

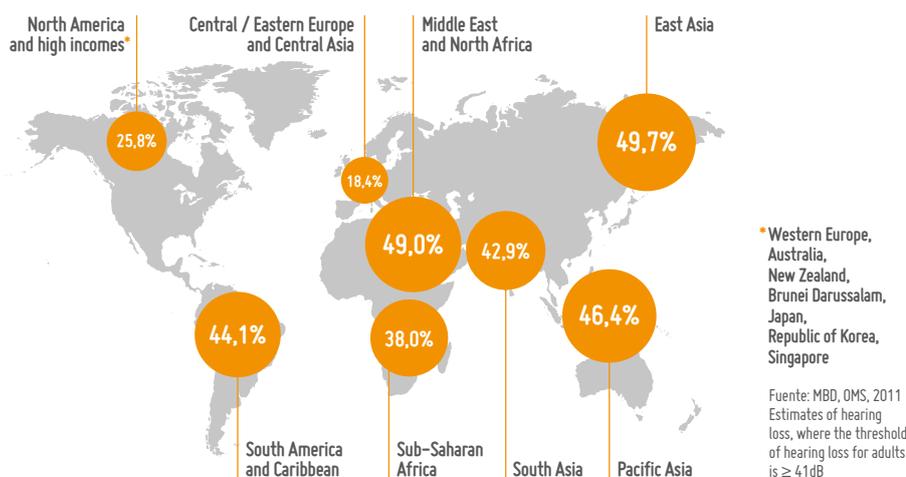
About the presbycusis

Age-related hearing loss, presbycusis, is the most frequently occurring sensory abnormality associated with aging.

A steady growth of life expectancy will lead to a rapid increase in the number of older people with expressed presbycusis. The etiology of presbycusis is multifactorial, comprising effects of noise exposure, ototoxic drugs, inflammation, and last but not least, genetic factors. From a functional point of view, in addition to increased hearing thresholds,

presbycusis is characterized by a decreased quality of the temporal processing of sounds, as well as of decreased space hearing. The results of many recent studies, show that, long-term hearing deprivation can impact cognitive performance by decreasing the quality of communication, leading to a social isolation and depression.

Percentage increase in number of persons age 65 and over with hearing loss from 2010-2020



Contact us

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Seventh Framework Programme (FP7) - PEOPLE Industry-Academia Partnerships and Pathways (IAPP) - Marie Curie Actions.
Call: FP7-PEOPLE-2013-IAPP.

Innovative integrated strategies for the healing of age-related hearing loss

We recommend

2-minute neuroscience: The cochlea
youtube.com

WHO: Deafness and hearing loss
who.int

Agir pour l'audition
agirpourl audition.org

White House report aging and President's Council of Advisors
obamawhitehouse.archives.gov

NASEM hearing loss consensus June 2016
nationalacademies.org

Hearing care equality Baltimore hears approach
ncbi.nlm.nih.gov

SPIRALtherapeutics
spiraltx.com

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7th Executive Committee Meeting

Toulouse (France), 15 May, 2017

7th Executive Committee Meeting was organised by AFFICHEM. The event took place in the Cancer Research Center of Toulouse (CRCT).



Workshop 'How to transfer the knowledge into productive and commercial results, patenting, creation of spin-offs and intellectual property rights'

Toulouse (France), 15 May, 2017 · By **Marina Bruno** (Researcher at UNIFI)

Monday 15th of May 2017 I had the opportunity to participate to the Targear project Workshop organized by Affichem in the Cancer Research Center of Toulouse (CRCT). The main topic dealt with how to carry out the effective collaboration and transference of knowledge between basic researchers and companies. It counted with the participation of Professor Marc Poirot and Mr. Stephane Sylvente founders of AFFICHEM. The talks allowed me to go further into the scientific discovery of Dendrogenin compounds and its role as the base to establish a biotechnological and pharmaceutical company, to promote these molecules as candidate drugs for prevention and/or treatment, and gave me the idea of the itinerary to be carried out to grow up as a spin-off. It was also very interesting to know how to build up a company from the



most legal and economic point of view, especially regarding the creation of relationships and collaborations with strategical partners. My attendance to this workshop was very fruitful for my academical and personal experience and formation, because allowed me to go deeper into the theme of converting an idea into a business, and to interact with researchers and professionals from different scientific and technological realities.

Upcoming activities

Training school: Drug Discovery and Development Basel (Switzerland), 4–6 October, 2017

COST Action BM1402, Development of a European network for preclinical testing of interventions in mouse models of age and age-related diseases (MouseAGE) invites researchers to apply for this training school. [See details here](#).

