

# Genome “dactyloscopy” (DNA finger-printing) and gene expression: PCR and RT-PCR in action

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# Aim of project:

Learn basic methods of molecular genetics:

## **Practice PCR:**

- DNA Structure and extraction
- PCR
- Gel electrophoresis (factor affecting fragment separation)

## **Practice Sequencing**

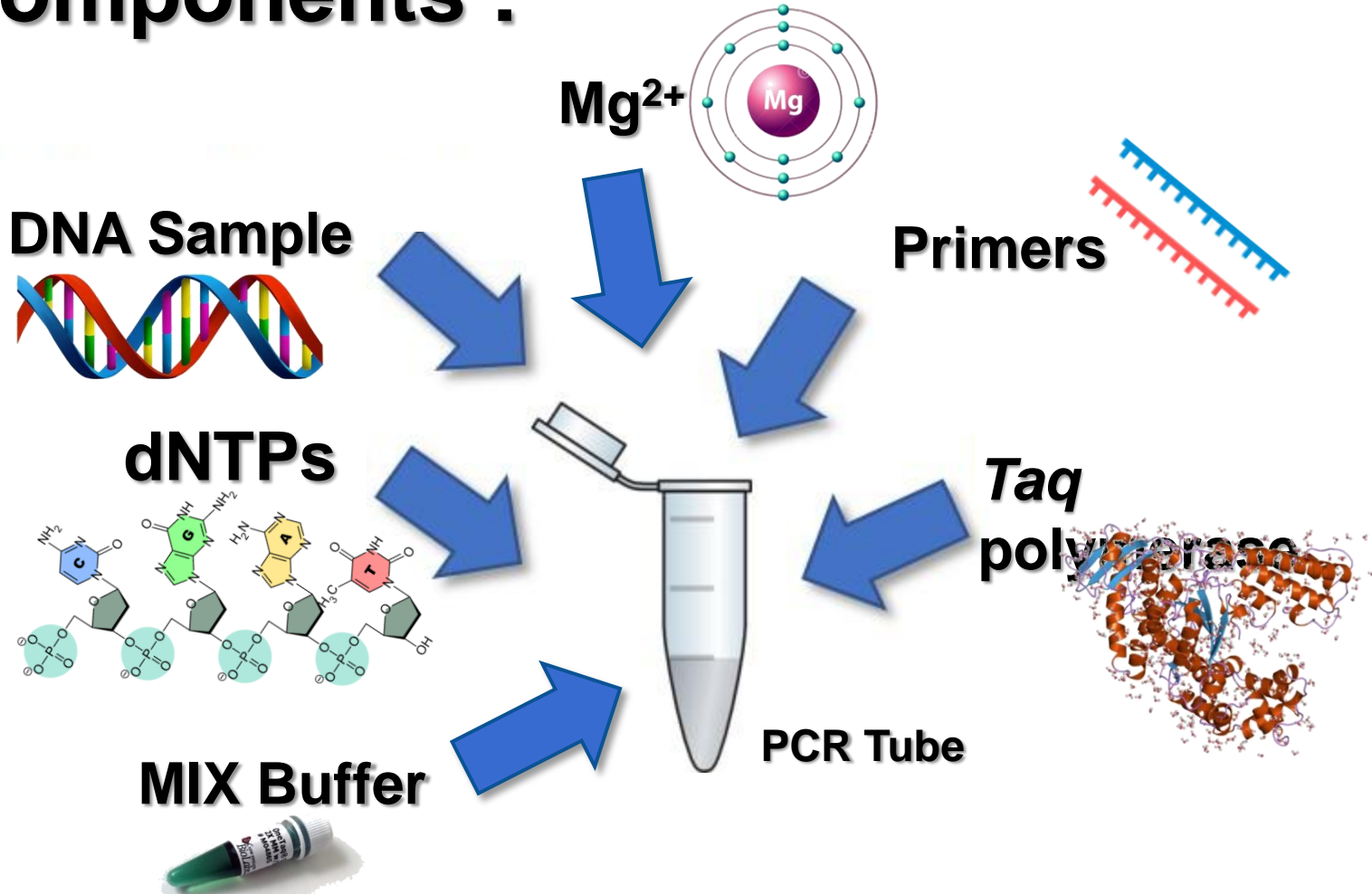
## **Allelic discrimination :**

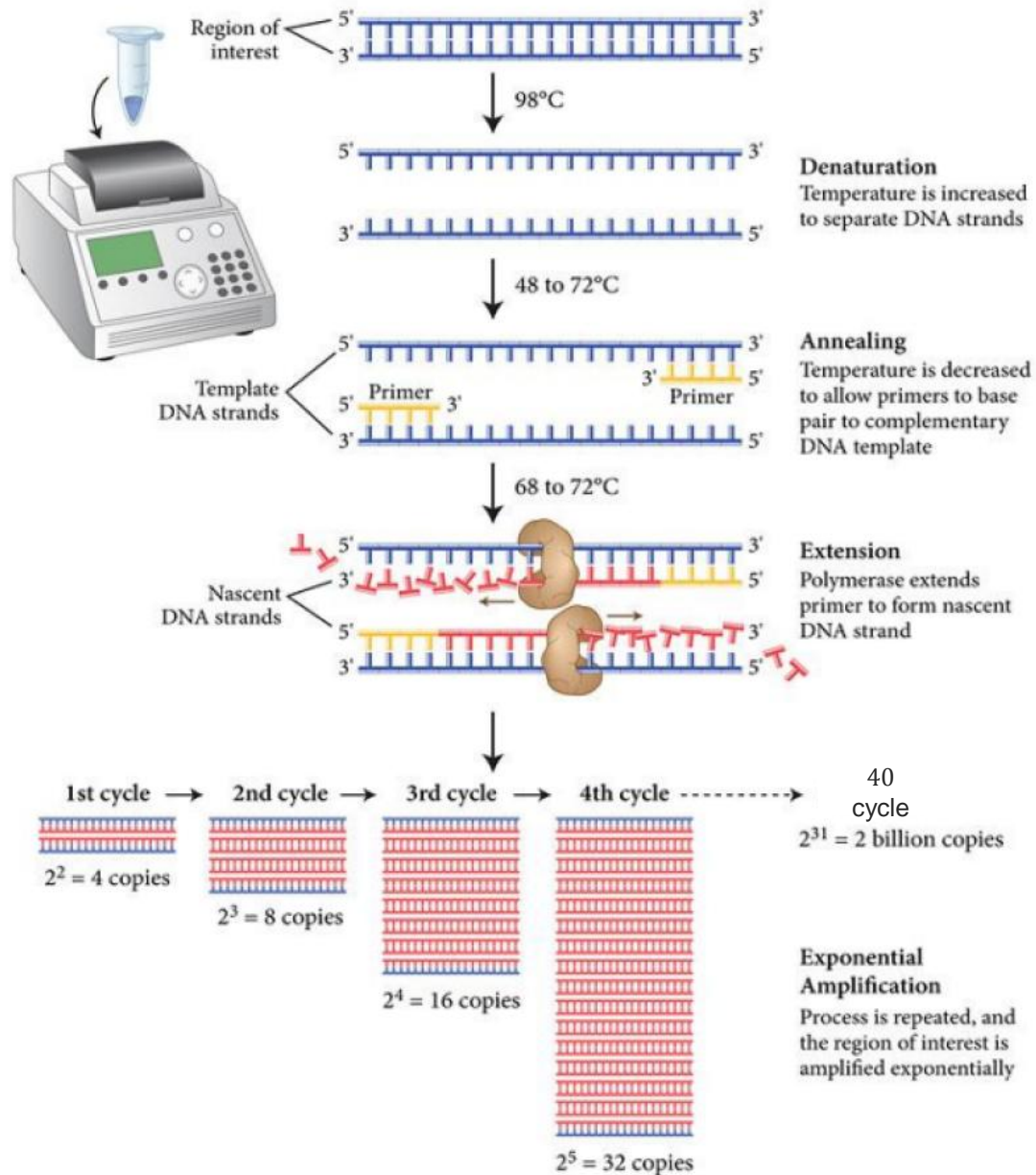
- Oxytocin test
- Allergy risk test



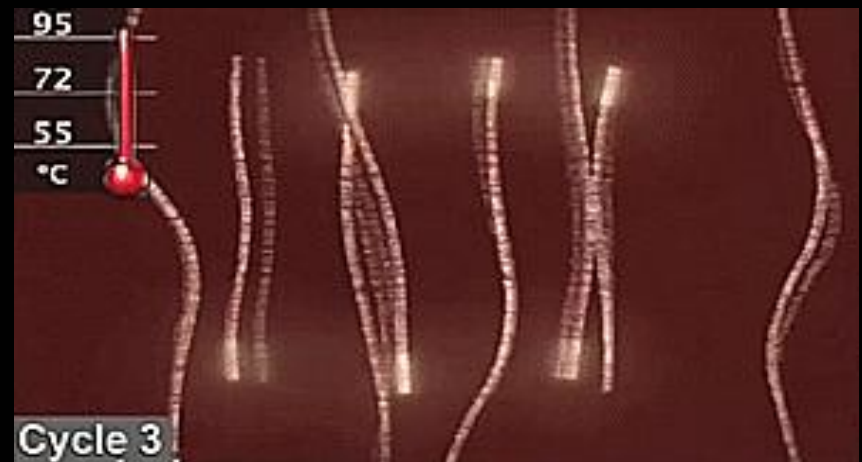
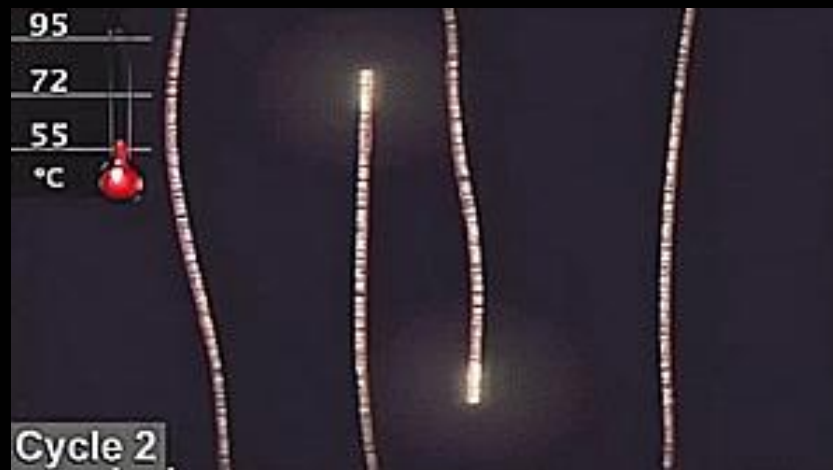
# PCR- Polymerase Chain Reaction

