

Curriculum Vitae

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Date, place of birth: February 21 1953, USA

Education:

1971-1973 University of North Wales (UK)

1973-1975 B.A. Harvard University (magna cum laude)

1975-1981 Ph.D. Harvard Medical School (Biochemistry) with A. Efstratiadis

Postdoctoral Training:

1981-1983 Postdoctoral Fellow with G. Khoury, (molecular virology) NCI, NIH

1983-1984 Staff Fellow, (molecular virology) Laboratory of Molecular Virology, NCI, NIH

Academic Appointments:

1984-1988 Instructor in Pediatrics, Harvard Medical School

1985-1988 Faculty, Cell and Developmental Biology, Harvard Medical School

1986-1988 Senior Associate, Howard Hughes Medical Institute

1988-1991 Assistant Professor Biochemistry, Boston U. School of Medicine

1991-1993 Associate Professor Biochemistry, Boston U. School of Medicine

1993-2001 Associate Professor of Medicine, Harvard Medical School

2001- Head of Mouse Biology Unit, EMBL Monterotondo (Rome)

2001- Senior Scientist, EMBL Developmental Biology Unit (Heidelberg)

2001-2003 Inaugural Professor-at-Large, Institute of Advanced Studies, U. of Western Australia

2003- Visiting Professor, University of Western Australia

2005- Professor of Cardiovascular Science, Imperial College London

2007- Founding Director, Australian Regenerative Medicine Institute, Monash U., Melbourne

Hospital Appointments:

1984-1988 Research Associate in Cardiology, Children's Hospital Medical Center

1993- Associate Biologist in Medicine, Massachusetts General Hospital

Major Committee Assignments:

International

2000- Scientific Advisory Committee, Genethon, Paris

2001- Scientific Advisory Board, Harefield Research Foundation, London

2001- EMBL representative, European Life Sciences Forum (ELSF)
 2002- International Mouse Mutagenesis Consortium
 2002- European Group on Life Sciences (EGLS)
 2002- President-Elect, International Society of Differentiation
 2002-2006 Grant Review Committee, Human Frontiers Science Program
 2003- Scientific Advisory Board, Genzyme
 2003-2006 Selection Committee: Chiara D'Onofrio Prize
 2004-2006 Scientific Advisory Board, ISMETT, Palermo
 2004-2006 President, International Society of Differentiation
 2005- Scientific Advisory Board, Institute of Advanced Studies, U. Western Australia
 2005- Grand Jury, Descartes Prize
 2005- Scientific Advisory Board, Keystone Symposia
 2006- Grand Jury, Koerber Prize
 2005-2009 Scientific Advisory Board, Max F. Perutz Laboratories, Vienna
 2007- Scientific Advisory Board, Center for Molecular Medicine, Vienna
 2008- Scientific Advisory Board, Institute of Molecular Biology and Biotechnology, Heraklion, Crete

European Molecular Biology Laboratory

2001 Animal Care Committee
 2002 Grants Committee
 2002 - Organiser, Centre for Disease Mechanisms

Professional Societies:

1988- American Society for Biochemistry and Molecular Biology (member)
 1992- American Society for Cell Biology (member)
 1994- Society for Developmental Biology (member)
 1996- Society for Developmental Biology (Board of Trustees)
 1997- Society for Developmental Biology (Northeastern Representative)
 2001- European Life Sciences Forum (EMBL Representative)
 2001- Australia and New Zealand Society for Cell and Developmental Biology
 2002- European Molecular Biology Organization (EMBO)

Editorial Boards

1992-1998 Editorial Board, Molecular and Cellular Biology
 1993- 2001 Editor, New England Journal of Medicine (Consultant in Molecular Medicine)
 1995- Editorial Board, Developmental Biology
 2001- Guest Editor, BioMedNet (mouse models of diseases reviews)
 2003- Editorial Board, Developmental Dynamics
 2004- Editorial Board, Rejuvenation Research
 2007- Founding Editor, Disease Models and Mechanisms

Awards and Honors:

1978-1979 Paul Mazur Fellowship in Experimental Biology
 1979-1981 National Institute of Health Student Fellowship
 1981-1983 Damon Runyon-Walter Winchell Cancer Fund Postdoctoral Fellowship
 1989-1990 Whitaker Health Sciences Award (Massachusetts Institute of Technology)
 1991-1996 Established Investigator Award, American Heart Association
 2002 Ferrari-Soave Prize in Cell Biology (University of Torino)
 2002 EMBO member
 2009 Doctor *honoris causa*, Université Pierre et Marie Curie, Paris

PART II: Research and Teaching

A. Research contributions as an independent investigator (with major publications)

Overview: My background is in molecular biology, with principle fields of expertise in mammalian molecular genetics, developmental biology, biology of ageing and regenerative medicine. A specific focus on skeletal muscle and heart disease has led to several discoveries in the past decade with significant therapeutic potential. My major contributions are summarized below:

Mammalian gene structure: While a PhD student at Harvard in the 1970s, I cloned and characterised the first mammalian globin and insulin gene sequences with Walter Gilbert, who won the Nobel prize for this work. (*Cell* 1979, 2 papers).

Mammalian transcriptional control: As a postdoctoral fellow at NIH I designed new experimental approaches building on my molecular virology expertise, that led to my discovery of the first enhancer in the human genome (*Science* 1983).

Muscle gene developmental regulation: In my first independent lab at Harvard, we applied this approach to characterize the first downstream enhancer in a mammalian gene, and defined it as a direct target for myogenic factors (*Genes and Development* 1988).

Epigenetic regulation of embryonic pattern: We provided the first evidence for an embryonic muscle patterning mechanism involving selective gene accessibility through site-specific methylation, representing a new strategy for maintaining pattern in embryonic development and an important component of tissue remodelling and regeneration in the adult (*Cell* 1992, *Development* 1995). In a related project we cloned and characterized Zbu1, a novel human muscle protein belonging to the helicase superfamily involved in regulating gene accessibility (*Developmental Biology* 1996).

Heart development: We demonstrated an essential role for retinoids in vertebrate heart growth and patterning, and defined the molecular mechanisms of anteroposterior chamber specification in the developing heart (*Development* 1999, 2003). In 1999 I co-published a book with Prof. Richard Harvey, *Heart Development*, which is considered the “bible” of the field. We are now preparing its sequel, *Heart Development and Regeneration*.

Regulation of muscle differentiation, hypertrophy and regeneration: We described novel signaling pathways responsible for the hypertrophic action of Insulin Growth Factor-I on skeletal muscle cells, involving the GATA family of transcription factors and the ubiquitin-proteasome pathway (*Nature* 1999, *Nature Genetics* 2001, *J Clin Invest* 2005, *Circ Research* 2005). Our recent work has implicated the NFkB pathway in the modulation of muscle hypertrophy and regeneration (*J Clin Invest* 2006) and has established a role for specific calcineurin isoforms in muscle and heart regeneration (*J Cell Biol* 2007, *Endocrinol* 2008). *Invited reviews J Mol Med, Trends Immunol.*

Stem cell-mediated regeneration: We described a stem cell-mediated repair mechanism whereby the IGF-1 increases recruitment of proliferating bone marrow cells to injured muscles, accompanied by elevated bone marrow stem cell production in response to distal trauma, readily converting co-cultured bone marrow to muscle (*PNAS* 2004). Using mouse genetic modeling we have established a role for macrophage polarization in skeletal muscle regeneration (*PNAS* 2009). *Invited reviews: New England J Med, Scientific American, EMBO Reports, Nature Reviews Drug Discovery.*

Enhanced regeneration of the mammalian heart. We have exploited the regenerative action of IGF-1 to induce repair of cardiac infarcts without scar formation by modulation of the inflammatory response, and increasing proliferative activity of endogenous cardiac progenitor cells, suggesting novel therapeutic strategies for improving the outcome of myocardial infarction (Circ Research 2007). In a more clinical setting we discovered that elevated myocardial expression of follistatin-like genes is a feature of human heart failure and may be linked to both disease severity and mechanisms underlying recovery, revealing new insight into the pathogenesis of heart failure and offering novel therapeutic targets (Endocrinology 2008). *Invited reviews: Nature Clin Practice.*

