



# **EpiTRAITS**

## **Epigenetic regulation of economically important plant traits**

### **Marie Curie International Training Network**

High profile joint research & training network that will improve career prospects in academia & private sector

#### **Key words:**

Epigenetics, flowering time, epigenetic profiling, bioinformatics, computational biology, plant biotechnology, Arabidopsis, field crops, kit development

11 PhD & 3 Postdoc positions abroad in:  
The Netherlands, Germany, England, Belgium, Poland, France and Spain

2-days interview at University of Amsterdam Nov 6-7, 2012

Contract negotiations with EU expected to be completed before October 1

[Application website epitraits.eu will be available September 1, 2012](http://epitraits.eu)

#### **Summary**

The mission of EpiTRAITS is to train young researchers in epigenetic gene regulation and flowering in the model plant *Arabidopsis thaliana* and the crop plants maize (*Zea mays*) and barley (*Hordeum vulgare*). Epigenetic gene regulation confers stability of gene expression patterns through cell divisions while allowing changes in expression in response to environmental or developmental cues. Although changes in epigenetic gene regulation are a major cause for trait variation, no rational strategies have been developed that utilize this knowledge for crop breeding purposes. EpiTRAITS will focus on one of the key plant traits, flowering, which is controlled by various epigenetic mechanisms. The scientific program aims to bridge the gap between fundamental and applied research by translating results from epigenetic research in model organisms to improved technologies for crop breeding and molecular diagnostic tools.

# EpiTRAITS Training program

## *Objectives of the training program*

The high profile EpiTRAITS program trains the appointed fellows to become

- Expert and leader in his/her research discipline
- Knowledgeable of cutting-edge technologies in other disciplines
- Skilled in presenting information both orally and in writing
- Trained to communicate beyond the boundaries of his/her own research field
- Experienced in managing a scientific project as an independent researcher
- Capable of interacting with academic and industrial sectors, and society at large
- Skilled in exploring the commercial exploitation of results

EpiTRAITS will offer an inter-disciplinary, custom developed training programme that promotes scientific excellence and exploits the interdisciplinary expertise and infrastructure present in the consortium.

## *The training program consists of:*

- Local individual training
- Network-wide training in research and transferable skills
- Internships at full and associated EpiTRAITS partners from the public and private sector.

### Local Individual Training

The fellows will be embedded in the research groups at their home laboratories, and benefit from i) close supervision and mentoring, ii) access to expertise in the local research group, iii) active participation in group meetings, company meetings and/or institute seminars, iv) access to courses provided by local graduate schools.

### Network-wide training in research and transferable skills

A number of mandatory network-wide training activities will be organized for the fellows: (i) meetings/workshops, (ii) courses on research-specific skills (e.g. bioinformatics, image analysis, modelling, next-generation sequencing) and (iii) courses on transferable skills (e.g. project management, presentation skills, scientific writing, proposal writing).

### Internships at partners from the public and private sector

The fellows will perform internships (secondments) at other academic and private sector partners. During these internships fellows will be trained in techniques and methods required for their project and will perform initial experiments applying those methods. The secondments are a network of reciprocal visits among and between the academic and private sector partners that promote synergies between the partners and fellows and provide the fellows with a multidisciplinary training.

# EpiTRAITS participants

## Full partners

Partner	Company	Country	Legal Entity Name (short name)	Scientist-in-charge	Department/Laboratory	Open Position	Type of Position
1		NL	Universiteit van Amsterdam (UvA)	Dr. Maike Stam (coordinator), Dr. Paul Fransz	Swammerdam Institute for Life Sciences (SILS)	2 x PhD	Molecular Biology/Biochemistry Cytology
2		DE	Max Planck Institute for Plant Breeding Research (MPIPZ)	Dr. Franziska Turck	Plant Developmental Biology	PhD	Molecular Biology/Biochemistry
3		NL	Wageningen University (WUR)	Prof. Gerco Angenent	Plant Sciences Group	PhD	Molecular Biology/Biochemistry
4		ES	Instituto Nacional de Investigaciones Agrarias (INIA)	Dr. Manuel Pineiro	Biotechnology	PhD	Molecular Biology/Biochemistry
5		DE	Heinrich-Heine-University Düsseldorf (UDUS)	Dr. Daniel Schubert	Institute for Genetics	PhD	Biochemistry
6		PL	Institute of Plant Genetics, Polish Academy of Sciences (IPG-PAS)	Prof. Pawel Krajewski	Laboratory of Biometry	PhD	Bioinformatics/Statistics
7	✓	ES	Biomol-Informatics, S.L. (BIOMOL)	Dr. Paulino Gómez-Puertas		PhD	Bioinformatics
8		UK	University of Nottingham (UNOTT)	Prof. Charlie Hodgman, Prof. Graham Seymour	Centre for Plant Integrative Biology	PhD	Bioinformatics/Modeling
9		FR	Institut National de la Recherche Agronomique (INRA)	Dr. Valerie Gaudin, Dr. Philippe Andrey	Institut Jean-Pierre Bourgin (IJPB)	2 x PhD	Cytology, Image analysis/Spatial modeling
10	✓	BE	Diagenode SA (DIAG)	Dr. Hélène Pendeville	Diagenode R&D Epigenetics	Post-doc	Molecular Biology
11	✓	NL	Keygene (KG)	Dr. Marcel Prins	Upstream Research	Post-doc	Bioinformatics/Molecular Biology
12	✓	DE	Phytowelt (PHY)	Dr. Peter Welters		Post-doc	Molecular Biology/Biochemistry/Cell Biology

## Associated partners

Partner	Company	Country	Legal Entity Name (short name)	Scientist-in-charge	Department/Laboratory	Expertise	Role
13	✓	NL	Rijk Zwaan Breeding B.V. (RZ)	Dr. Rob Dirks	Dept. Biotechnology	Plant Breeding	Training
14	✓	PL	Hodowla Roślin Smolice Sp. z o.o. Grupa IHAR (Smolice)	Prof. Józef Adamczyk Dr. Janusz Rogacki		Plant Breeding	Training
15	✓	UK	Vitae	Alison Mitchell	Vitae	Personal skill development	Training

# Requirements & conditions

## General information on PhD and Postdoc positions

### Appointment

Based on a full-time appointment the duration of the appointment as a Marie Curie ITN fellow will be for a maximum period of 3 years (PhD student) or 2 years (Post-doctoral fellow). The appointment as a PhD student should lead to a dissertation (PhD thesis). Positions are aimed at being full-time, but if necessary (e.g. for family or medical reasons) part-time appointments are possible. In cases where researchers – in agreement with the host organisation, and with prior approval of the European Research Executive Agency – execute their project on a part-time basis, the duration of the appointment can be extended, but not longer than the duration of the EpiTRAITS project (48 months; end date Sept 30, 2016). All partners are committed to facilitate an appropriate work-life balance when needed. We strongly encourage woman to apply.

### Requirements

- Candidates can only apply for a position in a country different from the one lived in for most of the time in the last three years. At the time of recruitment by the host organisation, researchers should not have resided or carried out their main activity (work, studies, etc) in the country of their host organisation for more than 12 months in the 3 years immediately prior to the reference date.
- **PhD students:** At the time of recruitment by the host organisation, early-stage researchers (PhD students) must be in the first four years (full-time equivalent) of their research career and have not yet been awarded a doctoral degree. This is measured from the date when they obtained the (MSc) degree that formally entitles them to become a PhD student.
- **Post-doctoral fellow:** At the time of recruitment by the host organisation, experienced researchers (Post-docs) must be in possession of a doctoral (PhD) degree, or have at least four years of full-time equivalent research experience. In both cases, they should have less than 5 years of full-time equivalent research experience. This is measured from the date when they obtained the (MSc) degree that formally entitled them to become a PhD student.

