Curriculum Vitae of Dr Luigi Catacuzzeno

Education and training
Born in Montefiore dell'Aso (Italy), 14/03/72
Present position: Researcher, PhD, permanent position, Department of Chemistry, Biology and Biotecnology.

EDUCATION
1991: Graduation High School "Liceo Scientifico"

1992-1997: Biology Student at the University of Perugia

1997: degree in Biolological Sciences at the University of Perugia. Thesis on the mechanism of verapamil block of voltage-gated K channels in DRG neurons, using the patch-clamp technique, approved with honours.

1997-1998: Internal Fellow in the Laboratory of Neuroscience of the Department of Chemistry, Biology and Biotecnology. He continued the study on the biophysical mechanism of block of verapamil block of voltage-gated K channels in DRG neurons.

2005-2007: phD specialization in "Biologia Cellulare e Molecolare" at the University of Perugia. He studied the pathophysiological mechanisms of the familial hemiplegic migraine, and more speficically the contribution of the trigeminal ganglion to the triggering and thevelopment of migraine headache.

Employment and research experience

Employment
1998-2000: postdoctoral fellow in Dr Nonner's lab, at the University of Miami, where he contributed to the development of a theory on Ca channel selectivity based on the Mean Spherical Approximation.

2001-2004: postdoctoral fellow in Prof Franciolini's lab, at the University of Perugia, where he has been involved in the study of the properties and role of ion channels in the growth and migration of glioblastoma cells.

2007-to date: As a researcher with a permanent position in the Dept. of Chemistry, Biology and Biotechnology, he has focused on the role of ion channels in the growth and migration of glioblastoma cells, and on the pathophysiological mechanisms of the familial hemiplegic migraine

2012: Abilitazione Scientifica Nazionale to associate professor in Physiology (SSD BIO/09)

Research experience:
Dr Catacuzzeno has focused on three main research topics. One is the role of ion channels in the pathophysiology of glioblastoma (GBM). More specifically, he found in GBM cell lines, primary cultures from human GBM, and GBM biopsies, an anomalous expression of KCa3.1 channels, whose expression is normally absent in the central nervous system (Fioretti et al., 2006). Based on this evidence, the research has focused of the role of this channel in the aggressiveness of these tumors, and found that these channels are particularly expressed in GBM stem cells, and have a prominent role in cell invasion and in responsiveness to important extracellular mediators (Ruggieri et al., 2012; Catacuzzeno et al., 2012; Sciaccaluga et al., 2010; Fioretti et al., 2009).
Given the importance of the tumor microenvironment in setting the aggressiveness of GBMs, Dr Catacuzzeno has recently started to study of effects on ion channels of chemical conditions known to be present is the GBM tissue and to exacerbate tumor cell aggressiveness, such as blood serum baing in contact with the tumor because of tumor brain barrier breakdown (Catacuzzeno et al., 2011; 2014), and tissue hypoxia (see Sforna et al., 2015).

A secon main research topic of Dr Catacuzzeno has been the phatophysiology of migraine, studied in collaboration with Dr Pietrobon, university of Padova. In particular he studied the effects of genetic mutations causing a rare form of migrane, called familial hemiplegic migrane (FHM). Using a knockin mouse model containing an FHM mutation, he demonstrated that a disfunction in the excitability of trigeminal ganglion neurons contributed to the development of migraine headache in FHM mice

(Catacuzzeno et al. ,2008; Fioretti et al., 2011). More in particular he found that a subpopulation of trigeminal ganglion neurons isolated from knockin mice expressed a voltage-gated calcium current having activation proterties different from that observed in wild-type mice. In turn, this electrophysiological difference causes a higher excitability of this neurons, that may be responsible for the development of headache.

COORDINATION OF RESEARCH PROJECTS:
2007-2010: PRIN 2007: Analisi funzionale ed implicazioni terapeutiche della eterogeneità cellulare in gliomi ad alto grado. Indagini su popolazioni selezionate in vitro con caratteri di multipotenza.

2014-2016: Fondazione Cassa di Risparmio di Perugia: "Ipossia e aggressivita' dei glioblastomi"

PARTECIPATION TO OTHER RESEARCH PROJECTS:
PRIN 2000: Ruolo, natura e distribuzione dei canali Ca voltaggio-dipendenti, canali K Ca-attivati, Ca-ATPasi e scambiatori Na/Ca nelle cellule ciliate vestibolari.

