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**I CONGRESO CIENTÍFICO INTERNACIONAL "EUROCIENCIA JOVEN„**

**5 y 6 de Mayo de 2025 Córdoba**

# A Matter of Taste
## Investigating our Genome

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## Abstract

Ever wondered how DNA, the genetic blueprint of life, encodes and transmits information to grow and maintain an organism? Just like a cookbook contains recipes for various dishes, DNA stores the instructions for life. Despite individual uniqueness, human DNA is 99.9% identical across all individuals. To introduce the concept of DNA structure, we first conducted a hands-on activity using candy to model a short DNA segment, demonstrating how genetic information is encoded. Additionally, we extracted DNA from fruit, providing a simple yet effective visualization of DNA isolation.

Building on this foundation, our primary research aimed to explore the connection between personal taste perception and genetic variation. The study focused on single nucleotide polymorphisms (SNPs) in the TAS2R38 gene, which influence the ability to detect bitter compounds like phenylthiocarbamide (PTC), commonly found in vegetables such as broccoli and Brussels sprouts. Our research question was: *Is personal taste perception linked to the genome?* Based on the test subject's reported sensitivity to broccoli's bitterness, we hypothesized that their genotype would be heterozygous (Tt; mild taster).

To test this hypothesis, we conducted a four-step molecular biology experiment: DNA extraction from cheek cells, Polymerase Chain Reaction (PCR) amplification of the TAS2R38 gene, DNA fragmentation using restriction enzymes, and gel electrophoresis for genotype determination. The electrophoresis results confirmed our hypothesis, identifying the test subject as a mild taster (Tt).

This study provides direct evidence of the genetic basis of taste perception, demonstrating how inherited variations shape individual taste preferences. By linking genotype to phenotype, our findings challenge the notion that taste is purely subjective and highlight the role of genetic factors in sensory experiences.