## Components :









# PCR IS USED FOR:



**MICROBIOLOG  
Y**



**MEDICIN  
E**



**ECOLOGY**



**GENETIC**



**FORENSIC**



**AGRICULTURE**

# PCR and genetic diseases analyses

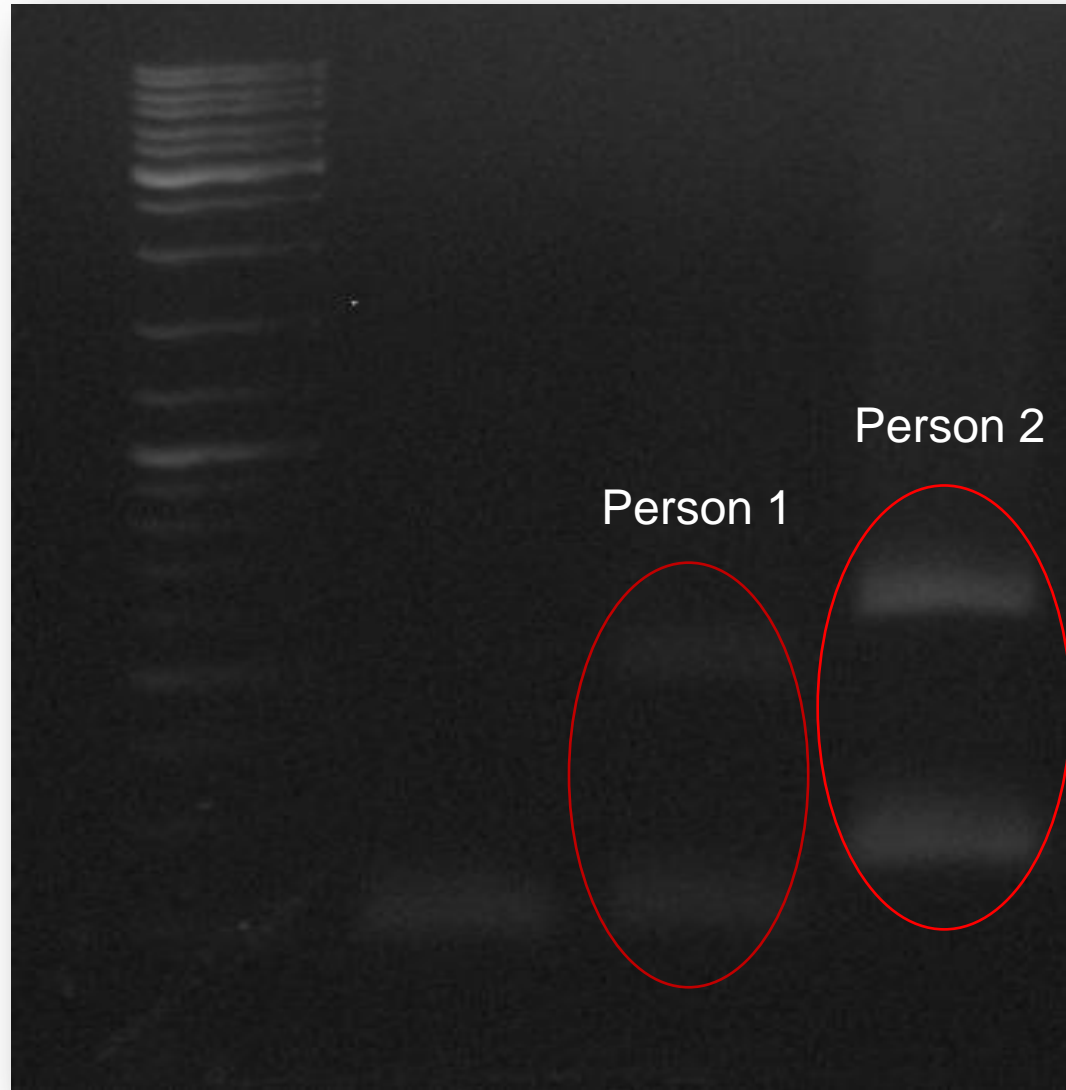
