



Ministero
dell'Università
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PIANO NAZIONALE
DI RIPRESA E RESILIENZA



Università
degli Studi di
Messina

PNRR - Mission 4, Component 2, Investment 1.5 - D.D. 3277 del 30.12.2021- Call for presentation of Intervention Proposals for creation and strengthening of "innovation ecosystems", building of "R&S territorial leaders" – Innovation Ecosystems"

SAMOTHRACE Project- Sicilian MicronanoTech Research And Innovation Center
CUP J43C22000310006

Call for presentation of applications for assignment of no.10 PhD scholarships funded by the "Innovation Ecosystems" Project – "Sicilian MicronanoTech Research And Innovation Center – SAMOTHRACE", by evaluation of project Proposals, only for candidates eligible who are not already recipients of D.M. no. 351/2022 or D.M. no. 352/2022 Scholarships, in the merit rankings relating to the Call for admission to the PhD Courses activated at the University of Messina – 38th CYCLE - referred to in D.R. No. 1741 of 27th June 2022 and subsequent Call D.R. No. 2603 of 5th October 2022

THE RECTOR

- IN VIEW OF the Law of 3rd July 1998, No. 210, and in particular art. 4 in the matter of PhD courses, as amended by art. 19, paragraph 1, of the Law of 30th December 2010, No. 240;
- IN VIEW OF the Statute of the University, issued with D.R. No. 1244 of 14th May 2012 (published on G.U. - General Series No. 116 of 19th May 2012) and amended with D.R. No. 3429 of 30th December 2014 (published on G.U. - General Series No. 8 of 12th January 2015);
- IN VIEW OF D.M. No. 226 of 14th December 2021 concerning "*Regulation laying down procedures for the accreditation of PhD centers and PhD courses and criteria for the establishment of PhD courses by accredited bodies*";
- IN VIEW OF *the Regulation of the University of Messina concerning the PhD courses*, issued with D.R. No. 834 of 25th March 2022;
- IN VIEW OF D.M. No. 301 of 22nd March 2022 with which the "*Guidelines for the accreditation of PhD courses*" were approved (Ministerial Note No. 8424 of 23rd March 2022, prot. No. 38641 of 24th March 2022) and D.M. No. 289 of 25th March 2021, with which the "General guidelines of the programming of the Universities 2021-2023 and indicators for the evaluation of the results" were defined;
- IN VIEW OF the resolutions of the Academic Senate, prot. no. 69064 of 30th May 2022, and the Board of Directors, prot. no. 69066 of 30th May 2022, with which, for the 38th cycle, the proposals for renewal, new activation, and participation in PhD Courses in a partnership or in PhD courses of national interest and the allocation of positions, once evaluated the consistency with the objectives of the PNRR, were approved, as well as, with regard to no. 15 PhD Courses based at the University of Messina, the initiation of the selection procedures, by qualifications and examinations, for admission to the PhD Courses of the 38th cycle, was established;
- IN VIEW OF D.R. No. 1741 of 27th June 2022 (prot. no. 82863 of 27th June 2022), with which the public competition, by qualifications and examinations, for admission to no. 15 PhD Courses, activated by the University of Messina – 38th cycle was launched and the subsequent DD.RR. reference numbers from

2457 to 2470 and 2472 of 23rd September 2022, with which the competition proceedings were approved and the merit rankings and admissions to the 15 PhD Courses available with the PhD call referred to in D.R. No. 1741/2022 were published;

IN VIEW OF the resolutions of the Academic Senate and the Board of Directors, respectively, prot. no. 121259 and no. 121739 of 3rd October 2022, with which the publication of a Call for presentation of applications for assignment of no. 14 PhD scholarships was authorized, expiring in 10 days from the publication, open to all the candidates eligible who are not already recipient of D.M. 351/2022 and D.M. 352/2022 scholarships in the competition for admission to the PhD Courses 38th cycle of the University of Messina, referred to in D.R. No.1741/2022, in order to assign the D.M. 351 and/or D.M. 352 positions available, by a selection based on the consistency evaluation of the projects presented by the candidates with regard to the obligatory topics referred to in D.M. No. 351 and No. 352 of 9th April 2022, carried out by the examination committees for admission to the PhD Courses expressly reconvened;

IN VIEW OF D.R. No.2603 of 5th October 2022, prot. no. 123678 of 5th October 2022, with which the Call for presentation of applications for assignment of no. 14 PhD scholarships, by evaluation of project proposals, only for candidates eligible who are not already recipients of D.M. 351 or D.M. 352 scholarships in the merit rankings relating to the Call for admission to the PhD Courses activated at the University of Messina – 38th CYCLE – referred to in D.R. No. 1741 of 27th June 2022 and subsequent DD.RR. reference number 2826/2022 – 2830/2022 – 2834/2022 – 2860/2022 – 2864/2022 – 2865/2022 – with which the competition proceedings were approved and the merit rankings and admissions were published;

IN VIEW OF D.D.G. No. 3277 of 30th December 2021, with which MUR, as part of the National Recovery and Resilience Plan, Mission 4 “Education and Research” – Component 2 “From Research to Company” – Investment 1.5, funded by the European Union – NextGenerationEU, approved the *Call for presentation of Intervention Proposals for creation and strengthening of “innovation ecosystems”, building of “R&S territorial leaders” – Innovation Ecosystems*;