Educational contributions

Since establishing an independent laboratory I have trained over 40 PhD students and postdoctoral fellows, and have hosted numerous high school and college students in summer work-study programs. I initiated and organized graduate and medical courses at Harvard Medical School and Boston University School of Medicine, and ran a course on genetics in modern medicine on the HST curriculum (a collaboration between Harvard Medical School and MIT). As an editor at the New England Journal of Medicine, I established and wrote the Molecular Medicine series, and co-organized the Clinical Implications of Basic Research series, to provide our clinical readership with the principles and current advances in medical research. I introduced mice into the curriculum of the Woods Hole Embryology Course where I served as faculty and course organized for several years. For ten years I served as faculty on the annual American Association for Cancer Research Clinical Oncology Workshop. I currently teach heart development at the annual Mouse Genetics Course at Cold Spring Harbor. In 2002 I was a guest faculty member in the second Australian Developmental Biology Workshop. In 2006 I delivered the Howard Hughes Holiday Lectures on *Potent Biology: Stem Cells, Cloning and Regeneration*. At EMBL I participate in the first year graduate course, and have hosted several EMBO workshops in Rome including From Mice to Cells and Mouse Colony Management. At Imperial I participate in a British Heart Foundation Research Excellence Award, supporting interdisciplinary postdoctoral fellowships in cardiovascular medicine.

Other contributions

Mouse biology in Europe: I established EMBL's role in multiple European mouse biology initiatives including EUMORPHIA (EU Integrated Project), a 12-centre initiative to understand human molecular physiology and pathology through integrated functional genomics in the mouse model, and a successive project, EUMODIC (EU Integrated Project): undertaking a primary phenotype assessment of up to 650 mouse mutant lines as a first step towards a comprehensive functional annotation of the mouse genome. EMBL is also a founding Partner in EUCOMM (EU Integrated Project): the European Conditional Mouse Mutagenesis Program, an 11-partner project to place conditional mutations throughout the mouse genome using high-throughput technologies. At EMBL-MR we are coordinating an EU-supported initiative generating and organizing Cre Driver mouse strains representing one of the first international efforts funded through the EU.

EMBL Associate Membership for Australia: I initiated and helped organise Australia's successful application for the first Associate (non-European) membership in EMBL, and am coordinating the establishment of EMBL Partner Laboratories in Australia.

B. Recent Funding Information (research):

2002-2006 EU Integrated project: EUMORPHIA: Understanding human molecular physiology and pathology through integrated functional genomics in the mouse model

2002-2005	Ricerca Finalizzata (Italian Ministry of Health) Gene-enhanced Therapies of Heart Disease
2005-2008	EU STREP: FLPFLEX (Coordinator): A flexible toolkit for controlling gene expression in the mouse
2005-2009	EU Network of Excellence: MYORES: Multi-organismic approach to study normal and aberrant muscle development, function and repair
2005-2008	EU STREP: Gene transfer in skin equivalents and stem cells: Novel strategies for chronic ulcer repair and tissue regeneration
2005-2008	EU Integrated Project: Application and Optimization of Human Stem Cells for Myocardium Repair
2004-2010	Leducq Fondation Transatlantic Network of Excellence in Cardiac Research: Cardiac regeneration
2005-2008	EU Integrated Project: EUCOMM The European Conditional Mouse Mutagenesis Program
2006-2009	EU Integrated Project: EUMODIC The European Mouse Disease Clinic: A distributed phenotyping resource for studying human disease
2005-2009	EU Integrated Project: Heart Failure and Cardiac Repair
2007-2011	Leducq Fondation Transatlantic Network of Excellence in Cardiac Research: Mitral Valve Repair
2008-2013	British Heart Foundation: Research Excellence Award
2008-2011	EU Coordination Action (Coordinator); CREATE: Coordination of resources for conditional expression of mutated mouse alleles

C. Report of Current Research Activities

For the last decade my research has concentrated on the mechanistic basis of mammalian aging and regeneration. A longstanding interest in the biology of insulin-like growth factor isoforms and downstream effectors has led to the development of a novel therapeutic approach to the attenuation of muscle atrophy in aging and the treatment of muscular dystrophies. We are currently focusing on the following areas:

- Signaling pathways in skeletal and cardiac muscle regeneration
- Cell-mediated therapies in heart and muscle disease
- Development of human disease models in mice

