AMMINISTRAZIONE CENTRALE
AREA COMUNICAZIONE E MARKETING
SETTORE **UFFICIO STAMPA**
Via VIII febbraio, 2 – 35122 Padova
stampa@unipd.it
http://www.unipd.it/comunicati
tel. 049-8273066/3041

UNIVERSITÀ DEGLI STUDI DI PADOVA

Padova, 13 febbraio 2019

BANDO EUROPEO HORIZON 2020, I VINCITORI
Finanziati 11 progetti all'Università di Padova

La Commissione Europea ha comunicato ai vincitori gli esiti del bando Horizon 2020, Azione Marie Skłodowska-Curie Individual Fellowship 2018.

Sono 74 le proposte presentate da ricercatori eccellenti che scelgono l'Ateneo di Padova come Host Institution; 11 i progetti finanziati per un importo di € 2.345.158,08

Di questi 3 fellowship European Standard, 3 Career Restart (dedicate a chi riprende la carriera nella ricerca dopo un'interruzione) 2 Reintegration (per chi desidera tornare in Europa dopo aver fatto ricerca in un Paese Terzo) e 3 sono Global Fellowship (prevedono un periodo di 1 a 2 anni presso un ente situato in un Paese terzo.

Con 14 progetti con punteggio >85 (Seal of Excellence), Padova è la prima Università in Italia che si è impegnata a finanziare gli assegnatari del Seal of Excellence (il bollino della Commissione Europea che garantisce sulla qualità della proposta presentata).

L'Università di Padova mette a disposizione un finanziamento pari a 50.000 Euro annui per coloro che hanno partecipato alle Call *Marie Skłodowska-Curie Actions* (MSCA) – IF 2018 e IF 2017, indicando l'Ateneo come Host Institution, e abbiano ottenuto il "Seal of Excellence – MSC Actions", non venendo finanziati dalla CE per limiti di budget. Il programma di Ateneo è appunto il MSCA Seal of Excellence @UniPD https://www.unipd.it/msca-seal-excellence

Tra gli 11 vincitori ci sono 5 partecipanti alla Marathon (https://www.unipd.it/en/msca-marathon18) (MSCA MARaThoN 2018 -*Marie Skłodowska-Curie Actions - MAster your Research and Tra*ining Needs) e 2 vincitori del finanziamento MSCA Seal of Excellence@Unipd bando 2018.

Ben 7 vincitori su 11 hanno quindi beneficiato di specifiche iniziative di supporto promosse dall'Università di Padova a favore dei candidati MSCA-IF. E' un risultato eccellente per chi progetta le politiche della ricerca del nostro ateneo e per chi le attua.

La prossima call H2020-MSCA-IF apre l'11 aprile 2019.

Dati degli scorsi anni:
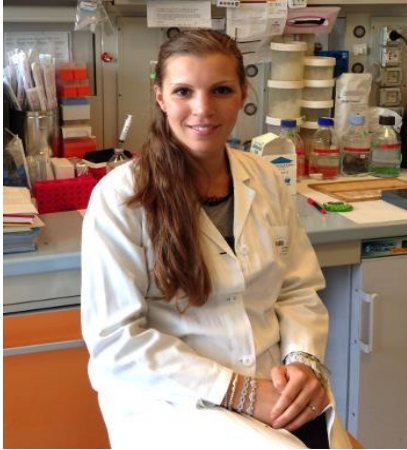Call MSCA IF 2017
55 proposte presentate
9 finanziate
Call MSCA IF 2016
53 proposte presentate
4 finanziate
Nella call 2018, rispetto alla 2017, abbiamo consolidato un risultato di successo. Quest'anno è aumentato significativamente il numero di proposte presentate (da 55 a 74) ed è aumentato anche il numero di progetti vinti (da 9 a 11).

Topic: MSCA-IF-2018
Type of action: MSCA-IF-EF-ST Standard European Fellowships
Proposal acronym: NeuroStemX
Fellow Cecilia Laterza (ITALIANA, è stata 2 anni in Svezia-Laboratory of Stem Cell & Restorative Neurology -Lund Stem Cell Center, Lund University, Sweden.)
Supervisor: Nicola Elvassore
Dipartimento di Salute della Donna e del Bambino)
ABSTRACT

Neurological and mental disorders are top priorities for the European Commission, which actively invests in research aimed at better understanding brain function and dysfunction, and at finding new therapies for brain disorders. Fragile X syndrome (FXS) is the major monogenetic cause for intellectual disability and is frequently associated with autism spectrum disorder.