GIVEN THAT in response to the invitation of the University of Catania (leader proposing subject), the University of Messina has taken part in the aforementioned Call, with the presentation of the project proposal “Sicilian MicronanoTech Research and Innovation Center – SAMOTHRACE” in which the University of Palermo, the National Research Council, the National Institute of Nuclear Physics, STMicroelectronics, Meridionale Impianti, UPMC Italy, Quantum Leap, the KORE University of Enna and the National Institute of Geophysics and Volcanology take part;

IN VIEW OF D.D.G. No. 1059 of 23rd June 2022, with which the Innovation Ecosystem “Sicilian MicronanoTech Research and Innovation Center – SAMOTHRACE”, field of intervention “4. Digital, Industry Aerospace”, for the implementation of the Research and Innovation Programme titled “Sicilian MicronanoTech Research and Innovation Center – SAMOTHRACE” was financed by MUR;

IN VIEW OF the resolutions of the Academic Senate and the Board of Directors of 27th

September 2022, respectively prot. no. 121259 and no. 121739 of 27th September 2022, with which, after authorizing the publication of a Call for assignment of additional PhD scholarships, for positions funded by D.M. 351/2022 and D.M. 352/2022, the publication of a subsequent Call for assignment of additional PhD scholarships in order to select the candidates and the related PhD projects for the implementation of the Research Programme “Sicilian MicronanoTech Research and Innovation Center – SAMOTHRACE” was authorized, by reducing and/or changing the terms and methods of the selections, possibly also by way of derogation from University regulatory provisions;

IN VIEW OF the resolutions of the Academic Senate and the Board of Directors of 25th November 2022, respectively prot. no. 154465 and no. 154737 of 30th November 2022, with which the PhD Courses and the respective number of positions for which the selection procedures on the basis of the topics of the WP of the PNRR project “Sicilian MicronanoTech Research and Innovation Center – SAMOTHRACE” – must be started, have been identified and the WP leaders of the project, after hearing the Coordinators of the PhD courses, were mandated to define the 14 topics which must be developed by the selected PhD students;

IN VIEW OF Rectoral note prot. no.11123 of 30th January 2023, with which *it is noted that, for requirements relating to the achievement of two different milestones of the Project (M2 and M3), no. 4 of the no. 14 PhD scholarships indicated in the aforementioned resolutions, do not need to be activated in this phase of the project; in particular, reference is made to the no. 2 PhD scholarships in Ingegneria Industriale e dell'Informazione, to no. 1 of the no. 2 PhD scholarships in Fisica and to no. 1 of the no. 2 PhD scholarships in Scienze Veterinarie. Consequently, the number of PhD scholarships to activate, foreseen by the M2 milestone, is equal to no. 10;*

GIVEN THAT with the afore-mentioned Rectoral note, it is asked to implement what has been authorized with the afore-mentioned resolutions, activating the required procedures, considering that the deadline for the presentation of the applications must be 10 days from the publication of the Call and that the PhD examination committees for admission will be the same ones already indicated for the competition for admission to the PhD Courses 38th cycle, expressly reconvened;

IN VIEW OF the specific profiles (Topics of the Work Packages) required for the no. 10 PhD scholarships, as well as those received from the WP leaders of the Samothrace Project, and attached to the afore-mentioned Rectoral note, prot. no.11123 of 30th January 2023;

IN VIEW OF D.M. No. 247 of 23rd February 2022 with which, starting from 1st July 2022, the annual amount of the scholarship for the attendance of the PhD courses was redetermined in € 16.243,00, gross of social security charges payable by the recipient;

GIVEN the need to adhere to the transversal principles provided by the PNRR, including, among others, the principle of contribution to the climate and digital goal (so called tagging), the principle of gender equality and the obligation of protection and enhancement of young people and that the

Rectoral note acknowledges that respect of the principle of gender equality, which means the need to show that at least the 40% of the personnel temporarily recruited or recipient of PhD or research scholarships is of female gender, is already guaranteed in the previous rankings;

GIVEN THAT

the total cost of the Scholarships for the amount of **700.000,00** Euros is covered by the funds related to the project "Sicilian MicronanoTech Research and Innovation Center – SAMOTHRACE", Project Code **PNRR_SAMOTHRACE_INVESTIMENTO_1.5**;

WITHOUT PREJUDICE TO any subsequent amendments and/or additions to the Call that will be advertised on the website of the University of Messina at the address <https://www.unime.it/bandi-e-concorsi>.

DECREES

Art. 1

Positions for which applications can be presented

Following the afore-mentioned resolutions of the Academic Senate and the Board of Directors, and the Rectoral note prot. no.11123/2023, with regard to the PhD Courses mentioned below, activated at the University of Messina, for A.Y. 2022/2023 (38th Cycle) **the following positions with Scholarship** are available:

Positions on PNRR obligatory Project <i>"SAMOTHRACE" – Sicilian MicronanoTech Research And Innovation Center</i>	
PhD Courses	Number of positions
BIOINGEGNERIA APPLICATA ALLE SCIENZE MEDICHE	No. 1
BIOLOGIA APPLICATA E MEDICINA SPERIMENTALE	No. 3
FISICA	No. 1
SCIENZE CHIMICHE	No. 2
SCIENZE UMANISTICHE	No. 1
SCIENZE VETERINARIE	No. 1
TRANSLATIONAL MOLECULAR MEDICINE AND SURGERY	No. 1

Please note: the Project Proposal must be carried out by the candidate taking into consideration the Topics of the Work Packages of the Project "Sicilian MicronanoTech Research and Innovation Center – SAMOTHRACE" indicated in the attachments to this Call (**Annexes no. 1-10**).

The duration of the PhD Courses is **three years**.

The PhD courses will ensure respect for horizontal priorities and DNSH (Do No Significant Harm) principle of the PNRR.

