



## Doctoral student in biology

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### Lund University, Faculty of Science, Department of Biology

Lund University was founded in 1666 and is repeatedly ranked among the world's top 100 universities. The University has around 44 000 students and more than 8 000 staff based in Lund, Helsingborg and Malmö. We are united in our efforts to understand, explain and improve our world and the human condition.

Lund University welcomes applicants with diverse backgrounds and experiences. We regard gender equality and diversity as a strength and an asset.

#### **Work duties**

The goal of the PhD project is to address the role of gene expression in hybridization derived novelty. It has long been known that hybrids can have phenotypes that are transgressive, more extreme than those of both parental species, in spite of having intermediate genomes. In this project we will investigate if hybridization can give rise to novel gene expression profiles. The project will investigate to which extent novel, transgressive patterns of gene expression that are more extreme compared to both parent species, are found in old hybrid lineages of the Italian sparrow. The Italian sparrows were formed by a hybridization ca. 5000 years ago. It will also investigate if the genes that will have novel patterns of gene expression in the hybrid species can be predicted based on their regulatory basis, the network they belong to and their function. The Italian sparrow system is especially well suited to address these questions as the four independent hybridization events have taken place on different Mediterranean islands, enabling the identification of general patterns through comparing the patterns across all populations. This research will shed new light on how hybridization can lead to novel phenotypes.

The project will involve state-of-art gene expression analyses, field work with birds, RNA-extractions both for whole tissues and single cell RNA, as well as bird breeding of F1- and F2-hybrids of the Italian sparrow and dissections. There will also be ample opportunities for e.g. improving on the reference genomes for both the focal species and its parental species and analyzing transposable elements.

The project include field work on Mediterranean islands and is suitable for candidates with a strong background in bioinformatics and evolutionary biology and an interest in evolutionary genomics and hybridization.

#### **Admission requirements**

A person meets the general admission requirements for third-cycle courses and study programmes if he or she:

- has been awarded a second-cycle qualification, or
- has satisfied the requirements for courses comprising at least 240 credits of which at least 60 credits were awarded in the second cycle, or
- has acquired substantially equivalent knowledge in some other way in Sweden or abroad.

A person meets the specific admission requirements for third cycle studies in Biology if he or she has passed an independent project (for example a degree project) of at least 30 credits in a relevant subject and have good oral and written proficiency in English.

#### Additional requirements

- A MSC in evolutionary biology/bioinformatics/evolutionary ecology or similar.
- Documented knowledge of evolutionary theory.
- Excellent oral and written proficiency in English.
- Demonstrated ability for proactive and independent work.
- Practical experience in advanced bioinformatical analysis in bash.
- Drivers license (if not, the candidate will be obliged to get one within 6 months after starting the position).

In addition to the mandatory requirements, documented experience in the following areas will be considered as strong merits:

- Extensive experience in bioinformatical data processing of NGS data in bash and python, and statistical scripting in R
- Experience with extracting RNA/single cell RNA (or other molecular lab work), and an interest in and dedication for learning these techniques
- Experience with field work and/or dissections
- Experience with analyzing bioinformatical data on clusters

#### Assessment criteria

Selection for third-cycle studies is based on the student's potential to profit from such studies. The assessment of potential is made primarily on the basis of academic results from the first and second cycle. Special attention is paid to the following:

- Knowledge and skills relevant to the thesis project and the subject of study.
- An assessment of ability to work independently and to formulate and tackle research problems.
- Written and oral communication skills
- Other experience relevant to the third-cycle studies, for example professional experience.

Consideration will also be given to strong collaborative skills, drive and independence, and how the applicant, through his or her experience and skills, is deemed to have the abilities necessary for successfully completing the third cycle programme.

#### Terms of employment

Only those admitted to third cycle studies may be appointed to a doctoral studentship. Third cycle studies at LU consist of full-time studies for 4 years. A doctoral studentship is a fixed-term employment of a maximum of 5 years (including 20% departmental duties). Doctoral studentships are regulated in the Higher Education Ordinance (1993:100), chapter 5, 1–7 §§.

#### Instructions on how to apply

Applications shall be written in English and include a cover letter (max 2 A4 pages) stating the reasons why you are interested in the postgraduate education programme and in what way the research project corresponds to your interests and educational background. The application must also contain a CV, degree certificate or equivalent, and other documents you wish to be considered as well as the contact details for at least two references.

The Faculty of Science conducts research and education within Biology, Astronomy, Physics, Geosciences, Chemistry, Mathematics and Environmental Science. The Faculty is organized into

nine departments, gathered in the northern campus area. The Faculty has approximately 1500 students, 330 PhD students and 700 employees.

We kindly decline all sales and marketing contacts.

**Type of employment** Temporary position longer than 6 months

**First day of employment** Preliminary 2022-09-01

**Salary** Monthly salary

**Number of positions** 1

**Working hours** 100

**City** Lund

**County** Skåne län

**Country** Sweden

**Reference number** PA2022/1785

**Contact**

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**Union representative**

- OFR/ST:Fackförbundet ST:s kansli, 046-2229362
- SACO:Saco-s-rådet vid Lunds universitet, 046-2229364
- SEKO: Seko Civil, 046-2229366

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