## **Genome dactyloscopy**

Genetic passport or human DNA Fingerprinting is the sum of individual data about the allelic state in a representative set of loci/genes in genome of an individual person.





# OUR RESULT :



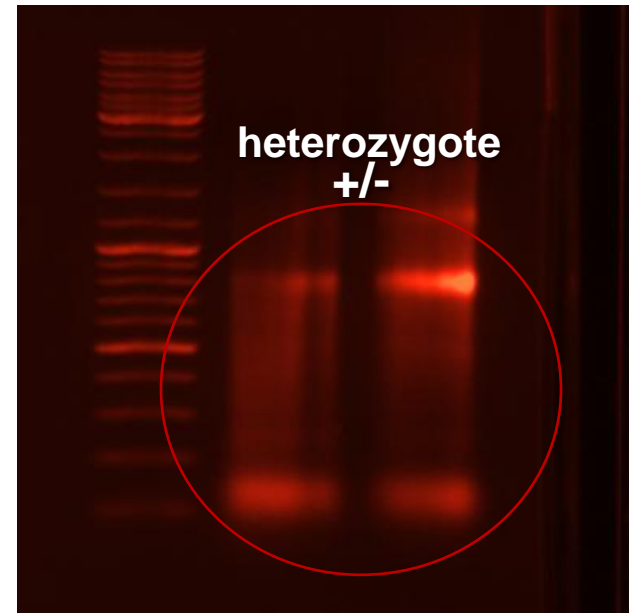
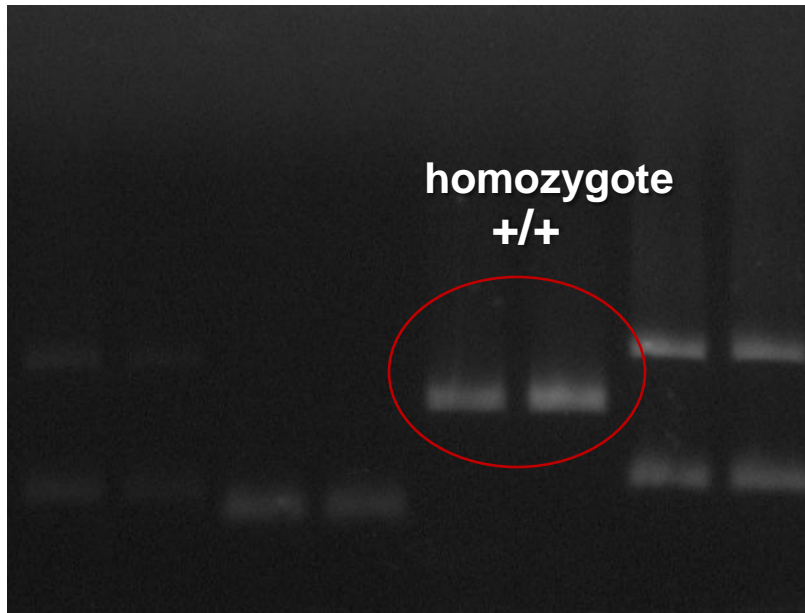


