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1 The INTEGRATE Doctoral Training Programme

Background:

Traditionally, research in complex diseases focused mostly on environmental causes and risk factors, such as smoking, infection, diet, etc. Since the completion of the human genome project, the contribution of genetics to human complex diseases is gaining increased attention. However, genome research depends heavily on quantitative analysis of large-scale, highly complex and noisy genomic sequence data and its integration with other physiological and molecular parameters is required to understand the physiological or pathophysiological processes underlying human diseases and phenotypes. The INTEGRATE programme is a specialised **training programme in Integrative Genomics Research** that will equip researchers with skills to analyse such data by providing interdisciplinary training in (1) biomedical science (2) health research skills and methodologies and (3) genomics data science. The researchers trained in the programme will thus develop the **knowledge and the ability to identify research questions that offer the greatest benefit to society** and have all the skills to address these typically complex problems.

What is integrative genomics?

Integrative genomics is an emerging field of genomics that uses interdisciplinary approaches to better understand complex diseases. For example, an integrative genomics project could analyse high-throughput genomics data using novel computational algorithms and relate the findings to clinical outcomes in order to identify biological pathways, molecular targets, prognostic and diagnostic markers and ultimately to develop better therapies.

INTEGRATE is a sub-programme within the Centre for Research Training in Genomics Data Science (CRT). It is co-funded by the European Commission's Marie Skłodowska Curie Actions (MSCA) COFUND programme and Science Foundation Ireland (SFI).

The INTEGRATE programme will offer 20 prestigious four-year PhD scholarships to eligible early stage researchers (ESRs). The aim of the INTEGRATE programme is to establish a student cohort within the Genomics CRT programme who will receive interdisciplinary training in **genomics data science focusing on biomedicine and human health**.

The INTEGRATE training programme has unique features and provides world-class specialised training with several advantages over the traditional, apprenticeship-based PhD training including:

- Cohort-based training where 25-30 students train together each year
- Students can choose their research project based on their personal professional interest
- A large number of research projects to choose from
- The training is interdisciplinary and intersectoral, with a cross-sectoral (e.g. academia to industry) secondments and joint supervision
- Structured career development planning and a broad spectrum of career opportunities

Research projects are available in a number of areas. Over 50 Research Group Leaders, including many of Ireland's top genomics scientists, are associated with the programme and available as PhD supervisors. The table below lists the thematic areas and the available supervisors for research projects:

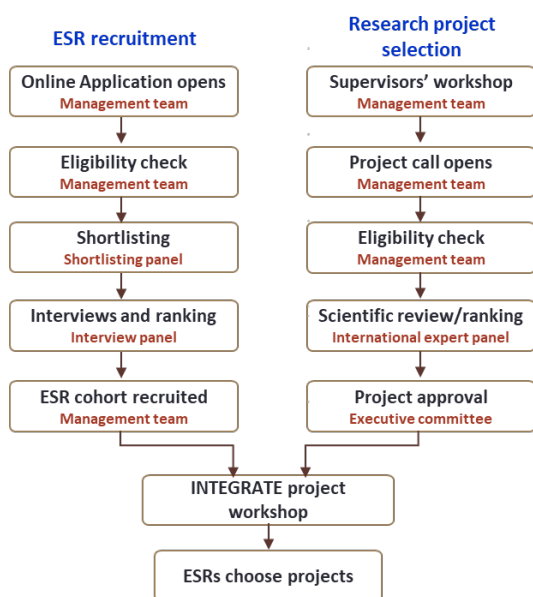
2 Application and Selection Process

The INTEGRATE programme offers a total of 20 PhD scholarships. The call for applications for the remaining 2 scholarships is currently open.

The timetable for the first call for applications is below:

1 st Call opens for applications	25-11-2021
1 st Call deadline	14-01-2022
Interviews of shortlisted candidates	Feb – Mar 2022
Successful applicants informed of outcome	Mar-April 2022
Applicants on reserve list informed of outcome	April- May 2022
Start date for successful applicants	01 Sept 2022

Steps of the application and selection process:



ESRs apply by submitting an online application through the INTEGRATE website:

(<https://integrategenomics.eu/application/>).

The applicants who pass the eligibility criteria will be evaluated and the top 8 candidates shortlisted and invited for interview. A reserve list of an additional 3-5 candidates will also be generated to be interviewed in case the 2 positions could not be filled from the main shortlist. The candidates will be ranked, and the top 2 candidates will be offered a place on the programme. Research projects will be selected in a parallel process. Supervisors associated with the INTEGRATE programme will submit proposals. The proposals will be evaluated and ranked based on scientific merit. All proposals which meet the required scientific quality threshold of 80% will be selected. The ESRs will receive all these project proposals and choose their top 3 projects, based on their research interests and career aspirations.

