

## Article 1

### Project in which the assignment of the assignment is requested. Duration, object and seat of the assignment.

The position will have a duration of 6 months, from **September 1<sup>st</sup> 2020 to February 28th 2021**, for an indicative commitment quantifiable in about **150 hours**.

#### Objectives and Project

In accordance with the provisions of the Visiting Guidelines of this University (art. 1), this selection is aimed at satisfying internationalization needs which require the attraction of figures of teachers, scholars and researchers from abroad, who can bring their contribution to all the institutional areas of the university (teaching, research and third mission). These activities are part of the wider framework of participation of our University in international networks and cooperation agreements with universities, research institutions and other public or private subjects from countries around the world, in order to promote academic collaboration in the didactic and scientific fields, and to create mobility and exchange programs for teachers, researchers and students.

#### Object of the assignment

As per the Visiting Guidelines of this University (art.2) this Visiting researcher assignment is intended for scholars or experts, foreign or Italian, of adequate scientific qualification coming from abroad, also for personal training purposes, and will have as its object research activity on the program indicated below.

*The program we plan to carry on in collaboration with the visiting researcher concerns basically the following topics:*

**1) Mathematical models of the diffusion of phosphorylated tau protein in the brain and its connections with Alzheimer's disease.** This problem has been recently attacked in the continuous case by M. Bertsch, B. Franchi, V. Meschini, M.C. Tesi, A. Tosin, *A sensitivity analysis of a mathematical model for the synergistic interplay of Amyloid beta and tau on the dynamics of Alzheimer's disease*, preprint 2020, arXiv:2006.01749.

In particular the researcher should implement a model originally proposed by A. Raj, A. Kuceyeski, M. Weiner *A network diffusion model of disease progression in dementia*, Neuron, 2012 and A. Raj, V. Tora, H. Cho, J. Y. Choi, Y. H. Ryu, C. H. Lyoo, B. Franchi *A combined model for aggregation and network diffusion in Alzheimer's disease recapitulates regional human tau-PET patterns*. The visiting researcher should also attack the study of techniques aimed to retrospectively reconstruct the coefficients that appear in the model (which is reduced to an ode's system) starting from the trajectories of the system itself, comparing them with the available clinical data.

**2) Mathematical models of the onset and progression of Alzheimer's disease.**

In this case the description of the microscopic / macroscopic passage is made through the mathematical tool of the so-called homogenization of the microscopic system for diffusion and agglomeration of the peptide A-beta, in the spirit of the works B. Franchi & S. Lorenzani, *From a microscopic to a macroscopic model for Alzheimer disease: Two-scale homogenization of the Smoluchowski equation in perforated domains*, J. Nonlinear Sci. 26 (3) (2016), 717-753 and B. Franchi, M. Heida & S. Lorenzani, *A Mathematical model for Alzheimer's disease: An approach via stochastic homogenization of the Smoluchowski equation*, Commun. Math. Sci. (2020) (in press).

For the microscopic model, see Y. Achdou, B. Franchi, N. Marcello & M.C. Tesi, *A Qualitative Model for Diffusion and Aggregation of beta-Amyloid in Alzheimer's disease*, Journal of

**Mathematical Biology, 67 (2014) pp. 1369-1392, whereas, for the macroscopic model, see M. Bertsch, B. Franchi, N. Marcello, M. C. Tesi, and A. Tosin. *Alzheimer's disease: a mathematical model for onset and progression*. Math. Med. Biol., 34(2):193–214, 2017**

The research activities will be carried on at the Department of Mathematics of the University of Bologna, as well as at any other University structure or other location identified by the researcher, provided they are functional to achieving the objectives related to the project.

The activities can also be carried out remotely as it is functional to the project and the pursuit of its objectives.

The **scientific manager** of the project is **prof. Bruno Franchi** and the **tutor** of the Visiting researcher is **prof. Maria Carla Tesi**

## **Article 2 Requirements for admission**

Both permanent employees of the University classified in category D and/or EP, as well as external subjects, may participate in this announcement.