Candidates need to register and provide the required information:

- Motivation letter
- C.V. (EU format; <http://europass.cedefop.europa.eu/en/home>), including:
  - TOEFL scores ([www.ets.org](http://www.ets.org)).
  - List of internships (subject, name supervisor, grade, etc)
  - Publications (if applicable)
  - PhD project details (for postdoctoral fellows only)
- Grades (with explanation on the grading system)
- Two letters of recommendation and contact information of two referees
- The position(s) of interest including a ranking

Applications that are not eligible (do not meet the requirements listed) will not be considered and will not receive a reaction.

### Salary

The fellows will obtain a monthly living and mobility allowance.

### Living Allowance

The Living allowance is the salary that is paid on a monthly basis. The host organisation will appoint the candidate under an employment contract. The host organisation will ensure that the researcher is covered under i) the social security scheme that is applied to employers within the respective country, or ii) under a social security scheme that provides coverage for at least sickness and maternity benefits, invalidity and accidents at work and occupational diseases, and covers the researcher in every place at which Marie Curie ITN activities will take place.

### Mobility Allowance

In addition to the living allowance, a mobility allowance will be paid on a monthly basis. This allowance is a contribution to cover personal household, relocation and travel expenses.

The amount of the mobility allowance depends on the family situation of the researcher *at the time of recruitment of the researcher*:

- €1000/month: Researcher with family responsibilities.
- €700/month: Researcher without family responsibilities.

A researcher with family responsibilities is defined as follows: persons linked to the researcher by (i) marriage, or (ii) a relationship with equivalent status to a marriage that is recognised by the national legislation of the country of the host organisation or of the nationality of the researcher; or (iii) dependent children who are actually being maintained by the researcher.

### **Interview Process**

The application deadline is October 1, 12 p.m. The recruitment committee will select the eligible candidates based on the criteria listed under Requirements. The evaluation of eligible applications will occur in the first weeks of October. The candidates selected will be notified 1-2 weeks before the 2-days interview process, which is scheduled on November 6 and 7 at the University of Amsterdam in Amsterdam, the Netherlands. Day 1 of the interviews will start with parallel sessions in which the candidates are invited to give a 10 minutes presentation, followed by 10 minutes discussion. Day 1 will also include an informal meeting between the interview committees and candidates and will end with a social program. On day 2 parallel sessions are scheduled in which the candidates will be interviewed. Within 2 weeks after the interviews candidates will be offered a position or informed about the arguments resulting in rejection.

The evaluation and selection procedure will occur in a non-discriminatory manner. We strongly encourage woman to apply.

## Position 1A

**PhD position in Molecular Biology** at the group of Maïke Stam, part of the Nuclear Organization group at the Swammerdam Institute for Life Sciences, University of Amsterdam (UvA), Amsterdam (NL), <http://www.science.uva.nl/sils/nog>

### **Project: “The role of chromosomal interactions in the regulation of flowering genes”**

A major challenge in science and biotechnology is the understanding of the biological mechanisms underlying eukaryotic gene regulation. Gene expression is controlled by different mechanisms, including epigenetic modifications, intra- and interchromosomal interactions and chromatin folding. All these levels of gene control are essential for normal growth and development. The mission of our group is to understand how these mechanisms together control genome activity. Intriguingly, recent studies have demonstrated that regulatory elements can also be located hundreds of kilobases from the gene they regulate. They do so by physically interacting with their cognate gene, resulting in chromatin loop formation. DNA sequences actually appear to be involved in numerous chromatin interactions. Our understanding of the role of all these interactions in gene regulation is however still very limited. **The aim of this project** is to determine the functional significance of long-range intra- and interchromosomal interactions in gene regulation of flowering genes. To this end, **the PhD student will** identify the interactions between particular flowering genes and the rest of the genome in Arabidopsis and maize by using the cutting-edge technology called chromosome conformation capture. Relationships between interacting sequences, transcriptional activity, DNA methylation and chromatin structure will be determined and the data obtained will be used to construct predictive models. To achieve our goals we will **collaborate with partners** MPIPZ, WUR, IPG-PAS, BIOMOL, UNOTT, DIAG and KG.

### **Requirements**

- Master's degree in Molecular Biology and/or Biochemistry (or equivalent)
- Experience with molecular biological techniques
- Experience with data analysis techniques
- The ability to work in a team and independently
- Highly motivated to pursue a career in science
- Background/expertise in (epigenetic) gene regulation

### **More information**

More project information can be obtained from Dr. M. Stam; e-mail: [m.e.stam@uva.nl](mailto:m.e.stam@uva.nl); phone +31-(0)20-525-7655.

### **Appointment**

Based on a full-time appointment, the duration of the appointment as a Marie Curie ITN fellow will be for a maximum period of 3 years and will, in line with the duration of a PhD study in the Netherlands, be extended another year according to the employment rules of the University of Amsterdam. The appointment will be 18 months plus a further 30 months after a positive evaluation and should lead to a dissertation (PhD thesis). A Personal Career Development Plan will be drafted that includes the attendance of EpiTRAITS courses and (international) meetings. The PhD student is also expected to assist in teaching of undergraduates.

The gross monthly salary will be according to the salary scales for PhD students in the host country. The collective employment agreement (CAO) of Dutch universities is applicable. Besides the salary, the PhD student will obtain a mobility allowance for the duration of the 3 years of the Marie Curie ITN project (see page 5). For the one-year extension of the appointment after the Marie Curie project, the gross monthly salary will be according to the salary scales of the University of Amsterdam. Positions are aimed at being full-time, but by exception, if needed for family reasons, part-time appointments are possible.

### **Interview Process**

The 2-days interview process will take place on November 6 and 7 at the University of Amsterdam. Candidates selected for an interview will be notified 1-2 weeks in advance.

## Position 1B

**PhD position in molecular cytology** at the group of Dr. Paul Fransz, part of the Nuclear Organization Group at the Swammerdam Institute for Life Sciences, University of Amsterdam (UvA), Amsterdam (NL), <http://www.science.uva.nl/sils/nog>

### Project: Functional relationships between nuclear organization and gene regulation

The development of a multicellular organism involves constant changes in gene activity in a stage- and tissue-dependent manner. Instrumental to this multicellular development is the ability of the nucleus to modify its program by switching on or off whole sets of genes and changing its protein and RNA composition. Understanding which biological mechanisms underlie nuclear re-programming is a major challenge and one of the key objectives of our group. We study the organization of chromosomes and the spatial position of chromosomal loci in interphase nuclei of *A. thaliana* in relation to their activity. One of our goals is to map physical interactions in plants between chromosomal regions, such as regulatory sequences and their cognate genes. **The aim of this project** is to identify 3D positions of genomic loci and proteins in nuclei from leaf and apex tissues of *A. thaliana* and maize. The PhD student will apply a combination of immunolabeling and FISH techniques to analyse the location of proteins and target sequences involved in flowering. Using confocal microscopy, he/she will measure the frequency of co-localization of sequences of interest and the spatial position relative to other loci, proteins and nuclear reference points such as chromocenter, nuclear envelop or nucleolus. A whole-mount FISH approach will be used to verify and quantify chromosomal interactions identified by EpiTRAITS collaborators in single cells. The generated data will be used to construct a predictive model for the functional 3D-organization of chromosomes. To achieve our goals we will **collaborate with partners** MPIPZ, WUR, INIA, UDOS, INRA.