# Cardiovascular disease test:

This test based on ACE (angiotensin I converting enzyme) gene is present on chromosome 17 and contain the aluinsertion (ACE-1) .

The absence of the Alu- sequence (ACE-D) allow high risk for heart diseases.

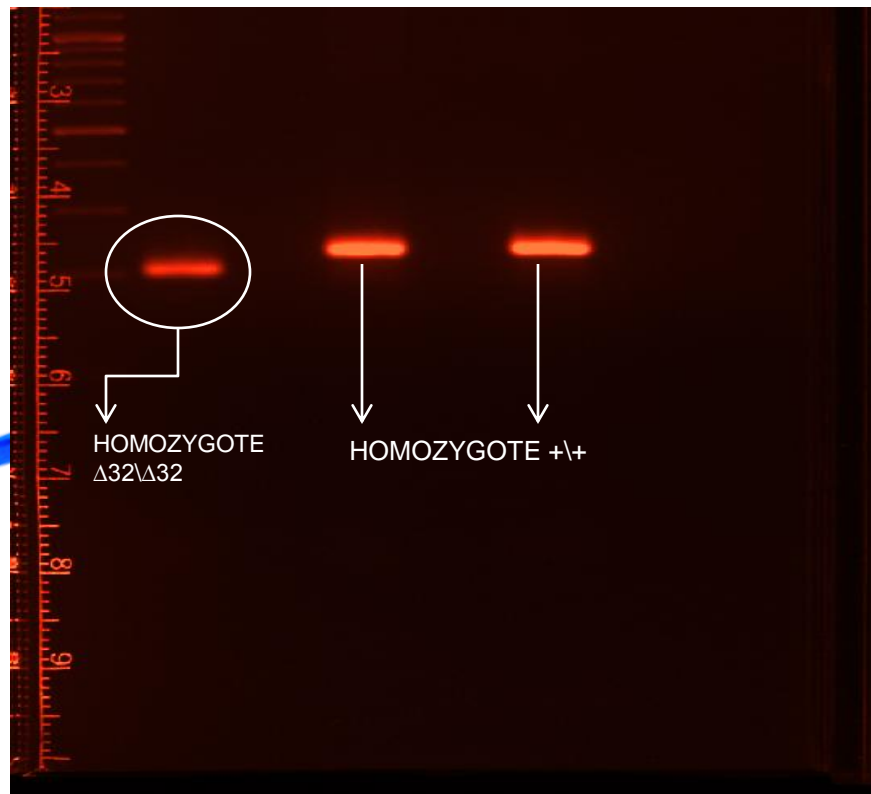
## OUR RESULT:



# CCR5 genes and HIV resistance test :

- CCR5 predominantly expressed on T cells, macrophages, dendritic cells, eosinophils, and a subpopulation of either breast or prostate cancer cells.
- CCR5 has a heterozygote genotype frequency of 10% in Europe (mostly found in northern Europe), and a homozygote ( $\Delta 32$  allele) frequency of 1%.