The admission requirements for this comparative assessment are as follows:

1. Educational level: **PhD in Mathematics** or equivalent;
2. Being carrying out scientific research in a country other than Italy as a scholar or expert with adequate scientific qualification (to be witnessed by the professional curriculum referred to in art. 4, attached to the application);
3. qualified professional experience and skills gained (at least 12 months) in public institutions or private organizations in relation to the subject of the contract;
4. Not having reported criminal convictions and/or not having pending criminal proceedings such as to determine situations of incompatibility with the assignment to be carried out;
5. Enjoyment of civil and political rights
6. Adequate knowledge of the Italian language, if a foreign citizen.

For the qualifications obtained abroad, the declaration of equivalence issued pursuant to current legislation is required. In the absence of the aforementioned declaration, candidates must attach to the application a translation into Italian of the foreign study title, accompanied by a self-declaration on the conformity to the original of the translation itself.

The foreign qualification can be declared admissible by the Selection Committee, for the sole purpose of participating in the selection. The winner, if he has obtained the qualification in a country not belonging to the European Union, will have to transmit to the Structure, with the same modalities foreseen for the presentation of the application for admission, the official translation with declaration of value of the qualification abroad by the competent Italian diplomatic or consular representations in the country of origin, according to the regulations in force on the matter, before the conclusion of the contract.

Those who have a degree of kinship or affinity, up to and including the fourth degree, with a professor belonging to the structure that requires the stipulation of the contract or with the Rector, the General Manager or a member of the Board of Directors of the selection cannot participate in the selections. Furthermore, early retired seniority staff cannot participate in the selections pursuant to art. 25 of law 724/1995.

The prescribed requirements must be met on the expiry date of this notice.

Failure to meet the admission requirements or failure to declare them implies the exclusion of the candidate from the selection procedure.

## **Article 3 University employees**

(omissis)

#### **Article 4 Application form**

The application for participation, drawn up following the form attached to this notice (Annex 1), addressed and accompanied by the documentation specified below, must reach this Administration without fail by and no later than **July 30, 2020, at 12:00 am** (Europe/Brussels time).

This selection notice will be published on the University portal <https://bandi.unibo.it/collaborazioni/incarichi> and on the website of the Department [www.matematica.unibo.it](http://www.matematica.unibo.it).

The application can be presented at the candidate's choice in one of the following ways:

- by e-mail, to the e-mail address: **mat.direzione@unibo.it**, by sending the duly completed and signed application form and any other required document in .pdf format, together with the scanning of an identity document in progress of validity;
- by Certified Electronic Mail (hereafter referred to as PEC), by sending, from your personal PEC address, an email to **mat.dipartimento@pec.unibo.it** containing the duly completed and signed application form and each other document required in .pdf format, together with the scanning of a valid identity document

The date of acquisition of the instances is established and proven from the date the e-mail was sent.

**Applications without subscription or received after the date indicated above or received by other means of sending will be excluded.**

The structure assumes no responsibility for non-delivery of communications that is not caused by the facts of its employees. In the application, candidates must indicate, under their own responsibility:

- surname and name;
- date and place of birth;
- citizenship;
- residence and address elected for the purposes of the selection;
- not to have reported criminal convictions and not to have ongoing criminal proceedings (if not, indicate which);
- to possess all the admission requirements required by art. 2 of the announcement.

The following documentation must be attached to the application:

1. professional curriculum signed and dated, using the European format attached to this call (attachment 4). The curriculum must highlight, in a detailed manner, all the training and professional experience gained, as well as the list of the titles and qualifications that are intended to be presented for their assessment;
2. copy of a valid identity document;
3. under penalty of exclusion, permanent employees of the University must present the clearance from the Head of the Facility (attachment 3).

All candidates are admitted to the selection subject to verifying that they actually meet the requirements necessary to participate in the selection; the Administration can order exclusion from the selection at any time, even after the discussion has taken place.

Please note that in relations with public administration bodies and managers of public services, the certificates and notarial deeds issued by Italian public administrations are always replaced by the declarations referred to in articles 46 and 47 D.P.R. 445/2000.

Any certifications attached to the application will therefore not be taken into consideration for the purposes of evaluating the aforementioned qualifications, pursuant to art. 15, Law 183/2011. These certifications must be self-certified by the candidate.

