

# TRANSPLANTS & GENETIC ANCESTRY

The Key Component in Fighting  
Transplant Inequity Among Recipients



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# THE ISSUE AT HAND

Hundreds of thousands of people in the United States and across the world are in need of transplants, but from kidneys to bone marrow there is a lack of donors available. In the face of huge disparities in donation and receipt between non-hispanic White individuals and other large racial groups, considering the genetic ancestries of donors and recipients may be the key to shrinking the gap.



## SIDES OF THE ARGUMENT



Genetic ancestry tests reveal genomic markers between donors and recipients of transplants that account for factors which hold great significance in transplant success

Genetic ancestry as a means of matching transplant donors to recipients is unnecessary because relation holds no significance in terms of transplant success



# WHY DOES THIS INEQUITY EXIST?

## PRIORITIZING CERTAINS TYPES OF GENETIC MATCHING OVER OTHERS

- Human Leukocyte Antigen (HLA) matching is currently valued most in matching, however there are other valid genetic markers to match by

## THERE ARE “MORE” WHITE DONORS-RECIPIENT MATCHES THAN THOSE OF OTHER RACIAL IDENTITIES

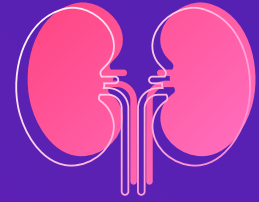
- When individuals self-identify their race, they often do not consider genetic ancestry as much as they consider the cultures they've been raised with

## PATIENT RELATIONSHIPS WITH HEALTH CARE PROFESSIONALS

- Historically relations between white-identifying/presenting individuals and health care workers have been much better than those between non-white individuals and health care workers



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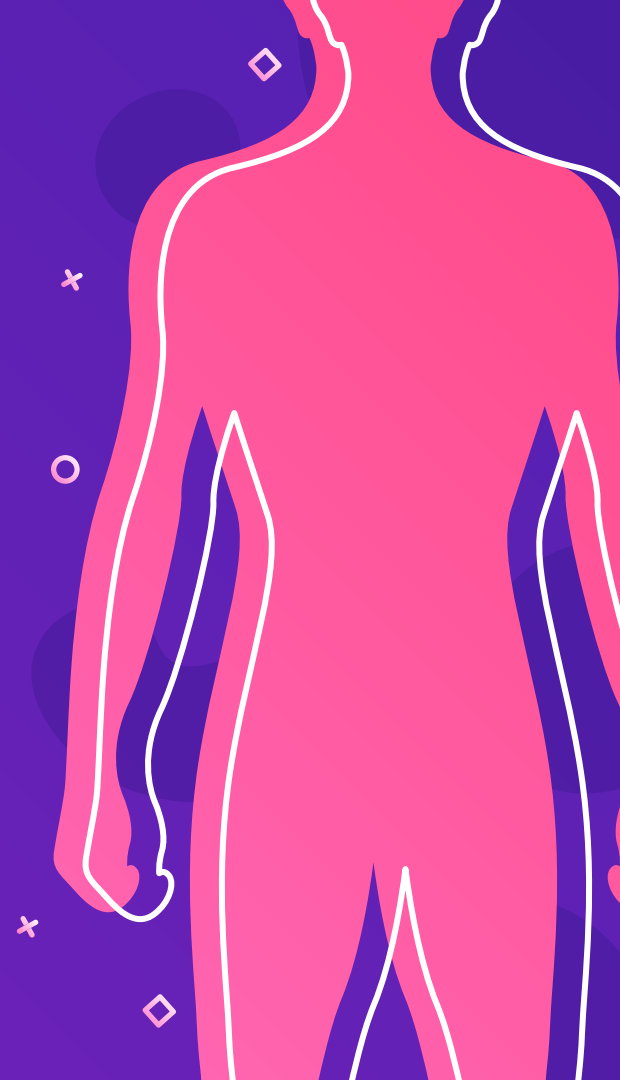
Should genetic ancestry be considered for transplant pair matches?



01

# STAKEHOLDERS

Who is involved and how?