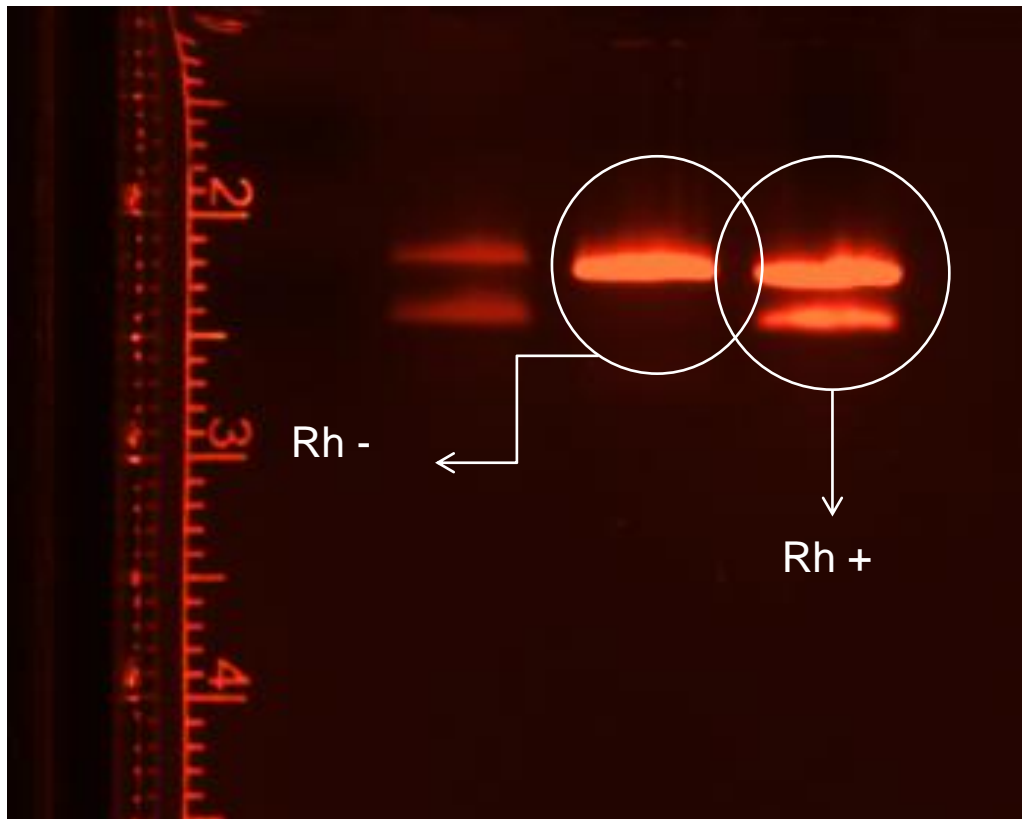
## OUR RESULT :



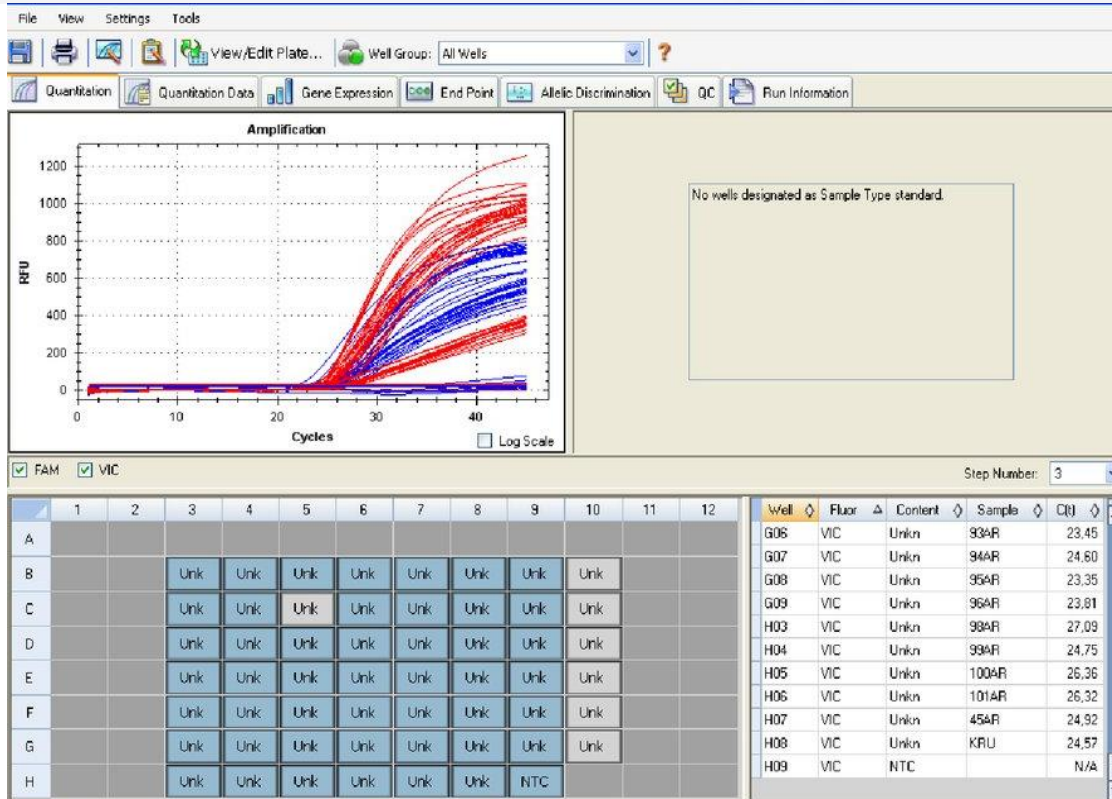
# RH test:

Rh - a protein located on the cell wall of red blood cells that has antigenic properties.

## Our result:



# Real-time PCR technique



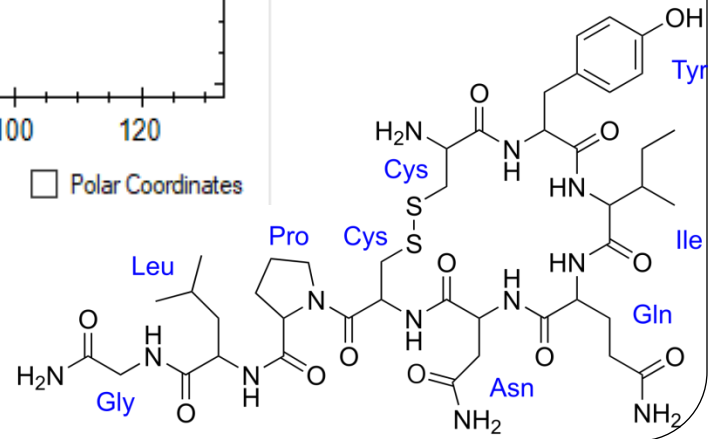
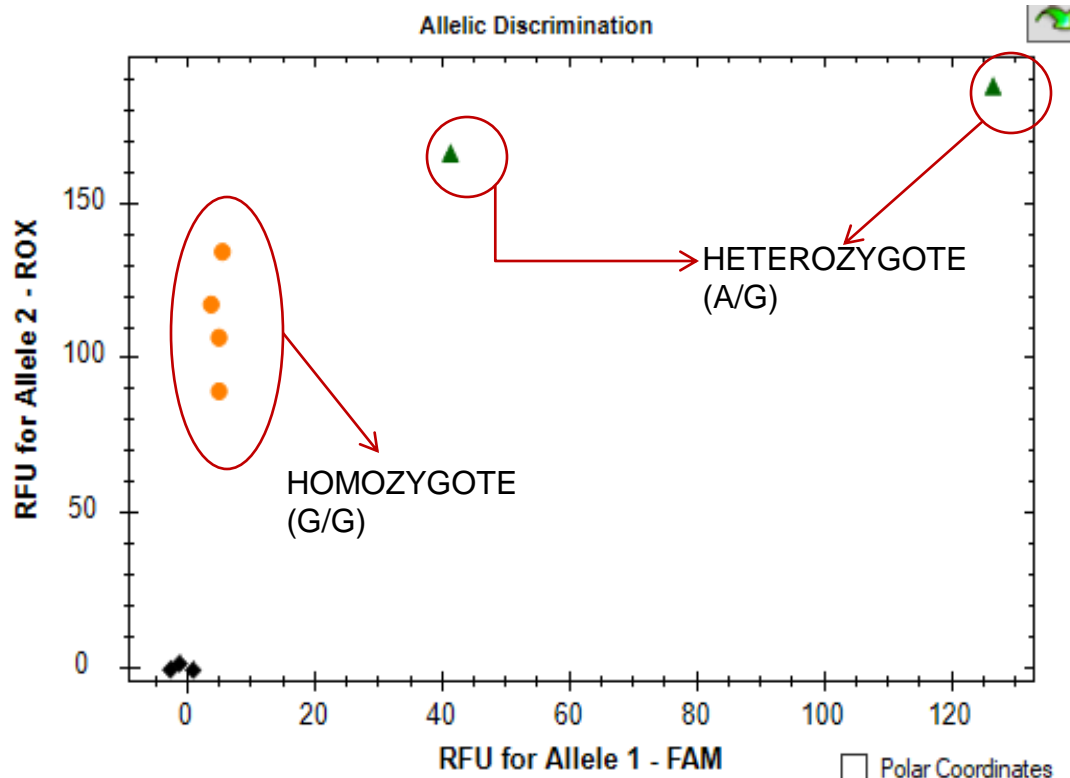


