

BIOGRAPHICAL SKETCH*August 7, 2023***Aldea, Marti**Research Professor, Molecular Biology Institute of Barcelona
Researcher ID K-3962-2014 ORCID 0000-0002-8710-5336**EDUCATION/TRAINING**

INSTITUTION AND LOCATION	DEGREE	YEARS	FIELD OF STUDY
Autonomous University of Barcelona, Barcelona, Spain	B.Sc.	1977	Biology
Autonomous University of Barcelona, Barcelona, Spain	B.Sc.	1978	Biochemistry
Autonomous University of Barcelona, Barcelona, Spain	Ph.D.	1982	Biological Sciences

A. Personal Statement

After receiving the Ph.D. degree in Biological Sciences in 1982, I did postdoctoral work with Dr. Miguel Vicente at the Center of Biological Research (CSIC, Madrid) and with Dr. Sidney Kushner at the University of Georgia (USA), trying to understand the mechanisms that coordinate growth and cell division in *Escherichia coli*. In 1992 I joined the University of Lleida to initiate my career as an independent scientist focusing my work on the control of the earliest steps of the cell cycle, willing to understand how cells control proliferation and growth in budding yeast, the first eukaryote where cyclins had been cloned in the early 90's. During this period, we discovered and deeply characterized a cytoplasmic-retention mechanism that controls the cell cycle in G1. Later work at the IBMB lead us to identify a molecular switch for cell cycle entry, and postulate a molecular theory linking cell size control to growth rate, stress and aging. In this regard, my research group has uncovered an unexpected link between protein aggregation and cell cycle entry, pointing to proteostasis decline as a key factor causing cell proliferation decay during aging. As a result of the most recent work, we have shown that interlaced protein degradation machineries impose a timer mechanism that tempers cell size control at Start and, more importantly, tailors G1 length at a single-cell level to diversify cell fitness in populations facing unpredictable environments.

B. Positions**Academic/Research**

INSTITUTION AND LOCATION	POSITION	YEAR(s)
Dept. of Basic Sciences, International University of Catalonia	Chair Professor	Since 2014
Molecular Biology Institute of Barcelona, CSIC, Barcelona	Research Professor	Since 2010
Dept. of Basic Medical Sciences, University of Lleida	Full Professor	1992-2009
Center of Biological Research, CSIC, Madrid	Research Associate	1989-1991
Dept. of Genetics, University of Georgia, Athens, GA, USA	Research Associate	1985-1988
Center of Biological Research, CSIC, Madrid	Postdoctoral Fellow	1983-1984
Dept. Microbiology, Autonomous University of Barcelona	Ph.D. Student	1978-1982

Management

INSTITUTION AND LOCATION	POSITION	YEAR(s)
Spanish Research Agency, Madrid	Chief Research Officer	2017-2019
Molecular Biology Institute of Barcelona, Barcelona	Director	2010-2014
Spanish National Agency of Evaluation and Prospective, Madrid	Coordinator (Molecular Biology)	2004-2008
University of Lleida, Lleida, Spain	Vice-Chancellor of Research	2000-2003

C1. Scopus summary, h-index, thesis supervised and other research indicators

Papers with citation data	80
Citations	4278
Citations/paper	53.5
h-index	33
PhD thesis supervised in the last 10 years	5
Research tracks (1980-2021)	6+1R

C2. Selected peer-reviewed publications

Pérez AP, Artés MH, Moreno DF, Clotet J, Aldea M

Mad3 modulates the G1 Cdk and acts as a timer in the Start network

Science Advances 8:eabm4086 (2022)

Yahya G, Pérez AP, Mendoza MB, Parisi E, Moreno DF, Artés MH, Gallego C, Aldea M

Stress granules display bistable dynamics modulated by Cdk

Journal of Cell Biology 220:e202005102 (2021)

Moreno DF, Jenkins K, Morlot S, Charvin G, Csikasz-Nagy A, Aldea M

Proteostasis collapse, a hallmark of aging, hinders the chaperone-Start network and arrests cells in G1
eLife 8:e48240 (2019)

Martínez-Láinez JM, Moreno DF, Parisi E, Clotet J, Aldea M

Centromeric signaling proteins boost G1 cyclin degradation and modulate cell size in budding yeast

PLoS Biology 16:e2005388 (2018)

Parisi E, Yahya G, Flores A, Aldea M

Cdc48/p97 segregase is modulated by Cdk to determine cyclin fate during G1 progression

EMBO Journal 37:e98724 (2018)

Saarikanga J, Caudron F, Prasad R, Moreno DF, Bolognesi A, Aldea M, Barral Y

Compartmentalization of ER-bound chaperone confines protein deposit formation to the aging yeast cell

Current Biology 27:773 (2017)

Georgieva MV, Yahya G, Codó L, Ortiz R, Teixidó L, ..., Gelpí JL, Gallego C, Orozco M, Aldea M