The trinucleotide repeat expansion, methylation and epigenetic silencing of fragile mental retardation 1 (FMR1) genepromoter leads to the loss of the corresponding protein. However, the molecular mechanism and the timing leading to FMR1 silencing are still unknown due to the absence of reliable in vivo and in vitro models. The recent development of naïve PSCs showing a broader unmethylated genome (including in FMR1) opened a new hope for disease modeling of FXS, but data are still partial and contradictory. The NeuroStemX project aims at filling this gap taking advantage of an optimized technique for the generation of naïve iPSCs developed at the University of Padova (UniPd) and generation of FXS neurons with various approaches mastered by the Experienced Researcher (ER) in conjunction with the microtechnologies developed by UniPd.

In particular, we aim at 1) identifying the timing of FMRP silencing during neural development using naïve iPSCs and 2) establishing a reliable in vitro system to model neuronal defects observed in FXS patients. In this project, we are addressing some of the most crucial problems related with FXS pathogenesis and modeling using a variety of innovative approaches.

This will give the ER an outstanding training-through-research opportunity by means of a personalized multidisciplinary project, in which the ER will enlarge her scientific competences and strengthen her professional profile. The training includes both scientific and transferable skills, aimed at the reinforcement of the ER professional maturity and independence.

Topic: MSCA-IF-2018
Type of action: MSCA-IF-EF-ST Standard European Fellowships
Proposal acronym: CLAYONRISK
Fellow: Elena Mercedes Pérez-Monserrat (spagnola)
Supervisor: Lara Maritan
Dipartimento: Geoscienze

Abstract: The CLAYONRISK project mainly aims to foster bricks manufacture processes in order to mitigate the negative impact of extreme weather events and earthquakes on historical structures. As a traditional building material widely used from ancient times and worldwide, both eco-innovative solutions and socio-cultural values of peoples will be tackled. For first time, the manufacturing of building bricks is addressed as a preventive measure for Disaster Risk Reduction management. Starting from: i) bricks decay due to climate change make ancient structures much more vulnerable to seismic risk, and ii) the negative impact of disasters on historical structures could be mitigated by improving the physical properties of bricks, directly influenced by the manufacturing parameters, a multidisciplinary and comparative study of bricks -both ancient and currently produced- is accomplished. Archaeometric methodologies by means of multianalytical approach is followed and building bricks resistance over time is assessed considering their mechanical behavior after ageing tests performance. Northern Italy entails an outstanding site to accomplish the project, as it is a high humidity area with regular seismic activity where the geology has enhanced an exceptional architecture shaped by bricks and a ceramic industry leadership. With a cutting-edge scope, CLAYONRISK will state bricks resistance over time and the achievement of technological improvements and sustainable solutions towards the strengthening of heritage (and new) constructions, ensuring peoples traditions and the socio-cultural values of ancient structures. The intersectorial transference of knowledge fostered by CLAYONRISK will promote a protocol development, launched by the academy-industry cooperation and where bricks entail a transnational understanding resource to aware the European cultural identity.

Topic: MSCA-IF-2018
Type of action: MSCA-IF-EF-CAR - Career Restart panel
Proposal acronym: SMART THEME
Fellow: Ivanovskaya Viktoriya (russa, negli ultimi anni ha vissuto in Francia)
Supervisor: Mauro Sambi
Dipartimento: Scienze Chimiche
ABSTRACT

