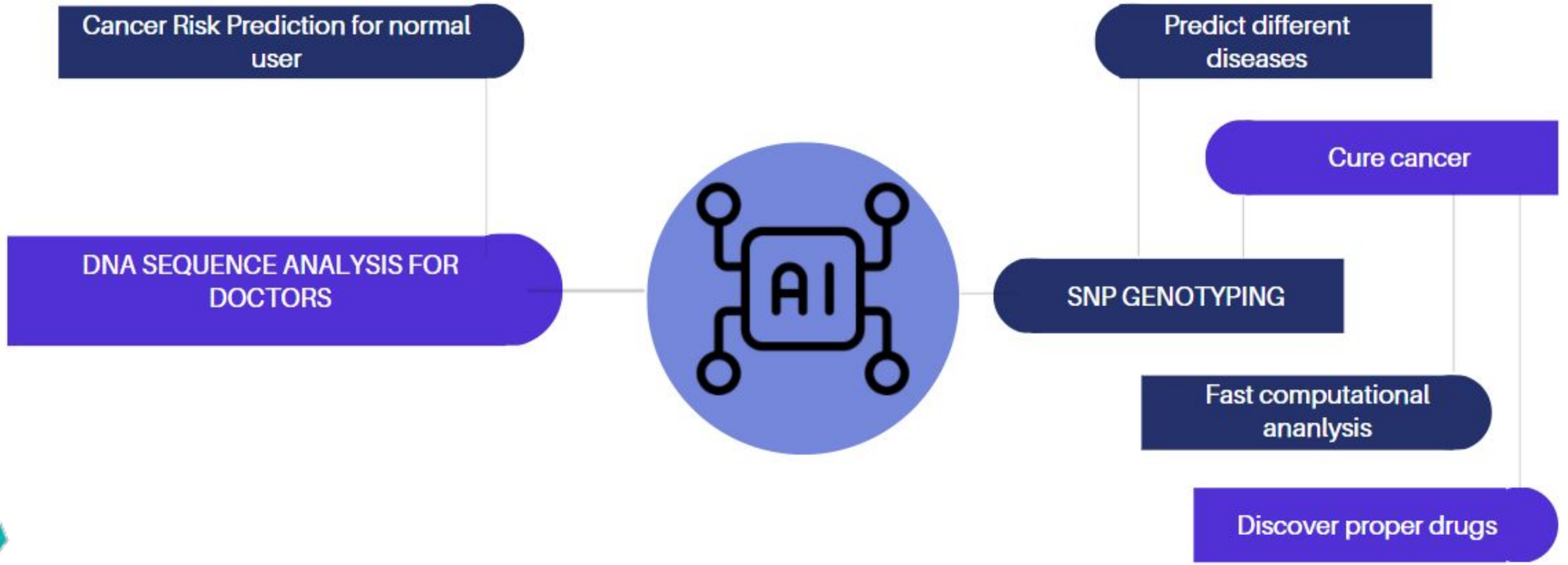
Larotrectinib
(Vitrakvi)

rucaparib
(Rubraca)

Niraparib (Zejula)

entrectinib
(Rozlytrek

AI GENOMIC ASSISTANT



Challenges with Genomic Data

COMPLEX TO HANDLE

The combined analysis of multi-omics datasets (e.g. proteomics, transcriptomics and metabolomics) and clinical data becomes complex

HETEROGENEOUS

Genomic datasets contain many attributes and measurements thus making the analysis more difficult.

REQUIRE LARGE SET OF RULES

The genomic data may require large sets of explicitly predefined rules for computer code.

