university of groningen

UPPSALA UNIVERSITET

LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

A Guide to Montpellier, its University, its labs for MEME students

November 2017

In memoriam

Isabelle Olivieri (1957-2016)

Isabelle Olivieri, Professor at FdS (Faculty of Sciences), with a long career in evolutionary biology, evolution of dispersal, and experimental evolution, was the first MEME coordinator in Montpellier; without her MEME would have not existed in Montpellier. MEME was very dear to Isabelle. You can read more about Isabelle by either visiting her Wikipedia page or reading the obituaries published in Mediapart, Evolutionary Applications or the Journal of Evolutionary Biology. You may also consult videos (in french) from a symposium in her memory.

MEME and Non-MEME contact persons

Local MEME coordinators

Dr. Yannis Michalakis

Director of research at CNRS, performing research on host-parasite interactions and life history evolution.
Contact: Yannis.Michalakis@ird.fr, (+33) 4 48 19 18 67, see here

Dr. Sandrine Maurice

Assistant Professor at FdS (Faculty of Sciences), performing research on plant reproductive systems and conservation biology.
Contact: sandrine.maurice-oms@umontpellier.fr, (+33) 4 67 14 49 10.

All correspondence should be addressed to both YM and SM using the e-mail addresses listed above.

Non MEME

Dr. Emmanuel Douzery

Professor at FdS (Faculty of Sciences), performing research on phylogeny and molecular evolution, head of the Master "Ecologie-Biodiversité" that includes the MEME formation.
Contact: emmanuel.douzery@umontpellier.fr

Before you arrive…

Letter of admission

Students interested in coming to Montpellier during any semester of their time in MEME should inform SM & YM as soon as possible of their interest. If needed for visa procedure, students must ask for a letter of admission from the Faculty of Sciences (currently, students should contact Luce Cardenas: luce.cardenas@umontpellier.fr, with SM in copy). Luce Cardenas will also send information about how to register. The students must write to SM (copy to YM) if they do not receive this letter.

Application for residence permit

With the letter of admission and a letter saying they will have a place to stay and where (ask Luce Cardenas: luce.cardenas@umontpellier.fr), students can ask for a visa. MEME students will most likely obtain a VISA "D" long séjour étudiant (CESEDA R311-3 6°).

If you read French, information is here: https://languedoc-roussillon-universites.fr/saiec/visas-et-titres-de-sejour

If you intend on getting the CAF (Caisse d'Allocations familiale) (which gives money for housing) and are from outside the Schengen zone, it is essential that you apply for a visa longer than six months which will get you a "visa long séjour". For many students that study abroad for six months, they will give you a type of visa that does not allow you to receive the Caf, it will say "Dispense temporaire de carte de séjour". This is a problem. If you get the "visa de long séjour" they should place it across from an empty page in your passport, that will be where the OFII sticker will go. When you arrive in Montpellier / Marseille by plane or train, try to find the customs ("douane") to stamp your passport with your date of entry in France. This is a little tricky as if you are coming from a destination within Europe, they will not necessarily be checking passports but you can say it is for the OFII (immigration) and that it is necessary. Then within ten days you will have to fill out and send the OFII form with a photocopy of your passport and visa that you filled out at the time of your visa application that will have a stamp on the Consulate on it. The OFII will get back to you with an appointment date ~3 months in the future where they will scan your lungs for tuberculosis and then give you the necessary full-page sticker in the passport that gives you the right to get the Caf. It is best to apply for the Caf as soon as possible, you don't need to wait for the OFII sticker, you can show the Caf the letter OFII sent you and that will suffice. See https://www.caf.fr/

Living in Montpellier

About the city

As students will notice, a lot of things (websites, banks...) are in French. But they should not be afraid: in the end, everybody manages perfectly well! Administration in France is a bit out of hand. Like a small black hole of paperwork. Most of it is in French. MEME students will find on the wiki page how to deal with it. If you find that the procedure has changed from what is presented on the wiki page and here, please tell us, so that we can amend this information and others can benefit from your experience. On the wiki, MEME students will find information on French legislation that concerns them, bikes, cars, shopping (supermarkets, farmers' markets), on mobile phones, banking, learning French, going out (pubs, restaurants, movie theaters, theaters, beach, hikes...), French culture.