The future of nano-electronics has been proposed to be switching soon from bulk 3D materials to lower dimensionalities. The self-assembly of well-designed molecular precursors on appropriate surfaces is a very promising route towards 1D/2D materials with a high degree of long-range order and tailored functionalities. However, the synthesis of well controlled molecular networks is a lengthy and expensive trial-and-error process because growth driving forces are poorly understood and generally hard to investigate. Research in the field can be improved and sped up thanks to optimization guidelines derived from first principles modeling of the elemental steps of the growth process. This project aims to develop a synergistic theoretical and experimental line of research on the on-surface synthesis of novel surface-supported molecular architectures. The candidate is a well experienced computational quantum chemist which will integrate a team of experimentalists and theoreticians expert in the field of molecular assembling and reactivity at surfaces. Novel methods in density functional theory will be employed to simulate complex molecular configurations and reactions paths. On one side the theoretical activity will provide predictive modeling of the mechanisms of surface-assisted reactions and fundamental insights for the interpretation of microscopy and spectroscopy observations. On the other side, precisely targeted experiments will provide the necessary validation of the theoretical approaches employed and will stimulate the most pertinent directions over which the theoretical modeling should be addressed. The ultimate goal of the project will be to build an irreplaceable theoretical tool to rationalize experiments and to drive them towards optimal synthesis routes.

Topic: MSCA-IF-2018
Type of action: MSCA-IF-EF-RI - Reintegration panel
Proposal acronym: MOVEMeNt
Fellow: Emanuela Zuccaro (italiana; torna dopo 6 anni negli USA presso Center for Regenerative Medicine, Massachusetts General Hospital, Boston, MA Stem Cell and Regenerative Biology, Harvard University, Cambridge, MA)
Supervisor: Maria Pennuto
Dipartimento: Scienze Biomediche
ABSTRACT

Alpha motor neurons (aMN) are a clinically relevant neuronal population that selectively degenerates in neuromuscular diseases, including amyotrophic lateral sclerosis (ALS) and spinal bulbar muscular atrophy (SBMA). Distinct classes of aMNs (SFR, FFR and FF) degenerate at different rate in these diseases, with the fast fatigable (FF) MNs degenerating first.

The molecular mechanisms underlying this selective vulnerability are only partially known. Understanding the molecular logics that shape the identity and function of aMN subtypes in vivo is directly relevant to the development of novel therapeutic strategies. Here I propose to harmonically integrate my solid background in dissecting the molecular fingerprints of distinct neuronal subtypes in adult mice by undertaking new technologies I pioneered at Harvard University, with new skills and knowledge I will build at the Host Institution, which will be critical for the successful achievement of my goal. The overreaching goal of MOVEMeNt is to identify the molecular substrate of disease vulnerability in aMNs. I will (Aim 1) isolate

and FACS-purify aMN-nuclei from adult mouse spinal cords, based on the specific expression of aMN markers. Single cell transcriptomic analysis will reveal class-specific molecular fingerprints, including factors playing key roles in suptype-specific development, function, and disease vulnerability. I will also (Aim2) analyze the transcriptional changes of differentially vulnerable aMN classes upon retrograde labeling and functional denervation by neurotoxin intoxication. This work will return candidate genes directly controlling terminal sprouting and remodeling, critical steps that disease-resistant aMN subtypes normally undertake for neuronal loss compensation upon insult. More broadly, I aim to contribute in filling an important knowledge gap by generating the first transcriptomic roadmap of aMN subtypes, and pinpointing at new candidates for

therapy development.

Topic: MSCA-IF-2018
Type of action: MSCA-IF-GF (Global Fellowships: andrà due anni presso Lawrence Berkeley National Laboratory Energy Geosciences Division, USA e poi tornerà per 1 anno al dip. di Geoscienze)
Proposal acronym: GROWING
Fellow Benjamin Mary (Francese, da due anni è a UNIPD e collabora col Prof. Cassiani)
Supervisor: Giorgio Cassiani
Dipartimento: Geoscienze