PRIN 2002: Ruoli, proprietà e distribuzione delle diverse correnti di calcio nelle cellule ciliate vestibolari

Prin 2005: Canali del sodio, calcio e potassio neuronali: ruolo fisiologico e canalopatie

Progetto di ricerca della Fondazione Cassa di Risparmio di Perugia - anno 2005 - COD. 2005.0055.020

Telethon 2006 - GGP06234 - Functional consequences of mutations associated to familial hemiplegic migraine type 1 and migraine mechanisms

Progetto di ricerca della Fondazione Cassa di Risparmio di Perugia - BANDO 2007

Progetto di ricerca della Fondazione Cassa di Risparmio di Perugia - anno 2009 - COD. 2009.020.0025

Progetto di ricerca della Fondazione Cassa di Risparmio di Perugia - anno 2012 - COD. 2012.0240.021

Publications

Rosa P, Sforna L, Carlomagno S, Mangino G, Miscusi M, Pessia M, Franciolini F, Calogero A, Catacuzzeno L. Overexpression of Large-Conductance Calcium-Activated Potassium Channels in Human Glioblastoma Stem-Like Cells and Their Role in Cell Migration. J Cell Physiol. 2017 Sep;232(9):2478-2488.

Sforna L, Cenciarini M, Belia S, Michelucci A, Pessia M, Franciolini F, Catacuzzeno L. Hypoxia Modulates the Swelling-Activated Cl Current in Human Glioblastoma Cells: Role in Volume Regulation and Cell Survival. J Cell Physiol. 2017 Jan;232(1):91-100.

D'Adamo MC, Sforna L, Visentin S, Grottesi A, Servettini L, Guglielmi L, Macchioni L, Saredi S, Curcio M, De Nuccio C, Hasan S, Corazzi L, Franciolini F, Mora M, Catacuzzeno L, Pessia M. A Calsequestrin-1 Mutation Associated with a Skeletal Muscle Disease Alters Sarcoplasmic Ca2+ Release. PLoS One. 2016 May 19;11(5):e0155516.

Lanciotti A, Brignone MS, Visentin S, De Nuccio C, Catacuzzeno L, Mallozzi C, Petrini S, Caramia M, Veroni C, Minnone G, Bernardo A, Franciolini F, Pessia M, Bertini E, Petrucci TC, Ambrosini E. Megalencephalic leukoencephalopathy with subcortical cysts protein-1 regulates epidermal growth factor receptor signaling in astrocytes. Hum Mol Genet. 2016 Apr 15;25(8):1543-58.

Sicca F, Ambrosini E, Marchese M, Sforna L, Servettini I, Valvo G, Brignone MS, Lanciotti A, Moro F, Grottesi A, Catacuzzeno L, Baldini S, Hasan S, D'Adamo MC, Franciolini F, Molinari P, Santorelli FM, Pessia M.

Gain-of-function defects of astrocytic Kir4.1 channels in children with autism spectrum disorders and epilepsy. Sci Rep. 2016 Sep 28;6:34325.

D'Adamo MC, Hasan S, Guglielmi L, Servettini I, Cenciarini M, Catacuzzeno L, Franciolini F. New insights into the pathogenesis and therapeutics of episodic ataxia type 1. Front Cell Neurosci. 2015 Aug 19;9:317.

Catacuzzeno L, Caramia M, Sforna L, Belia S, Guglielmi L, D'Adamo MC, Pessia M, Franciolini F. Reconciling the discrepancies on the involvement of large-conductance Ca(2+)-activated K channels in glioblastoma cell migration. Front Cell Neurosci. 2015 Apr 20;9:152.

Morpurgo G, Catacuzzeno L, Peruzzi S, Blasi P, Fioretti B. Are tyrosinase inhibitors in sunscreens and cosmetics enhancing UV carcinogenicity? Exp Dermatol. 2015 Jul;24(7):546-7.

Guglielmi L, Servettini I, Caramia M, Catacuzzeno L, Franciolini F, D'Adamo MC, Pessia M. Update on the implication of potassium channels in autism: K(+) channelautism spectrum disorder. Front Cell Neurosci. 2015 Mar 2;9:34.

