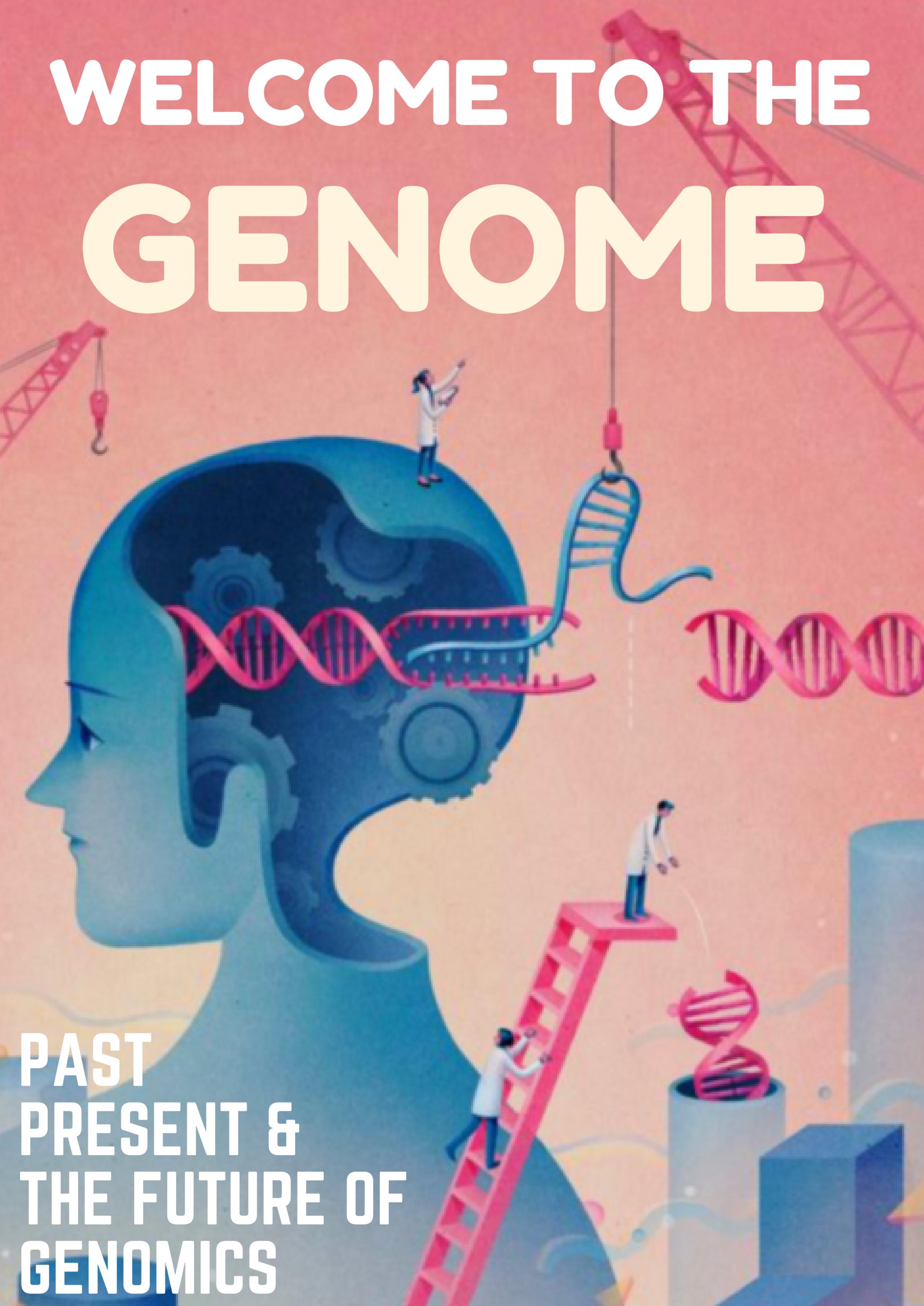


# WELCOME TO THE GENOME

PAST  
PRESENT &  
THE FUTURE OF  
GENOMICS



# INTRODUCTION

- *Although every person on our planet is built from the same blueprint, no two people are exactly the same. While we are similar enough to readily distinguish ourselves from other living creatures we also celebrate our individual uniqueness. So what is it that makes us all human, yet unique?*