Art. 2 Admission requirements

For the PhD Courses indicated in art.1, candidates **eligible** (admitted and not admitted), who are **not already recipients of D.M. No. 351/2022 and No. 352/2022 scholarships**, in the merit rankings within the selection procedure referred to in D.R. No. 1741 of 27th June 2022 and the subsequent Call D.R. No. 2603 of 5th October 2022, can participate in this Call exclusively for the PhD Course for which they are in the ranking.

Admission requirements indicated in art. 2 of the Call for selection referred to in D.R. No. 1741 of 27th June 2022 are left unprejudiced.

Art. 3 How to apply

Candidates **eligible** (admitted and not admitted) **who are not already recipients of scholarships according to D.M. No. 351/2022 and No. 352/2022** in the aforementioned merit rankings, holding the requirements referred to in art.2, **must** submit, electronically, through the Esse3 platform <https://unime.esse3.cineca.it/Home.do> (where they are already registered as participants in the Call for selection referred to in D.R. No. 1741 of 27th June 2022) an application to participate in this Call, according to the form available at the link <https://www.unime.it/bandi-e-concorsi> and on the Esse3 platform, and the Project Proposal for every single position with scholarship they want to participate in, in the PhD Course.

The submission of the application through the online procedure implies the acceptance of the rules contained in this Call and in the attachments to this Call (**Annexes 1-10**), in the current PhD Courses Regulation at the University of Messina, in the rules of the Call referred to in D.R. No. 1741 of 27th June 2022, including the attachments, which are integral part of it, and in all the mentioned rules, by the candidates.

The procedure for participation will be active **until 16th February 2023 at 11.59 p.m.** After this period, the connection will be no longer active, and it will be no longer possible to complete the application form. Applications received after the indicated deadline, or produced and/or received in a different way, **will be excluded**.

Candidates do not have to pay any contribution for participation in this procedure.

Art. 4 PhD examination Committees

The Project proposals referred to in this Call will be evaluated by the same examination Committees for admission to the PhD Courses (38th cycle), following a specific reconvening.

Art. 5 Evaluation of the Project Proposal

The PhD examination Committee proceeds with the evaluation of the Project Proposal of the candidate, expressing a judgement of suitability and consistency in relation to the topics referred to in the Work Packages of the PNRR "SAMOTHRACE" – Sicilian MicronanoTech Research And Innovation Center indicated in the attachments to this Call (**Annexes no. 1-10**) in a closed session.

Candidates **are not permitted** to attend this evaluation.
Committees must finalise work **by 22nd February 2023**.

Art. 6 Admission to PhD courses

Candidates are admitted to PhD Courses, according to the ranking order and considering the suitability expressed by the PhD Committee for the individual obligatory Projects presented by the candidates.

Reference is made in full **to art. 6** of the Call referred to in D.R. No. 1741 of 27th June 2022.

Art. 7 Enrollment Procedures

Candidates admitted to the PhD courses based on the final ranking must express their acceptance **within the peremptory deadline of 3 days from the publication** of the evaluation results on the website <https://www.unime.it/bandi-e-concorsi>.

Failure to complete the enrollment will result in the forfeiture of admission to the PhD Course. **No personal communications will be sent to candidates. Candidates admitted to the PhD Courses are responsible for checking the dates and enrollment procedures.**

For more information on how to enroll, reference is made in full to what is provided for **by art. 7** of the Call referred to in D.R. No. 1741 of 27th June 2022 published at the link <https://archivio.unime.it/it/ricerca/dottorati-ricerca>.

Agreement between the winner of the PhD Scholarship of this Call and the University will be regulated by the drawing up of a contract. The contract must be signed with the digital signature.

Art. 8 Scrolling of ranking and replacement

In the event of forfeiture or waiver by admitted candidates, the final ranking will be scrolled down for positively evaluated candidates **only in accordance with the procedures and deadlines provided for by the D.D.G. no. 3277 of 30th December 2021 and by all the rules related to the "SAMOTHRACE" Project – Sicilian MicronanoTech Research and Innovation Center,** as well as in compliance with the conditions established in art. 8 of D.R. No. 1741 of 27th June 2022.

Art. 9 Taxes and fees

For payment of taxes and fees for enrollment and registration to PhD Courses, reference is made to what is provided for by art. 9 of the Call referred to in D.R. No. 1741 of 27th June 2022.

Art.10 Scholarships

The PhD scholarships have a total duration of three years and are annually renewed, following a positive verification by the PhD Academic Board regarding the completion of the

program of the activities planned for the previous year, as provided for by art. 20 of the PhD Regulation of the University of Messina.

Starting from 1st July 2022, the annual amount of the scholarship for the attendance of the PhD courses is equal to 16.243,00 euros, gross of social security charges payable by the recipient.

The conduct of activity research abroad, prior authorization of the PhD Academic Board, is regulated by the PhD Regulation of the University of Messina.

The scholarship **cannot be combined** with any other scholarship, assigned for any purpose, except for those granted by Italian or foreign institutions useful for integrating the PhD student's training and research activity with stays abroad. The PhD scholarship is subject to the payment of social security contributions INPS "*Gestione Separata*" in accordance with current legislation, of which two-thirds shall be borne by the administration and one-third by the PhD student with a scholarship.

Art. 11

Rights and obligations of the PhD Student

PhD students must attend the courses and continuously carry out study and research activities under the approved individual programme, as provided for by art. 23 of the University Regulation.