Eligibility criteria

Applicants must fulfil 4 criteria:

- 1) You must be early stage researchers, meaning that at the call deadline they have must be in the first four years (full-time equivalent research experience) of their research careers and not yet have been awarded a doctoral degree.
- 2) You must comply with the MSCA mobility rules whereby they have not resided or carried out their main activity (work, studies, etc.) in Ireland for more than 12 months in the 3 years immediately before the call deadline.
- 3) You must have a 3rd level degree (B.Sc, equivalent of Honours 2.1 Irish degree or MSc.) in a relevant discipline, such as a biological science (genetics, biochemistry, biomedical science, etc.) or a data science (mathematics, statistics, bioinformatics, etc.).
- 4) You must have advanced level English language competency: You must demonstrate your ability to understand and express yourself in both written and spoken English at a sufficiently high level to be able to complete the training. English language competency can be demonstrated by certificates from International English language courses – see NUIG regulations at: <http://www.nuigalway.ie/international-students/entry-requirements/> but note that the requirements at some of our partner institutions may differ slightly.

Shortlisting of applications (scoring of applications)

Each submitted ESR application will be evaluated remotely and individually by members of the Shortlisting committee. Each applicant will be evaluated on the basis of the award criteria presented in the table below. For each of the evaluation criteria, a number of sub-criteria have been formulated,

to help the expert reviewers to decide on the quality of the application. Applications during shortlisting will be scored on each of the shortlisting evaluation criteria from 0 to 5.

The sub-criteria will help the Shortlisting panel to form their opinion about the application; but they are not required to score each sub-criterion. Scores with a resolution of one decimal place may be given. The scores shall then be weighted as indicated in the header row in the table below to calculate the overall score.

The total score will be calculated as percentage, after applying the weighing for each criterion as follows: $((\text{Criterion-1 score} * 0.3) + (\text{Criterion-2 score} * 0.2) + (\text{Criterion-3 score} * 0.4) + (\text{Criterion-4 score} * 0.1)) * 20$. Placing an applicant on the shortlist will be subject to a threshold of 70%.

In case of ex-aequo results, the priority of the proposals on the ranking will be based on the highest score for research experience, then academic achievements. In case a gender is underrepresented in the applicant cohort, "positive equality" will be applied for ex-aequo scores.

Shortlisting criteria and sub-criteria

Academic/scientific achievements 30%	Research experience 20%	Motivation 40%	Extracurricular achievements 10%
Academic qualifications (e.g. MSc)	Relevant research experience	Personal statement	Awards prizes received
Specialised training received	Summer internships	Career objectives	
Publications, presentations	Technical skills		

Interviews and scholarship offers

The shortlisted candidates will be invited for an **interview**. The interview will be carried out in English via teleconferencing or over the internet (e.g. using Zoom or Skype) by the Interview panel. The interview is an evaluation of the candidate's ability to discuss and debate scientific concepts, oral presentation and motivation. Each interview will be evaluated on the basis of the criteria presented in the table below. Each criterion will be scored from 0 to 5 and the final mark will be calculated as percentage $((\text{Criterion-1 score} + \text{Criterion-2 score}) * 10)$.

Candidates may be asked to give a 10 minute presentation, with visual aids, on their past research experience and a research project they have carried out, techniques/methods applied, results generated and their interpretation. The presentation will be followed by a 20 minute Questions and Answers session. The final mark for each candidate will be comprised of the score for their written application (shortlist score with 30% weighting) and the competency interview (70% weighting). In case of ex-aequo results, the priority will be based on the total interview score. In case a gender is underrepresented in the applicant cohort, "positive equality" will be applied for ex-aequo scores.

Interview award criteria, sub-criteria, and scoring

Presentation 50%	Questions and Answers session 50%
Quality of presentation content and organisation	Ability to respond to questions evaluated based on the candidate's ability to debate a scientific concept
Quality of presentation delivery	Motivation, evaluated by knowledge of candidate on their past research experience and knowledge of the INTEGRATE programme
Quality of communication skills	Ambition, evaluated by quality of candidates' career plans

Redress process

All candidates will have a right to a redress procedure if they feel that there has been a shortcoming in the way their proposal was evaluated and that this shortcoming may affect the final decision on their application, or if they believe that the results of the eligibility checks are incorrect. To avail of the redress procedure, applicants have to submit a written request for redress within 15 calendar days of receiving feedback of the evaluation of their proposal. Requests must be sent by email to the dedicated email address provided on the INTEGRATE website (integrate.genomics@nuigalway.ie). A form for redress requests will be available on the website.