Bank accounts

The students will find some information on the wiki page. Anyone should also visit http://www.banksfrance.com/

Do not forget to close your bank account when you leave: call or go to bank, say you want to close your account (compte courant = checking account, compte d'épargne = savings), make appointment to close account and if you cannot confirm an appointment with an English speaking rep, you might bring a francophone if you cannot speak French.

University issues

Housing issues

The university provides housing, through the housing center **"CROUS"**. CROUS rooms are usually relatively cheap, furnished with the minimum stuff, vary in size and are located in different parts of town: the "cité universitaire" (cité U). Students will find more information on the different cités in the MEME Wiki, students' experiences and advices. Information about how to get such a housing will be provided in the mail send by the administration (currently, Luce Cardenas) together with the paperwork for registration. The students will receive an offer of lodging (in December or January for S2, in July for S1), which should be dealt with quickly.

Students staying during the summer (S2) might have to change rooms during the summer, as some buildings within residencies are closed. If the administration of your cité U makes some difficulties for renting you a room in August, contact SM.

You need to cancel your home insurance when you leave: a recommended letter ("lettre recommandée") without confirmation of receipt (sans avis de réception, "avec" is about 1€ more) suffices.

To move out of the cité universitaire, you must schedule an appointment with the cleaning lady (femme de ménage) to do the state of things (état des lieux), she will have the copy from when you moved in which your photo is attached. Clean the room thoroughly. Some say this has to be done 10 days before moving out, ask her in advance to be sure.

University registration process

General registration

With the visa (if needed), students can register at the Faculty of Sciences (Faculté des Sciences) of the University of Montpellier in person, or e-mail to Luce. The student should not pay a registration fee for the university, because registration fees are already paid by MEME. Students should have a valid insurance, including liability, either provided by MEME or their own. However, a student may want to pay for French social security, depending on what kind of health needs the student has, as the coverage provided can be better than the Erasmus Mundus insurance for some medical acts (advertisements and registration for "mutuelles" such as MNEF are outside the building of registration in September, downtown after).

Pedagogic registration

A "pedagogic registration" for each teaching unit is necessary (PIE). SM will deal with that part.

University Pedagogic Student Network

Finally, students should register on the "espace pédagogique": https://ent.umontpellier.fr which will give them access to course documents (some of them are sent by email). Password is set up as MEME.

University website

Students can have a look at http://www.umontpellier.fr/university-of-montpellier for an overview of UM.

Student representatives

Student representatives, who are in charge of representing students, must be locally elected every semester and for each level.

Information days

There are two welcoming days, one in September for new M2 students and one in February when lectures start. These days include a brief presentation of the university. All students should subscribe to evoldir by sending a mail to brian@helix.biology.mcmaster.ca and to evolmontp (Montpellier Evolutionary Biologists network) and if they wish yo evolfrance (French Evolutionary Biologists network):

To subscribe to evolmontp :
Send a message to sympa@umontpellier.fr from your e-mail address, with only the following text (no subject):
SUB evolmontp Your_first_name Your_last_name

To subscribe to evolfrance:
Send a message to sympa@umontpellier.fr from your e-mail address, with only the following text (no subject):
SUB evolfrance Your_first_name Your_last_name

M1 students first follow courses (usually in February and March, for 15 ECTS), then do an internship from April to June, for 15 ECTS again). M2 students do an internship, from September to February (M2S1) and/or February (or March) to July (or August) (M2S2).

