



# Basic Issues in Evolution

## A Darwin 200 Symposium

Venice, May 2-4, 2009

Istituto Veneto di Scienze, Lettere ed Arti  
Palazzo Franchetti



Istituto Veneto  
di Scienze Lettere  
ed Arti

### Speakers

WERNER ARBER  
GIORGIO BERNARDI  
JOHN BUCKERIDGE  
LUIGI LUCA CAVALLI-SFORZA  
BRYAN CLARKE  
RITA COLWELL  
GIAN ANTONIO DANIELI  
ERIC DAVIDSON  
CHRISTIAN DE DUVE  
WALTER ERDELEN  
MARCUS W FELDMAN  
GARY FELSENFELD  
WALTER GEHRING  
TAKASHI GOJOBORI  
DANIEL HARTL  
NICOLE LE DOUARIN  
RITA LEVI-MONTALCINI  
GABRIEL MACAYA  
WILLIAM MARTIN  
LEOPOLDO MAZZAROLLI  
ALESSANDRO MINELLI  
GERD MÜLLER  
WERNER MÜLLER  
TOMOKO OHTA  
NORIHIRO OKADA  
ENGELBERT RUOSS  
NORI SATOH  
VITTORIO SGARAMELLA  
MAXINE SINGER  
MARC VAN MONTAGU  
MARVALEE WAKE  
JAMES D. WATSON  
EMILE ZUCKERKANDL

Overview of the Contributions of scientific research to the understanding fundamental mechanisms of evolution and identification of missing links and priorities for future research.

### Organizing Committee

GIORGIO BERNARDI (Istituto Veneto di Scienze, Lettere ed Arti, Venezia;  
Stazione Zoologica Anton Dohrn, Napoli)  
GIAN ANTONIO DANIELI (Istituto Veneto di Scienze, Lettere ed Arti, Venezia;  
University of Padova)  
WALTER ERDELEN (UNESCO, Paris)  
ALESSANDRO MINELLI (Istituto Veneto di Scienze, Lettere ed Arti, Venezia;  
University of Padova)  
ENGELBERT RUOSS (UNESCO-BRESCE, Venezia)  
TALAL YOUNÈS (IUBS, International Union of Biological Sciences, Paris)

### Program

#### Saturday, May 2<sup>nd</sup> 2009

**8.30 a.m.** Participants Registration

**9.00 a.m.** Welcome and Introduction to the Symposium

LEOPOLDO MAZZAROLLI (Istituto Veneto di Scienze, Lettere ed Arti, Venezia)  
JOHN BUCKERIDGE (International Union of Biological Sciences, Paris)  
ENGELBERT RUOSS (UNESCO Office in Venice)  
WALTER ERDELEN (UNESCO, Paris)  
*The Charles Darwin Year 2009 and UNESCO*  
RITA LEVI-MONTALCINI (European Brain Research Institute, Roma)

#### Session 1: Fundamental aspects of evolution

Chairpersons: ANGELO AZZI (Tuft University, Madford, USA), DAVID STEWART (Cold Spring Harbor laboratory, New York)

**10.00 a.m.** CHRISTIAN DE DUVE (Institute of Cellular Pathology, Bruxelles)  
*A darwinian look into the future*

**10.30 a.m.** WERNER ARBER (University of Basel)  
*The impact of microbial genetics on the theory of molecular evolution*

**11.00 a.m.** - Coffee



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- 11.30 a.m.** TOMOKO OHTA (National Institute of Genetics, Japan)  
*Drift and selection in evolution of complex systems*
- 12.00 p.m.** GIORGIO BERNARDI (Stazione Zoologica Anton Dohrn, Napoli)  
*The neoselectionist theory of genome evolution*
- 12.30 p.m.** General Discussion: *Contribution of basic science to the understanding of evolutionary processes*
- Chairperson: LARS JERMIIN (Sydney University)
- 1.00 p.m. - Lunch**

## Session 2: Evolutionary genomics

- Chairpersons: ERWIN BECK (University of Bayreuth), JEAN-MARC JALLON (Paris-Sud University)
- 2.30 p.m.** EDWARD TRIFONOV (University of Haifa)  
*Towards the earliest steps of molecular evolution*
- 3.00 p.m.** MARC VAN MONTAGU (European Federation of Biotechnology)  
*On the evolution of plant genomes*
- 3.30 p.m.** GARY FELSENFELD (NIH, Bethesda)  
*Chromatin and the evolution of regulatory mechanisms*
- 4.00 p.m. - Coffee**
- 4.40 p.m.** VITTORIO SGARAMELLA (Parco Tecnologico Padano - CERSA, Lodi)  
*Structural variations of the somatic genome in development and evolution*
- 5.00 p.m.** NORIHIRO OKADA (Tokyo Institute of Technology)  
*Multiple SINE insertions made our brain mammalian?*
- 5.30 p.m.** General Discussion: *Genetic mechanisms of evolution*
- Chairperson: RALF RESKI (University of Freiburg)