For positions with a **specific obligatory Project** of this Call, the PhD student must comply with all the conditions imposed by the Funder and is committed to providing at any time all the documents considered necessary by MUR, in relation to the reporting of the Research and Innovation Programme "Sicilian MicronanoTech Research and Innovation Center – SAMOTHRACE". In particular, PhD students must produce:

- a duly signed curriculum vitae
- a report indicating the time commitment
- a periodic summary of the main activities carried out and countersigned by the scientific supervisor/Coordinator
- an annual report
- documentation certifying the activity carried out.

The PhD Course Coordinator is responsible for verifying and validating what is submitted by the PhD student.

Art. 12

Attendance, suspension, forfeiture, and waiver

For the regulation on attendance, suspension, forfeiture and waiver, reference is made to art. 12 of the Call referred to in D.R. No. 1741 of 27th June 2022, without prejudice to respect of the constraints of the D.D.G. No. 3277 of 30th December 2021 and all the rules related to the "SAMOTHRACE" Project – Sicilian MicronanoTech Research and Innovation Center.

Art. 13

Processing of personal data

Pursuant to art.13 of European Regulation 2016/679, this University is the owner of the processing of personal data provided by the candidate to this selection and the same processing

will be carried out in compliance with the aforementioned European Regulation for the purposes of fulfilling the disclosure requirements referred to in Legislative Decree 33/2013. Data may be used and stored exclusively for the legal obligations related to the activity of this selection. Provision of data is required for these purposes. Data will be processed by this University, as Data Controller, in compliance with the provisions of European Regulation 2016/679 in the manner foreseen by the full set of information published on the University website. In accordance with art.15 ff. of European Regulation 2016/679, personal data collected by the Data Controller, may be checked and rectified, updated or deleted in any case and at any time, by contacting the Data Processing Officer (reachable at the email address: **rpd@unime.it**) and in the case of non-compliance with European Regulation 2016/679 a complaint may be addressed to the Personal Data Protection Authority.

The notice is available in the privacy section of the University, <https://www.unime.it/privacy-e-cookie-policy>, and is an integral part of this Call. The candidate acknowledges having read the aforementioned notice by signing the application form.

Art. 14

Properties of Results and Confidentiality

Reference is made to art. 14 of the Call referred to in D.R. No. 1741 of 27th June 2022.

Art. 15

Responsible for the procedure

The person in charge of administrative procedure is Dr. Angelina Venezia, Head of the "PhD Unit" of the Administrative Department "Scientific Research and Internationalization" of this University. For information, interested parties may contact the PhD Unit, telephone numbers: 090 676 8716/8502/8286/8277/8281 e-mail: dottorati@unime.it.

Art. 16

Final Rules

Although not expressly mentioned in this Call, reference is made to the current legislation on the subject, and in particular to the rules contained in art. 4 of Law 210/1998, in art. 19 of Law No. 240/2010, in D.M. No. 226/2021 and in the Regulation of the PhD courses of the University of Messina (D.R. No. 834/2022), in the Legislative Decree No. 81/2015 and subsequent amendments and additions, in the Regulation for the discipline of the patent activity of the University of Messina (D.R. No. 2773/2020), including those contained in the Conventions for the establishment of PhD courses in agreement and/or for the financing of scholarships, in the rules established by the Funder referred to, among others, in D.D.G. no.3277/2021 and related guidelines, as well as in the other current provisions.

Participation in the procedure implies, as previously acquired, consent to the release of the documents presented and of the minutes of the competition, in the case of a request by the other competitors, pursuant to the legislation on access to documents.

The University assumes no responsibility for the dispersion of communications resulting from inaccurate indications of residence and address by the candidate or failure or late

communication of the change of the same, nor for any postal or IT errors not attributable to the fault of the University itself.

This Decree, written both in Italian and in the English language, will be published on the register of the University at links <https://archivio.unime.it/it/ateneo/amministrazione/albo-online> and <https://www.unime.it/bandi-e-concorsi>.

THE RECTOR
Professor Salvatore Cuzzocrea

Avviso di ricognizione per l'assegnazione di n.10 borse di dottorato su progetto SAMOTHRACE, mediante la valutazione di proposte progettuali, riservato ai candidati idonei non già assegnatari di Borse nelle graduatorie di merito relative ai corsi di dottorato di ricerca attivati nell'Università degli studi di Messina – XXXVIII ciclo

All. n.1

Corso di Dottorato di Ricerca in “Bioingegneria Applicata alle Scienze Mediche”

Scheda n.1 – Progetto SAMOTHRACE – WP3 Health - Advanced Micro-Nano Technologies and Devices for Health

Tematica: Nell'ambito dello sviluppo di sistemi sensoristici indossabili per il monitoraggio in tempo reale di parametri vitali (es. ossigenazione del sangue, pressione arteriosa, PPG, frequenza cardiaca, funzioni neuromuscolari) e di patologie croniche ad impronta dismetabolica (es. diabete), il dottorando di ricerca parteciperà all'analisi dei dati pervenuti e alla valutazione del loro significato statistico e clinico, collaborando all'attività di validazione degli stessi mediante verifica della coerenza con le informazioni anamnestiche e obiettive già in possesso. Si occuperà altresì di collaborare alle attività del task 3.5 relative allo sviluppo della piattaforma dedicata all'integrazione dei dati provenienti dai vari device sensoristici nonché alla conservazione dei dati e loro gestione da remoto.

Profilo candidato: Il candidato dovrà possedere competenze informatiche e laurea in in una delle seguenti classi: LM-18 Informatica; LM-32 Ingegneria informatica.

