

## CURRICULUM VITAE ET STUDIORUM

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**Place and date of birth:** Rome, January 22, 1953

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### Education:

- 1972-1976 Doctoral graduation with honors in Biological Sciences - University of Rome, Rome, Italy
- 1974-76 Experimental thesis work in Molecular Biology - Centro Acidi Nucleici CNR, Rome
- 1976 Course in Marine Biology - Station Biologique (Faculté de Sciences, Paris VI) Roscoff, France
- 1977 EMBO course "Electron microscopy of nucleic acids" - EMBL, Heidelberg, Germany
- 1987 EMBO course "Antibodies in cell biology" - EMBL, Heidelberg, Germany

### Current position:

Full Professor of Molecular Biology University of Siena, Italy

### Previous positions:

- 1976-1978 Post-doctoral research associate - Centro Acidi Nucleici CNR, Rome, Italy
- 1978-1980 Post-doctoral long-term EMBO fellow - EMBL, Heidelberg, Germany
- 1981-1986 Staff scientist -Department of Genetics and Molecular Biology University of Rome "La Sapienza"
- 1983 Visiting scientist - EMBL, Heidelberg, Germany
- 1986-1998 Staff scientist - Department of Evolutionary Biology University of Siena, Italy
- 1998-2000 Associate Professor of Molecular Biology - University of Siena, Italy
- 2000-to date Full Professor of Molecular Biology -University of Siena, Italy
- 2009-2012 Chair of the Department of Evolutionary Biology (University of Siena)
- 2009-2015 Member of the Academic Senate of the University of Siena, Italy
- 2012-2018 Chair of the Department of Life Sciences (University of Siena)

### Organization of courses and meetings:

- 1994 Organizer of a EC COMET course "PCR technology and its applications". Siena, May 23-26
- 1997,1999, 2002, 2004 Organizer of the EMBO Workshop "Lymphocyte antigen receptor and coreceptor signaling". Siena
- 2007, 2009, 2011, 2014 Organizer of the EMBO Conference "Signaling in the immune system". Siena
- 2016, 2018 Organizer of the EMBO Conference "Lymphocyte antigen receptor signaling". Siena

### Peer reviewing, memberships and honours:

Expert evaluation research projects EU FP4-7, ERC, EMBO, INTAS, American Institute for Cancer Research (AICR), French Agence Nationale pour la Recherche (ANR), Deutsche Forschung Gemeinschaft (DFG), Food & Drug Administration (FDA), Human Frontier Science Program (HFSP), Wellcome Trust, Austrian Science Fund (FWF), Israel Science Foundation (ISF), Finnish Academy of Sciences, Czech Science Foundation, Portuguese Foundation for Science and Technology, Netherlands Organisation for Scientific Research (NWO), Health Research Board Ireland, Kennedy Trust for Rheumatology Research, AICR, ISS, MIUR, CNR, Ateneo Italo-Tedesco

Expert for career assessment University of Washington School of Medicine (USA), University of Lausanne (Switzerland), Institut Pasteur (France), FDA (USA)  
Expert for Full Professor recruitment at University of Freiburg (Germany)

Member Editorial Board *Nature Scientific Reports*

Member Editorial Board *European Journal of Immunology* (1995-2005)

Review Editor *Frontiers in Immunology*

Ad hoc reviewer for peer reviewed journals, including *Nature*, *Nature Medicine*, *Nature Communications*, *Leukemia*, *Immunity*, *PNAS USA*, *Journal of Experimental Medicine*, *Journal of Cell Biology*, *Cell Reports*, *Journal of Immunology*, *Journal of Cell Science*, *Journal of Clinical Investigation*, *PLoS Pathogens*, *Cancer Research*, *Oncogene*, *Blood*, *Nature Scientific Reports*, *Journal of Biological Chemistry*, *Autophagy*, *EMBO Reports*, *Frontiers in Immunology*, *Molecular and Cellular Biology*, *FEBS Letters*

EMBO member

Member Academianet (Network Leading Women Scientists)

Member Scientific Advisory Board Pompeu Fabra University (Barcelona, Spain)

Member EMBO Global Investigator Network committee

Member Top Italian Scientists

Member Italian Association for Cancer Research (AIRC) Scientific Board (2008-2017)

Member Italian Society for Biochemistry & Molecular Biology (SIBBM), Italian Society for Immunology, Clinical Immunology and Allergology (SIICA), European Cell Death Organization (ECDO)

**Principal research interests:** functional dissection of signal transduction pathways in lymphocyte activation and apoptosis and dysregulation of these processes in lymphoproliferative, immunodeficiency, neuroinflammatory and pathogen-related diseases.