42nd FEBS Congress: From molecules to cells and back Jerusalem (Israel), 10–14 Sept, 2017

The FEBS Congress aims to provide an outstanding international forum in the area of Europe and neighbouring regions for the face to face exchange of knowledge and ideas across the molecular life sciences. [Visit the website](#).

17th FEBS Young Scientists' Forum (YSF) Jerusalem 2017 Jerusalem (Israel), 7–10 Sept, 2017

The forum will provide a platform for PhD students and postdocs from the FEBS Constituent Societies to get together to present their work either as short oral presentations, or as posters, in a friendly international atmosphere. The YSF will also include keynote lectures by leading researchers, a roundtable event on skills required to build a strong basis for a successful scientific career, and a variety of social events. [Know more](#).

TARGEAR's editorial initiative: 'Hormones and neural aging: lessons from experimental models'

TARGEAR has launched a new editorial initiative in 'Frontiers in Ageing Neurosciences', it is OPEN for contributions on 'Hormones and Neuronal Aging: Lessons from Experimental Models'. [Read more](#).

TARGEAR's CSIC team will receive the XV Health Prize of FIAPAS Madrid (Spain), 5 July, 2017

The ceremony will be held in the 'Circulo de Bellas Artes' of Madrid. [Read more](#).

13th European Federation of Audiology Societies (EFAS) Congress

Interlaken (Switzerland), 7–10 June, 2017

Profs. Josef Syka (BIOMED) and Isabel Varela-Nieto (CSIC) organised and co-chaired the TARGEAR Structured Session 'Age-related hearing loss: new knowledge for an aging population'. The session was very well attended and counted with the excellent conferences of Profs. Paolo Gasparini (Trieste, Italy), Marlies Knipper (Tübingen, Germany) and Anna Fetoni (Rome, Italy). Detailed information about this Structured Session is available on this [link](#) as well as in the [website of the congress](#).



Mediterranean Neuroscience Society Conference (MNS) 2017

Saint Julians (Malta), 12–15 June, 2017 · By **Dr. Francesca Cencetti** (UNIFI)

The [6th MNS Conference](#) has been organized in Malta a popular tourist destination with its warm climate, numerous recreational areas and architectural and historical monuments. It has been a very good occasion especially to hear about new frontiers in neuroscience research. Indeed, the MNS 2017 Conference in Malta has brought together researchers in neuroscience from Mediterranean area and international experts at the forefront of basic and clinical neuroscience. The [MNS 2017 program](#) included 9 plenary lectures, the FENS special lecture, the EMBO Plenary lecture more than 60 symposia and hundreds of poster presentations as well as two workshops – on how to get a paper published, read and cited and on Statistical Modelling – which stimulated interaction between participants. The MNS hosted the [Symposium on 'Understanding and protecting progressive hearing loss'](#) the 15th of June. TARGEAR partners participated and presented recent data: it has been a good occasion to share results and future perspectives of the TARGEAR project among partners and with other neuroscientists. Furthermore, MNS has been for me an excellent occasion to talk with researchers about new



technical approaches that can be useful for my research projects. The possibility to join together neuroscientists that deals with basic and molecular research using in vitro and in vivo models as well as clinicians that are at the frontline in patients cure has been very much stimulating me. I met experienced researchers but also very young that fuelled scientific discussion with the aim to find common objectives and start new collaborations in basic and applied neurosciences. Neuroscience research has improved a lot our knowledge in these re-

cent years: from the discovery of mirror neurons to the understanding of the interplay between glia and neuronal cells, both at a metabolism and signalling level, as well as the crucial involvement of inflammation in degenerative disease. The main objective – beyond the training opportunity for students and young researchers – has been the scientific exchange between neuroscientists to find innovative strategies for the treatment of degenerative neuronal disease, which should be the priorities of today society.

First 'Occitanie / Nouvelle Aquitaine Economic Summit'

Toulouse (France), 23 May, 2017 · By **AFFICHEM**

AFFICHEM was honoured to be selected by the economic newspaper LA TRIBUNE to become part of the start-up village built around the theme of 'Health' at the 1st Occitanie / Nouvelle Aquitaine Economic Summit Organized in Toulouse. This innovative village in the new Occitanie region is located in the heart of the Central Hall of the Toulouse III—Paul Sabatier University and it has welcomed all the political personalities, business leaders and regional actors of the world of Research. It is during this morning of exchanges between the regional political and economic players that the AFFICHEM Company brought together its team of researchers who presented to a large public the relevance of the

research program realized by the European consortium TARGEAR. The booth of AFFICHEM on the TARGEAR program was acclaimed by all the actors and visitors. As usual, all the researchers of AFFICHEM on the stand of the company had a huge pleasure to go meet this wide public in order to answer the questions of the lay people and the most savant since this village took place at the very heart of the great Toulouse III—Paul Sabatier University, emblematic place of the Research and Scientific Teaching of the new great Occitanie region. Toulouse is also part of these cities, as are Montpellier, which include deafness specialists and eminent clinicians such as Prof. Fraysse who plays a predominant role in the new