ABSTRACT

GROWING is a project dealing with the use of minimally invasive methods for roots monitoring, with the specific aim of improving water use in arboriculture, viticulture and agronomy. The aim of GROWING is to develop our capability of understanding, through measuring and modeling, the actions of the root system on water state and fluxes in the soil-plantatmosphere system. This is particularly critical in areas of water scarcity, such as the Mediterranean region. GROWING is based upon three scientific pillars: (a) an advanced plant root phenotyping technology using geophysical methods, overcoming current limitation in imaging roots under field working conditions; (b) a coupled above and belowground monitoring using geophysical, plant physiology and atmospheric measurements and (c) a data assimilation scheme that uses the data above to construct a hydrogeophysical model of water distribution in soil and exchanges with the atmosphere. The scientific developments above will then foster the design of new tools and services for arboriculture, viticulture and agronomy with the ambition to transfer innovative knowledge to stakeholders, farmers, and winemakers in particular. The ground breaking nature of GROWING lies in the pooling of human, technical, and data resources, in order to better understand the hydric stress and roots response under a range of soil and agricultural practices. In order to warrant effective dissemination of the project's results, I will work both with academic partners, the university in Padua (UNIPD) and the Lawrence Berkeley National Lab (LBNL) during the outgoing phase, and with farmers and stakeholders thanks to private companies' collaboration (FruitionSciences, Noble research institute). A two- way knowledge transfer is expected, with novel practical solutions to be developed in order to make non-invasive geophysical methods a state-of-the-art practice particularly in high-value crops.

Topic: MSCA-IF-2018
Type of action: MSCA-IF-GF Global Fellowships (Andrà per due anni all'UNIVERSITY OF MELBOURNE, School of Computing and Information Systems, in Australia e poi tornerà per 1 anno al dip. di Matematica)
Proposal acronym: PRISENODE
Fellow: Mohammad Shojafar (Iraniano. E' in Italia dal 2012. Ha collaborato con l'Università Sapienza di Roma, l'Università di Modena and Reggio Emilia, l'Università Tor Vergata e da un anno circa con il Prof. Mauro Conti di UNIPD)
Supervisor: Mauro Conti
Dipartimento: Matematica

Abstract:
Major technological trends in information technology such as cloud computing, big data, and mobile computing are based on powerful computing resources. The ever-increasing demand for computing resources has led companies and cloud service providers (CSPs) such as Google, Amazon, and Microsoft to build large warehouse-sized data centers called cloud data centers (CDCs). CSPs incorporate software-defined networking (SDN) and virtualization in their CDCs to ensure full utilization of server resources and reduce the power and electricity that are consumed. Applying SDN in CDCs provides reliable Quality of Services (QoS) and satisfying the user-centric Quality of Experience (QoE) in CDCs that are called software-defined cloud data centers (SDDCs). SDDC faces resource management problem and under threaten of security and privacy issues. To the best of my knowledge, no any practical tool can provide robust solutions to these problems, and further investigation is needed.
In this project, I integrate fog technology with SDDCs and design a scalable fog network to manage the cloud service demands as well as providing secure processing and traffic data privacy in SDDC. I named this project PRISENODE: Privacy- and secuRity-aware solutIons in SoftwarE-defiNed fOg Data cEnter. My project targets fog data center (FDC) which consists of SDN-enabled switches that are instantiated on an SDDC server and serving as edge switches (Fog Nodes; FNs).
FNs accommodate small-size flows with limited response time and deliver high user QoE. In this way, I design a fundamental tool (open-source software) together with a holistic business model for privacy- and security-aware data traffic passed through SDN-enabled switches FDCs/CDCs. The salient feature of my project is to jointly monitor network traffic, validate network traffic policies, and detect malicious entities in the cloud system as well as introducing related security- and privacy-aware defenses in SDDCs.

Topic: MSCA-IF-2018
Type of action: MSCA-IF-EF-CAR (Career Restart panel)
Proposal acronym: GRINP
Fellow: Mariagrazia Ranzini (italiana, è stata per 5 anni in Belgio , alla Université Libre de Bruxelles).
Supervisor: Carlo Semenza
Dipartimento: Neuroscienze
Abstract:

Grasping and Reaching In Number Processing (GRINP) is focused on the study of the neural underpinnings of number processing and its impairment. Number-related deficits can dramatically affect everyday life. Nonetheless, this impairment is often marginally considered in clinical practice, possibly because the complex nature of numerical disorders makes their diagnosis and rehabilitation quite hard. GRINP builds upon action-based theories of cognition - considering many aspects of human cognition as built on motor action - and on the idea that the neural bases for abstract concepts representation are networks of functionally-related recycled mechanisms. Through a comprehensive approach which couples clinical (neuropsychological) with neuroimaging methods (magnetoencephalography), GRINP tests whether number magnitude recruits the same sensorimotor network involved in planning and executing hand movements. GRINP is timely because it relates the cognitive aspects of number and action with the study of their neural dynamics; GRINP is innovative because it promotes at different levels (scientific, clinical, societal) an action-based approach for the understanding of cognitive impairment. GRINP is based on the convergence between the solid expertise of the Fellow in numerical cognition and behavioural research methods, and the long lasting tradition of the Host in neuropsychological and neuroimaging training and research. GRINP will allow the Fellow to restart research in her native country after more than five years of international research/teaching experience and a maternity break. Thanks to the planned training on advanced neuropsychological (voxel-based lesion symptom mapping, brain tractography) and neuroimaging methods (functional connectivity) the Fellow will broaden her expertise from experimental psychology to cognitive neuroscience, putting the bases for a successful longterm career plan.