## LABS

Those who conduct the genetic/genomic testing



## MEDICAL COMMUNITY

People who perform transplants and transplant care



## FAMILIES

People who typically provide care for recipients



## DONORS

People, living and dead, who may give an organ or bone marrow



## RECIPIENTS

People who receive transplants for necessary health interventions





02

# BIOLOGY

How do transplants work, and how could  
the process be better?

# TRANSPLANT MATCHING PROCESS

## BLOOD TESTS

To match for blood type  
A, B, AB, or O



## GENETIC TESTING

Determining the 6 types  
of HLA's a person has ,  
and accompanying  
eplets



## A.I.M's

Ancestry Informative  
Marker tests in  
RECIPIENTS to check for  
inherited comorbidities  
+ self-classification



## MATCHING

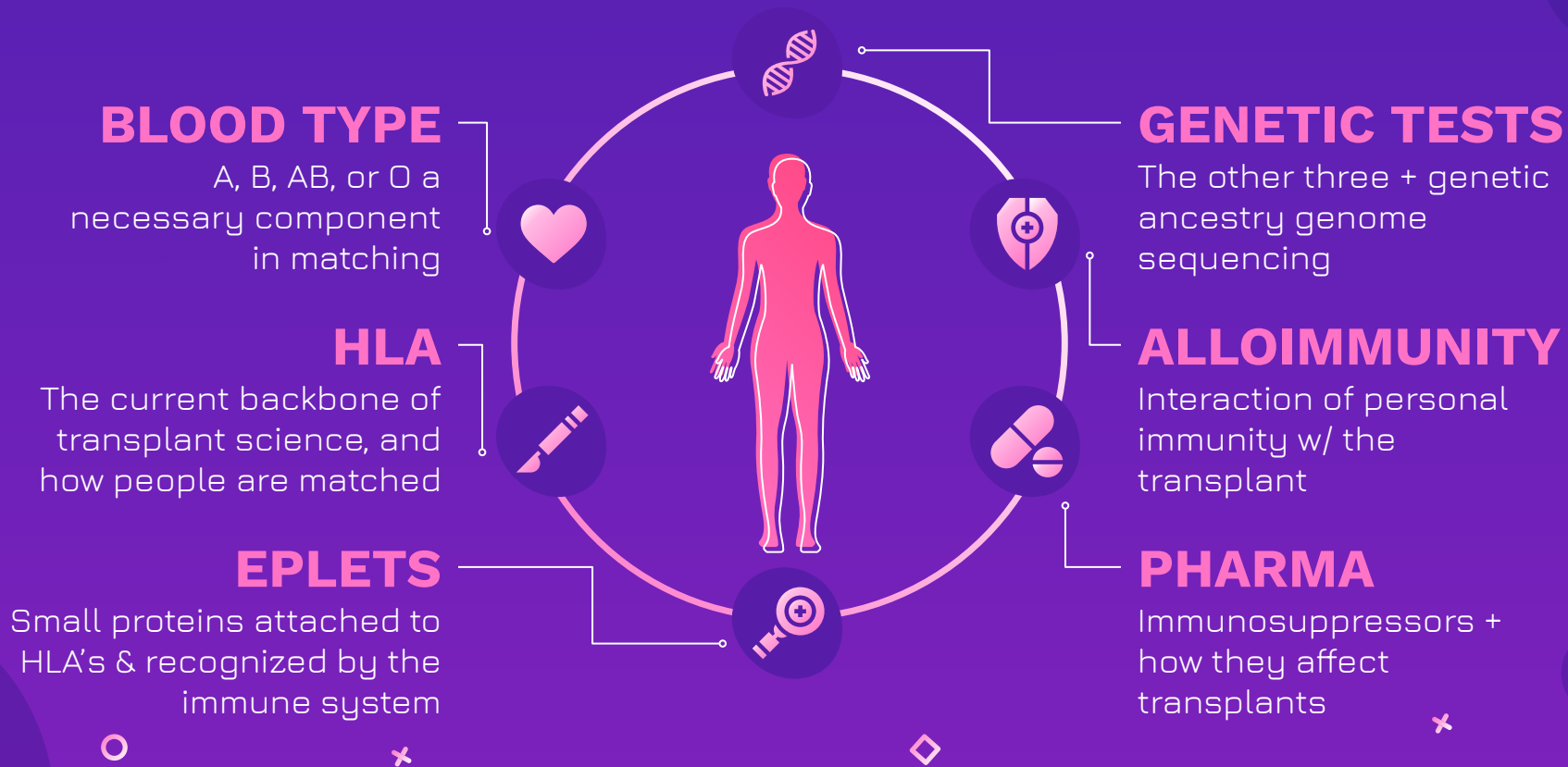
If a donor and recipient  
mirror each other well  
enough in the first two  
areas they will be  
matched