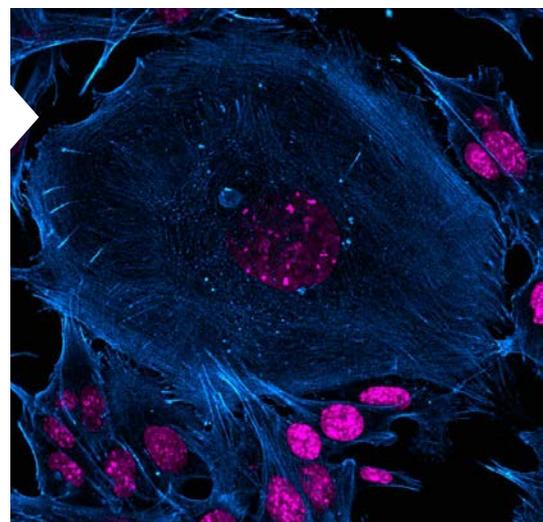
dynamics of the Occitanie region, promoting the interest of preclinical and clinical research in the field of auditory degeneration. The field of hearing degeneration is indeed one of the priority axes of the 'Aging' theme, which is the spearhead of the competitiveness cluster of Toulouse in the field of research on Aging and Cancer. During this meeting, AFFICHEM has worked to honour this Research of Excellence on deafness carried by an exceptional motivation emanating from all the private and public players gathered within the European Consortium TARGEAR.

The SEBBM published a photo of Dr. Blanca Cervantes in its Art Gallery of Science

June, 2017

A scientific picture taken by the TARGEAR recruited Dr. Blanca Cervantes (CSIC) has been published in the Art Gallery of Science at the website of the Spanish Society for Biochemistry and Molecular Biology (SEBBM). Blanca's

microphotograph 'Big brother is watching you' was published in June 2017 shows an immunofluorescence of HEI-OC1 cells. You will able to vote for it very soon, please [visit the following link](#).



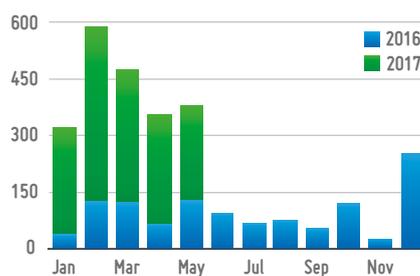
TARGEAR's Social Networks

By **Begonya Morales** (TARGEAR Project Manager)

In addition to the website of TARGEAR, our project is also present in social networks as YouTube, Facebook and Twitter in order to disseminate our work as well as interesting information related with age-related hearing loss. Among the three social networks, TARGEAR's Twitter account is the network with the biggest audience. Currently, we have 161 followers and our account is fast

increasing its scope. In fact, during the six last months we have triplicated the number of tweets impressions, passing from 917 impressions (Jul-Dec 2016) to 27532 (Jan-Jun 2017). In addition, the number of profile visits is also growing as the graphic below shows. If you have not visited our social networks yet, do not wait any longer to do it and follow us on your favorite social network.

Profile visits of TARGEAR's Twitter



TWITTER twitter.com/Targear
FACEBOOK facebook.com/Targear.project
YOUTUBE [youtube.com > Targear Info](https://youtube.com/TargearInfo)

Autophagy in the vertebrate inner ear

By Magariños M, Pulido S, Aburto MR, de Iriarte Rodríguez R and Varela-Nieto I.

Sphingosine 1-phosphate signaling axis mediates fibroblast growth factor 2-induced proliferation and survival of murine auditory neuroblasts

By Bruno M, Rizzo IM, Romero-Guevara R, Bernacchioni C, Cencetti F, Donati C, Bruni P.

Cochlear homocysteine metabolism at the crossroad of nutrition and sensorineural

By Partearroyo T, Vallecillo N, Pajares MA, Varela-Moreiras G, Varela-Nieto I.

A comparative study of drug delivery methods targeted to the mouse inner ear: bullostomy versus transtympanic injection

By Murillo-Cuesta S, Vallecillo N, Cediel R, Celaya A M, Lassaletta L, Varela-Nieto I, Contreras J.



