

Scientific Leadership Profile – Silvia Barabino

Major scientific or scholarly contributions.

The common theme throughout my research career is the investigation of post-translational control of gene expression. Using biochemical and molecular approaches I initially characterized the function of major snRNP components of the mammalian splicing apparatus by setting up a novel approach for the purification of RNA:protein complexes from cell nuclear extracts using modified antisense oligonucleotides, which is still currently used. Subsequently, I contributed to the characterization of the mammalian and yeast polyadenylation complexes with the isolation two novel subunits .

In recent years, the work of my research group has concentrated on a range of projects related to the control of pre-mRNA splicing and polyadenylation under physiological and pathological conditions. One of the projects uncovered novel functions for the mammalian 3' end processing factor CF I in mRNA export and in the processing of histone pre-mRNAs. More recently, we have shown that mitochondrial stress affects alternative splicing at a genome wide scale thus possibly contributing to the pathogenesis of neurodegenerative diseases.

Currently, we are concentrating on three main lines of research. The first one is focused on SRPK2, a protein kinase specific for the SR (serine/arginine-rich domain) family of splicing factors. We are currently studying the mechanisms by which DNA damage affects alternative splicing via the modulation of the activity of SRPK2. A second project concerns the mechanisms that couple the choice of alternative exons to transcription. Specifically, we are studying how *Brahma*, a component of the mammalian SWI/SNF chromatin-remodeling complex, contributes to the choice of alternative terminal exons through the interactions with components of the polyadenylation machinery. More recently, we have initiated a characterization of miRNA expression in cellular and mouse models of Amyotrophic Lateral Sclerosis. In parallel, we are currently studying the role of the ET family of RNA-binding proteins in genome stability and in neurodegeneration. To address all these questions, we are using a combination of biochemical and molecular approaches such as CRIPR/Cas9 genome editing, microscopy, *in vitro* cell culture systems (including iPSCs-differentiated cell types), and transgenic mouse models.

Efforts and ability to inspire younger researchers. More than 20 undergraduate students and 10 pre- and post-doctoral fellows have been trained in the laboratory, many of them pursuing successful careers in academic research.

Ability to establish new interdisciplinary approaches. We have been collaborating with many research groups both within Italy and abroad. This includes a large interdisciplinary network project financed by the Swiss National Science Foundation.

Curriculum Vitae

Born in Sorengo (CH), 07/09/1963.

1983 - 1987 Master degree. University of Pavia

1987 - 1988 Specialisation in Genetics at the Università degli Studi di Pavia,
1988 - 1992 Post-Doc. Lab of Prof. Angus I. Lamond, European Molecular Biology
Laboratory, Heidelberg (D).
1992 - 1994 Post-doc in Dr. E. Boncinelli's laboratory, DIBIT, H S. Raffaele, Milan,
Italy.
1994 - 2000 Assistant in Prof. W. Keller's laboratory, Cell Biology Department,
Biozentrum, University Basel, Switzerland.
2000 - 2001 Independent PI in Prof. F. Cotelli's laboratory, Department of Biology,
University of Milan, Milano, Italy
2001 – 2007 Assistant Professor in Molecular Biology, Department of Biotechnology
and Biosciences, University of Milano – Bicocca
2007 to present Associated Professor in Molecular Biology, Department of
Biotechnology and Biosciences, University of Milano - Bicocca

Courses taught: Molecular Biology