# PRIORITIES IN MATCHING:

## CURRENT VS. POTENTIAL W/ GENETIC ANCESTRY TESTING



# CURRENT RESEARCH & PUBLICATIONS



Since the beginning of transplant science in the mid-1900's HLA matches have been accepted w/o regard to relation

**HISTORICALLY**



Genealogically homogeneous sampling of transplant pairs indicates that genetic relation is insignificant

**WITHOUT  
GENETIC  
ANCESTRY**



In a sample of transplant pairs tested for relatedness/genomic similarity, relation is significant

**WITH GENETIC  
ANCESTRY**



# STUDIES & STATISTICS



## HOMOGENOUS



95%



## ADMIXED



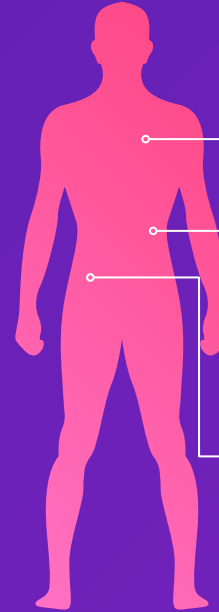
P value =  
0.005



## COMPARISON



1.43 x 1.68



## HLA

When admixture is not considered this accounts for 95% of transplant success

## SNP

Mismatch of protein secreting SNP's is highly significant

## HLA vs. SNP

In an admixed sample HLA and SNP mismatched have similar hazard ratios





03

# SOCIETY

What makes genetic ancestry in  
transplants a social issue?

# FACTORS TO CONSIDER



# CURRENT RESEARCH & PUBLICATIONS



A disparity between transplant recipients on the basis of race is well documented over the past few decades

**HISTORICALLY**



When recipients attempt to match with donors by self-identified race, the effect on transplant viability is lessened

**RACE SELF-IDENTIFICATION**



The use of genetic ancestry in matching donor-recipient pairs is associated with greater transplant viability

**WITH GENETIC ANCESTRY**



# STUDIES & STATISTICS

## HISPANIC AMERICANS

RECEIVED A  
TRANSPLANT  
ON THE  
WAITING LIST

30%

MATCHES  
IDENTIFIED  
ETHNIC ORIGIN  
BY RACE

0%

## AFRICAN AMERICANS

27.7%

70%

## WHITE AMERICANS

48.8%

99%



# IMPLICATIONS:

## NO USAGE OF GENETIC ANCESTRY TESTS:

- POLITICAL:
  - The current disparity that Black and Brown transplant hopefuls face, shows a failure of the healthcare system to adequately serve all of its patient
- ETHICAL:
  - Such heavy emphasis on the current system of matching, places pressure on stakeholders to find a match solutions (PGD)
- SOCIAL:
  - The pressures placed on families as well as the medical community to create HLA specific matches enforces the current Euro<sup>x</sup> beneficial system



## WITH USAGE OF GENETIC ANCESTRY TESTS

- POLITICAL:
  - Historically, recentering compatibility focus from HLA matching has caused uproar. (UCLA vs. NIH)
- ETHICAL:
  - Genomic testing is an additional cost to add to the cost of healthcare
  - Genetic counseling may be needed for either party involved after testing happens
- SOCIAL:
  - This form of matching has the capacity to cause people to question self-identified race, and how they relate to races that they do not identify with





# 04

## CONCLUSION

What to take away from this presentation?



# SHOULD WE CONSIDER GENETIC ANCESTRY?

**THE SHORT  
ANSWER IS . . .  
YES**

Using genetic ancestry corrects for haplotype specificity that typical HLA reliant donor-recipient matching misses. In other words, using genetic ancestry to make pairs ensures that (regardless of self-identifying race) individuals have the highest chance possible of receiving a transplant that their bodies will accept and nourish for as long as possible.



**THANK YOU!**



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