## **Article 5**

### **Admission, selection procedures, ranking and communications to candidates**

The selection will take place on the basis of the evaluation of the qualifications and will be carried out by a commission of experts.

Candidates excluded from the procedure will be notified by registered mail with return receipt, by e-mail, or by PEC.

Candidates who do not receive notice of exclusion could be contacted to provide any clarifications on their professional curriculum.

The categories of securities described in Annex 5 of this notice can be assessed, according to the score described therein.

A maximum of 50 points can be attributed to the titles presented.

The selection of external candidates will be carried out only if there is no availability of permanent employees of the University or if they are not suitable for the selection.

The categories of qualifications listed in Annex 5 of this notice can be assessed, according to the score described therein.

The overall score cannot exceed 50 points

Titles received after the deadline for the submission of applications for participation in the competition will not be evaluated.

The qualifications may be self-certified by means of a substitute declaration of notarial deed or self-certification contained in the professional curriculum.

The final overall score (max. 50 points) will be given by the sum of the scores reported for the qualifications provided for in attachment 5.

At the end of the selection procedure, the Commission will draw up a general merit ranking that will last 12 months and can be used in the event of the winner's renunciation of the assignment.

The Director of the Facility will arrange the approval of the ranking list, formulated by the Commission, which will be published on the Department website: [www.matematica.unibo.it](http://www.matematica.unibo.it).

The decree approving the ranking documents will be sent to the winning candidate and those in the ranking list.

## **Article 6**

### **Free nature of the service and specific methods of performance of the service for external personnel**

The activity subject of the assignment is provided free of charge. Accident insurance coverage is guaranteed for the performance of all the activities included in the assignment.

The visiting researcher is entitled to **reimbursement of expenses** that may become necessary for the performance of the activities covered by the contract, subject to authorization and upon

presentation of suitable documentation countersigned by the person in charge of carrying out the service (the **Scientific Manager** or the **Tutor of the Visiting Researcher**), in compliance with the current Mission and Travel Regulations and related reimbursement of expenses for the University of Bologna.

The visiting researcher will have to activate an appropriate insurance guarantee to cover the risk for civil liability towards third parties, which he can stipulate with the University broker.

Pursuant to articles 2222 and following of the civil code, the work performance covered by this contract is rendered by the provider in the context of an employment relationship without the character of subordination and involves the performance of the service without observing specific times and hierarchical constraints.

For the performance of this activity, the provider must organize itself independently, despite having the documentation and access to the structure available, without this in any way entailing stable insertion in the organization of the University of Bologna.

In particular, for the execution of the service, the provider:

- will carry out its work activity in a completely autonomous way;
- will act without any subordination constraint and without coordination with the University's activity and stable insertion in the organization;
- will determine the technical-operational procedures for carrying out the service, in compliance with the term agreed with the University.

This contract does not imply the creation of an exclusive relationship with the University.

The visiting researcher will carry out the requested activity personally, without using substitutes.

In accordance with the Visiting Guidelines of this University (art.8), the Visiting Researcher is required to carry out its activities according to the didactic and/or research program envisaged, to comply with all the statutory and regulatory provisions of the University, including the provisions of the code of ethics and behavior and those relating to workplace safety.

### **Article 7 Assignment**

The Administration reserves the right not to proceed with the stipulation of the contract in the event that only one application is received or deemed valid, if reasons of public interest exist or occur or in the event that the applications are not considered suitable by the unquestionable judgment of the Administration.

Once the person to whom the assignment is entrusted has been identified, the Administration, having verified the veracity of the declarations presented, will proceed with the stipulation of the contract.

For any further information, please contact **Prof. Franchi** at the following addresses:

**Tel .+ 39 051-2094460** mail **bruno.franchi@unibo.it**

### **Article 8 Final provisions and data processing**

For the purposes of applying the provisions of the Law of 7 August 1990, n. 241 the Head of the procedure is the Director of the Department, Prof. Giovanni Dore, Tel. 051-2094410, mail: [mat.direzione@unibo.it](mailto:mat.direzione@unibo.it).