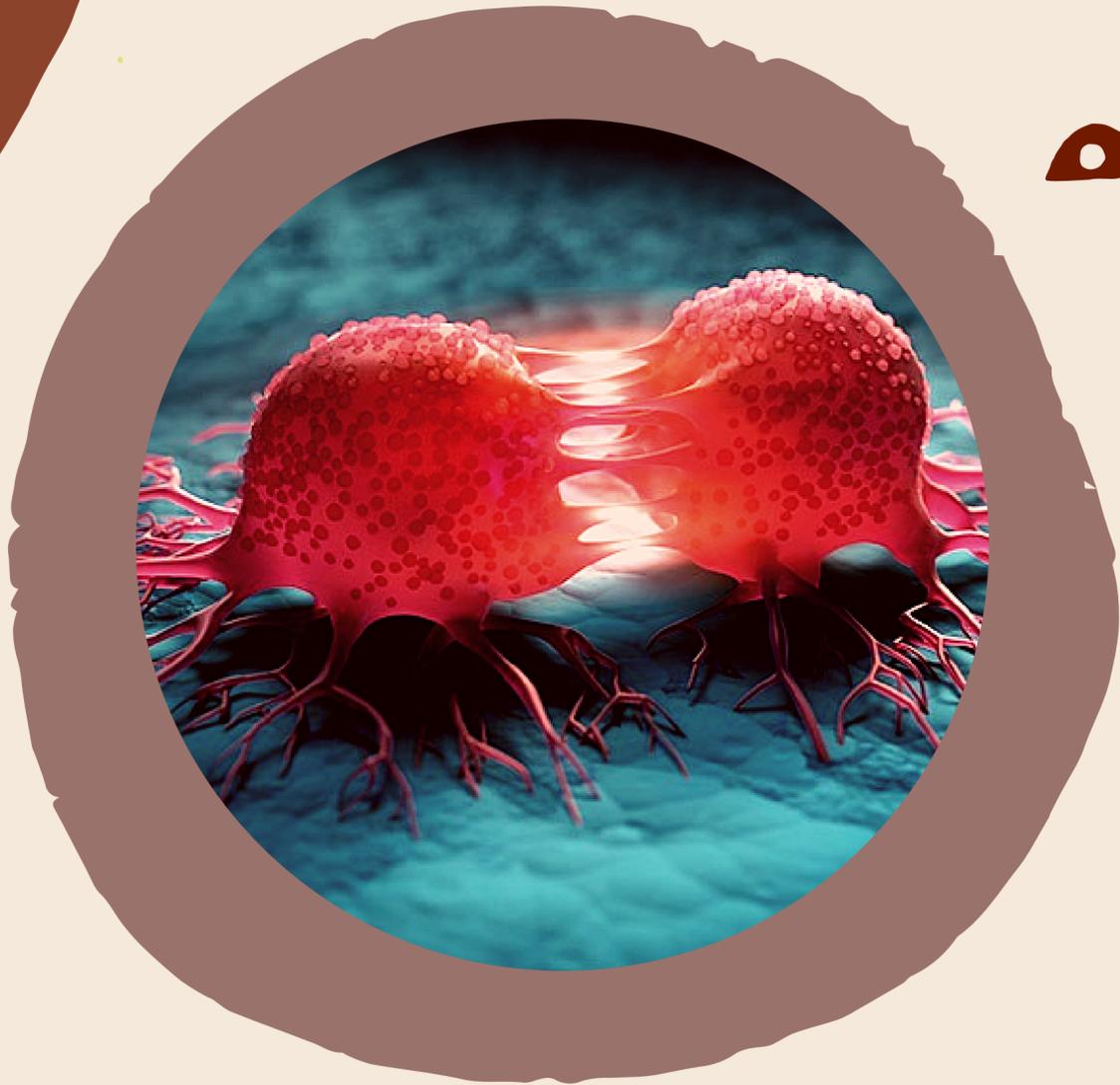
## *Our DNA*

- *Put three billion nucleotide base pairs together in the right order, and you have a complete set of human DNA—the human genome. If they were all written out as a list, they would fill around 10,000 copies of Harry Potter series.*

- *But establishing the sequence of three billion base pairs is a big deal !. The great and ambitious research program that sought to do this was called the Human Genome Project.*

# ADVANTAGES

- *But how much significance does this project have in our everyday lives?*
- *Did you know that we can now sequence and analyze our human genome in about \$1000? Genomic testing will become as common as standard blood tests are now.*
- *About 80 percent of rare disorders are genetic in origin, and 95 percent of them are incurable. The ability to read the human genome quickly and cheaply has led to discovering the causes of rare disorders and finding their cures.*