### Requirements

- Master's degree in **Molecular biology, Celbiology or Biochemistry** (or equivalent)
- Experience with **microscopical** techniques
- Experience with **data analysis techniques**
- Ability to work in a team and independently
- Highly motivated to pursue a career in science
- Background/expertise in (epigenetic) gene regulation

### More information

Project information can be obtained from Dr. P. Fransz; e-mail: [p.f.fransz@uva.nl](mailto:p.f.fransz@uva.nl); phone +31-(0)20-525-5153.

### Appointment

The duration of the appointment as a Marie Curie ITN fellow will be for a maximum period of 3 years and will, in line with the duration of a PhD study in the Netherlands, be extended another year according to the employment rules of the University of Amsterdam. The appointment will be 18 months plus a further 30 months after a positive evaluation and should lead to a dissertation (PhD thesis). A Personal Career Development Plan will be drafted that includes the attendance of EpiTRAITS courses and (international) meetings. The PhD student is expected to assist in teaching of undergraduates.

The gross monthly salary will be according to the salary scales for PhD students in the host country. The collective employment agreement (CAO) of Dutch universities is applicable. Besides the salary, the PhD student will obtain a mobility allowance for the duration of the 3 years of the Marie Curie ITN project (see page 5). For the one-year extension of the appointment after the Marie Curie project, the gross monthly salary will be according to the salary scales of the University of Amsterdam. Positions are aimed at being full-time, but by exception, if needed for family reasons, part-time appointments are possible.

### Interview Process

The 2-days interview process will take place on November 6 and 7 at the University of Amsterdam. Candidates selected for an interview will be notified 1-2 weeks in advance.

**Host institution: University of Amsterdam (UvA)**

The Faculty of Science occupies a leading position internationally in its fields of research and participates in a large number of cooperative programmes with universities, research institutes and businesses. The faculty has a student body of around 4,000 and 1,500 members of staff, spread over eight research institutes and a number of faculty-wide support services. A considerable part of the research is made possible by external funding from Dutch and international organizations and the private sector. The Faculty of Science offers thirteen Bachelor's degree programmes and eighteen Master's degree programmes in the fields of the exact sciences, computer science and information studies, and life and earth sciences.

Since September 2010, the whole faculty has been housed in a brand new building at the Science Park in Amsterdam. The installment of the faculty has made the Science Park one of the largest centers of academic research in the Netherlands. More information on working at the faculty of Science and moving to Amsterdam can be found at <http://www.science.uva.nl/vacancies>.

The Swammerdam Institute for Life Sciences (SILS) is one of the Faculty's largest institutes. Its approximately 200 scientists and staff members work in 14 research groups that perform excellent research centered on four themes: 1) The Living Cell, 2) Plant Signaling, 3) Neuroscience, and 4) Life Science Technologies.



## Position 2

**PhD position in Plant Developmental Biology** at the group of Dr. Franziska Turck/ Department Plant Developmental Biology at the Max Planck Institute for Plant Breeding Research (MPIPZ), <http://www.mpipz.mpg.de/>

### **Project: Elucidation of dynamic chromatin changes during the floral transition**

Our group focuses on the interplay of chromatin structure, *cis*-regulatory elements and transcription factors to regulate genes that promote flowering. The transcriptional regulation of these so called floral integrator genes combines information received from distinct pathways, such as temperature, photoperiod, developmental age and abiotic stress. In recent years, it has become obvious that important advances in crop breeding were dependent on the selection of *cis*-regulatory variants of floral integrator genes. The long-term goal of our work is to provide a more rational approach to the selection of flowering time variants for field crops. **The aim of this project** is to identify and characterize novel regulatory regions in candidate genes that regulate flowering in maize and Arabidopsis. **The rational is to use existing knowledge about chromatin modifications that are predominant at distal enhancers and to profile these modifications** during the reproductive phase shift in maize leaves. Chromatin modification patterns will be compared to transcriptome profiles generated by mRNA-seq. To elucidate the molecular mechanism of enhancer-promoter interactions, the PhD student will establish the INTACT system for cell type-specific ChIP to generate histone modification profiles at the *FT* locus in *A. thaliana* phloem cells during absence and presence of *FT* expression. 3C experiments will be carried out to map dynamic physical interactions between regulatory regions. To achieve these goals we will **collaborate with partners** UvA, IPG-PAS, BIOMOL, DIAG and KG.

### **Requirements**

- Master's degree in Biology or Agronomy (or equivalent)
- Experience with Molecular Biology techniques
- Ability to work in a team and independently
- Highly motivated to pursue a career in science
- Background/expertise in (epigenetic) gene regulation is preferred

### **More information**

Project information can be obtained from Dr. Franziska Turck; e-mail: ([turck@mpipz.mpg.de](mailto:turck@mpipz.mpg.de)); phone 0049-(0)221-5062-246.

### **Appointment**

The appointment will be on a temporary basis for a maximum period of 3 years (12 months plus a further 24 months after a positive evaluation) and should lead to a dissertation (PhD thesis). A Personal Career Development Plan will be drafted that includes the attendance of EpiTRAITS courses and (international) meetings.

The gross monthly salary will be according to the salary scales for PhD students in the host country. The collective employment agreement (CAO) of TVdÖ (state employees) is applicable. Besides the salary, the PhD student will obtain a mobility allowance (see page 5). Positions are aimed at being full-time, but by exception, if needed for family reasons, part-time appointments are possible.

### **Interview Process**

The 2-days interview process will take place on November 6 and 7 at the University of Amsterdam. Candidates selected for an interview will be notified 1-2 weeks in advance.

### **Host institution: Max Planck Institute for Plant Breeding Research**

The overall research goal of the Max Planck Institute for Plant Breeding Research (MPIPZ) is to elucidate whether and how a detailed understanding of molecular mechanisms in model plant species can be used to rationally manipulate selected traits in crop plants. The MPIPZ employs 350 people in four scientific departments and service groups. Together with the Universities of Düsseldorf and Cologne, the MPIPZ is part of the recently installed Cluster of Excellence on Plant Sciences. The EpiTRAITS project will be hosted at the Department of Plant developmental biology, which is headed by Prof. Dr. George Coupland.

### Position 3

**PhD position in Molecular Biology** at the group of Prof. Gerco Angenent, Plant Sciences Group/Molecular Biology at Wageningen University and Research Centre (WUR), The Netherlands, <http://www.pri.wur.nl/UK/research/bioscience/team-pds/>

#### **Project: The role of MADS-box TFs in chromosomal interactions during flower development**

Our group focuses on the action of transcription factors and how they control gene expression in plants. In particular, we study the transcriptional regulation of the transition to flowering and the formation of the floral organs by unraveling the molecular action of MADS domain transcription factors and their interactions with other proteins and DNA. For this, we use *Arabidopsis* as model species and molecular/biochemical tools combined with genome analysis and Next Generation Sequencing. **The Aim of the project** is to study the role of MADS domain TFs and chromosomal interactions in floral meristem initiation and development in *A. thaliana*. **The approaches** that we will follow are immunoprecipitation of protein complexes containing tagged MADS-box TFs and biochemical characterization by LC-MS/MS to reveal potential interactions between MADS-box TFs and chromatin-associated proteins. Furthermore, the occurrence of chromatin interactions at *AP3*, *SEP3*, *AG* and *SOC1* loci will be studied using 3C combined with ChIP, using antibodies against MADS-box TFs and NGS to identify the interactions. Also *in vivo* (ChIP-seq) and *in vitro* techniques to understand the interactions between TF complexes and DNA sequences are frequently used in our lab. The data on chromatin interactions involving MADS-box TFs will be linked with existing expression data using statistical tools. The nuclear localization of tagged MADS-box proteins relative to repressed and active nuclear features will be studied in collaboration with partners at the University of Amsterdam. The PhD student will actively collaborate with many partners in EpiTRAITS (e.g partners UvA, IPG-PAS, BIOMOL and INRA).

