



DNA DAY ... a good starting point to disseminate

genetic education in high school

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DNA Day – a special day-initiated in 2003 by American Society of Human Genetics to commemorate the completion of the Human Genome Project in April of that year, and the discovery of the DNA double helix fifty years earlier!

In 2008 The European Society of Human Genetics (ESHG) joined the American Society of Human Genetics (ASHG) in making a Europe-wide celebration of genetics and its promises and decided to expand a very successful initiative: the **DNA Day Essay contest**.

That contest is one of several ongoing initiatives to promote knowledge and understanding of genetics in secondary schools, where the teachers of today and the leaders of tomorrow can participate.

Nationwide Contest diffusion

It has been promoted by Italian Society of Human Genetics and spread by Ufficio Scolastico Regionale of Liguria (Regional Education Authority). To stimulate more schools to participate in the contest the SIGU has set up a local award solely for students in Italian high schools besides the winners of the European selection.



DNA DAY at GENOVA

The University of Genoa has been the focal point of this European initiative taking on the responsibility for spreading information on the contest by way of events organised along with renowned scientific institutions such as Sigu and National Institute for Cancer Research, resulting in the participation of hundreds of high school students

“ Experiences of genetic research as explained to students ”

- 2008 -20th May “If you were a genetic researcher.”
- 2009 -3th April From vegetable to human
- 2010-25th March Past and future of Genetics. Mendel and personalised medicine.

Genetic Teaching in Italian schools

is included in a Biology program and is proposed and developed in a fragmentary way over three years. The syllabus begins with classical Mendelian genetics and passes on to Molecular Biology - totally unconnected- and with no laboratory experiments. We think that new teaching models and methods are required to overcome this dichotomy and to update present- day scholastic knowledge inside the reality of scientific research



A NEW PROPOSAL

In a doctorate project in Genetics- Department of Paediatrics -IRCCS G.Gaslini, a Biology high school teacher was granted the possibility to develop collaboration between the University of Genova and high schools, giving rise to a quality innovative didactic experience in Molecular Genetics and Biology for teachers and students. The aim is to create a link between scientific research and schools with the involvement of public institutions in genetics, biology and biotechnology.

GENERAL OBJECTIVES

1. to set up a project of interaction between research and school
2. To review teacher training emphasizing with them the basic essential points of molecolare biologia and mendeliana genetica so as to have precise, up-to-date lessons
3. To prepare evaluation of the students on syllabus content

SPECIFIC OBJECTIVES

- 1) TO CARRY OUT LABORATORY EXPERIMENTS IN MOLECULAR GENETICS
 - 2) TO PLAN IN-SERVICE THEORY/PRACTICE COURSES WITH HIGH SCHOOL TEACHERS IN INNOVATIVE TOPICS IN THE FIELD OF GENETICS
 - 3) TO ORGANIZE IN-DEPTH COURSES FOR STUDENTS
 - 4) TO PREPARE ONE-DAY TRAINING COURSES FOR HIGH SCHOOLS ON LIFE SCIENCES - CONFERENCES, WORKSHOPS, EXPERIMENTAL DEMONSTRATIONS
 - 5) TO TAKE PART IN NATIONAL AND EUROPEAN PROJECTS
- THE THEORY/PRACTICE LABORATORY PROPOSAL, SUITABLE FOR A GROUP OF TEACHERS AND/OR PUPILS, REQUIRES THE FOLLOWING FOR EACH GROUP

METHODOLOGY

DIDACTIC ACTIVITY:

BIOINFORMATIC LABORATORY

SEARCHING THE WEB FOR DATABANKS TO RECONSTRUCT THE PATH OF KNOWLEDGE LEADING TO EXPERIMENT PROJECTING

MOLECULAR GENETIC LABORATORY

- DNA EXTRACTION FROM ORAL MUCOSE
- AMPLIFICATION OF DNA SEGMENT, WITH THE INVESTIGATING POLYMORPHISM BY PCR
- ENZYMATIC DIGESTION
- POLYMORPHISM IDENTIFICATION, EVALUATION AND ANALYSIS OF DATA OBTAINED AND COMPARISON WITH DATA IN LITERATURE ON HUMAN POPULATION



RESULTS:

In 2010, 13 teachers and 120 students participated in the project. A formal assessment was conducted with a pre-test and a post-test of 20 questions to measure knowledge of molecular biology and Genetics.

PRE-TEST

≤ 10 uncorrect answers 58%

> 10 correct answers 42%



POST-TEST

≤ 10 uncorrect answers 8%

> 10 correct answers 92%



CONCLUSIONS:

Students benefit from hands-on and minds-on activities increasingly knowledge and confidence with study of Genetics.

Teachers were enthusiastic about their training activity and they appreciated the help to better understanding and than explain Molecular Genetics