By Dr. Nicolas Caron (AFFICHEM)

How much do you know about Intellectual Property (IP)? Test yourself with this Quizz proposed by Dr. Nicolas Caron during the TARGEAR Workshop 'How to transfer the knowledge into productive and commercial results, patenting, creation of spin-offs and IPR'.

- 01 **What is the purpose of a search of prior art?**
 - a. It makes to verify the novelty of the invention
 - b. It provides legal protection
 - c. It recapitulates the procedural steps that have been taken so far
- 02 **An inventor is:**
 - a. A physical person who invented something
 - b. Indifferently a physical or moral person who invented something
 - c. The agent of an innovative entity
- 03 **In addition to novelty and inventive step, what is the third modality of patentability?**
 - a. Be exorbitant of the state of the art
 - b. Be capable of industrial application
 - c. A suitable description of the invention
- 04 **An activity is qualified as inventive if:**
 - a. It is a discovery
 - b. It is deductible from the state of technique by the interplay of simple current operations
 - c. It is an invention unaffected by obviousness

- 05 **What is an 'industrial application'?**
 - a. The possibility to transfer a theorized model in the framework dedicated to the industry
 - b. An invention whose industrial application is effective at the time of filing
 - c. The object of the invention may be manufactured or used in industry
- 06 **In the context of a patent application, what is a consultant?**
 - a. A person who advises inventors on how to write a patent
 - b. A person who advises applicants on how to write a patent
 - c. A person (or department) who manages the legal aspect and write a patent
- 07 **What is the 'person skilled in the art'?**
 - a. A fictional character provided with means to fully carry out the invention described
 - b. A fictional person with normal knowledge in the field considered
 - c. A versatile fictional character in the engineering sciences

- 08 **What are the claims in the patent procedure?**
 - a. Indication of objections concerning the procedure for the deposit of a patent
 - b. The exact definition of the invention and the perimeter of the protection requested by specifying the technical characteristics
 - c. The legal action brought by a person claiming paternity of the invention
- 09 **Which of these 3 suggestions can be a reason for rejection?**
 - a. Lack of estimation of the cost of carrying out the invention
 - b. Claim number less than 5
 - c. Defective exemplification
- 10 **What formalizes a licensing?**
 - a. A contract awarded by the national industrial protection agency
 - b. A contract by which the patentee assigns to a licensee the right to exploit the patent
 - c. A contract by which the patentee assigns to a licensee the ownership of his patent

Silvia Murillo

Researcher at CSIC-CIBERER

Dr. Silvia Murillo-Cuesta is a postdoctoral researcher in the Neurobiology of Hearing group, Institute of Biomedical Research 'Alberto Sols' CSIC-UAM, Madrid (SPAIN). She has been working in the laboratory led by Prof. Isabel Varela Nieto since 2006 as the person in charge of the development and neurofunctional evaluation of animal models to study the molecular basis of hearing and deafness. Her attention was brought to auditory science several years ago thanks to the professional activity in the Complutense University Veterinary Teaching Hospital, where she collaborated to the setup of an ORL service for pets. As a veterinarian, she has a strong experience in animal models, surgery and anesthesia. In addition, she specialized in the characterization of the auditory phenotype in animal models, mainly with in vivo

non-invasive electrophysiological methods such as the auditory brainstem response, the acoustic startle reflex and the otoacoustic emissions. Moreover, she is an expert in the development of animal models of hearing loss secondary to noise exposure or ototoxic drug administration, both in mice and rats. Since 2007 she is the responsible of the Non-invasive Neurofunctional Evaluation Service at IIBm Alberto Sols ([read more](#)) and since 2009, responsible of the Laboratory Animals Phenotyping Network, CIBER of Rare Diseases (CIBERER). During the last 10 years she has participated in national and international several projects covering the molecular basis of hearing and deafness (mainly the IGF-1 deficiency) and the development of preclinical studies with new therapies for deafness. Since 2013 she had the opportunity



to participate in TARGEAR project, which allowed her to look at age related hearing loss or presbycusis. Within this project, she has collaborated with TARGEAR fellows and secondees in different areas, such as the development and diagnostic of tinnitus, or the evaluation of new coated cochlear implants in rat models. In addition, she participated as a teacher in the TARGEAR Auditory Summer School in 2016.