D. Report of Teaching

1. Medical Schools

1975-1978	Teaching Fellow, Developmental Biology, Harvard University <i>20 graduate students per class, 6 hrs preparation, 4 hrs contact/wk/semester</i>
1975-1978	Teaching Fellow and Lecturer, Genetics, Harvard University <i>30 graduate students per class, 10 hrs preparation, 4 hrs contact/wk/semester</i>
1978-1980	Teaching Fellow, Gene Structure and Expression, Harvard University <i>20 graduate students per class, 10 hrs preparation, 4 hrs contact/wk/semester</i>
1987-1988	Teaching Fellow, Biochemistry Harvard Medical School <i>30 medical students per tutorial, 10 hrs preparation, 8 hrs contact/wk/semester</i>

2. Graduate Courses

1987-1990	Faculty, Genetics, Embryology and Reproduction, Harvard Medical School <i>10 medical students, 4 hours preparation, 6 hrs contact/wk/semester</i>
1990-1993	Faculty, Biochemistry, Boston University School of Medicine

- 2001- *350 medical students, 10 hrs preparation, 5 hrs contact/wk/semester*
Faculty, EMBL Predoctoral Course
- 2002 *60 predoctoral students, 5 hrs preparation, 3 hrs contact/wk/semester*
Faculty, 2nd Australian Developmental Biology Workshop, Queensland
20 medical students/residents/faculty, 6 hrs preparation, 20 hours contact

3. Invited Teaching Presentations

- 1995- Lecturer, Grand Rounds (Cardiology) Massachusetts General Hospital
70 medical students/residents/faculty, 3 hrs preparation, 1 hour contact/yr
- 1996 Lecturer, Department of Genetics, Harvard Medical School
50 medical students/residents/faculty, 3 hrs preparation, 1 hour contact
- 1996-99 Lecturer (Pharmacology) Boston University School of Medicine
150 medical students/residents/faculty, 3 hrs preparation, 1 hour contact/yr
- 1999 Lecturer, Grand Rounds (Oncology) Albert Einstein College of Medicine
200 medical students/residents/faculty, 6 hrs preparation, 1 hour contact
- 2003 Lecturer, University of Rome La Sapienza,
50 medical students/residents/faculty, 8 hrs preparation, 8 hours contact

4. Continuing Education Courses

- 1990-1998 Faculty, Research and Update in Neuroscience for Neurosurgeons,
Marine Biological Laboratory, Woods Hole
150 medical students/residents/faculty, 6 hrs preparation, 3 hour contact/yr
- 1994- Faculty, AACR Workshop, Clinical Oncology (Aspen)
120 medical students/residents/faculty, 6 hrs preparation, 20 hour contact/yr
- 1994-1999 Faculty, Embryology Course, Marine Biological Laboratories, Woods Hole)
50 graduate students/faculty, 4 hrs preparation, 10 hour contact/yr
- 1997 Faculty, Molecular Biology in Clinical Oncology (Beijing)
250 medical students/residents/faculty. 10 hrs preparation, 20 hrs contact
- 2002- Faculty, Cold Spring Harbor Mouse Embryology course (NY)
30 graduate students/postdoctoral fellows, 10 hrs preparation, 8 hours contact/yr

5. Teaching Leadership Roles:

- 1992 Course organizer, Advanced Topics in Developmental Biology, Boston U. School
of Medicine.
Designed and taught course, oversaw teaching fellows, examined and graded students
- 1996 Co-organizer, Organogenesis, Harvard Medical School.
Designed and taught course, chose readings, read and graded term papers
- 1998-2001 Co-director, Molecular Biology and Genetics in Modern Medicine, HST
*Organized lectures and clinics, taught lectures, oversaw teaching fellows, designed
quizzes, examined students and graded term papers*
- 2003 Course co-organizer, From Mice to Cells, EMBO
Taught course, oversaw teaching fellows

6. Advisees and Trainees:

Postdoctoral:

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|-----------|-------------------------|--|
| 1985-1988 | Heidemarie Ernst, Ph.D. | Research Asst Professor, Charleston, SC
Medical University of South Carolina, |
| 1986-1989 | Bruce Wentworth, Ph.D. | Director, Cardiovascular Science, Genzyme |
| 1993-2001 | Craig Neville, Ph.D. | Instructor, Massachusetts General Hospital |
| 1994-1997 | Jennifer Moss, Ph.D. | Assistant Professor, Tufts Medical School |
| 1994-1996 | Elena Ceccarelli, Ph.D. | Director, Centre CEA de Saclay, Gif-sur-Yvette |

1994-1996	Hilary Clark, Ph.D.	Scientist, Genetics Institute
1994-1997	Jiang Ping, Ph.D.	Scientist, Advanced Cell Technology
1996-1999	Jose Xavier-Neto, M.D.	Associate Professor, U/ Sao Paulo, Brazil
1996-1999	Antonio Musaro, Ph.D.	Associate Professor, U/Rome la Sapienza, Italy
1998-2000	Lana Tsao, MD	Chief Cardiologist, Beth Israel Hospital
1998-2000	Karl McCullagh, Ph.D.	Research Fellow, Oxford University
1999-2001	Frederic Depreux, Ph.D.	Research Fellow, Harvard Med. School
2000-2003	Angelika Paul, Ph.D.	Research Scientist, Novartis, Boston
2002-2003	Joshua Downer	Research Fellow, U. Colorado, Boulder
2002	Michele Pelosi	Staff Fellow, Mendel Institute, Rome
2003-2008	Foteini Mourkioti	Staff Fellow, Stanford Medical School
2003	Ekatarina Semenova	Staff Fellow, Imperial College London
2003	Enrique Lara-Pezzi	Faculty, CNIC, Madrid
2004	Pascal te Welcher	(current)
2004	Ekaterina Salimova	Grants administrator, EMBL-Monterotondo
2005	Tommaso Nastasi	ELLS, EMBL-Monterotondo
2007	Marianne Hede	(current)
2008	Manlio Vinciguerra	(current)
2008	Joanne Tonkin	(current)
2009	Alexander Pinto	(current)
2009	Arianna Casciati	(current)

PhD students:

1985-1990	Maria Donoghue, Ph.D.	Associate Professor, Yale University
1986-1990	Erick Berglund, Ph.D.	Research Scientist, Hoechst Inc, Germany
1987-1993	Uta Grieshammer, Ph.D.	Instructor, Department of Anatomy, UCSF
1989-1994	Yonghong Xiao, Ph.D.	Research Scientist, LION Bioscience
1989-1995	James Engert, Ph.D.	Professor, McGill University, Montreal
1989-1998	Leslie Houghton, Ph.D.	Research Fellow, MGH
1990-1995	Michael McGrew, Ph.D.	Scientist, Roslin Institute, Edinburgh
1995-1997	Sunjay Kaushal, M.D./Ph.D.	Resident, Harvard Medical School
1997-2001	Michael Shapiro	Assistant Professor, University of Utah
2001-2006	Maria Paola Santini	Senior Research Staff, Imperial College London
2002-2007	Nadine Winn	Staff, Novartis, Basel
2002	Olivier Mirabeau	postdoctoral fellow, Gif-sur-Yvette, France
2004	Paschalis Kratsios	postdoctoral fellow, Columbia U., New York
2005	Caterina Catela	(current)
2005	Lieve Temmerman	(current)
2006	Lars Bochmann	(current)
2009	Janko Gospocic	(current)

E. Regional, national, or international contributions in the past 5 years:

2004

Chair: Keystone Symposium, Cardiovascular Development and Disease, Keystone

Plenary speaker: EGLS symposium, Modern Biology and Visions of Humanity, Genoa

Keynote Speaker: ISMETT Grand Opening, Palermo

Plenary Speaker: 2nd MGH Cardiovascular Conference, Boston, US

Plenary Speaker: 2nd International Conference on Functional Genomics of Ageing, Crete

Plenary Speaker: Weinstein Cardiac Symposium
Plenary Speaker: Myogenesis Gordon Conference, Il Ciocco, Italy