# Oxytocine test-system:

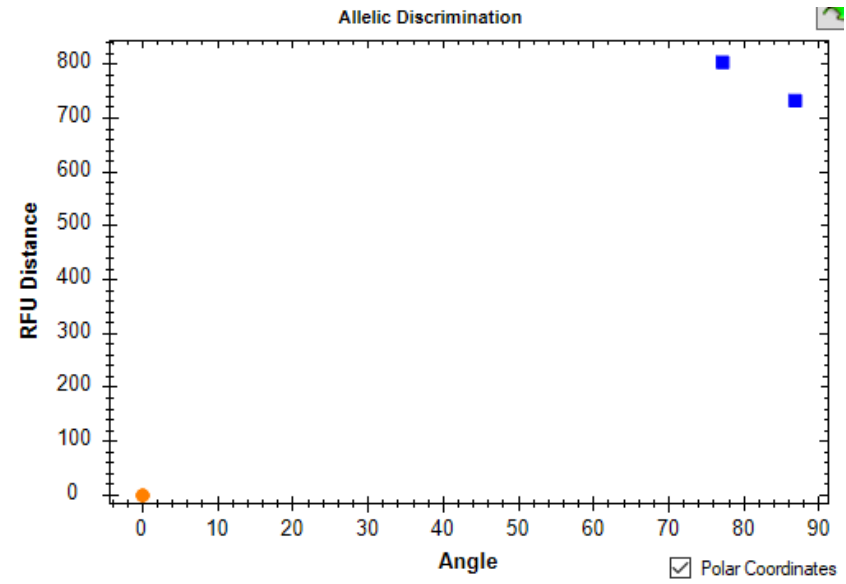
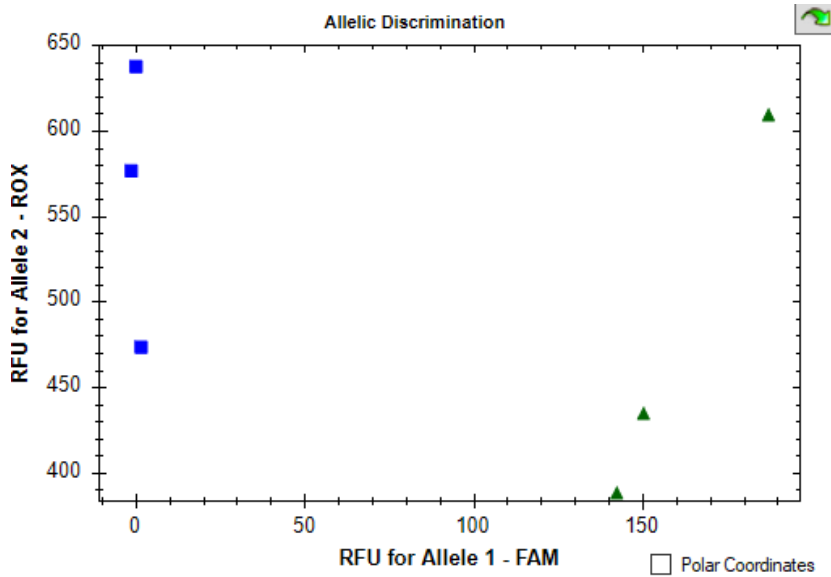
Oxytocin system plays an important role in human socially related personality traits and behaviors, referred to as “sociality.”

Three possible genetic variants exist for the most commonly studied oxytocin receptor polymorphism **rs53576**: A/G, A/A or G/G.

**OUR RESULT:**



**Allergy test-system: FCER1A is a gene encoding the alpha chain of the high-affinity IgE receptor on chromosome 1q23 and producing a protein that plays an important role in the development of allergic reactions.**



RS2427837	GG	AG	AA
RS2251746			
TT	highest	highest	average
CT	highest	average	lower
CC	average	lower	lowest

Person1

Person2

# Sequencing

**DNA sequencing** is the process of determining the sequence of nucleotide bases (A, T, C, and G) in a piece of DNA. Today, with the right equipment and materials, sequencing a short piece of DNA is relatively straightforward.

**In result:**







**Thank You for  
your  
attention!**