Courses

For organizational reasons, lectures in the university cannot be set up for less than 6 students. Since the lectures in February and March have been set up especially for MEME M1 students, they are required to attend all courses. Students nowadays do something else (*e.g*, SMS) during courses. If this continues, either we will get rid of all lectures (but still have exams), or will take phones *etc.* before courses. Also, students are expected to work home after each course.

M1 courses represent 15 ECTS, the other 15 ECTS being based on the project. An additional course, 'Grant proposal writing', consisting of a one week retreat will be offered at least in 2020.

Lectures at Montpellier:

1. Reading papers and seminars (2 ECTS)

Code: HMBE2A2

Organization: Oliver Kaltz oliver.kaltz@umontpellier.fr.

Contents:

- reading papers in genetics and statistics.

In this course, we will simulate several important steps in the dissemination of scientific results. At

the beginning of the course, each student will be given one article, for which this student will write a summary, present a poster and give a short oral presentation. The challenge is to get to know the paper as if it were the student's own. This involves reading of relevant literature, but most importantly understanding (or questioning!) each and every detail of the article.

- one seminar per week (Montpellier Seminar in Evolution and Ecology = SEEM – Fridays 11h30, all seminars in english are compulsory)

2. Hot topics in ecology (2 ECTS)

Code: HMBE2A1

Organization: Philippe JARNE, philippe.jarne@cefe.cnrs.fr

Contents: Each class section will cover a different topic. Each year, Philippe will suggest a number of topics, but the list will be neither binding nor exhaustive: any topic that relates to evolution is fair game. Each class session, a group of two or three people will be responsible for presenting the topic they have chosen. Each person should participate in presentations in two of the sessions. Philippe will give each group a small selection of recent papers that they will use to begin to explore the topic, or the groups will themselves propose pertinent papers. Among these, the group will distribute (one week before the class session) one-two papers that everyone should read before class. The group will be responsible for **presenting the topic** to the rest of the class and **leading discussion** of it. The group presentation should explain why the topic is interesting and present the state of the art, outlining points of controversy and defining big open questions. The presentation format will be defined by the group, keeping in mind that it should open discussions. Grades will be based on Philippe's evaluation of how students perform in the presentations, in generating discussion and in overall participation in discussions.

A sample of topics treated in previous runs of the course:

Transgenerational transmission of heritable epigenetic variation; human evolution; cultural evolution; cultural group selection; comparative studies of agriculture in protists, animals and humans; Darwinian agriculture: what can artificial selection do that natural selection cannot?; species diversity and ecosystem functioning: what relationships?; spatial self-organization in ecosystems: processes and consequences; origin of life; RNA world; life in extreme environments; life on other planets?; astrobiology; Pleistocene overkill, ecological anachronisms and Pleistocene Park; evolution within individuals: diplontic selection; cancer and evolution; the human microbiome: microbial ecology of the human gut; neutral theory of biodiversity in community ecology; sexual conflict; synthetic biology; environmental DNA and applications in ecology; fast evolution and environmental change ; parallel evolution ; current species extinction ; ecological correlates of species diversification ; what's new on the evolution of sex ; CRISPRcas in ecology and evolution.

3. Advanced statistics (2.5 ECTS)

Code: HMBE225

Organization: Céline Devaux celine.devaux@umontpellier.fr

Contents: The course scans through both multivariate and univariate (linear models) analyses, and aims at providing students with (i) solid mathematical and theoretical background, (ii) insights into protocol and model building and (iii) knowledge for accurate interpretation of data. At the end of the course, students are well aware of many classical models in ecology and evolution and some estimation methods, and can thus autonomously build their own experimental designs and analyze

their own data.