#### **Requirements**

- Master's degree in molecular biology and/or biochemistry (or equivalent)
- Experience with molecular biology and/or biochemical techniques
- Experience with data analysis techniques is desirable
- Ability to work in a team and independently
- Highly motivated to pursue a career in science
- Background/expertise in (epigenetic) gene regulation is preferred

#### **More information**

Project information can be obtained from prof Gerco Angenent; e-mail: [gerco.angenent@wur.nl](mailto:gerco.angenent@wur.nl); phone 0031-(0)317-480953.

#### **Appointment**

The duration of the appointment as a Marie Curie ITN fellow will be for a maximum period of 3 years and will, in line with the duration of a PhD study in the Netherlands, be extended another year according to the employment rules of the Wageningen University. The appointment will be 18 months plus a further 30 months after a positive evaluation and should lead to a dissertation (PhD thesis). A Personal Career Development Plan will be drafted that includes the attendance of EpiTRAITS courses and (international) meetings.

The gross monthly salary will be according to the salary scales for PhD students in the host country. The collective employment agreement (CAO) of Dutch universities is applicable. Besides the salary, the PhD student will obtain a mobility allowance for the duration of the 3 years of the Marie Curie ITN project (see page 5). For the one-year extension of the appointment after the Marie Curie project, the gross monthly salary will be according to the salary scales of the Wageningen University. Positions are aimed at being full-time, but by exception, if needed for family reasons, part-time appointments are possible.

#### **Interview Process**

The 2-days interview process will take place on November 6 and 7 at the University of Amsterdam. Candidates selected for an interview will be notified 1-2 weeks in advance.

**Host institution: Wageningen University (WU).**

WU is part of the Wageningen University and Research Centre (WUR) that also comprises Plant Research International (PRI). WUR has the largest plant research community (>750 researchers) in the Netherlands and they are housed in a new building with state of the art labs, plant growth facilities and microscopy infrastructure. The genomics facilities are excellent and unique in its broadness in The Netherlands with NGS sequencers, Mass spectrometry equipment and bioinformatics infrastructure. The research of the plant departments ranges from molecule to crop and uses a plethora of disciplines.

## Position 4

**PhD position in Molecular Biology** at the group of Dr. Manuel Piñeiro in the Dept. of Biotechnology at the Instituto Nacional de Investigaciones Agrarias (INIA) and Centro de Biotecnología y Genómica de Plantas (CBGP), Madrid, Spain, [http://www.cbgp.upm.es/phase\\_transitions.php](http://www.cbgp.upm.es/phase_transitions.php).

### Project: The role of chromatin proteins in flowering

The transition from vegetative growth to flowering is one of the most dramatic developmental switches that take place during the life cycle of plants. The timing of flowering is crucial for the optimal production of fruits and seeds, and therefore for the reproductive success of plants. In addition, flowering time directly impacts crop yield, making it a developmental process with considerable biotechnological potential. Our group is focused on understanding the molecular mechanisms involved in the regulation of flowering. We are especially interested in unveiling the pivotal role that chromatin remodelling processes play in the control of gene expression patterns regulating the floral transition. In particular, we are characterizing the plant-specific chromatin factor EBS, involved in the repression of flowering in *Arabidopsis thaliana*. **The aim of this project** is to further understand the role of EBS in the silencing of flowering genes in this model species. For that, **the PhD student** will use biochemical tools to identify effector proteins mediating the role of EBS in gene repression. The function of EBS will be analyzed by comparing the genome-wide binding sites of this protein (ChIP-seq) with transcriptomic profiles (RNA-seq) in leaves and vegetative meristems. The expression of master genes of flowering, and the distribution of histone marks in their genomic regions will be analyzed, comparing wild type plants with *ebs* mutants. The data obtained will be used to construct predictive models. To achieve these goals we will **collaborate with partners** UvA, WUR, IPG-PAS, BIOMOL and DIAG.

### Requirements

- Master's degree in Molecular Biology and/or Biochemistry (or equivalent)
- Experience with molecular biology techniques
- Experience with data analysis techniques is desirable
- Ability to work in a team and independently
- Highly motivated to pursue a career in science
- Background/expertise in (epigenetic) gene regulation

### More information

Project information can be obtained from Dr. Manuel Piñeiro; e-mail: [pineiro@inia.es](mailto:pineiro@inia.es) or [pineiro181@gmail.com](mailto:pineiro181@gmail.com); phone +34-91 336 4582.

### Appointment

The appointment will be on a temporary basis for a period of three years. The appointment will be according to the employment rules of the host country and should lead to a dissertation (PhD thesis). A Personal Career Development Plan will be drafted that includes the attendance of EpiTRAITS courses and (international) meetings.

The gross monthly salary will be according to the salary scales for PhD students in the host country. Besides the salary, the PhD student will obtain a mobility allowance (see page 5). Positions are aimed at being full-time, but by exception if needed for family reasons part-time appointments are possible.

### Interview Process

The 2-days interview process will take place on November 6 and 7 at the University of Amsterdam. Candidates selected for an interview will be notified 1-2 weeks in advance.

### Host institution: Instituto Nacional de Investigaciones Agrarias (INIA)

INIA is a nation-wide leading research institute in the fields of Agriculture, Forestry, Animal Livestock, Food and Environment. As such, INIA encourages its research staff to play a major role in pooling national and international research resources in those thematic areas, to participate in cooperative programs and to coordinate projects aimed at solving problems through

interdisciplinary or multidisciplinary approaches. Nearly 1.000 staff members of INIA perform research activities in different Centers and Departments. The host group belongs to the Biotechnology Department and is located in the Centro de Biotecnología y Genómica de Plantas (CBGP), a joint centre involving INIA and the Universidad Politécnica de Madrid (UPM). The CBGP resides in the Montegancedo Campus, a recently awarded Spanish Campus of International Excellence. The CBGP started to operate at the end of 2008 and despite its recent creation, CBGP has a strong position in plant science in Europe, and international recognition in the areas of plant biochemistry, plant development and plant-microbe interaction. Research carried out by the different groups at CBGP is supported mostly by external funding, from competitive granting agencies of Spain and the EU, from non-profit private foundations, contracts with the private sector, etc. In the CBGP, more than 250 scientists gather around 20 research groups that perform excellent research, supported by a number of core services, including Genomics, Proteomics and Metabolomics facilities, Microscopy services, and also plant growth facilities.

## Position 5

**PhD position in plant developmental epigenetics** at the group of Dr. Daniel Schubert, Institute for Genetics, Heinrich-Heine-University Düsseldorf (UDUS), Germany, <http://www.entwicklungsepigenetik.hhu.de/>.