**Funding:** European Union, Italian Ministry of Education, University & Research, Italian Association for Cancer Research, Telethon, Italian Association for Multiple Sclerosis

**H-index:** 44 (Scopus), 51 (Google Scholar)

**Citations:** > 6400 (Scopus), > 8600 (Google Scholar)

### Selected research articles last 15 years

BONCRISTIANO M, ROSSI PACCANI S, BARONE S, ULIVIERI C, PATRUSSI L, ILVER D, AMEDEI A, D'ELIOS MM, TELFORD JL, **BALDARI CT.** (2003). The *Helicobacter pylori* vacuolating toxin inhibits T-cell activation by two independent mechanisms. *J Exp Med* 198, 1887-1897.

ROSSI PACCANI S, PATRUSSI L, ULIVIERI C, MASFERRER JL, D'ELIOS MM, **BALDARI CT.** (2005). Nonsteroidal anti-inflammatory drugs inhibit a Fyn dependent pathway coupled to Rac and stress kinase activation in TCR signaling. *Blood* 105, 2042-2048.

ROSSI PACCANI S, TONELLO F, GHITTONI R, NATALE M, MURARO L, D'ELIOS MM, TANG W-J, MONTECUCCO C, **BALDARI CT.** (2005). Anthrax toxins suppress T-lymphocyte activation by disrupting antigen receptor signaling. *J Exp Med* 201, 325-331.

ROSSI PACCANI S, BONCRISTIANO M, PATRUSSI L, ULIVIERI C, WACK A, VALENSIN S, HIRST TR, AMEDEI A, DEL PRETE G, TELFORD JL, D'ELIOS MM, **BALDARI CT.** (2005). Defective Vav expression and impaired F-actin reorganization in a subset of common variable immunodeficiency patients with T-cell defects. *Blood* 106, 626-634.

GHITTONI, R., PATRUSSI, L., PIROZZI, K. PELLEGRINI, M., LAZZERINI, P.E., CAPECCHI, P.L., LAGHI PASINI, F. and **BALDARI, C.T.** (2005). Simvastatin inhibits T cell activation by selectively impairing the function of Ras superfamily GTPases. *FASEB J.* 19, 605-607.

GHITTONI R, NAPOLITANI G, BENATI D, ULIVIERI C, PATRUSSI L, LAGHI PASINI F, LANZAVECCHIA A, **BALDARI CT.** (2006). Simvastatin inhibits the MHCII pathway of antigen processing and presentation by impairing Ras superfamily GTPase dependent antigen uptake. *Eur J Immunol.* 36, 2885-2893.

PELLEGRINI M, FINETTI F, PETRONILLI V, ULIVIERI C, GIUSTI F, LUPETTI P, GIORGIO M, PELICCI PG, BERNARDI P, **BALDARI CT.** (2007). p66Shc promotes T-cell apoptosis by inducing mitochondrial dysfunction and impaired Ca<sup>2+</sup> homeostasis. *Cell Death Differ* 14, 338-347.

ROSSI PACCANI S, TONELLO F, PATRUSSI L, CAPITANI N, SIMONATO M, MONTECUCCO C, **BALDARI CT.** (2007). Anthrax toxins inhibit immune cell chemotaxis. *Cell Microbiol* 9, 924-929.

PATRUSSI L, MARIGGIO' S, ROSSI PACCANI S, CAPITANI N, ZIZZA P, CORDA, D, **BALDARI CT.** (2007). Glycerophosphoinositol-4-phosphate enhances SDF-1 $\alpha$ -stimulated T-cell chemotaxis through PTK-dependent activation of Vav. *Cell Signal* 19, 2351-2360.

PATRUSSI L, ULIVIERI C, LUCHERINI OM, ROSSI PACCANI S, GAMBERUCCI A, LANFRANCONE L, PELICCI PG, **BALDARI CT.** (2007). p52Shc is required for CXCR4-dependent signaling and chemotaxis in T-cells. *Blood* 110, 1730-1738.

FINETTI F, PELLEGRINI M, ULIVIERI C, SAVINO MT, PACCAGNINI E, GINANNESCHI C, LANFRANCONE L, PELICCI PG, **BALDARI CT.** (2008). The proapoptotic and antimitogenic protein p66Shc acts as a negative regulator of lymphocyte activation and autoimmunity. *Blood* 111, 5017-5027.