Topic: MSCA-IF-2018
Type of action: MSCA-IF-EF-ST (Standard European Fellowships)
Proposal acronym: Mitobetes
Fellow: Lukáš ALÁN (proviene dalla Repubblica ceca, lavorerà due anni col Prof. Scorrano)
Supervisor: Luca Scorrano
Dipartimento: Biologia
Abstract:

Mitobetes project brings a new research on poorly characterized mitochondrial protein involved in important cellular and physiological processes such diabetes, kidney failure and cancer. It also aims on the role of mitochondria in diabetes, the disease which affects almost 10% of European population. The mitobetes project has a potential to help to find a new mitochondrial protein involved in diabetes, find a mechanism of diabetes development, increase the public knowledge about diabetes and thus helps to decrease EU healthcare costs. Mitochondria are crucial organelles not only in energy conversion, but also in a plethora of other biological processes. Their function is closely related to their dynamics, controlled by the pro-fusion proteins Mitofusin (Mfn) 1 and 2 and Optic atrophy 1 (Opa1); and by the fission proteins mitochondrial fission factor (Mff) and dynamin related protein 1 (Drp1). Opa1 not only controls mitochondrial fusion, but also shape of the mitochondrial cristae, a crucial parameter in determining mitochondrial function and participation in apoptosis. Opa1 exists in high molecular weight complexes of unknown composition that are dynamically modulated during cristae remodeling. Recently, the host laboratory completed a proteomic catalogue of proteins associating with Opa1 in intact cristae and leaving the complex only when cristae shape was disrupted. Among the hits associating with Opa1, the host lab discovered Von Willebrand Domain-containing Protein 8 (Vwa8), a mitochondrial protein of unknown function whose higher levels correlate with worse prognosis of Acute Myeloid Leukemia (AML). Here, I propose to understand the function of Vwa8 in mitochondrial network and cristae shape, Opa1 function, apoptosis and bioenergetics. This project will not only characterize the role of a novel protein in involved mitochondrial morphology and function, but also verify if a link between mitochondrial morphology and AML exists.

Topic: MSCA-IF-2018
Type of action: MSCA-IF-EF-CAR - Career Restart panel
Proposal acronym: EyeGestLearn
Fellow: Bjørn Nicola WESSEL-TOLVIG (danese)
Supervisor: Maria Grazia Busà
Dipartimento: Studi Linguistici e Letterari
Abstract:

The overall objectives for this proposal are two-fold: 1) Learning new theories and methods with international recognized scientists to push forward the boundaries of the state of the art; 2) promoting to peers and public the insights and methodological advancements from the project with the scope of changing teaching methods in online learning. More precisely, the purpose of this MSCA-fellowship is to acquire expert level knowledge in second-language teaching and eyetracking to investigate the cognitive effects of teachers' co-speech gestures on learning in an online learning environment where learners are not native English speakers. By tracking the students' eye movements and attention to teachers' cospeech hand gestures in the learning situation, I will gain unique understanding of how the learners attend to gestures and how the attention correlates with the uptake of new information. With the relevant guidance from the host organization both the progression and advancement of this proposal is in safe hands. The expertise of the supervisors in second-language teaching, speech analysis, educational psychology and eye-tracking will form an educational platform for myself to achieve my ambition of carrying this research proposal through. The objectives are relevant to the work program in two ways: 1) by maturing myself as a researcher to reach top international level with a solid international network; and 2) by working to create better learning materials and teaching skills in the massively expanding area of online learning (Massive Open Online Courses). In the grander picture, I work towards creating better learning opportunities for learners of all linguistic and socioeconomical backgrounds.