### **Project: “The identification of novel chromatin associated proteins involved in flowering”**

Research in our group focuses on the role of Polycomb-group (PcG) proteins and histone modifications in controlling plant development and cell fate (see Schatlowksi et al. 2010, Plant Cell 22, 2291; Lafos et al. 2011, PLoS Genetics 7: e1002040; Schatlowksi et al 2008, Semin Cell Dev Biol 19, 547). We have identified two novel PcG-associated proteins that control various developmental traits. One may bind RNA to recruit PcG proteins, the other may connect histone phosphorylation to PcG proteins. The **aim of the project** is to identify the complex partners of the two novel proteins and their genomic target genes, and reveal their link with PcG proteins. To this end, the PhD student will use available transgenic, tagged Arabidopsis lines for co-immunoprecipitation and consecutive LC-MS/MS. The genome-wide target genes of the novel proteins will be uncovered by ChIP-Seq. (Mis-)expression of the targets will be determined by RNA-Seq in lines mutant for the two genes (available in the lab). Lastly, the transgenic, tagged lines will be used to reveal the subnuclear localization of the proteins. Collectively, this project offers a sound combination of biochemistry, molecular epigenetics and plant developmental biology. The PhD student will collaborate with partners WUR, IPG-PAS, BIOMOL, DIAG on advanced biochemistry, bioinformatics, cellular biology and imaging.

### **Requirements**

- Master's degree in molecular biology and/or plant biology (or equivalent)
- Experience with molecular biology and/or biochemistry techniques
- Ability to work in a team and independently

### **More information**

Project information can be obtained from Dr. Daniel Schubert; e-mail: [Daniel.Schubert@hhu.de](mailto:Daniel.Schubert@hhu.de); phone +49-(0)211-81-10484.

### **Appointment**

The appointment will be according to the employment rules of Heinrich-Heine-University Duesseldorf and should lead to a dissertation (PhD thesis). A Personal Career Development Plan will be drafted that includes the attendance of EpiTRAITS courses and (international) meetings.

The gross monthly salary will be according to the salary scales for PhD students in the host country. The collective employment agreement (CAO) of Tv-L is applicable. Besides the salary, the PhD student will obtain a mobility allowance (see page 5). Positions are aimed at being full-time, but by exception if needed for family reasons part-time appointments are possible. The application of women is encouraged. Women will be preferentially considered if they are equally qualified, educated and fulfilling the application requirements. The application of severely disabled persons is encouraged.

### **Interview Process**

The 2-days interview process will take place on November 6 and 7 at the University of Amsterdam. Candidates selected for an interview will be notified 1-2 weeks in advance.

### **Host institution: Heinrich-Heine-University Duesseldorf (UDUS)**

UDUS houses faculties of medicine, science, economics, law and philosophy, and offers a modern curriculum for 17,000 students. Currently, the university employs 2.294 people in total and 581 at the faculty of science. UDUS is one of the leading German universities in plant sciences. Together with the University of Cologne and the MPIPZ, UDUS is part of the recently installed Cluster of Excellence on Plant Sciences. Duesseldorf is a lively and international city in the heart of Germany, offering lots of cultural and recreational activities.

## Position 6

**PhD position in statistics/bioinformatics** at the group of Prof. Paweł Krajewski, Laboratory of Biometry, Institute of Plant Genetics, Polish Academy of Sciences (IPG-PAS), [www.igr.poznan.pl](http://www.igr.poznan.pl).

### **Project: Statistical and bioinformatic analysis of genome-wide data sets**

The data sets generated by the use of high-throughput technologies require the collaboration of knowledgeable bioinformaticians that are capable to obtain the desired information from these experiments. Our group is focused on the development of statistical methodologies needed to understand results of large scale plant genetic and genomic experiments, and bioinformatic methods necessary to organize and process large volumes of data arising in such experiments. In particular, our research group is familiar with the processing of next-generation sequencing data in the form of high numbers of short reads. The development of such procedures requires the knowledge from the area of experimental design, statistics, database management and genome structure. The **aim of this project** is the statistical and bioinformatic analysis of genome-wide data sets. For that **the PhD student** will use various bioinformatic and statistical methods such as data quality checks, mapping sequences to genomes, assembling sequences, testing hypotheses on the distribution of reads over reference sequences, patterns detection, FDR computations, clustering, motif identification, data integration, and providing data for modelling. In addition, he/she will develop a system that is able to efficiently store and transfer large data sets from EpiTRAITS. These studies will be carried out in **collaboration with partners** UvA, MIPZ, WUR, INIA, UDUS, BIOMOL, UNOTT, INRA and PHY.

### **Requirements**

- Master's degree in mathematics and/or information sciences (or equivalent)
- Experience with programming and computation in the supercomputer (cluster) environment
- Experience with Linux, R, C++, Python, Perl
- Ability to work in a team and independently
- Highly motivated to pursue a career in science
- General interest in biology/life sciences

### **More information**

Project information can be obtained from Prof. Paweł Krajewski; e-mail: [pkra@igr.poznan.pl](mailto:pkra@igr.poznan.pl); phone +48-61 6550238.

### **Appointment**

The appointment will be on a temporary basis for a maximum period of 3 years (12 months plus a further 24 months after a positive evaluation) and should lead to a dissertation (PhD thesis). A Personal Career Development Plan will be drafted that includes the attendance of EpiTRAITS courses and (international) meetings.

The gross monthly salary will be according to the salary scales for Marie-Curie ITN early-stage researchers and local Polish tax/social security regulations. Besides the salary, the PhD student will obtain a mobility allowance (see page 5). The position is aimed at being full-time, but by exception if needed for family reasons a part-time appointment is possible.

### **Interview Process**

The 2-days interview process will take place on November 6 and 7 at the University of Amsterdam. Candidates selected for an interview will be notified 1-2 weeks in advance.

### **Host institution: Laboratory of Biometry, Institute of Plant Genetics, Polish Academy of Sciences**

IPG PAS, a centre of agrobiological and molecular genetics (100 scientific and technical workers, 25 PhD students), performs research in genetics, genomics, cytogenetics, biotechnology, biometry and bioinformatics, on crop and model plants. IPG-PAS coordinates the EU co-funded POLAPGEN consortium comprising ten scientific and two industrial Polish partners devoted to joint research and development in the area of genetics and genomics ([www.polapgen.pl](http://www.polapgen.pl)). The Laboratory of Biometry performs research and consultancy on computational and statistical methods for analysis of genetic and genomic data. Currently the Laboratory is, among other projects, a partner in the ITN SYSFLO ([www.sysflo.eu](http://www.sysflo.eu)) and transPlant ([transplantdb.eu](http://transplantdb.eu)).

## Position 7

**PhD position in Computational Biology** at Biomol-Informatics (BIOMOL), S.L., Madrid, Spain, [www.biomol-informatics.com](http://www.biomol-informatics.com)

### **Project: Comparative genomics and analysis of genome-wide data sets**

The project aims to perform a computational study of the genes involved in the flowering of *A. thaliana*, amongst others genome-wide next generation sequencing data from ChIP-Seq, RNA-Seq, and 4C experiments. A major objective will be the implementation of bioinformatics analysis methods and the integration of newly developed methods for the analysis of genome-wide epigenetic sequencing data in an automated pipeline. Meta-analysis of several genomic data sets will also be performed in collaboration with other partners. This project involves collaborations with most partners within the EpiTRAITS consortium.