- *Imagine, a 25 year old young adult starting to live her adult life suddenly gets to know that she has stage 3 cancer and only has 1 year left to live. What if she got to know about it earlier?*
- *Mapping an individual's genome provides doctors with the ability to predict any disease that the individual may be predisposed to.*

# DISADVANTAGES

- *But how much significance does this project have in our everyday lives?*
- *Shocking part is that more than 80% of genomic studies have focused exclusively on individuals of European ancestry, the rest of the world is virtually unrepresented — and that is dangerous.*
- *The underrepresentation of human populations in genetic studies impairs the understanding of genome architecture and exacerbates health differences*
- *this bias prevents to fully understand the genetic architecture of human disease and leads to an incomplete genetic assessment of complex traits, and to an inaccurate disease diagnosis and treatment in under-represented groups.*



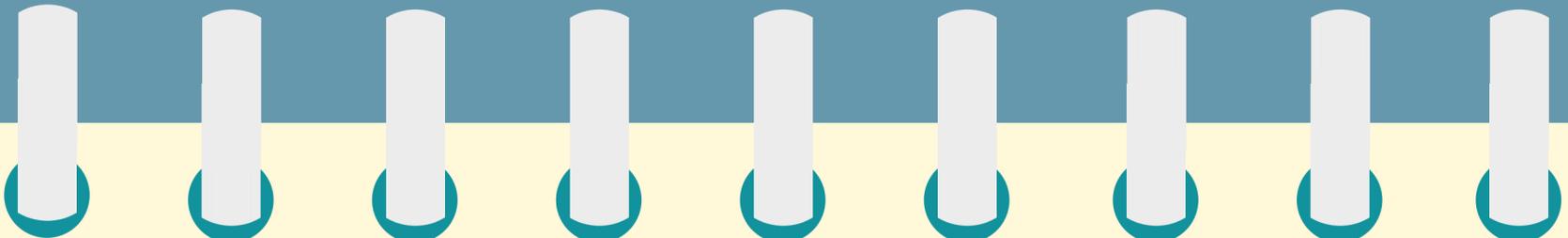
TAKING THE EXAMPLE OF ONE OF THE LARGEST CONTINENTS, AFRICA WITH DEADLIEST DISEASES LIKE TYPE 2 DIABETES, AIDS, , SYPHILIS HAS THE LEAST ACCESS TO THE HGP.

IMAGINE THE PEOPLE WHO NEED IT THE MOST ARE THE LAST TO BENEFIT FROM IT.

SO FOR WHOM EXACTLY WAS THIS HGP CREATED?

LIMITING OUR INVESTIGATION  
INTO THESE GENOMIC  
RESPONSES TO SCIENTIFICALLY  
WELL-REPRESENTED  
POPULATIONS CERTAINLY  
CURTAILS PROGRESS IN THE  
ENTIRE FIELD OF GENOMICS.





# SOLUTION



- *The genomes of diverse individuals harbor a treasure trove of humanity's responses which has a significant impact on our understanding of biology.*
- *We must include people of diverse ethnicity in order to exploit the knowledge of the human genome to its full extent.*
- *This bias and systematic lack of engagement of indigenous people in both clinical trials and genomics studies is partially the result of a history of the mistrust.*
- *We should start a consultation resource focused on educating communities on the potential use of genetic information*
- *The research community needs to immerse itself in indigenous culture*

- ONE SOLUTION TO OVERCOME THE BIAS IS BY SEARCHING FOR THOSE PEOPLE IN EUROPE WHO HAVE MIGRATED FROM DIFFERENT CONTINENTS AND SETTLED THERE. WE COULD TAKE THEIR DNA AS WELL AS THEIR OFFSPRING'S DNA AS A SAMPLE WHICH MIGHT OVERCOME THE HURDLE OF PEOPLE NOT BEING INCLUDED FROM DIFFERENT ETHNICITIES.
- STUDYING DIVERSE POPULATIONS INCREASES OUR ABILITY TO BROADLY UNDERSTAND GENETIC DISEASE ARCHITECTURES THAT WILL, ULTIMATELY, LEAD TO INCREASED PRECISION IN MEDICAL CARE.



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*Thank  
You!*

