THE POSITION
We offer a **3-year Ph.D. position** in the Unit for Plant Molecular Cell Biology. We are searching a highly motivated Ph.D. candidate to study the molecular and genetic interaction of the barley powdery mildew pathogen (*Blumeria graminis* f.sp. *hordei*) with its host plant, barley. The focus of this position lies on fungal long noncoding RNA molecules and their role in the regulation of transposable elements, effector genes, and their influence on pathogen virulence. The student will:

1. Identify existing long noncoding RNAs in *Blumeria graminis* f.sp. *hordei* using next generation sequencing technology, and study their expression pattern.
2. Functionally investigate relevant long noncoding RNAs with respect to regulation or interaction with transposable elements, genes, or proteins, and their potential to affect host plant immunity.

The head of the lab is Prof Ralph Panstruga, the supervisor is Dr Stefan Kusch. The position is funded, the gross salary is approx. 33,000 €/year (depending on personal situation).

THE SCIENCE
*Blumeria graminis* f.sp. *hordei* is an obligate biotrophic fungal pathogen of barley and of high agronomic relevance. Its genome is inflated due to the expansion of transposable elements in the genome – these elements are likely the drivers of rapid co-evolution of the fungus with its host plant. We study the evolution and regulation of transposable elements in the fungus to uncover how they contribute to the loss, gain, and mutation of virulence genes such as effector genes. Our focus lies on studying epigenetic regulation, e.g. silencing through non-coding RNAs, DNA methylation, and histone acetylation. In fact, we discovered spliced long noncoding RNAs within transposable elements, suggesting that they regulate these elements by silencing or inducing DNA methylation, regulate genes (in *trans*), or serve as template for neofunctionalization of transposable elements, giving rise to novel virulence genes. Methodologies include transient over-expression assays by particle bombardment, next generation RNA sequencing, genome and epigenome sequencing, and laser scanning microscopy.

RESPONSIBILITIES
- Study the barley-powdery mildew interaction.
- Develop hypotheses and ideas for your research.
- Present your research in internal seminars and at conferences.
- Write manuscripts to publish your data.
- Teach/supervise undergraduate students.

REQUIRED QUALIFICATIONS
- Master’s degree in biology, or equivalent degree
- Practical experience in laboratory work (e.g. experimental Master’s thesis)
- Experience with plants and/or with fungi
- Motivated and curiosity-driven
- Ability to communicate in English

Optional Skills
- Familiarity with fungal plant pathogens or powdery mildews
- Experience with next generation sequencing technologies and sequence data analysis
- Using R and command line

http://www.bio1.rwth-aachen.de/PlantMolCellBiology/index.html

**skusch@bio1.rwth-aachen.de**

**+49 241 80 26640**

**@stefan_kusch**
Ph.D. position in molecular fungal genomics.

**HOW TO APPLY**
Send your application to Stefan Kusch (skusch@bio1.rwth-aachen.de) and Prof Ralph Panstruga (panstruga@bio1.rwth-aachen.de). The application deadline is 01-March-2020, the position is available earliest 01-April-2020. Feel free to get in contact for more information (see below for contact information). Your application should include:

- Letter of motivation (no more than 500 words!)
- Detailed CV with a brief (max. 200 words) description of your thesis project (do not include a photo).
- Contact information for one or two referees.

We will invite suitable candidates for an interview (via Skype is possible), where you should be prepared to give a brief presentation about your previous research experience.

**ABOUT RWTH AACHEN UNIVERSITY**
RWTH Aachen University hosts more than 40,000 students and has a strong science and engineering infrastructure. RWTH Aachen University is funded by the German excellence initiative and offers support and workshops for graduate students and early career scientists. The Unit for Plant Molecular Cell Biology (head: Prof Ralph Panstruga) is part of the Institute Botany and Molecular Genetics, one of 7 institutes in the Biology department. More than 20 Ph.D. students pursue projects related to plant-microbe interactions in the department.

Aachen offers many cultural activities as well as active student and international communities. Its attractive location at the border to Belgium and The Netherlands makes commuting or traveling to many places such as Köln (50 min), Brussels (50 min), Amsterdam (3 h), and Paris (2.5 h) easy.

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