Topic: In the context of the development of wearable sensory systems for real-time monitoring of vital parameters (e.g. blood oxygenation, blood pressure, PPG, heart rate, neuromuscular functions) and of chronic diseases with a dismetabolic imprint (e.g. diabetes), the PhD student will participate in the analysis of the data received and the evaluation of their statistical and clinical significance, collaborating in the validation of the same by verifying consistency with the anamnestic and objective information already in possession. He will also collaborate on the activities of task 3.5 related to the development of the platform dedicated to the integration of data from the various sensor devices, as well as data storage and their remote management.

Candidate profile: The candidate will have to possess IT skills and one of the following degrees: LM-18 Informatics; LM-32 Computer Engineering.

Avviso di ricognizione per l'assegnazione di n.10 borse di dottorato su progetto SAMOTHRACE, mediante la valutazione di proposte progettuali, riservato ai candidati idonei non già assegnatari di Borse nelle graduatorie di merito relative ai corsi di dottorato di ricerca attivati nell'Università degli studi di Messina – XXXVIII ciclo

All. n.2

Corso di Dottorato di Ricerca in “Biologia Applicata e Medicina Sperimentale”

Scheda n.2 - Progetto SAMOTHRACE - WP5 Agritech - Sensors and Devices for plant health detection

Tematica: Il progetto riguarda la valorizzazione di biomasse vegetali di scarto come fonte per la produzione di materiali carboniosi ad elevato valore aggiunto e basso impatto ambientale, mediante l'impiego di processi ecosostenibili di conversione termochimica, come la carbonizzazione idrotermale (HTC). Tali materiali bio-carboniosi (hydrochar) sono particolarmente attraenti perché potenzialmente utilizzabili in molti campi, tra cui la catalisi, lo stoccaggio e la conversione di energia, in agricoltura, biomedicina e risanamento ambientale. In ultima fase, eventuali residui della produzione di hydrochar potrebbero essere destinati alla produzione di fertilizzanti e biostimolanti da impiegare in agricoltura.

Profilo candidato: Il candidato dovrà avere competenze di biologia vegetale e biochimica ed uno dei seguenti titoli: LM-6 Biologia; LM-60 Scienze della Natura; 6/S (Biologia); 68/S (Scienze della Natura)

Topic: The project deals with the valorisation of waste plant biomass as a source to produce carbonaceous materials with high added value and low environmental impact, through the use of eco-sustainable thermochemical conversion processes, such as hydrothermal carbonization (HTC). Such bio-carbon materials (hydrochar) are particularly attractive because they have the potential to be used in many fields, including catalysis, energy storage and conversion, agriculture, biomedicine and environmental remediation. Finally, any residues from the production of hydrochar could be used for the production of fertilizers and biostimulants to be used in agriculture.

Candidate profile: The candidate must have skills in plant biology and biochemistry and one of the following degrees: LM-6 Biology; LM-60 Natural Sciences; 6/S (Biology); 68/S (Natural Sciences)

Avviso di ricognizione per l'assegnazione di n.10 borse di dottorato su progetto SAMOTHRACE, mediante la valutazione di proposte progettuali, riservato ai candidati idonei non già assegnatari di Borse nelle graduatorie di merito relative ai corsi di dottorato di ricerca attivati nell'Università degli studi di Messina – XXXVIII ciclo

All. n.3

Corso di Dottorato di Ricerca in “Biologia Applicata e Medicina Sperimentale”

Scheda n.3 - Progetto SAMOTHRACE - WP5 Agritech - Sensors and Devices for plant health detection

Tematica: Lo studio si propone di studiare le risposte fisiologiche di diverse specie vegetali irrigate con acque contenenti contaminanti di vario tipo. Più in dettaglio, verranno svolti esperimenti volti a comprendere se e in che misura la presenza di contaminanti nelle acque influenzi l'idraulica delle piante, inducendo effetti negativi sugli scambi gassosi, sull'efficienza fotosintetica e, come conseguenza, sulla crescita e produttività delle specie vegetali. Attenzione sarà posta anche agli effetti (e l'eventuale presenza) dei contaminanti nelle parti edibili delle piante misurate. Le misure verranno svolte sia in piante cresciute in condizioni ottimali che in piante sottoposte a condizioni di stress ambientali.

Profilo candidato: Il candidato dovrà avere competenze di fisiologia vegetale ed uno dei seguenti titoli: LM-6 Biologia; LM-60 Scienze della Natura; 6/S (Biologia); 68/S (Scienze della Natura)

Topic: The study aims to investigate the physiological responses of plant species irrigated with polluted water on samples growing in optimal conditions and on samples submitted to environmental constrains. More in detail, measurements will focus on the knowledge of the effects of polluted water on plant hydraulics and, more specifically, on gas exchanges, photosynthetic efficiency and, as a consequence, on plant growth and productivity. Attention will be also given to the presence and effects of contaminants in edible parts of the plants.

