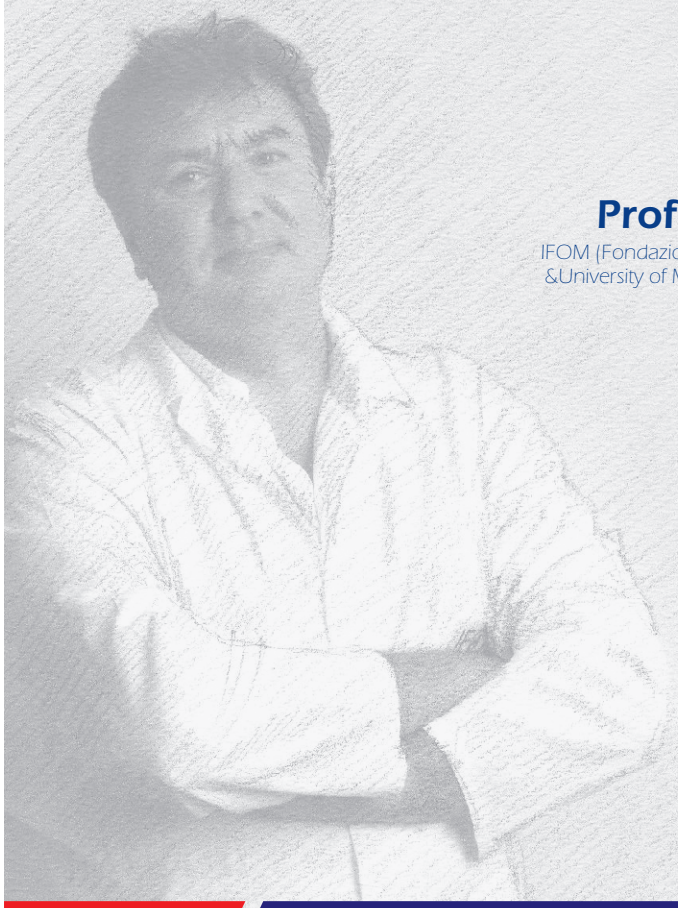
CSIR - INDIAN INSTITUTE OF TOXICOLOGY RESEARCH

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH

Golden Jubilee Lecture

November 27, 2015



Professor Marco Foiani

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1965 2015 स्वर्ण जयन्ती

50 Years of Service to the Nation

Professor Marco Foiani

Prof. Foiani did his graduation in Biological Sciences from University of Milan in 1985 and,after spending a year in Italian Army, he pursued his Ph.D. in Molecular biology from University of Milan and earned it with highest honors. In1989, he moved to NIH, U.S.A. as Fogarty fellow for his postdoctoral research. In 1991 he moved back to Milan and joined University of Milan as Assistant professor. At Milan university, and later at IFOM, his group studied different cellular processes (chromosome replication, translation, DNA recombination, DNA repair, DNA topology, transcription, autophagy) and regulatory pathways (translational control, cell cycle, checkpoint, sumo and ubiquitin pathways, protein acetylation, gene gating). His studies had a strong impact in the field of genome instability and he is thus considered one of the leading scientists in the chromosome dynamics and genome integrity field. His ground **breaking research activities earned him prestigious awards and recognitions over the years. A few of them are (Biotech award (AMGEN), Chiara D'Onofrio award, Member of EMBO, Member of the Academia Europaea). He is also Member of theeditorial board of Cell.**He also has the distinction of becoming the youngest full professor at the University of Milan, Italy.At present, Prof. Foiani is the Scientific Director of IFOM - The FIRC Institute of Molecular Oncology Foundation, a cutting-edge science and technology center which focuses on the study of the molecular mechanisms of cancer formation and development. Main branch of IFOM is in Milan while three IFOM outstations are located in Turin (Italy), Singapore and Bangalore (India). As Director, Prof. Foiani is responsible for the research strategic planning, the development of programs that aim to bring out the results into practice and for the establishment of national and international co-operation programs and joint ventures. In addition, he is founder and vice President of CEN (the European Center of Nanomedicine) and director of the Cancer Genetic Test laboratory at Cogentech.