## Sunday, May 3<sup>rd</sup> 2009

### Session 3: Evolutionary developmental biology

- Chairpersons: JEAN DAVID (LEGS-CNRS, Gif sur Yvette FR), FRANCESCO SALVATORE (University of Napoli Federico II)
- 9.30 a.m.** BRYAN CLARKE (University Park, Nottingham)  
*The importance of natural history to understanding molecular biology*
- 10.00 a.m.** WALTER GEHRING (University of Basel)  
*Darwinian evolution of eyes and photoreceptors*
- 10.30 a.m. - Coffee**
- 11.00 a.m.** EMILE ZUCKERKANDL (Institute of Molecular Medical Sciences in Palo Alto)  
*Epigenetic plasticity and evolution*
- 11.30 a.m.** GERD MÜLLER (Istituto Veneto di Scienze, Lettere ed Arti, Venezia; University of Wien)  
*The extended evolutionary synthesis*
- 12.00 p.m.** General Discussion: *Developmental biology and evolutionary theory*
- Chairperson: ETTORE OLMO (Università politecnica delle Marche, Ancona)
- 12.30 p.m.** Special UNESCO-ICTP Session: *Latest developments from physics for the study of evolution*
- Chairperson: TALAL YOUNÈS (IUBS)
- 1.00 a.m. - Lunch**

### Session 4: The evolutionary tree of life

- Chairpersons: PIETRO CALISSANO (European Brain Research Institute, Roma), MOTONORI HOSHI (Open University of Japan)
- 2.30 p.m.** WILLIAM MARTIN (Heinrich Heine University, Düsseldorf)  
*Hydrothermal vents and the origin of life (an idea that Darwin might have liked)*
- 3.00 p.m.** WERNER MÜLLER (Johannes Gutenberg University, Mainz)  
*Shaping the root of the metazoan tree of life: Urmetazoa*

- 3.30 p.m.** TAKASHI GOJOBORI (National Institute of Genetics, Japan)  
*Is darwinian evolution the impetus of species differences in the genome network system?*
- 4.00 p.m. - Coffee**
- 4.30 p.m.** NICOLE LE DOUARIN (Collège de France, Paris)  
*The neural crest: a major innovation for the evolution of vertebrates*
- 5.00 p.m.** NORI SATOH (Kyoto University)  
*Notochord, a key organ to understand the evolution of chordates*
- 5.30 p.m.** General Discussion: *Missing links in the tree of life*
- Chairperson: CECILIA SACCONI (CNR, Bari)

## Monday, May 4<sup>th</sup> 2009

### Session 5: Evolution, man and environment

- Chairpersons: FERNANDO ALVAREZ VALIN (University of Montevideo), GIUSEPPE MARTINI (CNR, Roma)
- 9.30 a.m.** MARVALEE WAKE (University of California, Berkeley)  
*Darwinian principles of diversification and today's biodiversity crisis*
- 10.00 a.m.** RITA COLWELL (University of Maryland, College Park)  
*Climate, oceans, infectious diseases: the evolution of vibrio cholerae and cholera*
- 10.30 a.m.** DAN HARTL (Harvard University, Cambridge)  
*Evolutionary pathways of drug resistance*
- 11.00 a.m. - Coffee**
- 11.30 a.m.** MARCUS FELDMAN (Stanford University)  
*Darwin and the human genome*
- 12.00 p.m.** LUCA CAVALLI-SFORZA (Stanford University)  
*Darwin's prophecy on linguistic evolution*
- 12.30 p.m.** General Discussion
- Chairperson: PAOLO AMATI (Sapienza, University of Roma)
- 1.00 p.m. - Lunch**

### Session 6: Evolution in education

- Chairpersons: TELMO PIEVANI (Istituto Veneto di Scienze, Lettere ed Arti, Venezia, University of Milano Bicocca), GIOVANNI GIACOMETTI (Istituto Veneto di Scienze, Lettere ed Arti, Venezia; University of Padova)
- 2.30 p.m.** MAXINE SINGER (Carnegie Institution of Washington)  
*Teaching evolution in schools*
- 3.00 p.m.** GABRIEL MACAYA (University of Costa Rica)  
*Darwin(ism) in the classroom: science for a renewed citizenship*
- 3.30 p.m.** JOHN BUCKERIDGE (International Union of Biological Sciences, Paris)  
*The Creationist challenge to evolution and science: is this to be taken seriously?*
- 4.00 p.m.** General Discussion: *Conclusions of the Sessions 1 - 6*
- Chairperson: ALESSANDRO MINELLI (Istituto Veneto di Scienze, Lettere ed Arti, Venezia; University of Padova)
- 2.30-4.00 p.m.** UNESCO-BRESCE Web Conference with the participation of WERNER ARBER, CHRISTIAN DE DUVE, WALTER GEHRING, RITA COLWELL and students from selected European Universities (Palazzo Zorzi)
- Chairperson: GIORGIO BERNARDI (Istituto Veneto di Scienze, Lettere ed Arti, Venezia; Stazione Zoologica Anton Dohrn, Napoli)
- 4.30 p.m.** JAMES WATSON
- 5.00 p.m.** Closing remarks and end of the Symposium
- 6.00 p.m.** GIORGIO BERNARDI, GIAN ANTONIO DANIELI, ALESSANDRO MINELLI  
*Summary of the Symposium (in Italian)*