ELENA RAIMONDI - CURRICULUM VITAE ET STUDIORUM

ACADEMIC POSITION

Associate Professor of Genetics, Department of Biology and Biotechnology "L. Spallanzani", University of Pavia, Via Ferrata 1, 27100 Pavia, Italy.

PLACE AND DOB: Milan, May 13th, 1959

EDUCATION

1987:	Ph.D. degree in Genetic Sciences (Genetics and Molecular Biology), University of Pavia, Italy.
1982:	Degree (Laurea) cum laude in Biological Sciences, University of Milan, Italy.

PROFESSIONAL EXPERIENCE

1992-present	Associate Professor of Genetics.
1993	University of Pavia, Faculty of Sciences, charged of the Cytogenetics and Genetics courses for the Biological Sciences Degree.
1992	University of Pavia, Faculty of Sciences, charged of the Environmental Mutagenesis course for the Biological Sciences Degree.
1991	Associate Professor of Genetics.
1991	Visiting fellow, in the Prof. U. Claussen Laboratory, Erlangen, Nurnberg University.
1990-2005	Coordinator of the courses of Cytogenetics I, Cytogenetics II and Mutagenesis for the Specialization School of Applied Genetics, Faculty of Sciences, University of Pavia, Italy.
1990	Fellow of the "Fondazione Anna Villa Rusconi" at the Department of Genetics and Microbiology, University of Pavia, Italy.
1988-1989, 1989-1990 e 1990-1991	- "Professore a Contratto" Faculty of Sciences, University of Pavia, Italy.
1988	Fellow of the Italian National Research Council, at the Faculty of Sciences, University of Pavia, Italy.
1987	Visiting fellow, in the Prof. B.D. Young Laboratory, ICRF London.
1987	Visiting fellow, in the Prof. M. Sthoer Laboratory, DKFZ Heidelberg University.
1986-2001	Coordinator of the course "Structure and function of the eukaryoitic chromosome", Ph.D. Program in Genetic Sciences (Genetics and Molecular Biology), University of Pavia, Italy.
1985	Visiting fellow, in the Prof. J.F. Mattei Laboratory, INSERM Marseille.
1983-1987	Doctoral fellow at the Department of Genetics and Microbiology University of Pavia, in the Prof. L. De Carli Laboratory.
1982-1983	Fellow at the "Centro Studi di Genetica Umana" University of Milan, directed by Prof. G. Morganti.

MANAGEMENT ACTIVITY

- Vicar coordinator of the Ph.D. in Genetic and Biomolecular Sciences, now Ph.D. in Genetics, Molecular and Cell Biology.
- Vicar President of the "Teaching Council" of Biological Sciences.
- Co-coordinator of the teaching activity of the Ph.D. in Genetic and Biomolecular Sciences, now Ph.D. in Genetics, Molecular and Cell Biology.
- Co-coordinator of the course "Evolution: from phenotype to molecular approaches", Ph.D. in Genetics, Molecular and Cell Biology.
- President of the "Spaces Committee" of the Department of Genetics and Microbiology, now Department of Biology and Biotechnologies.
- Member of the Scientific-Editorial Committee of Pavia University Press representing the Departments of the Life Sciences Area.

- Member of the Scientific Committee of the Science and Technology Library, University of Pavia.

SCIENTIFIC ACTIVITY

1) Chromosome pathology and cancer cytogenetics; 2) high resolution cytogenetic analysis and molecular cytogenetics; 3) centromere molecular organization and function; 3) chromosome engineering, construction of mammalian artificial chromosomes; 4) mammalian genome plasticity and evolution; 5) genome instability and carcinogenesis; 6) structure and evolution of mammalian centromeres.

CURRENT SCIENTIFIC INTERESTS

The most recent researches are focused on the study of the evolution of mammalian karyotype, on the analysis of the organisation of the centromere and on the study of genome instability and of its involvement in carcinogenesis. We analyse the molecular mechanisms driving karyotype evolution with particular reference to those events involving centromere function.

The centromere is the specialised region which guarantees the fidelity of chromosome segregation in eukaryotic cells. The centromere recruits a protein macro-structure, named kinetochore, which mediates its interaction with the mitotic and meiotic spindle. Even if the centromere of a number of organisms has been described in detail from a cytological and genetic point of view, surprisingly, the molecular nature of centromeric function still remains an opened question, thus representing one of the most fascinating challenges of genetics and molecular biology. The first surprising feature is that, although centromeric function is highly conserved in eukaryotes, however, the centromeric DNA sequences are divergent both among species and within a single species. It has been demonstrated that a DNA sequence necessary and sufficient to sustain centromere function does not exist.

Mammalian centromeres are typically associated to highly repeated DNA (satellite DNA); this organisation has so far hampered the detailed molecular analysis of centromere chromatin. In this scenario, it was of special scientific interest the discovery by our research group – in strict collaboration with the laboratory of Molecular Biology of the Department of Biology and Biotechnology of the University of Pavia, leaded by Prof. Elena Giulotto – that, in the species of the genus *Equus* (horses, donkeys, zebras), an exceptionally high number of centromeres are satellite-free. Due to this peculiarity, equids represent a unique biological model for the study of the birth, evolution and complete maturation of the centromere.

In my laboratory, it has been designed a high resolution quantitative and semi-quantitative technology which is based on FISH (Fluorescence *In Situ* Hybridisation) and FISH coupled with immuno-fluorescence. These methodologies are applied to fibres of high molecular weight purified DNA, which is "combed" on microscope slides, and to fibres of chromatin (DNA associated with proteins), which are mechanically extended on microscope slides. We analyse the architecture of satellite-free centromeres and we compare it with that of centromeres containing the canonical sequences of highly repeated DNA. In addition, we study the epigenetic modifications characterising satellite-free and satellite-based centromeres in order to identify features distinguishing the two classes of centromeres. The results of these researches are particularly relevant for the knowledge of the molecular bases of centromere function.

It is well known that alterations of chromosome segregation are responsible of the occurrence of chromosome number variations, which have been observed in the large majority of cancers. The equid system offers an unprecedented opportunity to investigate the mechanisms involved in chromosome instability associated with the occurrence and progression of a large number of cancer forms.

ADDITIONAL INFORMATION

- Member of the Italian Federation of Life Sciences (FISV).
- Member of the Italian Society of Human Genetics (SIGU).
- Member of the European Cytogenetics Society (ECS).

- From 1997 to 2000 she has been a member of the directive committee of the Italian Association of Genetics (AGI).
- Reviewer of grant applications presented to the Italian Ministry of the University and Scientific Research.
- She was granted AIRC contracts, Telethon contracts (1995-1997), as well as national projects funded by MIUR (PRIN 2000-present) and CNR, Progetto Bandiera Epigenomica (2013-present).
- She is author of 76 papers on peer-reviewed journals and international books, of a number of meeting communications, of book chapters and she has participated, as invited speaker, to numerous National and International Congresses.
- H index Google Scholar:
  Index H 20
  i10-index 33

INSTITUTIONAL TEACHING ACTIVITY

- Genetics II (first level degree in Biological Sciences, III year, 6 CFU)
- Laboratory of Cellular Methodologies (first level degree in Biological Sciences, III year, 3 CFU)
- Cytogenetic and Chromosome Engineering (second level degree in Experimental and Applied Biology, II year, Curriculum Biomedical Molecular Sciences, 6 CFU)