PhD fellowship in CRIPSR bioinformatics Department of Veterinary and Animal Sciences

A PhD fellowship in CRISPR bioinformatics in the Gorodkin lab is available from 1 December 2020 or as soon as possible hereafter. We are in search of a team player who is driven by curiosity and excitement and willing to put the necessary effort into the project and thereby play a key role in obtaining successful results.

Our group and research
The Gorodkin lab (https://ivh.ku.dk/bioinformatics), Center for non-coding RNA in Technology and Health (RTH), (http://rth.dk) at Department of Veterinary and Animal Sciences (https://ivh.ku.dk/english), work broadly with biological sequence data ranging from bacterial to animal and human genomes where we develop algorithms, constructing tools and analyze data. A key theme is non-coding and structured RNAs which is also relevant for the current phd position.

Project description

The CRIPSR technology has become a key cutting tool for genome editing with all the applications that follows. However, unintended cuts elsewhere in the genome, off-targets, can have detrimental effects, result in additional and irrelevant gene activity not related to intended target and for the data analysis it can impossible to filter these effects out. Interestingly, off-targets seem most often ignored in various applications of CRISPR. In this project off-targets will systematically be addressed by developing a computational framework, with outset in an energy model recently published by the lab combined with machine and deep learning, and data generated within the project. This phd project will employ off-target and DNA accessibility data generated within the project. It is visoned that the final model is a hybrid model of the mechanistic energy based charateristics and machine learning for the more implicit features. The CRISPR enzymes will focus on Cas9 and Cas12a. This PhD project supported by the Independent Research Fund Denmark, Technology and Procuction.

Principal supervisor is Professor, Jan Gorodkin, Department of Veterinary and Animal Sciences, E-mail: gorodkin@sund.ku.dk

Start: 15 December 2020 or as soon as possible thereafter.

Duration: 3 years as a PhD student.

Job description
Your key tasks as a PhD student at SUND are:

- Carry through an independent research project under supervision. This include (but not limited to):

- Extend an existing energy model for the CRISPR-Cas9 system and implement in conjuction of existing code
- Integrate methylation data into the off-target mapping algorithm and implement the pipeline
- Implement a hybrid energy model and machine or deep learning framework for predicting off-target

- Complete PhD courses or other equivalent education corresponding to approx. 30 ECTS points
- Participate in active research environments including a stay at another research team. This will involve a research visit to project partner Professor, Ivo L Hofacker, University of Vienna.
- Obtain experience with teaching or other types of dissemination related to your PhD project
- Teach and disseminate your knowledge
- Write a PhD thesis on the grounds of your project

Key criteria for the assessment of applicants
Applicants must have qualifications corresponding to a master's degree related to the subject area of the project such as Bioinformatics, Computer Science or similar areas. Most importantly that you meet the technical requirements in bullet #2 below.

Other important criteria are:

- The grade point average achieved
- Professional qualifications relevant to the PhD project. This include (but not limited to)
  For the following criteria the level has to be at level where you are able to work independently:
  - Strong knowledge of RNA folding and RNA-RNA interaction algorithms.
  - Strong knowledge of algorithms using suffix-arrays / suffix-trees for mapping (complementary) sequences to genomes
  - Machine learning
  - All of C++ or C, Perl or Python, shell scripting and Unix or Linux operating system

Critically importantly: your cover letter must address the items one by one explaiing how you match these criteria.

- Previous publications
- Relevant work experience
- Other professional activities
- Language skills

Place of employment

The place of employment is at the Gorodkin lab, Department of Veterinary and Animal Sciences, Faculty of Health and Medical Sciences, University of Copenhagen. The work environment in the lab is highly dynamic with good synergy among the different research projects, it is very international (currently 7 nationalities), and we just moved to a new building which will further support the dynamics. The group has access to all the necessary computational infrastructure and high performance computing needed for the project.

Terms of employment
The employment as PhD fellow is full time and for 3 years.

It is conditioned upon the applicant's successful enrolment as a PhD student at the Graduate School at the Faculty of Health and Medical Sciences, University of Copenhagen. This requires submission and acceptance of an application for the specific project formulated by the

applicant possibly during an initial three-month employment as a research assistant.

The PhD study must be completed in accordance with The Ministerial Order on the PhD programme (2013) and the Faculty's rules on achieving the degree. Salary, pension and terms of employment are in accordance with the agreement between the Ministry of Finance and The Danish Confederation of Professional Associations on Academics in the State. Depending on seniority, the monthly salary begins around 26.755 DKK /approx. 3.567 EUR (April 2018-level) plus pension.

Questions
For specific information about the PhD fellowship, please contact the principal supervisor.

General information about PhD study at the Faculty of Health and Medical Sciences is available at the Graduate School's website: https://healthsciences.ku.dk/phd/guidelines/

Application procedure
Your application must be submitted electronically by clicking 'Apply now' below. The application must include the following documents in PDF format:

- Cover letter spanning your motivation for the position, while addressing point by point the criteria in bullet #2 under the general criteria listed above.
- CV incl. education, experience, language skills and other skills relevant for the position
- Master of Science diploma and transcript of records. If not completed, a certified/signed copy of a recent transcript of records or a written statement from the institution or supervisor will do
- Publication list (if possible)

Application deadline: 4 October 2020, 23.59pm CET

We reserve the right not to consider material received after the deadline, and not to consider applications that do not live up to the abovementioned requirements.

The further process
After the expiry of the deadline for applications, the authorized recruitment manager selects applicants for assessment on the advice of the hiring committee. All applicants are then immediately notified whether their application has been passed for assessment by an unbiased assessor.

The assessor makes a non-prioritized assessment of the academic qualifications and experience with respect to the above-mentioned area of research, techniques, skills and other requirements listed in the advertisement.

Once the assessment work has been completed each applicant has the opportunity to comment on the part of the assessment that relates to the applicant him/herself.

You can read about the recruitment process at https://employment.ku.dk/faculty/recruitment-process/

The applicant will be assessed according to the Ministerial Order no. 242 of 13 March 2012 on the Appointment of Academic Staff at Universities.

Interviews are expected to be held in week 43 and 44

SØG STILLINGEN

Københavns Universitet giver sine knap 10.000 medarbejdere muligheder for at udnytte deres talent fuldt ud i et ambitiøst, uformelt miljø. Vi sikrer traditionsrige og moderne rammer om uddannelser og fri forskning på højt internationalt niveau. Vi søger svar og løsninger på fælles problemer og gør ny viden tilgængelig og nyttig for andre.

Kontakt

Jan Gorodkin
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Info

Ansøgningsfrist: 04-10-2020
Ansættelsesdato: 01-12-2020
Arbejdstid: Fuldtid
Afdeling/Sted: Institut for Veterinær- og Husdyrvidenskab

Søg i stillinger

SØG

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