Pursuant to Regulation (EU) 2016/679 and Legislative Decree no. 196/2003 ss.mm.ii the personal data provided by the candidates are processed exclusively for the purposes of managing the selection, below is the link relating to the information on the processing of personal data:

<https://www.unibo.it/it/ateneo/privacy-e-note-legali/privacy/informative-sul-trattamento-dei-dati-personali>.

For anything not expressly provided for in this notice, the "Visiting Guidelines (teachers, scholars and researchers from abroad)" approved by the University with a Resolution of the Academic Senate of 24/09/2019 apply.

**To the Director of the  
Department of Mathematics  
University of Bologna**

The undersigned \_\_\_\_\_

### REQUESTS

to participate in the comparative assessment by qualifications relating to the assignment of a non-occasional self-employment assignment pursuant to and for the purposes of art. 2222 et seq. of the c.c. for the needs of the Department of Mathematics of the University of Bologna.

To this end, he/she declares under hir/her own responsibility, that everything indicated in this application is true, pursuant to art. 46 of the Presidential Decree n. 445/2000:

SURNAME

NAME

DATE OF BIRTH

BIRTH PLACE  PROV

RESIDENT IN  PROV  CAP

VIA  N.

ITALIAN CITIZENSHIP  YES  NO

UE citizens: citizenship

Non-UE citizens: citizenship

ELECTORAL LIST REGISTRATION  
(Only for Italian citizens)

Y Comune: \_\_\_\_\_  
 NO Since \_\_\_\_\_

**Criminal convictions (a)**

NO
SI

Which \_\_\_\_\_

**REQUIREMENTS :**

- educational qualification - DEGREE:

➤ **Previous Italian system:** \_\_\_\_\_

Issued by \_\_\_\_\_

\_\_\_\_\_ Country \_\_\_\_\_

Obtained in date

	Rating: .....
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➤ **New Italian system:** \_\_\_\_\_

Belonging to the classe di laurea specialistica/magistrale/

Issued by \_\_\_\_\_

\_\_\_\_\_ Country \_\_\_\_\_

Obtained in date

	Rating: .....
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- Foreing educational qualification:

-

➤ **Level and denomination of the qualification** \_\_\_\_\_

Issued by \_\_\_\_\_

\_\_\_\_\_ Country \_\_\_\_\_

to be in possession of the declaration of equivalence issued pursuant to current legislation on the matter

to attach to this application a translation in Italian of the foreign qualification, accompanied by a self-declaration relating to the conformity of the translation with the original

- educational qualification - PHD IN MATHEMATICS (OR EQUIVALENT: ...)

Issued by \_\_\_\_\_

\_\_\_\_\_ Country \_\_\_\_\_

Obtained in date

	Rating (if existing): .....
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- Being carrying out scientific research in a country other than Italy as a scholar or expert with adequate scientific qualification (to be witnessed by the professional curriculum referred to in art. 4, attached to the application);
- NOT to be related or related (up to and including the fourth degree) with a professor belonging to the structure requesting the stipulation or with the Rector, the General Manager or a member of the University's Board of Directors; di non essere in quiescenza anticipata di anzianità ai sensi dell'art. 25 della legge 724/1995;
- to possess qualified professional experience and skills of at least \_\_\_\_\_ matured in public institutions or private organizations in relation to the subject of the contract \_\_\_\_\_;
- to have adequate knowledge of the Italian language (if a foreign citizen);
- not having reported criminal convictions and / or not having pending criminal proceedings such as to determine situations of incompatibility with the assignment to be performed. If not, indicate which \_\_\_\_\_;
- to declare in the curriculum attached to the application for participation the qualifications that are intended to be presented for their assessment.
- ...

To be handicapped

Y
N

and need the following help \_\_\_\_\_

- to elect their domicile for communications regarding this selection in

VIA

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COMUNE

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PHONE

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CELL PHONE

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E-MAIL  
ADDRESS

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AT

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The undersigned, attaches a photostatic copy of a valid identity document to this application.

The undersigned expresses his/her consent so that the personal data provided can be processed in compliance with Regulation (EU) 2016/679 and Legislative Decree no. 196/2003 ss.mm.ii for the obligations related to this procedure..