ULIVIERI C, FANIGLIULO D, BENATI D, LAGHI PASINI F, **BALDARI CT.** (2008). Simvastatin impairs humoral and cell mediated immunity in mice by inhibiting lymphocyte homing, T cell activation and antigen cross-presentation. *Eur J Immunol* 38, 2832-2834.

SAVINO MT, ORTENSINI B, ULIVIERI C, FANIGLIULO D, FERRO M, PACCAGNINI E, LAZZI S, OSTI D, PELICCI G, **BALDARI CT.** (2009). Rai (ShcC) acts as a negative regulator of autoimmunity by inhibiting lymphocyte activation and survival. *J Immunol* 182, 301-308.

ROSSI PACCANI S, BENAGIANO M, TONELLO F, CAPITANI N, LADANT D, MONTECUCCO C, D'ELIOS MM, **BALDARI CT.** (2009). The adenylate cyclase toxins of *Bacillus anthracis* and *Bacillus pertussis* promote Th2 cell differentiation by shaping T cell antigen receptor signaling. *PLoS Path* 5, e1000325.

FINETTI F, ROSSI PACCANI S, RIPARBELLI MG, GIACOMELLO E, PERINETTI G, PAZOUR GJ, ROSENBAUM J, **BALDARI CT**. (2009). An intraflagellar transport component is required for polarized recycling of the TCR/CD3 complex to the immune synapse. *Nat Cell Biol* 11, 1332-1339.

CAPITANI N, LUCHERINI OM, SOZZI E, FERRO M, GIOMMONI N, FINETTI F, DE FALCO G, CENCINI E, RASPADORI D, PELICCI PG, LAURIA F, FORCONI F, **BALDARI CT**. (2010). Impaired expression of p66Shc, a novel regulator of B-cell survival, in chronic lymphocytic leukemia. *Blood* 115, 3726-3736.

ULIVIERI C, FANI GLIULO D, MASI G, SAVINO MT, GAMBERUCCI A, PELICCI PG, **BALDARI CT**. (2011). p66Shc is a negative regulator of FcεRI-dependent signalling in mast cells. *J Immunol* 186, 5095-5106.

ROSSI PACCANI S, FINETTI F, DAVI M, PATRUSSI L, D'ELIOS MM, LADANT D, **BALDARI CT**. (2011). The adenylate cyclase toxin of *Bordetella pertussis* binds to T cells via the integrin LFA-1 and induces its disengagement from the immune synapse. *J Exp Med* 208, 131-1330.

ROSSI PACCANI S, BENAGIANO M, SAVINO MT, FINETTI F, TONELLO F, D'ELIOS MM, **BALDARI CT**. (2011). The adenylate cyclase toxin of *Bacillus anthracis* is a potent promoter of Th17 cell development. *J Allergy Clin Immunol*. 127, 1635-7.

CAPITANI N, PATRUSSI L, TRENTIN L, LUCHERINI OM, CANNIZZARO E, MIGLIACCIO E, FREZZATO F, GATTAZZO C, FORCONI F, PELICCI PG, SEMENZATO G, **BALDARI CT**. (2012). S1P1 expression is controlled by the pro-oxidant activity of p66Shc and is impaired in B-CLL patients with unfavourable prognosis. *Blood* 120:4391-4399.

SAVINO MT, ULIVIERI C, EMMI G, PRISCO D, DE FALCO G, ORTENSINI B, BECCA STRINI E, EMMI L, PELICCI G, D'ELIOS MM, **BALDARI CT**. (2013). The Shc family protein adaptor, Rai, acts as a negative regulator of Th17 and Th1 cell development. *J Leukoc Biol*. 93, 549-559.

FINETTI F, PATRUSSI L, MASI G, LUCHERINI OM, ONNIS A, PAZOUR GJ, **BALDARI CT**. (2014). Immune synapse targeting of specific recycling receptors by the intraflagellar transport system. *J Cell Sci* 127, 1924-37

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ONNIS A, FINETTI F, PATRUSSI L, GOTTARDO M, CASSIOLI C, SPANO S, **BALDARI CT**. (2015). The small GTPase Rab29 is a common regulator of immune synapse assembly and ciliogenesis. *Cell Death Diff* 22, 1687-99

FINETTI F, PATRUSSI L, GALGANO D, CASSIOLI C, PERINETTI G, PAZOUR GJ, **BALDARI CT**. (2015). The small GTPase Rab8 interacts with VAMP-3 to regulate the delivery of recycling TCRs to the immune synapse. *J Cell Sci* 128, 2541-2552.