2005

Plenary Speaker: Duchenne Parent Project France, Monaco
Plenary Speaker: Forefronts in Nephrology, Karuizawa, Japan
Plenary Speaker, Annual Meeting, Japanese Society for Regenerative Medicine, Osaka
Plenary Speaker: Telethon Convention, Salsomaggiore, Italy
Plenary Speaker: Keystone Conference on Cardiac Development, Colorado
Plenary Speaker: Novartis Symposium on Heart Failure, London
Plenary Speaker: Latin American Society for Developmental Biology, Brazil
Plenary Speaker: EMBO workshop on myogenesis, Fontevraud, France
Plenary Speaker: International Society for Developmental Biology, Sydney

2006

Plenary Speaker: Keystone Symposium on Cardiovascular Disease, Santa Fe
Plenary Speaker: International Conference on Ageing, Sicily
Plenary Speaker: Skeletal muscle conference, Ascona
Plenary Speaker: FEBS Conference, Istanbul
Plenary Speaker: Basic Cardiovascular Science, Colorado
Plenary Speaker: EMBO conference on regeneration, Ascona
Plenary Speaker: International Society for Differentiation Congress, Innsbruck

2007

Plenary Speaker and Chair: Keystone Cardiovascular Conference, Colorado
Plenary Speaker: Meeting of the Royal Society, London
Plenary Speaker: AGEACTION, Newcastle
Plenary Speaker and organizer: Gordon Myogenesis Conference, Il Ciocco
Plenary Speaker: NIBB-EMBL conference Okasaki
Plenary Speaker: Japanese Society of Developmental Biologists, Fukuoka
Plenary Speaker: FASEB Myogenesis meeting, California
Plenary Speaker: Mouse Models of Disease, Sanger Institute Hinxton
Plenary Speaker: Skeletal Muscle Ageing conference, Texas
Plenary Speaker: SET-Routes International Women in Science Conference

2008

Plenary Speaker: Keystone Conference on Cardiac Hypertrophy, Colorado
Plenary Speaker: Banbury Conference on Muscle Atrophy, Cold Spring Harbor
Plenary Speaker: IGF conference, Adelaide
Plenary Speaker: Stem cell conference, Rome
Plenary Speaker: RIMED conference, Rome
Plenary Speaker: SET Routes Conference, Athens
SET Routes Insight Lecture, EMBL

2009

Plenary Speaker: Lorne Genome Conference, Melbourne
Plenary Speaker: Keystone Symposium on Cardiac Disease, Asheville NC
Plenary Speaker: Interventions on Aging, Volterra, Italy
Plenary Speaker: Gordon Conference on IGF, Ventura CA
Plenary Speaker: Eurogold EMBO Symposium, Singapore
Plenary Speaker: FASEB Myogenesis Meeting, New York

Presidents Lecture: Society for Developmental Biology, San Francisco

Plenary Speaker: IUPS Conference, Kyoto

Plenary Speaker: International Society for Developmental Biology Conference, Edinburgh

Plenary Speaker and Chair: British Heart Foundation Symposium, London

b. Meeting organization

1994 Keystone Symposium on Muscle Development (Co-organizer)

1995 Society for Developmental Biology National Symposium (Co-organizer)

1996 National Institute on Aging Myogenesis Symposium (Co-organizer)

2003 EMBL Molecular Medicine: Mechanisms of Cardiovascular Disease (Co-organizer)

2004 Keystone Symposium on Cardiac Development and Disease (Co-organizer)

2007 Gordon Conference on Muscle Development (Co-organizer)

2009 Keystone Symposium on Cardiac Hypertrophy (Co-organizer)

2011 Gordon Conference on Muscle Development (Organizer)

Full Publication List

Original Articles

Jones, WC, Rosenthal N, Rodakis G, Kafatos FC. Evolution of two major chorion multigene families as inferred from cloned cDNA and protein sequences. Cell 1979; **18**: 1285-1297.

Hardison, RC, Butler ET, Lacy E, Maniatis T, Rosenthal N, and Efstratiadis A. The structure and evolution of four linked rabbit B-like globin genes. Cell 1979; **18**: 1285-1297.

Lomedico P, Rosenthal N, Efstratiadis A, Gilbert W, Kolodner R, Tizard R. The structure and evolution of two non-allelic rat preproinsulin genes. Cell 1979; **18**: 545-558.

Rosenthal N, Kress M, Gruss P, Khoury, G. The BK viral enhancer element and a human cellular homolog. Science 1983; **222**: 749-755.