The major scientific contributions of the Foiani's laboratory are as follows: 1. The finding that the ATR/Mec1-mediated checkpoint response controls the stability of stalled replication forks preventing fork reversal (Lopes et al. Nature 2001; Sogo et al. Science, 2002 (with cover and preview));2.The identification and characterization of sister chromatid junctions (hemicatenanes) that contribute to physiological and pathological chromosomal transitions (Lopes et al. Mol Cell 2003; Cotta-Ramusino et al. Mol Cell 2005; Liberi et al. Genes &Dev 2005); 3. The finding that Cdk1 controls DNA end resection, homologous recombination and checkpoint activation (Ira et al. Nature 2004); 4. The finding that specialized sumoylation pathways control hemicatenane metabolism when cells experience DNA damage in S phase (Branzei et al. Cell 2006 (with preview); Branzei et al. Nature 2008); 5.The characterization of genomic clusters that undergo DNA topoisomerase 2-mediated topological transitions to coordinate the clash between replication forks and transcription units (Bermejo et al. Genes &Dev 2007; Bermejo et al. Cell 2009); 6. The finding that the ATM/Tel1 checkpoint controls the stability of replication forks encountering DNA breaks or short telomeres, preventing fork reversal (Doksani et al. Cell 2009 (with cover and preview)); 7.The identification and characterization of those fragile genomic loci where replication forks converge (Fachinetti et al. Mol Cell 2010 (with cover and preview)); 8.The observation that specialized protein acetylation/deacetylation events couple the DNA damage response to autophagy (Robert et al. Nature 2011); 9. The finding that the ATR/Mec1 checkpoint controls the stability of replication forks encountering transcribed genes by controlling the association of the transcribed loci to the nuclear pore (Bermejo et al. Cell, 2011 with preview);10. The finding that ATR initiate checkpoint signaling in response to mechanical stress (Kumar et al. Cell, 2014 with preview).
M.Foiani has trained more than 100 undergraduate students, PhD students and postdocs. Some of them have been very successful and initiated their research laboratories in different parts of the world and continued their careers as group leaders, postdocs at prestigious universities/research institutes.

M.Foiani is author of more than 90 articles in peer-reviewed journals. He has published 22 reviews on different topics (DNA replication/recombination/checkpoint). Out of these 1 ***TiBS***; 1 ***Nature*** (N&V); 2 ***Nat.Rev.Mol Cell Biol.***; 2 ***Cell***; 2 ***G&D***; 1. ***Mol Cell.***; 1 ***Curr.Op.Cell. Biol.***.His paper received 10 evaluations from ***Faculty of 1000***. The citations can be visualized below.

He has organized several international conferences (EMBO, GRC, J,Monod etc.) on the topics described above and he is routinely an invited speaker at international meetings. He currently supervises a group of 15 scientists.

An integrated network controlling cell plasticity, cell migration and genome integrity.

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Eukaryotic cells control genome integrity by coupling cell cycle progression with DNA repair. Specialized PI3-kinases have evolved to coordinate the different DNA repair options with the cell cycle phases and with chromosome dynamics.

The ATR and ATM PI3-kinases counteract aberrant transitions at replicating chromosomes by controlling the clash between replication forks and transcription units and by preventing dangerous recombination events. ATR and ATM also modulate nuclear plasticity in response to topological forces arising when chromosomes undergo replication and condensation or when cells experience mechanical stress.

I will discuss observationsconnecting the response to mechanical stress with the response to DNA damage within the context of cell plasticity and cell migration.

CSIR-INDIAN INSTITUTE OF TOXICOLOGY RESEARCH

(COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH)

CSIR-IITR, Lucknow is the only multidisciplinary research institute in the field of toxicology in South East Asia with the motto:

Safety to Environment & Health and Service to Industry

R&D Areas

- Food, Drug & Chemical Toxicology
- Environmental Toxicology
- Regulatory Toxicology
- Nanotherapeutics & Nanomaterial Toxicology
- Systems Toxicology & Health Risk Assessment

Recognitions

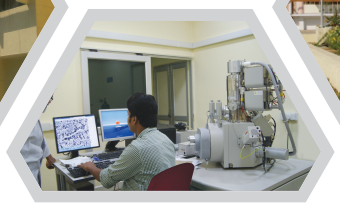
- Scientific & Industrial Research Organizations (SIROs)
- UP Pollution Control Board (Water & Air)
- Indian Factories Act (Drinking Water)
- Bureau of Indian Standards (Synthetic Detergents)
- Food Safety & Standards Authority of India (FSSAI)

Services Offered

- GLP certified for pre-clinical toxicity studies
- NABL accredited
- Safety / toxicity evaluation of NCEs
- Water quality assessment and monitoring
- Analytical services
- Environmental monitoring and impact assessment
- Epidemiological studies
- Information on chemicals / products

Technologies Developed / Available

- Water Analysis Kit
- Mobile Laboratory Van for on spot water quality analysis
- Argemone Detection Kit for rapid screening of Argemone in mustard oil
- CD-Strip for detection of butter yellow, an adulterant in edible oils
- Arsenic Detection Kit



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