PATRUSSI L, CAPITANI N, MARTINI V, PIZZI M, TRIMARCO V, FREZZATO F, SEMENZATO G, TRENTIN L, **BALDARI CT**. (2015). Enhanced chemokine receptor recycling and impaired S1P1 expression promote leukemic cell infiltration of lymph nodes in chronic lymphocytic leukemia (CLL). *Cancer Res* 75, 4153-4163.

RUFFO E, MALACARNE M, LARENS S, DAS R, PATRUSSI L, WUELFING C, BISKUP C, SCHWARTZBERG P, **BALDARI CT**, RUBIO I, NICHOLS KE, SNOW A, BALDANZI G, GRAZIANI A (2016). Inhibition of Diacylglycerol kinase alpha rescues TCR-induced diacylglycerol signaling and restimulation induced cell death in XLP-1 T lymphocytes. *Sci Transl Med* 8, 321ra7.

VIVAR OI, MASI G, CARPIERJM, MAGALHAES J, GALGANO D, PAZOUR GJ, AMIGORENA S, HIVROZ C, **BALDARI CT**. (2016). IFT20 controls LAT recruitment to the immune synapse and T cell responses in vivo. *Proc Natl Acad Sci USA* 113, 386-91.

- KABANOVA A, SANSEVIERO F, CANDI V, GOZZETTI A, BOCCHIA M, **BALDARI CT** (2016). Non-lytic degranulation of CD8<sup>+</sup> cytotoxic T lymphocytes. *Cell Rep* **15**, 9-18.
- ULIVIERI C, SAVINO MT, LUCCARINI I, FANI GLIULO E, ALDINUCCI A, BONECHI E, BENAGIANO M, ORTENSINI B, PELICCI G, D'ELIOS MM, BALLERINI C, **BALDARI CT**. (2016). Rai promotes astrocyte-dependent inflammation during experimental autoimmune encephalomyelitis. *J Immunol* **197**, 480-90.
- CATTANEO F, PATRUSSI L, CAPITANI N, FREZZATO F, D'ELIOS MM, TRENTIN L, SEMENZATO G, **BALDARI CT**. (2016). Expression of the p66Shc protein adaptor is regulated by the activator of transcription STAT4 in normal and chronic lymphocytic leukemia B cells. *Oncotarget* **7**, 57086-57098
- GALGANO D, ONNIS A, PAPPALARDO E, GALVAGNI F, ACUTO O, **BALDARI CT**. (2017). The T cell IFT20 interactome reveals new players in immune synapse assembly. *J Cell Sci* **130**:1110-1121
- ZURLI V, WIMMER G, CATTANEO F, CANDI V, CENCINI E, GOZZETTI A, SANSEVIERO F, BOCCHIA M, **BALDARI CT\***, KABANOVA A\*. (2017). Ectopic ILT3 controls BCR-dependent activation of Akt in B-cell chronic lymphocytic leukemia. *Blood* **130**, 2006-2017
- ARUMUGHAM VB, ULIVIERI C, ONNIS A, FINETTI F, TONELLO F, LADANT D, **BALDARI CT** (2018). Compartmentalized cAMP production by the *B. pertussis* and *B. anthracis* adenylate cyclase toxins differentially affects the immune synapse in T lymphocytes. *Front Immunol* **9**:919.
- PATRUSSI L, CAPITANI N, CATTANEO F, MANGANARO N, GAMBERUCCI A, FREZZATO F, MARTINI V, VISENTIN A, PELICCI PG, D'ELIOS MM, TRENTIN L, SEMENZATO G, **BALDARI CT**. (2018). p66Shc deficiency promotes B cell chemotaxis by enhancing CXCR4 and CCR7 recycling in chronic lymphocytic leukemia. *Oncogene* **37**, 1534-1550
- ONNIS A, CIANFANELLI V, CASSIOLI C, PELICCI OG, CECCONI F, **BALDARI CT** (2018). The pro-oxidant adaptor p66Shc promotes B cell mitophagy by disrupting mitochondrial integrity and recruiting LC3-II. *Autophagy* **14**, 2117-2138.
- PATRUSSI L, CAPITANI N, ULIVIERI C, MANGANARO M, GRANAI M, CATTANEO F, KABANOVA A, MUNDO L, GOBESSI S, FREZZATO F, VISENTIN A, FINETTI F, PELICCI PG, D'ELIOS MM, TRENTIN L, SEMENZATO G, LEONCINI L, EFREMOV D, **BALDARI CT** (2019). p66Shc deficiency in a CLL mouse model enhances disease aggressiveness by altering the chemokine receptor landscape. *Haematologica* **104**, 2040-2052
- ULIVIERI C, DE TOMMASO D, FINETTI F, ORTENSINI B, PELICCI G, D'ELIOS MM, BALLERINI C, **BALDARI CT** (2019). A T cell suppressive circuitry mediated by CD39 and regulated by ShcC/Rai is induced in astrocytes by encephalitogenic T cells. *Front Immunol* **10**:1041.
- FINETTI F, CASSIOLI C, CIANFANELLI V, ONNIS A, PACCAGNINI E, KABANOVA A, **BALDARI CT** (2019). The intraflagellar transport protein IFT20 controls lysosome biogenesis by regulating the post-Golgi transport of acid hydrolases. *Cell Death Differ*, 2019 May 29. doi: 10.1038/s41418-019-0357-y. [Epub ahead of print].

