

## CURRENT POSITION

Full Professor Comparative Anatomy and Cytology

## EDUCATION

1988 BSc Cum laude in Biology–Siena Univ.

1993 PhD Invertebrate Cell Biology–Siena Univ.

## FACULTY DUTIES

2010-2012 Vice chair of Evolutionary Biology Dept.

2010-2011 PhD program Director Evolutionary Biology

2011-2016 PhD program Director Life Sciences

2013- Vice chair of Life Sciences Dept.

2009- Head Electron Microscopy core facility. Dept. Life Sciences

2016-2022 Rector's delegate for Siena University PhD courses

## MEMBERSHIPS

1995- American Society for Cell Biology

1998- Italian Society for Pure and Applied Biophysics

2000- Italian Union of Zoologists

2007- European Microscopy Society

2007- Italian Society of Microscopy Sciences

2016- Research associate CNR Institute for Protein Biochemistry (Naples)

2018- Accademia dei Fisiocritici (Siena)

## LECTURING

Second level Univ. Degree:

3D modeling of cell components

Parasitology

## PhD Courses

Functional morphology of cell components

Scientific Writing

## INTERNATIONAL COURSES LECTURING

May 1991 University of Coimbra, Portugal: Introduction to Electron microscopy and biochemical systematics in insects

June 1999 University of Siena: First practical course of Criotechniques for Electron Microscopy

August 2000 UENF rio de Janeiro: Ultrastructural Cell Biology

February 2006 NIHE Hanoi, Vietnam: Electron microscopy in cell biology and microbiology

September 2008 Foggia (IT). Microscopy Workshop

May 2015 Siena (IT). The Biology of Cilia and Flagella

## RESEARCH ACTIVITY

The research activity is focused on the intensive use of both light and electron microscopies for studies on cell motility, functional morphology, and phylogeny in several invertebrates. In the last decade PL dedicated full time to the coordination of research projects aimed at the production of high resolution models of eukaryotic flagellar components such as the intraflagellar transport complexes, the transition zone and the ciliary tip. PL researches allowed the publication of more than 100 papers on international peer review journals and have good prospects for further developments thanks to the cultural environment consolidated in the Dept. and to the technological implementations for which PL has been active for years. The experiences developed through a solid basic preparation attained in Siena, were then consolidated through training experiences and scientific collaborations activated in some of the internationally recognized laboratories for ultramicroscopic techniques in cell biology. PL has in fact actively contributed in recent years to implement the already competitive electron microscopy laboratory of the Life Sciences Dept. taking a leading role in fund raising necessary to purchase, install and operate a FEG cryomicroscope equipped with a high contrast and resolution CCD camera, and software to perform 3D electron microscopy. Thanks to the constant support by the Siena University,

Novartis, GSK, and colleagues of the Life Sciences Department, PL has managed in recent years to found and coordinate a research group in which are actively involved one full-time researcher, two technicians with high skills in electron microscopy, three PhD students and some students. The group works in constant collaboration with some internationally renowned researchers to carry out studies on the functional morphology of flagellar components. PL research group has operated with the economic support of MIUR (PRIN projects), Telethon, AIRC and local grants. The lab also developed with Novartis research laboratories a fruitful collaboration, currently continuing with GSK Vaccines. Also the University of Siena through the funds of the MPS Foundation contributed to co-finance the constant technological implementations of the laboratory that currently consists of 1 ESEM, 1 SEM and 4 TEM, Vitrobot and Reichert ultra-rapid freezers for cryoTEM, 3 ultramicrotomes, 2 freeze etching units. Thanks to the instrumental equipment as well as the recognized technical skills available in the EM laboratory directed by PL, there are significant requests for third party services whose deriving incomes are constantly re-invested in technological implementations necessary to maintain the competitiveness of the research facility.

#### RESEARCH GRANTS

GSK (P.Lupetti) 2019-2025

Ultrastructural analyses on biological samples of interest for vaccinology.

FAB-LAB (P. Lupetti) 2020

Interdepartment project to set up of correlative microscopy platform

Role: PI

AIRC IG 2014 Id.15564 (L. Bracci) 2015 - 2018

Synthesis and biological validation of novel cancer selective theranostic nanodevices

Role: Co-investigator

PRIN 2009JNTZ4L (P. Lupetti) 2011 - 2013

High resolution structural analyses of in situ and purified Intraflagellar Transport (IFT) complexes.

Role: PI

TELETHON GGP07269 (P. Lupetti) PI 2007 - 2011

High resolution structural study of the in situ and purified intraflagellar transport (IFT) complex: key molecular machinery essential for ciliogenesis and the cellular basis for PKD (polycystic kidney disease).

Role: PI

NOVARTIS (P. Lupetti) 2010 -2015

Ultrastructural analyses on biological samples of interest for vaccinology.

MPS 35578 II (Italy) (Lupetti, Dallai, Rappuoli, Ferlenghi) 2009 - 2010

High resolution 3D modelling of macromolecular complexes for the development of new vaccines and therapies.

MPS 35578 I (Italy) (Lupetti, Dallai, Rappuoli, Ferlenghi) 2008 -2009

High resolution 3D modelling of macromolecular complexes for the development of new vaccines and therapies.

PRIN 2004050349 (P. Lupetti) 2004 - 2006

High resolution structural studies of in situ and purified flagellar components.