Redress requests must be: 1) Related to the evaluation process or eligibility; 2) Completed by using the form available on the INTEGRATE website, including a clear description of the grounds for complaint; 3) Received within 15 calendar days after receiving the feedback on eligibility or evaluation; 4) Submitted personally (not via a third party) by the applicant.

Redress requests will be reviewed by the Redress Committee. If there is clear evidence that a shortcoming has occurred that could affect the eventual funding decision, the application will be re-evaluated. Redress will be solely concerned with the evaluation and/or eligibility checking process. The committee will not call into question the scientific or technical judgement of appropriately qualified experts. Only one request for redress per applicant will be considered. All requests for redress will be treated confidentially. Applicants will be informed via email of the outcome within 15 calendar days of receipt of the redress request.

How to apply

Applications have to be submitted online, through the INTEGRATE website. The Application form has 5 sections:

- 1) Personal information, including proof of mobility-related eligibility
- 2) Academic qualifications (including B.Sc., MSc, other degrees, grades achieved, ranking in class, subjects studied, special training)
- 3) Work and research experience (detailing type of work, duties, research projects, expertise gained)
- 4) Scientific achievements (publications, awards, prizes, etc)
- 5) Personal statement detailing the motivation and how the INTEGRATE programme helps the applicant fulfil their career aims. The online application system will automatically close on the 6th of May, 2020. Applications will not be accepted after this date.

To Apply, please follow the following link: (<https://integrategenomics.eu/application/>)

Feedback provided to applicants:

All applicants will be informed whether their application has met the eligibility requirements via e-mail. Ineligible applicants will be provided with an explanation of the grounds for ineligibility. All

applicants will be informed of the outcome of the shortlisting via email providing them with qualitative feedback and a broad place in the ranking of the applicants. Following shortlisting and interview, applicants will be informed of the overall outcome of the evaluation via email providing them with a qualitative feedback and broad place in the final ranking of the applicants.

3 Appointment conditions of researchers

Living allowance and mobility allowance: Successful applicants will get employment contracts offered, providing provisions for social security and pension and parental leave. ESRs with family (spouse and/or child/children) will also receive 500 Euro per month family allowance. In the second round of recruitment if deferral is necessary, the ESR will receive an offer for the following year as a Genomics CRT (not INTEGRATE COFUND) student. Where an ESR has to take time off due to parental leave or long-term illness, the situation will be handled on a case-to-case basis, to make sure the ESR will receive the best possible offer to complete their training. NUIG is committed to provide 48 months of salary to each ESR.

Amounts provided for INTEGRATE ESRs.

Salary/living allowance categories	Total cost (EUR/Per month)
Living allowance (subject to taxes and contributions)	2109
Mobility allowance (subject to taxes and contributions)	600
Tuition fee	458
Researcher support total	3,367

Upon recruitment, all ESRs will receive an employment contract and become an employee of NUI Galway. All students will spend the first semester at NUIG where they will undertake a series of courses in genomics data science. During this period, they will choose their research project and then relocate to the institute hosting that project, where they will register as a PhD student. In line with the Terms of Employment Acts 1994 and 2001, the employment contract will specify the following: nature of the appointment; start date and total duration of the employment; guarantee that the employment contract with the host organisation will be maintained for the total duration of the scholarship; salary level, including any additional payments, such as mobility allowance etc.; annual leave and other leave entitlements (e.g. maternity leave).

By signing employment contracts, the ESRs' rights are determined in Irish law under the Fixed Term Workers Act 2003, meaning that the ESRs have equal rights as other employees, such as entitlement to annual leave, maternity leave. Social security (16.05%) and employer pension (20%) contributions will be automatically deducted from the ESR's salary and the ESR will have to pay standard employee taxes and contributions. Social security contributions qualify the ESRs for social benefits, including 26 weeks paid m/paternity/adoptive benefit, carers benefit, occupational injuries benefit etc. Under Irish law, **all host organisations** are obligated to provide appropriate accident insurance for all ESRs.

Support offered during the application process:

A support helpdesk for applicants will operate through a dedicated email address (integrate.genomics@nuigalway.ie).

The support helpdesk will help with enquiries about: the application process, eligibility criteria, the submission procedure and the range and potential research topics.