Inntags: small self-structured epitopes for innocuous protein tagging

Nature Methods 12: 955–958 (2015)

Yahya G, Parisi E, Flores A, Gallego C, Aldea M

A Whi7-anchored loop controls de G1 Cdk-cyclin complex at Start

Molecular Cell 53: 115-126 (2014)

Menoyo S, Ricco N, Bru S, Hernández-Ortega S, Escoté X, Aldea M, Clotet J

Phosphate-activated CDK stabilizes G1 cyclin to trigger cell cycle entry

Molecular and Cellular Biology 33: 1273-84 (2013)

Ferrezuelo F, Colomina N, Palmisano A, Garí E, Gallego C, Csikasz-Nagy A, Aldea M

The critical size is set at a single-cell level by growth rate to attain homeostasis and adaptation

Nature Communications 3: 1012 p1-11 (2012)

Ferrezuelo F, Colomina N, Fitcher B, Aldea M

The transcriptional network activated by Cln3 cyclin at the G1-to-S transition of the yeast cell cycle

Genome Biology 11: R67 p1-18 (2010)

Vergés E, Colomina N, Garí E, Gallego C, Aldea M
Cyclin Cln3 is retained at the ER and released by the J-chaperone Ydj1 in late G1 to trigger cell cycle entry
Molecular Cell 26: 649-662 (2007)

Clotet J, Escoté X, Adrover MA, Garí E, Aldea M, De Nadal E, Posas F
Multiple checkpoint activation by the Hog1 MAPK is required for cell survival upon osmostress
EMBO Journal. 25: 2338-2346 (2006)

Wang H, Garí E, Vergés E, Gallego C, Aldea M
Recruitment of Cdc28 by Whi3 restricts nuclear accumulation of the G1 cyclin-Cdk complex to late G1
EMBO Journal 23: 180-190 (2004)

Garí E, Volpe T, Wang H, Gallego C, Futcher B, Aldea M
Whi3 binds the mRNA of the G1 cyclin CLN3 to modulate cell fate in budding yeast
Genes & Development 15: 2803-2808 (2001)

Colomina N, Garí E, Gallego C, Herrero E, Aldea M
G1 cyclins block the Ime1 pathway to make mitosis and meiosis incompatible in budding yeast
EMBO Journal 18: 320-329 (1999)

Gallego C, Garí E, Colomina N, Herrero E, Aldea M
The Cln3 cyclin is downregulated by translational repression and degradation during the G1 arrest caused by nitrogen deprivation in budding yeast
EMBO Journal 16: 7196-7206 (1997)

Dujon B, Albermann K, Aldea M, Alexandraki D, Ansorge W, et al.
The nucleotide sequence of Saccharomyces cerevisiae chromosome XV
Nature 387(Suppl.): 98-102 (1997)

D. Research Support

Ultradynamic protein assemblies and network channeling. MICINN PID2022-141460NB-I00, 2023-2025, 362500 €
Protein cluster dynamics and network channeling. MICINN PID2019-109638GB-I00, 2020-2022, 351000 €
Proteotoxic aggregates, chaperome alterations and ... MINECO BFU2016-80234-R, 2017-2019, 351000 €
Prions and aggregates as inhibitors of Start: a path to cell ageing. MINECO BFU2013-47710-R, 2014-2016, 351000 €
Molecular competition and cell size control. MICINN BFU2010-20205/BFS, 2011-2013, 290400 €
Development of new peptidic tags. MICINN IPT-010000-2010-019, 2011-2013, 195400 €
Genomic instability. MEC (Programa Consolider-Ingenio) CSD2007-00015, 2008-2013, 164500 €
Morphogenesis and spatial control of cell cycle entry. MEC BFU2007-67929-C02-01/BMC, 2008-2010, 219100 €
Characterization of the essential role of Smc5/6 complex in...FP6-2002 (EU) 16049 ERG 7, 2006, 54200 €

E. Lectures and Conferences (selection)

Cell size, transcriptomic balance and optimal growth, Cell Size & Growth, researchseminars.org 2023
Holistic control by molecular networks in proliferation and aging, 29th ICYGMB, Göteborg, 2019
Do cells count chromosomes in G1? Francis Crick Institute, London, 2018
Growth sensors in the Start network to set cell size. 42nd FEBS Congress, Jerusalem, 2017
Molecular competition and cell size control. EMBO workshop on Cell Cycle, Budapest, 2015
Molecular competition: a link to cell ageing? Yeasterday 2015 (keynote speaker), University of Amsterdam, 2015
The speedometer: a molecular competition.... The Cell Cycle, Cold Spring Harbor Laboratory, NY, May 2014
Size homeostasis by growth rate EMBO workshop on Exploring the Logic of the Cell Cycle, Montpellier, 2011

F. Patents

PCT/ES2014/070460 (filed in the 04/06/2014) on "Peptidic tags for protein fusion, and antibodies for their detection" (currently licensed to Merck & Co)