Candidate profile: The candidate must have skills in plant physiology and one of the following degrees: LM-6 Biology; LM-60 Natural Sciences; 6/S (Biology); 68/S (Natural Sciences)

Avviso di ricognizione per l'assegnazione di n.10 borse di dottorato su progetto SAMOTHRACE, mediante la valutazione di proposte progettuali, riservato ai candidati idonei non già assegnatari di Borse nelle graduatorie di merito relative ai corsi di dottorato di ricerca attivati nell'Università degli studi di Messina – XXXVIII ciclo

All. n.4

Corso di Dottorato di Ricerca in “Biologia Applicata e Medicina Sperimentale”

Scheda n.4 - Progetto SAMOTHRACE - WP2 Environment - Innovative solid-state chemical sensors for pollutants

Titolo: Progettazione, sintesi e caratterizzazione di setacci micro- e nanomolecolari a base di carbonio e sensori micro- e nanoporosi per l'identificazione di contaminanti in campioni marini

Tematica: La tematica del dottorato riguarda la progettazione, sintesi e caratterizzazione di setacci micro- e nanomolecolari a base di carbonio e sensori micro- e nanoporosi per l'identificazione di contaminanti in campioni marini. Sempre più preminente sta diventando la problematica inerente la presenza di inquinanti di dimensioni micro- e nanomolecolari che si inseriscono nelle catene trofiche e generano differenti livelli di criticità negli organismi viventi. Il carbonio è un materiale estremamente duttile e dalle grandi potenzialità applicative che potrebbe avere importanti applicazioni in questo ambito. Inoltre, la creazione di sensori capaci di identificare questi componenti, in tempo reale, potrebbe fornire un primo approccio per intervenire tempestivamente ed evitare problematiche a valle, proprio basandosi sulla natura dei materiali nanostrutturati, che per le dimensioni estremamente ridotte e per le caratteristiche proprietà elettriche e ottiche, sono in grado di analizzare e identificare contaminanti presenti anche in tracce, sfruttando un'elevata superficie di assorbimento su aree molto ridotte.

Profilo candidato: Il candidato dovrà possedere competenze di chimica, biochimica e biologia e laurea in una delle seguenti classi: LM-6 scienze biologiche; LM-9 Biotecnologie mediche, veterinarie e farmaceutiche; LM-13 Farmacia e farmacia industriale.

Title: Design, synthesis and characterization of carbon-based micro- and nanomolecular sieves and micro- and nanoporous sensors for the identification of contaminants in marine samples

Topic: The project aims at the design, synthesis and characterization of carbon-based micro- and nanomolecular sieves and micro- and nanoporous sensors for the identification of contaminants in marine samples. The problem concerning the presence of pollutants of micro- and nanomolecular dimensions which enter the trophic chains and generate different levels of criticality in living organisms is becoming more and more prominent. Carbon is an extremely ductile material with great application potential that could have important applications in this area. Furthermore, the creation of sensors capable of identifying these components, in real time, could provide a first approach to promptly intervene and avoid downstream problems, precisely based on the nature of nanostructured materials, which due to their extremely small dimensions and characteristic electrical properties and optics, are able to analyze and identify contaminants present even in traces, exploiting a large absorption surface on very small areas.

Candidate profile: The candidate must have skills in chemistry, biochemistry and biology and a degree in one of the following classes: LM-6 biological sciences; LM-9 Medical, veterinary and pharmaceutical biotechnology; LM-13 Pharmacy and industrial pharmacy.

Avviso di ricognizione per l'assegnazione di n.10 borse di dottorato su progetto SAMOTHRACE, mediante la valutazione di proposte progettuali, riservato ai candidati idonei non già assegnatari di Borse nelle graduatorie di merito relative ai corsi di dottorato di ricerca attivati nell'Università degli studi di Messina – XXXVIII ciclo

All. n.5

Corso di Dottorato di Ricerca in “Fisica”

Scheda n.5 - Progetto SAMOTHRACE - WP2 Environment - Innovative solid-state chemical sensors for pollutants

Titolo: Sviluppo di nanomateriali attraverso tecniche fisiche per sensori chimici

Tematica: Il progetto di cui dovrà occuparsi il dottorando riguarderà la sintesi e la caratterizzazione di nanocompositi e sistemi multistrato di ossidi metallici, nanomateriali a base di carbonio, strati polimerici ottenuti mediante metodi fisici di preparazione/deposizione. I materiali così ottenuti saranno utilizzati per la fabbricazione di sensori chimici allo stato solido basati sulle piattaforme di trasduzione elettrica ed elettrochimica. E' richiesta una conoscenza sperimentale delle più comuni tecniche fisiche di preparazione e di deposizione oltre che delle spettroscopie necessarie alla caratterizzazione.

Profilo candidato: Il candidato dovrà possedere competenze di fisica e chimica e laurea in una delle seguenti classi: LM-17 Fisica.

Title: Development of nanomaterials through physical techniques for chemical sensors

Topic: The project that the PhD student will have to deal with will concern the synthesis and characterization of nanocomposites and multilayer systems of metal oxides, carbon-based nanomaterials, polymeric layers obtained by physical preparation/deposition methods. The materials thus obtained will be used for the fabrication of solid-state chemical sensors based on the electrical and electrochemical transduction platforms. An experimental knowledge of the most common physical preparation and deposition techniques is required as well as the spectroscopies necessary for characterization.

Candidate profile: The candidate must have physics and chemistry skills and a degree in one of the following classes: LM-17 Physics.

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All. n.6

Corso di Dottorato di Ricerca in “Scienze Chimiche”

Scheda n.6 - Progetto SAMOTHRACE - WP2 Environment - Innovative solid-state chemical sensors for pollutants

Titolo: Progettazione, sintesi e caratterizzazione di sensori per l'identificazione in campioni acquosi di metalli rari

Tematica: La tematica del dottorato riguarda l'attività di progettazione, sintesi e caratterizzazione di sensori per l'identificazione in campioni acquosi di metalli rari. I metalli rari rappresentano un elemento su cui si concentrano i maggiori sforzi per la loro ricerca, visti gli innumerevoli impieghi che stanno trovando all'interno degli ambiti economici. Il loro crescente utilizzo sta anche facendo crescere i loro livelli all'interno degli ambienti marini e lacunari potendo portare a fenomeni di tossicità all'interno degli organismi filtratori e poi a cascata negli altri organismi di dimensioni maggiori.