### **Requirements**

- Master's degree in Biological or Computational Sciences (or equivalent)
- A Master's degree in Computational Biology or Bioinformatics is highly valued
- Experience with the Linux operating system
- Experience with programming and/or scripting languages
- Ability to work in a team and independently
- Highly motivated to pursue a career in science
- Background/expertise in (epigenetic) gene regulation is highly valued

### **More information**

Project information can be obtained from Dr. Jan-Jaap Wesselink/Dr. Paulino Gómez-Puertas; e-mail: [jjw@biomol-informatics.com](mailto:jjw@biomol-informatics.com)/[bioinfo@bioinfo.es](mailto:bioinfo@bioinfo.es); phone +34 918 279 767.

### **Appointment**

The appointment will be on a temporary basis for a maximum period of 3 years and should lead to a dissertation (PhD thesis). A Personal Career Development Plan will be drafted that includes the attendance of EpiTRAITS courses and (international) meetings. The PhD student may also be expected to assist in teaching duties.

The gross monthly salary will be according to the salary scales for PhD students in the host country. Besides the salary, the PhD student will obtain a mobility allowance (see page 5). The position is aimed at being full-time, but by exception if needed for family reasons part-time appointments are possible.

### **Interview Process**

The 2-days interview process will take place on November 6 and 7 at the University of Amsterdam. Candidates selected for an interview will be notified 1-2 weeks in advance.

### **Host institution: Biomol-Informatics, S.L., Madrid.**

Biomol-Informatics was founded in 2007 and works in several fields of computational biology including structural biology, rational drug design, comparative genomics and next generation sequencing. Additionally, Biomol-Informatics supervises PhDs and Post-Docs and teaches computational biology courses at various universities in Spain. Biomol-Informatics is housed in the new building of the Parque Científico de Madrid with state-of-the-art infrastructure, including NGS facilities. More info: [www.biomol-informatics.com](http://www.biomol-informatics.com).



## Position 8

**PhD position in Applied Mathematics** at the group of Prof. Charlie Hodgman and Prof. Graham Seymour, Centre for Plant Integrative Biology, University of Nottingham (UNOTT), <http://cpib.ac.uk/>, <http://www.nottingham.ac.uk/>

### **Project: Development of static and dynamic models of the floral transition network**

The transition from vegetative growth to flowering is a remarkable process involving major changes in DNA quaternary structure as well as activation and repression of many genes. The time of flowering is dependent upon multiple factors which directly impact upon crop yield, so a thorough understanding is important for increasing yields to meet growth in the human population. The Centre for Plant Integrative Biology has an overarching interest in addressing matters of Global Food Security, and also applies multidisciplinary approaches, including applied mathematical and computational modelling. The aim of this project is to gain a quantitative understanding of the processes involved, initially through developing static (graph theoretic) models, from which key components will be subject to deterministic dynamic modelling. More specifically, the student will first, in collaboration with other EpiTRAITS students, develop a system for data storage and sharing. This will involve interactions with ALL consortium partners. Based on pre-existing data sets, the PhD student will then create and parameterise initial chromatin regulation models to provide a first mathematical view of the control of floral transition. Models will be refined and extended as new data emerge. The models will represent both inactive/active chromatin transitions (using step functions) and *cis*-acting gene regulation (using Hill or logistic functions). He/she will run simulations to generate hypotheses on the behaviour of the floral transition network behaviour for experimental testing. This will require **ongoing interactions with ALL consortium partners**. Furthermore, the project will include secondments to partner companies where other smaller models will be developed.

### **Requirements**

- Master's degree in Applied Mathematics, Integrative or Systems Biology (or equivalent)
- Experience of mathematical modelling and simulation techniques
- Experience of the development of simple ODE models, numerical methods, simple computer programming and database design
- Ability to work in a team and independently
- Highly motivated to pursue a career in science
- Background knowledge of (epigenetic) gene regulation

### **More information**

Project information can be obtained from Prof Charlie Hodgman; e-mail: [Charlie.Hodgman@nottingham.ac.uk](mailto:Charlie.Hodgman@nottingham.ac.uk); phone +44-(0)11595-16290.

### **Appointment**

The appointment will be on a temporary basis for a maximum period of 3 years. The appointment will be according to UK employment law and should lead to a dissertation (PhD thesis). A Personal Career Development Plan will be drafted that includes the attendance of EpiTRAITS courses and (international) meetings. The PhD student is also expected to gain experience in assisting undergraduate teaching.

The gross monthly salary will be according to the salary scales for PhD students in the host country. Besides the salary, the PhD student will obtain a mobility allowance (see page 5). Positions are aimed at being full-time, but by exception if needed for family reasons part-time appointments are possible.

### **Interview Process**

The 2-days interview process will take place on November 6 and 7 at the University of Amsterdam. Candidates selected for an interview will be notified 1-2 weeks in advance.

### **Host institution: Centre for Plant Integrative Biology, School of Biosciences, University of Nottingham**

The University of Nottingham was recently awarded the *Queen's Anniversary Prize* for its contributions to addressing Global Food Security, reflecting the Higher Education Funding Council for England's *Research Assessment Exercise*, which places the

School of Biosciences top for Research Power in Agriculture. The Centre for Plant integrative Biology is one of the UK's Centres for Integrative Systems Biology (initially funded by the UK BBSRC and EPSRC). Comprising some 30 academics and a similar number of postdoctoral researchers of PhD students, the Centre is developing multiscale models of root growth and architecture, germination, abscission processes, fruit ripening and canopy mechanics. Since its inception in 2007, it has averaged £4m per year of follow-up research income and has recently gained central University funding to ensure its continuing existence for the foreseeable future.

## Position 9A

**PhD position in Molecular Biology/cytology** at the group of Dr. Valérie Gaudin, Institut Jean-Pierre Bourgin (IJPB), Institut National de la Recherche Agronomique (INRA), **France**, <http://www-ijpb.versailles.inra.fr>.

### **Project: “Functional relationships between nuclear organization and gene regulation”**

A major challenge in biology is the understanding of the molecular mechanisms underlying eukaryotic gene regulation. Epigenetic modifications, chromosomal interactions and chromatin dynamics as well as the nuclear context are key elements of gene regulation. The relationship between nuclear architecture and gene regulation is still far from understood in plant systems. The main goal of the group is to better understand the mechanism of gene regulation by Polycomb repressive complexes (PRC) and their role in the 3D organization of the genome. We previously established the genome-wide distribution of the plant PRC1 complex protein LHP1. Now, **the aim of this project** is to establish functional relationships between gene regulation, spatial organization within the plant cell nucleus and the role of LHP1. To this end, the project combines both molecular biological and cytological/imaging approaches. By using immunolabeling, 3D-FISH and confocal microscopy, **the PhD student will** study the 3D organization of flowering loci in the nuclei of different cell types as well as epitope-tagged protein factors relative to nuclear structures. Genome-wide chromosomal interactions mediated by LHP1 will be mapped by combining different cutting-edge technologies; The biological significance of these interactions will be tested. The data obtained will be used to establish 3D models of the functional organization of the plant cell nucleus. To achieve these goals, the PhD student will work in an interdisciplinary context based on the **collaboration with ITN Partners** MPIPZ, WUR, UDUS, IPG-PAS, BIOMOL and DIAG.

### **Requirements**

- Master's degree in molecular biology and/or cytology (or equivalent)
- Experience with molecular biological techniques
- Experience with cytology/microscopy and high motivation for 3D approaches
- Ability to work in a team and independently
- Highly motivated to pursue a career in science
- Background/expertise in (epigenetic) gene regulation

### **More information**

Project information can be obtained from Dr. Valérie Gaudin; e-mail: ([valerie.gaudin@versailles.inra.fr](mailto:valerie.gaudin@versailles.inra.fr)); phone +33 (0) 1 30 83 35 22.