Sforna L, D'Adamo MC, Servettini I, Guglielmi L, Pessia M, Franciolini F, Catacuzzeno L. Expression and function of a CP339,818-sensitive K^+ current in a subpopulation of putative nociceptive neurons from adult mouse trigeminal ganglia. J Neurophysiol. 2015 Apr 1;113(7):2653-65.

D'Adamo MC, Gallenmüller C, Servettini I, Hartl E, Tucker SJ, Arning L, Biskup S, Grottesi A, Guglielmi L, Imbrici P, Bernasconi P, Di Giovanni G, Franciolini F, Catacuzzeno L, Pessia M, Klopstock T. Novel phenotype associated with a mutation in the KCNA1(Kv1.1) gene. Front Physiol. 2015 Jan 15;5:525.

Sforna L, Cenciarini M, Belia S, D'Adamo MC, Pessia M, Franciolini F, Catacuzzeno L. The role of ion channels in the hypoxia-induced aggressiveness of glioblastoma. Front Cell Neurosci. 2015 Jan 15;8:467.

Ambrosini E, Sicca F, Brignone MS, D'Adamo MC, Napolitano C, Servettini I, Moro F, Ruan Y, Guglielmi L, Pieroni S, Servillo G, Lanciotti A, Valvo G, Catacuzzeno L, Franciolini F, Molinari P, Marchese M, Grottesi A, Guerrini R, Santorelli FM, Priori S, Pessia M. Genetically induced dysfunctions of Kir2.1 channels: implications for short QT3 syndrome and autism-epilepsy phenotype. Hum Mol Genet. 2014 Sep 15;23(18):4875-86.

Catacuzzeno L, Sforna L, D'Adamo MC, Pessia M, Franciolini F. A method to identify tissue cell subpopulations with distinct multi-molecular profiles from data on co-localization of two markers at a time: the case of sensory ganglia. J Neurosci Methods. 2014 Mar 15;224:88-95.

Catacuzzeno L, Michelucci A, Sforna L, Aiello F, Sciaccaluga M, Fioretti B, Castigli E, Franciolini F. Identification of key signaling molecules involved in the activation of the swelling-activated chloride current in human glioblastoma cells. J Membr Biol. 2014 Jan;247(1):45-55.

De Angelis F, Marinelli S, Fioretti B, Catacuzzeno L, Franciolini F, Pavone F, Tata AM. M2 receptors exert analgesic action on DRG sensory neurons by negatively modulating VR1 activity. J Cell Physiol. 2014 Jun;229(6):783-90.

D'Adamo MC, Catacuzzeno L, Di Giovanni G, Franciolini F, Pessia M. K(+) channelepsy: progress in the neurobiology of potassium channels and epilepsy. Front Cell Neurosci. 2013 Sep 13;7:134.

Ruggieri P, Mangino G, Fioretti B, Catacuzzeno L, Puca R, Ponti D, Miscusi M, Franciolini F, Ragona G, Calogero A. The inhibition of KCa3.1 channels activity reduces cell motility in glioblastoma derived cancer stem cells. PLoS One. 2012;7(10):e47825.

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Catacuzzeno L, Fioretti B, Franciolini F. A theoretical study on the role of Ca(2+)-activated K+ channels in the regulation of hormone-induced Ca2+ oscillations and their synchronization in adjacent cells. J Theor Biol. 2012 Sep 21;309:103-12.

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Catacuzzeno L, Aiello F, Fioretti B, Sforna L, Castigli E, Ruggieri P, Tata AM, Calogero A, Franciolini F. Serum-activated K and Cl currents underlay U87-MG glioblastoma cell migration. J Cell Physiol. 2011 Jul;226(7):1926-33.

Morpurgo G, Babudri N, Fioretti B, Franciolini F, Catacuzzeno L. Synthetic aromatic compounds interfering with melanogenesis are responsible of the rising trend of malignant melanoma incidence. Med Hypotheses. 2011 Mar;76(3):374-7.

Morpurgo G, Babudri N, Fioretti B, Catacuzzeno L. Mosaicism may explain the evolution of social characters in haplodiploid Hymenoptera with female workers. Genetica. 2010 Dec;138(11-12):1111-7.

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Trequattrini C, Catacuzzeno L, Petris A, Franciolini F. Verapamil block of the delayed rectifier K current in chick embryo dorsal root ganglion neurons. Pflugers Arch. 1998 Mar;435(4):503-10.