Date,

Signature

I Attach to the present application a dated and signed curriculum and declare that everything indicated therein is true according to art. 46 of the Presidential Decree 445/2000 and that any attached photocopies conform to the original pursuant to art. 47 of the Presidential Decree 445/2000.

Date,

Signature

**ALLEGATO 4)**

**FORMATO EUROPEO  
PER IL CURRICULUM  
VITAE**



**INFORMAZIONI PERSONALI**

Nome **[COGNOME, Nome, e, se pertinente, altri nomi ]**

Indirizzo **[ Numero civico, strada o piazza, codice postale, città, paese ]**

Nazionalità

**ESPERIENZA LAVORATIVA**

- Date (da – a) [ Iniziare con le informazioni più recenti ed elencare separatamente ciascun  
impiego pertinente ricoperto. ]
- Nome e indirizzo del datore di lavoro
- Tipo di azienda o settore
  - Tipo di impiego
- Principali mansioni e responsabilità

**ISTRUZIONE E FORMAZIONE**

- Date (da – a) [ Iniziare con le informazioni più recenti ed elencare separatamente ciascun  
corso pertinente frequentato con successo. ]
- Nome e tipo di istituto di istruzione o formazione
- Principali materie / abilità professionali oggetto dello studio

- Qualifica conseguita
  - Livello nella classificazione nazionale (se pertinente)

**CAPACITÀ E COMPETENZE PERSONALI**

*Acquisite nel corso della vita e della carriera ma non necessariamente riconosciute da certificati e diplomi ufficiali.*

PRIMA LINGUA

**[ Indicare la prima lingua ]**

ALTRE LINGUE

**[ Indicare la lingua ]**

- Capacità di lettura [ Indicare il livello: eccellente, buono, elementare. ]
- Capacità di scrittura [ Indicare il livello: eccellente, buono, elementare. ]
- Capacità di espressione orale [ Indicare il livello: eccellente, buono, elementare. ]

**CAPACITÀ E COMPETENZE RELAZIONALI**

*Vivere e lavorare con altre persone, in ambiente multiculturale, occupando posti in cui la comunicazione è importante e in situazioni in cui è essenziale lavorare in squadra (ad es. cultura e sport), ecc.*

**[ Descrivere tali competenze e indicare dove sono state acquisite. ]**

**CAPACITÀ E COMPETENZE ORGANIZZATIVE**

*Ad es. coordinamento e amministrazione di persone, progetti, bilanci; sul posto di lavoro, in attività di volontariato (ad es. cultura e sport), a casa, ecc.*

**[ Descrivere tali competenze e indicare dove sono state acquisite. ]**

**CAPACITÀ E COMPETENZE TECNICHE**

*Con computer, attrezzature specifiche, macchinari, ecc.*

**[ Descrivere tali competenze e indicare dove sono state acquisite. ]**

**CAPACITÀ E COMPETENZE ARTISTICHE**

*Musica, scrittura, disegno ecc.*

**[ Descrivere tali competenze e indicare dove sono state acquisite. ]**

ALTRE CAPACITÀ E  
COMPETENZE  
*Competenze non  
precedentemente indicate.* [ Descrivere tali competenze e indicare dove sono state acquisite. ]

PATENTE O PATENTI

**ULTERIORI INFORMAZIONI** [ Inserire qui ogni altra informazione pertinente, ad esempio persone di riferimento, referenze ecc. ]

**ALLEGATI** [ Se del caso, enumerare gli allegati al CV. ]

Data

Firma

## Attachment 5

### Valuable qualifications

<b>Max Points 5</b>	Professional experience gained in administrations of the University sector in the specific areas of activity of the profile and with the characteristics of the profile itself, with a subordinate and non-subordinate employment contract.
<b>Max Points 25</b>	Evaluation of the curriculum and cultural training (participation in courses, conferences, seminars etc ..) in relation to the activity that the candidate will have to carry out.
<b>Max Points 20</b>	Additional qualifications compared to the access requirement (master's degree, research grant, specialization schools, etc ..)