Topic: MSCA-IF-2018
Type of action: MSCA-IF-GF Global Fellowships (Andrà due anni presso il Department of Philosophy dell' University of Chicago)
Proposal acronym: NINA
Fellow: Luca Corti (italiano, è stato in Germania e Portogallo. Con la GF farà 18 mesi in USA per tornare 1 anno al Fisppa)
Supervisor: Luca Illetterati
Dipartimento: Studi Linguistici e Letterari

Abstract:

What are norms? Where do they come from? NINA aims to develop a new paradigm for thinking norms, moving beyond the prevailing but rigid dualism between norms and nature. It does so by excavating (and updating) a largely neglected tradition within Classical German Philosophy (CGP) with great potential for current scholarship. CGP is recognized as the origin of modern reflections on norms (the so-called "normative turn").However, prominent philosophers have imported ideas from CGP into current debates to defend "non-naturalist", "constructivist" theories of norms. Aside from being historically inaccurate, these theories setup a problematic dichotomy between norms and nature, increasingly recognized as untenable.

Yet there exists within CGP an alternative, forgotten line of thought –started by Kant and pursued by Hegel– that locates norms in nature. Rather than "leaving nature behind," Hegel analyzed key natural-scientific notions ("organism", "function" etc.) to reveal forms of normativity in nature. NINA aims to recover this unexplored tradition. Bringing together the most upto-date EU and US research in CGP with the best work on "normativity" and "naturalism", it will: (1) Open a new narrative in the growing field of the "history of metanormativity", by disclosing the post-Kantian tradition of normativity in nature (2) Provide the first comprehensive reconstruction of Hegel's views on natural normativity through direct dialogue with today's

debates on norms (3) Develop key Hegelian insights for current debates. NINA implements a unique cross- and interdisciplinary program that uncovers promising ideas from the past and mobilises them to impact current debates. Offering outstanding, focused training to the ER, NINA will facilitate unique transfer-of-knowledge and develop pathways for future cooperation with prestigious US institution (i.e. the largest Consortium for German Philosophy in the US), thus greatly improving the study of classical philosophy in Europe.

Topic: MSCA-IF-2018
Type of action: MSCA-IF-EF-RI Reintegration panel
Proposal acronym: GT-GM1
Fellow: Valentina Poletti (italiana, è stata 4 anni in Francia , ora si trova al Dana-Farber Cancer Institute Boston)
Supervisor: Alessandra Biffi
Dipartimento di Salute della Donna e del Bambino
ABSTRACT

GM-gangliosidosis (OMIM #230500) is a rare, autosomal recessive, neurodegenerative Lysosomal Storage Disorder. It is caused by mutations in the GLB1 gene, encoding the lysosomal hydrolase β-galactosidase. Infantile GM1-gangliosidosis is characterized by neurodevelopmental delay, hypotonia, dysphagia, seizures and death by 3 years of life. Due to the rapid progression and severe nature of this disease, which involves storage of undegraded metabolites and secondary mechanisms of cell damage, correction requires a rapid and robust enzyme delivery to the whole central nervous system (CNS), possibly associated to reduction of local inflammation. Here we propose an ex vivo gene therapy (GT) strategy aimed at preventing or ameliorating the symptoms of the disease in the murine model. Multiple copies of GLB1, alone or in association with a neuroprotective factor, will be delivered ex vivo to hematopoietic stem/progenitor cells by lentiviral gene transfer to determine a sustained and robust expression of the therapeutic enzyme in the CNS of transplanted mice. Genetically modified HSPCs will be administered by a novel approach combining the conventional intravenous route with direct administration into the brain lateral ventricles, to anticipate the myeloid reconstitution in the brain and possibly the therapeutic effect. Our working hypothesis is that this optimized GT strategy could successfully control disease manifestations in the animal model. Moreover, a deep genome-wide genomics analysis will be performed on individual brain cells to elucidate the molecular mechanisms at the basis of the disease and mediating the therapeutic effect. The study will generate a proof of concept for a future clinical development of an efficacious ex vivo GT for infantile GM1-gangliosidosis and will inspire the development of therapies for other LSDs.