Donoghue M, Ernst, E, Wentworth B, Nadal-Ginard B, Rosenthal N. A muscle-specific enhancer is located at the 3' end of the myosin light chain 1/3 gene locus. Genes and Dev. 1988; **2**: 1779-1790.

Rosenthal N, Kornhauser J, Donoghue M, Rosen K, Merlie J. The myosin light chain enhancer activates muscle-specific, developmentally regulated gene expression in transgenic mice. Proc. Natl. Acad. Sci. 1989; **86**: 7780-7784.

Braun T, Bober E, Winter B, Rosenthal N, Arnold H. Myf-6, a new member of the human gene family of myogenic determination factors: evidence for a gene cluster on chromosome 12. EMBO J. 1990; **9**: 821-831.

Rosenthal N, Berglund E, Wentworth B, Donoghue M, Winter B, Braun T, Bober E, Arnold H. A highly conserved enhancer downstream of the human MLC1/3 locus is a target for multiple myogenic factors. Nucl. Acids Res. 1990; **18**: 6239-6245.

Wentworth B, Donoghue M, Engert J, Berglund E, Rosenthal N. Paired MyoD binding sites regulate myosin light chain gene expression. Proc. Natl. Acad. Sci. 1991; **88**: 1242-1246.

Ernst H, Walsh K, Rosenthal N. The myosin light chain enhancer and the skeletal actin promoter share binding sites for common nuclear factors. Mol. Cell. Biol. 1991; **11**: 3735-3744.

Donoghue M, Merlie JP, Rosenthal N, Sanes JR. Rostrocaudal gradient of transgene expression in adult skeletal muscle. Proc. Natl Acad. Sci. 1991; **88**: 5847-5851.

Grieshammer U, Sassoon D, Rosenthal N. A transgene target for positional regulators marks early rostrocaudal specification of myogenic lineages. Cell 1992; **69**: 79-93.

Benecke H, Flier JS, Rosenthal N, Siddle K, Klein HH, Moller DE. Muscle-specific expression of the human insulin receptor in transgenic mice. Diabetes. 1992; **42**: 206-212.

Rosen K, Rosenthal N, Villa-Komaroff L. Specific, temporally regulated expression of the insulin-like growth factor II (IGFII) gene during muscle differentiation. Endocrinology 1993; **133**: 474-481.

McGrew M, Rosenthal N. Quantitation of genomic methylation using ligation-mediated PCR. Biotechniques 1993; **15**: 822-729.

Grieshammer U, McGrew M, Rosenthal N. Role of methylation in maintenance of positionally restricted transgene expression in developing muscle. Development. 1995, **121**: 2245-2253.

Xiao Y-H, Grieshammer U, Rosenthal N. Regulation of a muscle-specific transgene by retinoic acid. J. Cell Biol., 1995, **129**: 1345-1354.

Engert J, Servaes S, Sutrave P, Hughes S, Rosenthal N. . Activation of a muscle specific enhancer by the ski proto-oncogene Nucl. Acids. Res. 1995; **23**: 2988-2994.

Moss JM, Price AL, Raz E, Driever W, Rosenthal, N. Green fluorescent protein marks skeletal muscle in murine cell lines and zebrafish. Gene 1995; **173**: 89-98.

McGrew M, Bogdanova N, Hasegawa K, Hughes S, Kitsis R, Rosenthal, N. Distinct gene expression patterns in skeletal and cardiac muscle are dependent on common regulatory sequences in the MLC1/3 locus. Mol. Cell. Biol.. 1996; **16**: 4524-4534.

Neville C, Gonzales D, Houghton L, McGrew M, Rosenthal N. Modular elements of the MLC1/3 locus confer fiber-specific transcriptional regulation in transgenic mice. Dev. Genet. 1996; **19**: 157-162.

Engert J, Berglund E, Rosenthal N. . Proliferation precedes differentiation in IGF-1 stimulated myogenesis. J. Cell Biol. 1996; **135**: 431-440.

Gong X, Kaushal S, Ceccarelli E, Bogdanova N, Clark H, Khatib Z, Valentine M, Look T, Rosenthal N. Developmental regulation of Zbu1/HIP116, a DNA-binding member of the SWI2/SNF2 family. Dev. Biol. 1996; **183 #2**: 166-182.