MULTIDIMENSIONAL AND LARGE IN SIZE

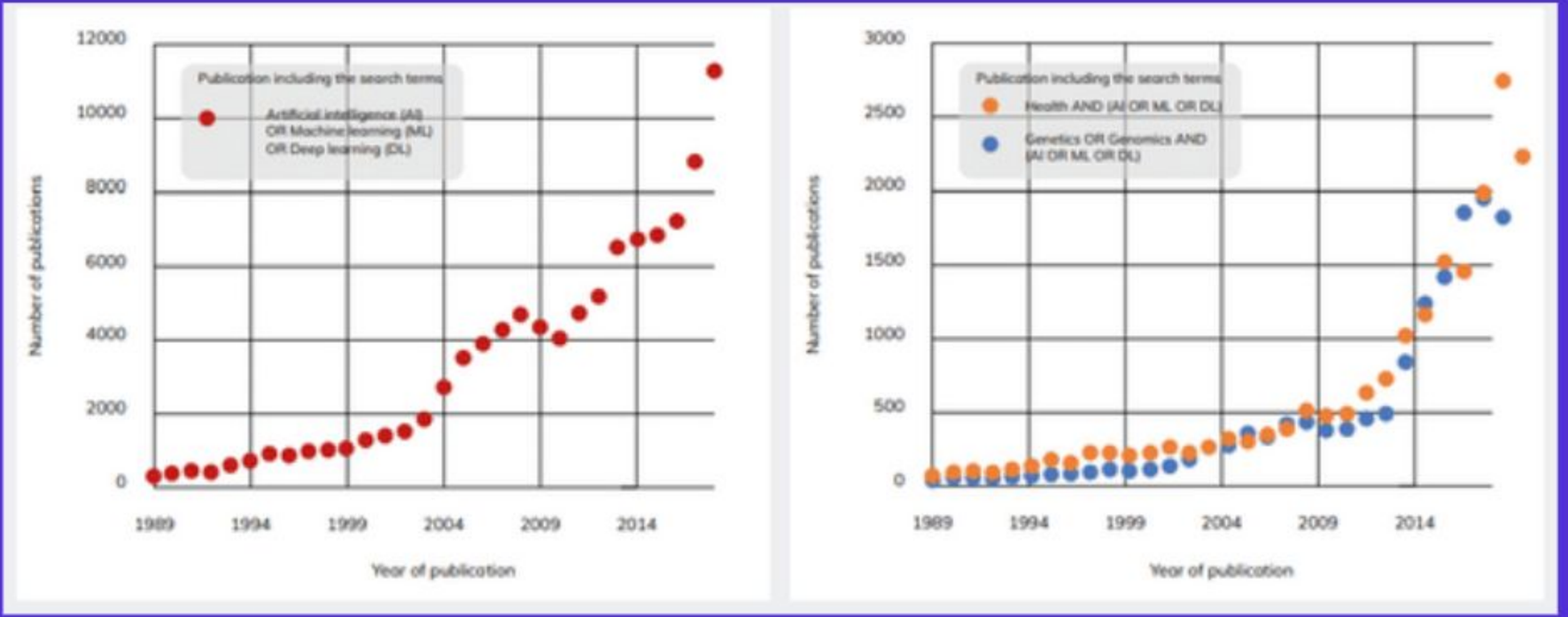
A genome is made up of approximately 3 billion DNA base pairs. A thousands of genes are present in one cell.

AI is the SOLUTION

AI is being excessively applied in the field of genomics and healthcare due to the following reasons:

- Due to continuously increasing computing power, machine learning and deep learning models can easily analyze massive genomic sequence datasets.
- Due to rise in the open source availability of computational frameworks and libraries, more and more researchers are everyday contributing to solve complex data problems.
- The volume of genomics and biomedical datasets is explosively rising and so is the advancement in field of biotechnology leading to more and more creation of precise and accurate datasets for better predictions and analysis.

Growth in the number of research publications archived in PubMed for AI, Genomics and Healthcare



- Today, machine learning and deep learning are being widely used in healthcare domain to:
- Generate predictions.
- Discover new patterns and relationships within complex genomic datasets.
- Removing the need to explicitly program every step and rule to get results from data.

THE GENOMIC DATA PIPELINE

DNA SAMPLE

GENOMIC SEQUENCING

DATA PROCESSING (INCL. ASSEMBLY AND VARIANT CALLING)

ANALYSIS AND INTERPRETETION

CLINICAL INTERPRETATION AND CLINICAL REPORTING

RESEARCH REPORTING: GENOMICS KNOWLEDGEBASE

YOUR TECH STACK

1. **DNA SEQUENCING**

   k-mer classification, Scikit learn, Multinomial Naive Bayes Classifier Countvectorizer (NLP) Matplotlib Pandas

2. **SNP IDENTIFICATION**

   BLAST SOFTWARE, Clinvar Dataset, Matplotlib, pandas

3. **CANCER RISK PREDICTION**

   Logistic Regression, Scikit learn Gaussian Naive Bayes Classifier Random Forest Matplotlib, Seaborn Pandas

SOLUTION DEMO AND EXPLANATION LINK

https://www.youtube.com/watch?v=ADPmyW-fR2g

THANK YOU