Marina Bruno

Secondee from UNIFI to MED-EL

I am attending my Ph.D. program in Biochemistry and Molecular Biology in the Department of Biomedical, Experimental and Clinical Sciences 'Mario Serio' at the University of Florence since November 2015, but I had the chance to join the Lipid Cell Signaling and Biology laboratory of Prof. Paola Bruni at UniFi in October 2012, for the experimental project of my Bachelor's Degree. I received my Master's Degree in Biology at the University of Florence in July 2015, with an experimental thesis on the role of sphingosine 1-phosphate signaling axis in proliferation and survival of auditory murine neuroblasts. As part of my Ph.D. course, I was involved in the TARGEAR project and I was seconded from the University of Florence to MED-EL Spain, in Madrid, for a six months period, from January to July 2017. My secondment research plan included a theoretical part, per-

formed in the company, in which I had the opportunity to deeply understand how a cochlear implant is built and how it works, the different types of implant depending on the personal needs of each patient and the auxiliary devices to facilitate patient life's quality. I had also the big chance to personally assist to the technical fitting of the implants and follow up of implanted patients (Hospital La Paz, Madrid). Besides, during my secondment I was also involved in studying the releasing of AF243 from silicon sheets loaded with 10% AF243, incubated in cell culture medium for different time points, using the cell culture facilities of the CSIC (Prof. Isabel Varela-Nieto laboratory). This research was carried out with the purpose of investigating the possibility to use AF243 as a neurotrophic factor useful to improve the efficacy of the cochlear implant.

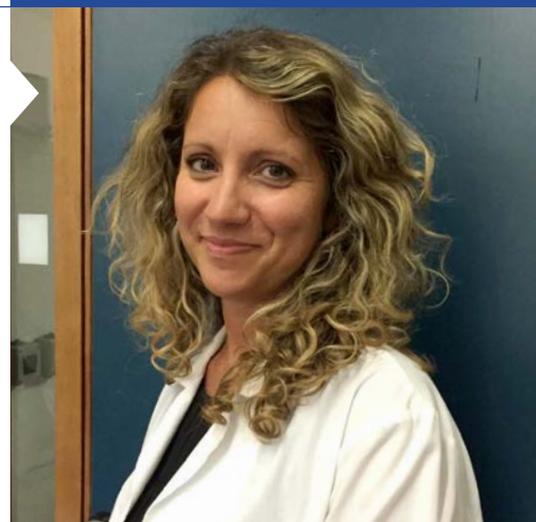
Francesca Cencetti

Researcher at UNIFI

[→ Read more](#)

Dr. Francesca Cencetti is a researcher in the Department of Experimental and Clinical Biomedical Sciences Mario Serio at the University of Florence (UNIFI). She has accumulated experience in cellular biochemistry and biology. In the lab. Lipid Cell Signaling and Biology coordinated by Prof. Paola Bruni at UNIFI she participated to several projects, giving a strong contribution to the study of the role of S1P in skeletal muscle regeneration. She had the opportunity to join Targear project which allowed dedicating herself to the study of hearing loss. The possibility to work in collaboration with people that are engaged in the study of hearing impairment from different points of view excited and motivated her, given that at present no

pharmacological treatment of this inability is available but the only intervention is represented by hearing aids and various implantable devices. In UNIFI she began to study of molecular mechanisms involved in proliferation and survival of otic neuroprogenitors, in order to find possible target of intervention to prevent neuronal degeneration in hearing loss. Recently, UNIFI demonstrated a crucial role for S1P signaling axis in the proliferation and the survival of otic vesicle neuroprogenitors. These findings are promising since research interest in this field is aimed at identifying cell or gene therapy based solutions or pharmacological approaches that could be applied therapeutically alongside the auditory devices to pre-



vent hair cell and neuron loss. At present she is engaged in in vitro study regarding the role of S1P signaling in cell progenitors derived from ventral otocyst that differentiate to sensory and non-sensory epithelial cells, that possibly will clarify S1P action in hair cell progenitor's behavior.



QUIZZ

The solutions

QUESTIONS

SOLUTIONS

01	a. If the project is supposed to be innovative and capable of an application it is imperative to undertake a search for anteriority to convince itself of the novelty of the idea.
02	a. Researchers and engineers who are at the origin of innovation.
03	b. The 3 modality of patentability are novelty, inventive and industrial application.
04	c. An invention is considered to be inventive if, for a person skilled in the art, it is not evident from the state of the art.
05	a. The invention must be technically feasible and have the possibility of being transferred into an application framework. Warning: It is assumed that if its cost of execution would be too high to allow a profitable exploitation then one would stay in a virtual or putative domain.
06	c. A person (or a department) who manages the legal aspect and write a patent in compliance with technical and legal forms.
07	b. The person skilled in the art has specialized knowledge and qualifications required in the specific field of the invention.
08	b. The claims are the key elements of the patent, they enumerate very precisely the constituents of the invention which the applicant requires protection.
09	c. Defective exemplification can be a reason for rejection
10	b. The license equates to a lease. However, the patentee retains ownership of its patent.