Slack JP, Grupp IL, Ferguson DG, Rosenthal N, Kranias EG. Ectopic expression of phospholamban in fast-twitch skeletal muscle alters sarcoplasmic reticulum Ca²⁺ transport and muscle relaxation. J. Bio. Chem., 1997; **272**: 18862-18868.

Moss JB, Xavier-Neto J, Shapiro M, Rosenthal N. Dynamic patterns of retinoic acid synthesis and responsiveness in the developing vertebrate heart. Dev. Biol. 1998; **199**: 55-71.

Barton-Davis E, Shoturma D, Musaro A, Rosenthal N, Sweeney L. Viral mediated expression of IGF-1 blocks age-related loss of skeletal muscle function. Proc. Natl. Acad. Sci. 1998; **95**: 15603-15607.

Musaro A, Rosenthal N. Maturation of the myogenic program is induced by post-mitotic expression of IGF-I Mol. Cell. Biol. 1999; **19**: 3115-3124.

Xavier-Neto J, Neville C, Shapiro M, Houghton L, Wang, GF, Nikovits W, Stockdale F, Rosenthal N. A retinoic acid-inducible transgenic marker of sino-atrial development in the mouse heart. Development 1999; **126**: 2677-2687.

Ceccarelli E, McGrew M, Nguyen T, Grieshammer U, Nguyen T, Horgan D, Hughes S, Rosenthal N. An E box comprises a positional sensor for regional differences in skeletal muscle gene expression and methylation Dev. Biol., 1999; **213**; 217-229.

Musaro A, McKullagh K, Naya F, Olson EN, Rosenthal N. IGF-1 induces skeletal myocyte hypertrophy through calcineurin in association with GATA-2 and NF-ATc1. Nature 1999; **400**; 581-585.

Houghton L., Rosenthal N. Regulation of a muscle-specific transgene by persistent expression of Hox genes in post-natal murine limb muscle. Developmental Dynamics, 1999, **216**; 385-397..

Tsao L, Neville C, Musaro A, McCullagh, K, Rosenthal N. Revisiting calcineurin and human heart failure. Nature Medicine, 2000; **1**; 2-3.

Xavier-Neto J, Shapiro M, Houghton L, Rosenthal N. Sequential programs of retinoic acid synthesis in the myocardial and epicardial layers of the developing avian heart. Developmental Biology, 2000, **219**, 129-141.

Musaro A, McCullagh K, Houghton L, Barton ER, Sweeney HL, Rosenthal N. Localized IGF-I transgene expression sustains hypertrophy and regeneration in senescent skeletal muscle. Nature Genetics 2001, **27**: 195-200.

Bruneau BG, Bao ZZ, Fatkin D, Xavier-Neto J, Georgakopoulos D, Maguire CT, Berul CI, Kass DA, Kuroski-de Bold ML, de Bold AJ, Conner DA, Rosenthal N, Cepko CL, Seidman CE, Seidman JG. Cardiomyopathy in *Irx4*-deficient mice is preceded by abnormal ventricular gene expression. Mol Cell Biol. 2001, **21**, 1730-6.

Paul AC, Rosenthal N. Different modes of hypertrophy in skeletal muscle fibers. J. Cell Biol. 2002, **156**: 751-60.

Jiang P, Song J, Gu G, Slonimsky E, Li E, Rosenthal N. Targeted deletion of the *MLC1f/3f* downstream enhancer results in precocious MLC expression and mesoderm ablation. Dev Biol. 2002, **243**:281-9

Barton ER, Morris L, Musaro A, Rosenthal N, Sweeney HL. Muscle-specific expression of insulin like growth factor I counters muscle decline in *mdx* mice. J. Cell Biol. 2002, **157**:137-48.

Prevot V, Rio C, Cho GJ, Lomniczi A, Heger S, Neville CM, Rosenthal N, Ojeda SR, Corfas G. Normal female sexual development requires neuregulin *erbB* receptor signaling in hypothalamic astrocytes. J. Neurosci.2002, **23**: 230-239.

Shapiro M, Henken J, Rosenthal N. Developmental basis of evolutionary digit loss in an Australian lizard. J. Exp. Zoolog. 2003, **297**:48-56.

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