### **Appointment**

The duration of the appointment as a Marie Curie ITN fellow will be for a maximum period of 3 years. The appointment will be according to the employment rules of the host country and the collective employment agreement (CAO) of INRA is applicable. A Personal Career Development Plan will be drafted that includes the attendance of EpiTRAITS courses and (international) meetings.

The gross monthly salary will be according to the ITN salary scales for PhD students in the host country. Besides the salary, the PhD student will obtain a mobility allowance (see page 5). Positions are aimed at being full-time, but by exception if needed for family reasons part-time appointments are possible.

### **Interview Process**

The 2-days interview process will take place on November 6 and 7 at the University of Amsterdam. Candidates selected for an interview will be notified 1-2 weeks in advance.

## Position 9B

**PhD position in image analysis and spatial modeling** at the group of Dr. Philippe Andrey, Institut Jean-Pierre Bourgin (IJPB), Institut National de la Recherche Agronomique (INRA), <http://www-ijpb.versailles.inra.fr/en/bc/equipes/modelisation-imagerie/index.html>

### **Project: Development of spatial models for the functional organization of the genome**

Because of their functional importance, quantifying and modeling spatial organizations and architectures is a key issue in the understanding of biological systems. Biological imaging is a tool of choice to reveal and analyze organizations and processes in cells and tissues. However, quantitative and systematic approaches for the processing, analysis, and integration of biological image data remain limited in comparison with their massive production. Bridging this gap is one of the major current challenges in biological imaging. In this context, our group develops methods, algorithms and tools for processing, analyzing and modeling biological image data. Our activity is at the intersection of image processing and analysis, spatial statistics, and mathematical and computational modeling, and involves several collaborations with biologists. Numerous studies have underlined the functional significance of nuclear architecture and genome spatial organization regarding to the regulation of gene expression. The **aim of this project** is to develop spatial models of the functional 3D organization of the genome within the plant cell nucleus. **The PhD student** will develop tools to process and quantitatively analyze 3D images of nuclei, and will assist in the optimization of image acquisition conditions. He/she will develop statistical spatial models to unravel and quantify principles of nuclear organization and to quantitatively assess the links between genome regulation and 3D nuclear architecture. He/she will also contribute to developing the EpiTRAITS data-storage and transfer system. The project involves sustained interactions with both biologists and other modelers, and will be conducted in **collaboration with** Partners UvA, IPG-PAS, UNOTT and INRA.

### **Requirements**

- Master's degree in Applied Mathematics, Applied Statistics or Computer Science (or equivalent)
- Background/experience with object-oriented computer programming (C++ or Java)
- Background in at least image processing, image analysis, or spatial statistics
- Motivation/ability to work in a highly inter-disciplinary context
- Ability to work in a team and independently
- Highly motivated to pursue a career in science

### **More information**

Project information can be obtained from Dr. Philippe Andrey; e-mail: [philippe.andrey@versailles.inra.fr](mailto:philippe.andrey@versailles.inra.fr); phone +33-(0)1-3083-3350.

### **Appointment**

The duration of the appointment as a Marie Curie ITN fellow will be for a maximum period of 3 years. The appointment will be according to the employment rules of the host country. A Personal Career Development Plan will be drafted that includes the attendance of EpiTRAITS courses and (international) meetings. The PhD student is also expected to possibly assist in teaching of undergraduates.

The gross monthly salary will be according to the ITN salary scales for PhD students in the host country. The collective employment agreement (CAO) of INRA is applicable. Besides the salary, the PhD student will obtain a mobility allowance (see page 5). Positions are aimed at being full-time, but by exception if needed for family reasons part-time appointments are possible.

### **Interview Process**

The 2-days interview process will take place on November 6 and 7 at the University of Amsterdam. Candidates selected for an interview will be notified 1-2 weeks in advance.

**Host institution: Jean-Pierre Bourgin Institute, INRA Centre de Versailles-Grignon**

INRA is ranked the number one agricultural institute in Europe and number two in the world. The J-P Bourgin Institute (IJPB) (<http://www-ijpb.versailles.inra.fr/en/>) is dedicated to agronomy and plant biology research and belongs to the Saclay Plant Science (SPS) LabEx ([http://www6.inra.fr/saclay-plant-sciences\\_eng/](http://www6.inra.fr/saclay-plant-sciences_eng/)), which unites research and education in plant biology in order to develop new approaches in plant research and face new questions from the society. With about 360 members organised in five thematic poles and 25 research groups sharing multidisciplinary concepts and tools, the IJPB provides an excellent research environment and facilities with cytological and cell imaging (<http://www.versailles-grignon.inra.fr/pciv>), biochemical and plant chemistry platforms as well as excellent plant experimental facilities. About 120 post-docs and PhD students are working in the Institute. IJPB is located near Paris in the INRA Versailles-Grignon research center, which was ranked second in the « The Scientist » 2011 survey of best places for academic research outside the United States.

## Position 10

**Postdoc (ER: experienced researcher) position in molecular biology** at the group of Dr. Hélène Pendeville, Diagenode R&D Epigenetics, Diagenode SA, Belgium (DIAG), [www.diagenode.com](http://www.diagenode.com)

### **Project: Development of marketable ChIP and 5-mC protocols for plant tissues**

Being an European SME, Diagenode is a leading developer and marketer of innovative life-science kits, reagents and integrated systems for epigenetics, genomics and diagnostics. Diagenode's portfolio includes state-of-the-art products and technologies for chromatin and DNA sonication (Bioruptor series), best-in-class antibodies and high-quality kits for chromatin immunoprecipitation and methylation studies, and an automated epigenetics system, the IP-star. **The aim of this project** is to develop a robust, marketable ChIP protocol that is compatible with monocot plant tissues and small cell numbers. For that, the experienced researcher (ER) appointed will develop a robust marketable ChIP protocol, be involved in setting up cost-effective 5-mC screens. The ER will furthermore, apply next-generation sequencing to generate ChIP-seq and DNA methylation profiles. The project involves **collaborations with partners** UvA, MPIPZ, INIA, UDUS, INRA, DIAG and PHY.

### **Requirements**

- PhD degree in Life Sciences (Molecular/Cell biology, Biochemistry or other areas of Biomedical Science)
- Experience in standard molecular biology techniques.
- Experience in Epigenetics and next-generation sequencing technologies is highly valued.
- Excellent knowledge of the English language (spoken and written)
- Ability to work in a team and independently
- Highly motivated to pursue a career in science

### **More information**

Project information can be obtained from Dr.Hélène Pendeville; e-mail: [helene.pendeville@diagenode.com](mailto:helene.pendeville@diagenode.com); phone +32-(0)43642061.

### **Appointment**

The appointment will be on a temporary basis for a maximum period of 2 years. The appointment will be according to the employment rules of the host country. A Personal Career Development Plan will be drafted that includes the attendance of EpiTRAITS courses and (international) meetings.

The gross monthly salary will be according to the salary scales for Postdoctoral fellows in the host country and according to the FP7 Marie Curie scheme for ITN measures. Besides the salary, the fellow will obtain a mobility allowance (see page 5). Positions are aimed at being full-time, but by exception if needed for family reasons part-time appointments are possible.

### **Interview Process**

The 2-days interview process will take place on November 6 and 7 at the University of Amsterdam. Candidates selected for an interview will be notified 1-2 weeks in advance.