### Selected reviews last 15 years

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**BALDARI CT**, LANZAVECCHIA A, TELFORD JL. (2005). Immune subversion by *Helicobacter pylori*. *Trends Immunol.* **26**, 199-207.

**BALDARI CT**, TONELLO F, ROSSI PACCANI S, MONTECUCCO C (2006). Anthrax toxins: a paradigm of bacterial immune suppression. *Trends Immunol.* **27**, 434-440.

TOURNIER JN, ROSSI PACCANI S, QUESNEL-HELLMANN A, **BALDARI CT**. (2009). Anthrax toxins: a weapon to systematically dismantle the host immune defenses. *Mol Aspects Med* **30**, 456-466

**BALDARI CT**, ROSENBAUM JL. Intraflagellar Transport: It's Not Just for Cilia Anymore. (2009). *Curr Opin Cell Biol* **22**, 75-80

FINETTI F, SAVINO MT, **BALDARI CT**. (2009). Positive and negative regulation of antigen receptor signaling by the Shc family of protein adapters. *Immunol Rev.* **232**, 115-134

CAPITANI N, LUCHERINI OM, **BALDARI CT**. (2010). Negative regulation of immunoreceptor signaling by protein adapters: Shc proteins join the club. *FEBS Lett* **584**, 4915-4922

TELFORD JL, **BALDARI CT**. (2011). *Shigella* targets T cells. *Cell Host Microbe* **9**:253-254.

FINETTI F, PACCANI SR, ROSENBAUM J, **BALDARI CT**. (2011). Intraflagellar transport: a new player at the immune synapse. *Trends Immunol.* **32**, 139-145.

FINETTI F, **BALDARI CT**. (2013). Compartmentalization of signaling by vesicular trafficking: a shared building design for the immune synapse and the primary cilium. *Immunol Rev* **251**, 97-112.

FINETTI F, ONNIS A, **BALDARI CT**. (2015). Regulation of vesicular traffic at the T cell immune synapse: lessons from the primary cilium. *Traffic* **16**, 241-349

ONNIS A, FINETTI F, **BALDARI CT**. (2016). Vesicular trafficking to the immune synapse: how to assemble receptor-tailored pathways from a basic building set. *Front Immunol* **7**, 50. doi: 10.3389/fimmu.2016.00050

ARUMUGHAM VB, **BALDARI CT** (2017). cAMP: a multifaceted modulator of T cell activation and differentiation. *J Leuk Biol* **101**, 1301-1316.

KABANOVA A, ZURLI V, **BALDARI CT** (2018). Signals controlling lytic granule polarization at the cytotoxic immune synapse. *Front Immunol* **9**, 307. doi: 10.3389/fimmu.2018.00307

FINETTI F, **BALDARI CT**. (2018). The immunological synapse as a pharmacological target. *Pharmacol Res* **134**, 118-133

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ONNIS A, **BALDARI CT**. (2019). Orchestration of immunological synapse assembly by vesicular trafficking. *Front Cell Dev Biol* **7**:110. doi: 10.3389/fcell.2019.00110

CASSIOLI C, **BALDARI CT** (2019). A ciliary view of the immunological synapse. *Cells* **8**, 789; doi:10.3390/cells8080789

FINETTI F, CAPITANI N, **BALDARI CT** (2019). Emerging roles of the IFT system in the orchestration of cellular degradation pathways. *Front Cell Dev Biol*, 19 November 2019; doi.org/10.3389/fcell.2019.00292