Profilo candidato: Il candidato dovrà possedere competenze di chimica, biochimica e biologia e laurea in una delle seguenti classi: LM-6 Biologia; LM-8 Biotecnologie industriali; LM-13 Farmacia e farmacia industriale; LM-22 Ingegneria chimica; LM-53 Scienza e ingegneria dei materiali; LM-54 Scienze chimiche.

Title: Design, synthesis and characterization of sensors for the identification of rare metals in aqueous samples

Topic: The theme of doctorate aims to design, synthesis and characterization of sensors for the identification of these rare metals in aqueous samples. Rare metals represent an element on which they concentrate the major efforts for their research, given the innumerable uses they are finding within the economic spheres. Their growing use is also causing their levels to grow within marine and lacunar environments, which could lead to toxicity phenomena within filter-feeding organisms and then cascade into other larger organisms.

Candidate profile: The candidate must have skills in chemistry, biochemistry and biology and a degree in one of the following classes: LM-6 Biology; LM-8 Industrial biotechnology; LM-13 Pharmacy and industrial pharmacy; LM-22 Chemical Engineering; LM-53 Materials science and engineering; LM-54 Chemical sciences.

Avviso di ricognizione per l'assegnazione di n.10 borse di dottorato su progetto SAMOTHRACE, mediante la valutazione di proposte progettuali, riservato ai candidati idonei non già assegnatari di Borse nelle graduatorie di merito relative ai corsi di dottorato di ricerca attivati nell'Università degli studi di Messina – XXXVIII ciclo

All. n.7

Corso di Dottorato di Ricerca in “Scienze Chimiche”

Scheda n.7 – Progetto SAMOTHRACE – WP3 Health - Advanced Micro-Nano Technologies and Devices for Health

Titolo: Sviluppo di inibitori del proteasoma coniugati con nanomateriali fluorescenti, quali nuovi sensori per il bio-imaging nella diagnostica e nella cura dei tumori.

Tematica: Il candidato si occuperà della progettazione e della sintesi di nuovi agenti antitumorali, aventi come target il proteasoma 20S, sistema proteolitico non lisosomiale capace di controllare i livelli di numerose proteine che regolano la progressione del ciclo cellulare e l'apoptosi; difetti e aberrazioni di questo sistema proteolitico possono condurre a differenti tipi di tumori, sia ematologici che solidi.

Tutti i nuovi inibitori saranno coniugati con particelle di grafene quantum dots (GQDs), una nuova generazione di nanomateriali a base di carbonio, dotati di dimensioni ridotte ed ampia superficie per creare legami con altre molecole, oltre ad una naturale fotoluminescenza che li rende i nanocarrier ideali per il drug delivery, per la diagnostica e non ultimo per il bio-imaging in vitro ed in vivo.

Questi nuovi nanomateriali saranno coniugati con inibitori del proteasoma, iperespresso nelle cellule tumorali. Tale approccio sarà sfruttato per creare una vera e propria target-therapy, inoltre i GQDs sono dotati di una fluorescenza intrinseca molto stabile che permette di impiegarli come sensori per il tracking delle molecole sia in vitro che in vivo e crea le basi per lo sviluppo di nuovi composti da utilizzare a scopo teranostico.

Profilo candidato: Il candidato dovrà possedere competenze di chimica organica e chimica farmaceutica e laurea in una delle seguenti classi: LM-8 Biotecnologie industriali; LM-9 Biotecnologie mediche, veterinarie e farmaceutiche; LM-11 Conservazione e restauro dei beni culturali; LM-13 Farmacia e farmacia industriale; LM-22 Ingegneria chimica; LM-53 Scienza e ingegneria dei materiali; LM-54 Scienze chimiche.

Title: Development of proteasome inhibitors conjugated to fluorescent nanomaterials, as new sensors for bio-imaging in cancer diagnosis and treatment

Topic: The candidate will be involved in the design and synthesis of new anticancer agents, targeting the 20S proteasome, a non-lysosomal proteolytic system able to control the levels of several proteins that regulate cell cycle progression and apoptosis; defects and aberrations of this proteolytic system can lead to different types of tumors, both hematological and solid.

All the new inhibitors will be conjugated with graphene quantum dots (GQDs), a new generation of carbon-based nanomaterials, with small dimensions and a large surface area to create bonds with other molecules, and endowed with a natural photoluminescence that makes them ideal nanocarriers for drug delivery, diagnostics and, last but not least, for in vitro and in vivo bio-imaging.

These new nanomaterials will be conjugated with inhibitors of the proteasome, overexpressed in tumor cells. This approach can be exploited to create a real target-therapy, moreover GQDs are equipped with a very stable intrinsic fluorescence which allows them to be used as sensors for tracking molecules both in vitro and in vivo and to create the basis for the development of new compounds to be used for theranostic purposes.

Candidate profile: The candidate must have skills in organic chemistry and pharmaceutical chemistry and a degree in one of the following classes: LM-8 Industrial biotechnology; LM-9 Medical, veterinary and pharmaceutical biotechnology; LM-11 Conservation and restoration of cultural heritage; LM-13 Pharmacy and industrial pharmacy; LM-22 Chemical Engineering; LM-53 Materials science and engineering; LM-54 Chemical sciences.