### **Host institution: [www.diagenode.com](http://www.diagenode.com)**

Diagenode is a global company, with headquarters in Liège, Belgium and Denville, NJ, USA. Diagenode currently employs over 50 people and is the only SME in the EU providing a complete solution for epigenetics research. Diagenode products provide researchers with the best quality and performance and allow scientists to produce consistent, cost-effective and robust results in their research. Diagenode customers include leading epigenetics researchers, academic institutions, high-profile genome centers and core labs, life sciences tools companies, molecular diagnostics players, and pharmaceutical and biotechnology companies.

## Position 11

**Postdoc position in molecular biology and bio-informatics** at the groups of Dr. Marcel Prins and Dr. Roeland van Ham, KeyGene (KG), [www.keygene.com](http://www.keygene.com).

### **Project: Development of cost-effective DNA methylation screens**

You will contribute to KeyGene's Advanced Molecular Breeding and Bio-Informatics & Modeling platforms, which aims to identify and develop novel (sequence-based) applications for the plant breeding industry. Within KeyGene you will work in the bio-informatics department of dr Roeland van Ham and be in close interaction with the trait biology research group of dr. Marcel Prins. The research project will focus on the role of epigenetic modifications of genomes in important traits. The particular **aim of this project** is to identify novel methods for detection of genome-wide epigenetic changes by using state-of-the-art equipment such as next generation sequencing (NGS) platforms (e.g. Illumina HiSeq or PacBio RS). An important aspect of the work will also be to develop bio-informatics tools for the analyses of the large datasets that are generated. Within the project you will closely collaborate with the other partners on both the wet-lab and bioinformatics side of the analyses. The appointed **postdoctoral fellow** will use NG sequencing to generate cost effective genome-wide DNA methylation screens. Using transcriptomics analyses and 5-mC screens, he/she will provide insight into the contribution of epigenomics to traits relevant to agriculture with the aid of bioinformatics tools that will be developed. The project involves **collaborations with partners**: UvA, MIPZ, IPG-PAS, DIAG.

### **Requirements**

- PhD degree in Molecular Biology, Plant Breeding or Bio-informatics
- Prior multidisciplinary experience is an asset
- Able to think critically about experimental design and interpretation
- Motivated to carry out fundamental scientific research with a strong focus towards application to plant breeding
- Good communication skills
- Ability to work in a team and independently
- Creative and result oriented

### **More information**

Additional project information can be obtained from Dr. Marcel Prins, Program Scientist Trait Biology; e-mail: [mpr@keygene.com](mailto:mpr@keygene.com) or Dr. Roeland van Ham: vice president Bio-Informatics and Modeling, e-mail: [rvh@keygene.com](mailto:rvh@keygene.com); phone: [0031-\(0\)317466866](tel:0031-0317466866).

### **Appointment**

Based on a full-time appointment, the duration of the appointment as a Marie Curie ITN fellow will be for a maximum period of 2 years. The appointment will be according to the employment rules of the host country. A Personal Career Development Plan will be drafted that includes the attendance of EpiTRAITS courses and (international) meetings. You will take part in the post-doc program of KeyGene ([www.keygene.com](http://www.keygene.com)).

The gross monthly salary will be according to the salary scales for Postdoctoral fellows in the host country. The employment agreement of Keygene is applicable. Besides the salary, the fellow student will obtain a mobility allowance (see page 5). Positions are aimed at being full-time, but by exception, if needed for family reasons, part-time appointments are possible.

### **Interview Process**

The 2-days interview process will take place on November 6 and 7 at the University of Amsterdam. Candidates selected for an interview will be notified 1-2 weeks in advance.

### **Host institution: KeyGene**

KeyGene offers a dynamic job in a challenging, highly innovative and interactive inter-disciplinary working environment, with state-of-the-art next generation DNA sequencing facilities, and phenotyping equipment. KeyGene is an internationally operating biotechnology company located in the Netherlands and has an affiliate company in the US. KeyGene's passion is to

explore and exploit genetic variation in vegetables and other 6F crops (Food, Feed, Fuel, Fiber, Fun, Flower). Through profound biotechnology research and new technology development, KeyGene responds to the world's needs for yield stability, quality and health of crops. KeyGene helps strategic partners and customers with cutting-edge molecular breeding technology and trait platforms to develop game changing opportunities.



## Position 12

**Postdoc position in Molecular Biology/Biochemistry/Cell Biology** at the group of Dr. Renate Lühns, head of dept. of Cell Biology, Phytowelt GreenTechnologies GmbH (PHY), Nattermannallee 1, D-50829 Cologne, [www.phytowelt.com](http://www.phytowelt.com)

### **Project: The role of epigenetic changes in plant regeneration potential**

Somatic hybridization means the combination of nuclear and cytoplasmic genetic information by fusion of somatic cells, and is a powerful technique to develop new crop varieties with improved qualitative and quantitative traits. In Phytowelt we use electrofusion of isolated protoplasts to achieve this somatic hybridization, a process that represents one of Phytowelt's core expertise. The generation of hybrids is, however, hampered in many plant species due to the loss of regeneration potential after protoplast electrofusion. In monocots, loss of regeneration potential already occurs after a cell culture phase of around 6 months. In order to improve the regeneration protocols for selected hybrids, we are interested in understanding the molecular mechanisms underlying the regeneration potential of some crop species and particularly in barley. **The aim of the project** is to determine the role of epigenetic mechanisms in regeneration of the crop plant barley. To achieve this goal, the **postdoc** appointed will perform genome-wide comparative analyses of transcriptome and methylation profiles of histones and DNA in regeneration competent vs. incompetent barley cells. The compiled data analyses will identify differentially regulated genes that are candidate to be involved in mediating the regeneration potential of plant cells. **Collaborations with partners** MPIPZ, UDUS, IPG-PAS, BIOMOL and DIAG will provide the training to efficiently address these objectives.

### **Requirements**

- PhD in Molecular Biology, Cell Biology and/or Biochemistry (or equivalent)
- Experience with molecular biology techniques
- Experience with basic plant cell culture technologies, preferentially embryogenic cell cultures
- Ability to work in a team and independently
- Highly motivated to pursue a career in science
- Background/expertise in (epigenetic) gene regulation

### **More information**

Project information can be obtained from Dr. Peter Welters (CEO); e-mail: [contact@phytowelt.com](mailto:contact@phytowelt.com); phone +49-(0)2162-77859.

### **Appointment**

The appointment will be on a temporary basis for a maximum period of two years. A Personal Career Development Plan will be drafted that includes the attendance of EpiTRAITS courses and (international) meetings.

The gross monthly salary will be according to the salary scales of researchers in the Germany. Besides the salary, the Postdoc will obtain a mobility allowance (see page 5). Positions are aimed at being full-time, but if needed for family reasons part-time appointments are possible.

### **Interview Process**

The 2-days interview process will take place on November 6 and 7 at the University of Amsterdam. Candidates selected for an interview will be notified 1-2 weeks in advance.

### **Host institution: Phytowelt GreenTechnologies GmbH**

Phytowelt GreenTechnologies (GmbH) is a company in the newly developing area of industrial plant biotechnology (Green Chemistry and Green Energy) and has the objective of achieving optimized use of plants for industrial production processes. Depending on the task, plants are used as raw material (recyclable material), as production organisms or as models for process innovations (bionics and synthetic biology). We are continuously improving sustainability of production processes by converting renewable raw materials with innovative enzyme systems and fermentation processes. We also work to specifically improve plants as renewable energy carriers and suppliers of renewable resources by using state-of-the-art breeding technologies, e.g. marker-assisted protoplast fusion.