Leopoldina
Nationale Akademie
der Wissenschaften

Curriculum Vitae Professor Dr Andrea Musacchio

Image: Roberta Palumbo

Name: **Andrea Musacchio**
Born: **11 July 1964**

Research Priorities: Cell division, chromosomes, mitotic spindle, centromeres, kinetochores

Andrea Musacchio is an Italian structural biologist. He studies the molecular mechanisms of cellular division. Amongst other things, these are important to the study of genetic alterations.

Academic and Professional Career

since 2012	Honorary Full Professor, Universität Duisburg-Essen, Duisburg-Essen, Germany
since 2011	Director, Section Mechanistic Cell Biology, Max Planck Institute for Molecular Physiology, Dortmund, Germany
2003 - 2011	Senior Group Leader, Department of Experimental Oncology, European Institute of Oncology, Milan, Italy
1999 - 2003	Junior Group Leader, Department of Experimental Oncology, European Institute of Oncology, Milan, Italy
1995 - 1998	Postdoctoral Fellow, Harvard Medical School, Boston, USA
1991 - 1995	PhD in Biochemistry, European Molecular Biology Laboratory (EMBL), Heidelberg, Germany
1985 - 1990	Studies in Biology, Tor Vergata University of Rome, Rome, Italy

Functions in Scientific Societies and Committees

since 2023	Member, Scientific Advisory Board, Human Technopole, Milan, Italy
2017 - 2020	Senior Editor, eLife, eLife Sciences Publications, Cambridge, UK
2016 - 2018	Member, Scientific advisory Committee, Armenise-Harvard Foundation, Boston, USA

2015 - 2021	Member, Perspectives Committee, Max Planck Society, Munich, Germany
2015 - 2017	Member, Expert Advisory Board, eLife, eLife Sciences Publications, Cambridge, UK
2014 - 2020	Member, Editorial Board, Journal of Structural Biology
2014 - 2019	Speaker, Chemical and Molecular Biology, International Max Planck Research Schools (IMPRS)
since 2012	Member, Advisory Board, Biology Open
2011 - 2017	Chair, LS1 Review Panel for ERC Starting Investigator Grants, European Research Council (ERC)
2011 - 2017	Advisory Editor, EMBO Journal
2009 - 2020	Advisory Editor, EMBO Reports
since 2009	Member, Editorial Board, Cell Research
since 2009	Member, Editorial Board, Journal of Cell and Molecular Biology
2006 - 2020	Associate Editor, Chromosoma
2003 - 2006	Scientific Director, Milan Branch, European School of Molecular Medicine, SEMM Foundation, Milan, Italy

Project Coordination, Membership in Collaborative Research Projects

2021 - 2027	Synergy Grant (SyG) “BIOMECANET – Integration of the Biochemical and Mechanical Networks of Cell Division”, ERC
2015 - 2020	Senior Investigator Grant (StG), “RECEPIANCE – Molecular reconstitution of epigenetic centromere inheritance)”, ERC
2008 - 2013	Senior Investigator Grant (StG), “KINCON – Molecular bases of kinetochore-microtubule attachment and their implications for cell cycle control)”, ERC

Honours and Awarded Memberships

2023	Member, German National Academy of Sciences Leopoldina, Germany
2020	Gottfried Wilhelm Leibniz Award, German Research Council (DFG), Germany
since 2009	Member, European Molecular Biology Organization (EMBO)
2006	Chiara D'Onofrio Prize, Chiara D'Onofrio Foundation, Italy
2000 - 2004	Young Investigator, EMBO
1999 - 2004	Scholar, Italian Foundation for Cancer Research, Italy

1997 - 1998 Senior Postdoctoral Fellow, American Cancer Society Senior, USA

1995 - 1997 Postdoctoral Fellow, Human Frontier Science Program, International Human Frontier Science Program Organization (HFSPO), Strasbourg, France

Research Priorities

Andrea Musacchio is an Italian structural, molecular, and cell biologist. He studies the molecular mechanisms of cell division, with important implications for the study of genetic alterations in tumors and other diseases.

Andrea Musacchio's focus in on the processes that enable errorless distribution of the genome from a mother to its daughter cells. During mitosis, chromosomes consist of two identical, connected copies. During cell division (mitosis) the chromosomes attach themselves to a framework called the mitotic spindle. The attachment involves complex structures called kinetochores. As soon as the chromosomes are all arrayed on the spindle through such attachments, they are disconnected and redistributed towards both ends on the dividing mother cell. Thus, each daughter cell inherits the same chromosomal make-up.

Musacchio's group focuses on the study of kinetochores. Kinetochores provide the chromosomes with points of attachment onto the mitotic spindle during cell division. In addition to that, kinetochores also govern control mechanisms that correct errors during attachment to the microtubules of the mitotic spindle and that coordinate the timing of chromosome disconnection with the achievement of alignment. These mechanisms are vital for cell viability, as their suppression would lead to mistakes during the division of chromosomes, in turn causing the daughter cells to inherit the wrong number of chromosomes. Thus, kinetochores are pivotal for the inheritance of the genome and the propagation of life.

In his research, Andrea Musacchio combines biochemical reconstructions with structural and cell biological analyses to gain insight into the function of kinetochores. His working group was able to reconstitute in vitro kinetochore particles that contain all known core subunits. Similarly, it reassembled one of the aforementioned error correction mechanisms with purified components. Using X-ray crystallography and single-particle cryo-electron microscopy, Musacchio's group determined the structures of the kinetochore's crucial modules and used this information to introduce precise, targeted perturbations to address function. These approaches are allowing Musacchio to elucidate fundamental unknown functional aspects of kinetochore's biology.