Avviso di ricognizione per l'assegnazione di n.10 borse di dottorato su progetto SAMOTHRACE, mediante la valutazione di proposte progettuali, riservato ai candidati idonei non già assegnatari di Borse nelle graduatorie di merito relative ai corsi di dottorato di ricerca attivati nell'Università degli studi di Messina – XXXVIII ciclo

All. n.8

Corso di Dottorato di Ricerca in “Scienze Umanistiche”

Scheda n.8 - Progetto SAMOTHRACE - WP6 Cultural Heritage - Smart Technologies for cultural heritage monitoring

Tematica: La ricerca verterà sull'analisi di un insieme coerente di manufatti e/o di uno o più contesti archeologici, con particolare riferimento allo studio degli aspetti tipologici, tecnici, produttivi e cronologici, mediante l'applicazione delle metodologie e degli strumenti propri della ricerca archeologica nella sua più ampia accezione. Il candidato produrrà un quadro conoscitivo delle evidenze oggetto della tesi, che supporti l'individuazione di criticità inerenti la loro conservazione e integrità in rapporto alle condizioni ambientali dell'attuale luogo di custodia (indoor o outdoor). La ricerca andrà inoltre a supporto dell'attività di creazione di sensori e sistemi per il monitoraggio e la fruizione integrata ed intelligente dei siti del patrimonio archeologico.

Profilo candidato: Il candidato dovrà possedere competenze specifiche nelle discipline archeologiche

Topic: The research will focus on the analysis of a coherent set of artefacts and/or of one or more archaeological contexts, with particular reference to the study of the typological, technical, productive and chronological aspects, through the application of the methodologies and tools typical of archaeological research in its broadest sense. The candidate will produce a cognitive framework of the evidence object of the thesis, which will support the identification of critical issues concerning their conservation and integrity in relation to the environmental conditions of the current place of custody (indoor or outdoor). The research will also support the creation of sensors and systems for the monitoring and for the integrated and intelligent fruition of archaeological heritage sites.

Candidate profile: The candidate must have specific skills on archeological disciplines

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All. n.9

Corso di Dottorato di Ricerca in “Scienze Veterinarie”

Scheda n.9 - Progetto SAMOTHRACE - WP5 Agritech - Sensors and Devices for plant health detection

Tematica: Nell'ambito del progetto il dottorando si occuperà di indentificare i marker biochimici specifici per il rilevamento della salute delle piante, andando a determinare la tossicità e l'effetto biologico dei contaminanti. Rilievo importante ha lo studio delle metodologie di laboratorio e bioinformatiche per l'analisi qualitativa e quantitativa e la caratterizzazione delle componenti strutturali, per l'osservazione delle loro modificazioni, e per la validazione dei risultati sperimentali. In questo modo si potranno implementare i sistemi di monitoraggio dei contaminanti e indagare i loro effetti sulla salute delle piante, degli animali e dell'uomo, sull'ambiente e sull'economia.

Profilo candidato: Il candidato dovrà possedere competenze di chimica, biochimica e biologia molecolare e in discipline affini.

Topic: As part of the project, the PhD student will be responsible for identifying the specific biochemical markers for detecting plant health, determining the toxicity and biological effect of contaminants. The study of laboratory and bioinformatics methodologies for the qualitative and quantitative analysis and characterization of the structural components, for the observation of their modifications, and for the validation of the experimental results has an important role. In this way it will be possible to implement contaminant monitoring systems and investigate their effects on plant, animal and human health, on the environment and on the economy.

Candidate profile: The candidate must possess skills in chemistry, biochemistry and molecular biology and in related disciplines.

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All. n.10

Corso di Dottorato di Ricerca in “Translational Molecular Medicine and Surgery”

Scheda n.10 – Progetto SAMOTHRACE – WP3 Health - Advanced Micro-Nano Technologies and Devices for Health

Tematica: A seguito dello sviluppo di device utili per il monitoraggio di parametri vitali (es. ossigenazione del sangue, pressione arteriosa, PPG, frequenza cardiaca, funzioni neuromuscolari) e di patologie croniche ad impronta dismetabolica (es. diabete), il dottorando di ricerca parteciperà all'arruolamento dei soggetti in studio curando la raccolta di dati anamnestici e collaborando alla valutazione clinica iniziale. Si occuperà inoltre della gestione dei dati pervenuti partecipando all'analisi del loro significato clinico, statistico e curando la validazione degli stessi mediante verifica della coerenza con le informazioni anamnestiche e obiettive già in possesso e del valore aggiunto dei dati rilevati dal device, al fine di valutare le performance del sistema utilizzato.

Profilo candidato: Il candidato dovrà possedere competenze mediche o biomediche e laurea in una delle seguenti classi: LM-6 Biologia; LM-9 Biotecnologie mediche, veterinarie e farmaceutiche; LM-13 Farmacia e farmacia industriale; LM-41 Medicina e chirurgia; LM-67 Scienze e tecniche delle attività motorie preventive e adattate.

Topic: Following the development of devices useful for the monitoring of vital parameters (e.g. blood oxygenation, blood pressure, PPG, heart rate, neuromuscular functions) and of chronic diseases with a dismetabolic imprint (e.g. diabetes), the PhD student will participate in the enrolment of the subjects in the study by taking care of the collection of anamnestic data and collaborating with the initial clinical evaluation. He will also manage the data received by participating in the analysis of their clinical significance and ensuring the validation of the same by verifying the consistency with the historical and objective information already in possession and the added value of the data collected by the device, in order to evaluate the performance of the system used.

Candidate profile: The candidate must have medical or biomedical skills and a degree in one of the following classes: LM-6 Biology; LM-9 Medical, veterinary and pharmaceutical biotechnology; LM-13 Pharmacy and industrial pharmacy; LM-41 Medicine and surgery; LM-67 Sciences and techniques of preventive and adapted motor activities.