Role: PI

PRIN 2002051513 (R. Dallai) 2002 - 2004

Structure and function of invertebrate male germ cells.

Role: Co-investigator

#### COLLABORATIONS

- Dept. of Molecular Cellular and Developmental Biology. Prof. Joel Rosenbaum. Yale University (CT) U.S.A. Electron tomography of intraflagellar transport complexes, transition zone and flagellar tip.

- Prof. Salvatore Lanzavecchia. Milan Univ. 3D modeling of cilia and flagella.

- NIH Zurich. Dr. Takashi Ishikawa. Cryo electron microscopy of radial spokes from Tetrahymena flagellar fractions.

- Department of Cell Biology and Physiology. Prof. John Heuser. Washington University in St. Louis. (MO) U.S.A. Development and applications of electron microscopy cryotechniques for the study of invertebrates cell components.

- Lab. Biochimie et Biologie Moléculaire des Insectes, Institut Pasteur, Paris. Structural studies of

malaric Plasmodia.

- NOVARTIS, Siena. Structural characterization of macromolecules of biomedical interest.
- GSK, Siena. Imaging of biological samples of immunological interest.

#### VISITING FOREIGN INSTITUTIONS

- (Oct. '95 -Dic. '95) Dept. of Cell Biology and Physiology. Washington University in St. Louis (U.S.A.) Training in cryotechniques for electron microscopy.
- (Nov. '96) Dept. of Cell Biology and Physiology. Washington University in St. Louis (U.S.A.) Molecular structure of axonemal dyneins using the quick-freeze, deep-etching technique
- (Nov. '97) Dept. of Cell Biology and Physiology. Washington University in St. Louis (U.S.A.) Cell motility of some Apicomplexa protozoa by in vivo, confocal laser microscopy and electron microscopy techniques.
- (Dec. '98) Dept. of Cell Biology and Physiology. Washington University in St. Louis (U.S.) Further research on the motility of Apicomplexa protozoa.
- (Nov.2004-Dec.2004). Dept. of Molecular Cellular and Developmental Biology Yale University (CT) USA Learn the basics on the biology of Chlamydomonas to study the functional morphology of eukaryotic cell flagella.

#### TALKS IN INTERNATIONAL MEETINGS

- 3rd International Seminar on Apterygota. Siena, Italy, 1989
- VII International Colloquium on Apterygota, Helsinki. Finland, 1992.
- XII Congresso della Società Italiana di Biofisica pura ed applicata. Padova, Italy 1996
- XX International Congress of Entomology. Firenze, Italy, 1996
- 60° Congresso Nazionale Unione Zoologica Italiana. Pavia, Italy, 1999
- 4th International Malpighi Symposium. Rome, 1999
- 62° Congresso Nazionale Unione Zoologica Italiana. Sanremo, Italy, 2001
- FASEB Meeting The Biology of Cilia & Flagella. Vermont USA, 2007
- Dynein 2013, Kobe, Japan
- Cilia 2014, Paris, France

#### INVITED TALKS

- Dip. di Biologia, Univ. di Padova 1991
- Institute Pasteur, Paris, France, 1998.
- ESALQ-NAP-MEPA Sao Paulo Univ., Brazil 1999
- Centro de Biotecnologia UENF Rio de Janeiro Brazil 1999
- Laboratorio de Ultraestrutura Celular Herta Meyer. Univ. Federal do Rio de Janeiro, Brazil 2000
- XXI International Congress of Entomology Foz do Iguassu. Brazil, 2000
- Dip. di Scienze Ambientali Università della Tuscia, Viterbo, 2000
- 5th Multinational Congress of Electron Microscopy. Lecce, 2001
- XIX Congresso Nazionale di Entomologia. Catania, 2002
- NATO. Biofisica CNR Pisa, 2004
- Wellcome Trust Centre for Human Genetics. University of Oxford. UK, 2004
- Dept. of Molecular Cellular and Developmental Biology. Yale University. USA 2004
- XX Congresso Nazionale Italiano di Entomologia. Assisi, 2005
- Biology of Spermatozoa 8. Sheffield, UK, 2005
- International Workshop Dynein 2005. Kobe, Japan 2005
- National Institute of Hygiene and Epidemiology. Hanoi. Vietnam, 2006
- 16th International Microscopy Congress. Sapporo. Japan. 2006
- FASEB Meeting Biology of Cilia and Flagella. Vermont. USA. 2007
- YALE University. MCDB Seminar Series. USA, 2007
- ENEA. Centro Ricerche Casaccia. Roma, 2007
- ISI Università di Genova, 2008
- DIBIT 1. Ospedale San Raffaele. Milano, 2008
- Dynein meeting Kobe, Japan 2009
- Dept. of Cell Biology University of Massachusetts USA 2010
- Gordon Conference: Cilia, mucus and mucociliary interactions. Lucca 2010

Istituto di Biochimica delle Proteine CNR Napoli. 2017  
Organizing committee member: Dynein meeting Kobe Japan Nov. 2013.

#### EDITORIAL ACTIVITY

2012- Editor in chief Tissue&Cell (Elsevier)

#### REVIEWER ACTIVITY

Nature Structural Biology

Journal of Cell Biology

Journal of Cell Science

Micron

Molecular Biology Reports