The sessions are as follows:

1. Introduction to multivariate statistics and description of some classification methods
2. Detailed description of principal component analysis
3. Detailed description of correspondence analysis
4. Brief recap of descriptive statistics and hypotheses tests
5. Explicit link between multivariate and univariate analyses, using multiple regression
6. Building simple ANOVAs and make *a posteriori* validation tests and group differences
7. Building ANOVAs with complications, such as random factors and non-independence
8. Insights into model selection, and discussion of students' own data and models

4. Advanced population genetics (2.5 ECTS)

Code: HMBE2221

Organization: Yannis Michalakis, Yannis.Michalakis@ird.fr, with the participation of T. Lenormand and G. Martin)

Contents: The objective of this course is to provide the theoretical background for understanding, and potentially being able to use and apply the principles of how selection will affect the evolution of populations. Y. Michalakis describes the basics of selection theory and shows with elementary algebra that it is possible to derive some fundamental results in Population Genetics, such as Fisher's Fundamental Theorem. He also gives an introduction to mutation--selection balance and two--locus theory. The latter topics are put in perspective in the courses by T. Lenormand on the evolution of sexual reproduction, migration and local adaptation. T. Lenormand also presents the theory that allows understanding the dynamics of adaptation. G. Martin's courses explain how stochastic effects interact with selection to influence the fate of adaptive mutations.

5. Genetic data analysis (2.5 ECTS)

Code: HMBE222

Organization: Renaud Vitalis renaud.vitalis@supagro.inra.fr, with the participation of R. Leblois

Contents: The objectives of this course are threefold: (i) to remind students of the theoretical bases of some essential concepts of population genetics theory; (ii) to detail some "classical" inference methods (e.g., F-statistics) and more "modern" approaches (based, e.g., on coalescent theory); (iii) to show how demographic history may be inferred from the analysis of genetic polymorphisms.

The sessions are as follows:

1. Classical inference in population genetics. *F*-statistics provide a useful description of genetic structure at several levels (individuals, populations, *etc.*). The definition of F-statistics as well as the statistical framework used to develop estimates of these parameters will be examined, and then some application examples for the inference of sex-specific demography will be provided.
2. Inference of dispersal in isolation-by-distance models. Limited dispersal results in a correlation between genetic and geographic distances. How dispersal characteristics can be inferred from the analysis of genetic polymorphisms will be shown.
3. Maximum-likelihood and Bayesian inference in population genetics. Modern techniques of inference in population genetics are based upon maximum-likelihood and Bayesian methods. The principles of these methods will be shown, and some application examples with the software

package STRUCTURE will be provided.

4. Coalescent theory. Coalescent theory provides a conceptual framework for the study of genetic variation in populations, and is the source of essential tools for making inference about population evolutionary history. The basics of coalescent theory will be developed and some application examples for the inference of population size changes will be provided.

5. Measuring selection from gene frequency data. The recent advent of high throughput sequencing and genotyping technologies makes it possible to produce, easily and cost- effectively, large amounts of relevant information for the characterization of population genetic diversity, even for species for which a detailed knowledge of the genome structure is not yet available. How this information can be used to detect genomic signatures of past or on-going selection will be shown.

6. Modelling in ecology and evolution (2.5 ECTS)

Code: HMBE224

Organization: Guillaume Martin, Guillaume.Martin@umontpellier.fr

Contents: Modelling is a methodology that is frequently used in biological sciences nowadays, in particular in ecological and evolutionary studies. However, models usually frighten students. The aim of this initiation is to show that modelling is by no means more inaccessible than other techniques in biology. The goal is to give students a feel of how a model is constructed, to be able to spot the key assumptions behind a result, and to test their validity. The course will seek to familiarize the students with several basic modelling techniques (stochastic or deterministic dynamical systems and their analysis) and tools (mathematical softwares, computer simulation).

The course will illustrate by practical work the different phases of modelling, from the formalization of the biological hypotheses to the exploitation of results

The course will be based on an initial problem, either purely hypothetical scenario or based on a given published dataset, the students will work by groups of 2 -3 and will build up the model to describe the situation at hand, analyze it mathematically and simulate it. They will work on computers and use mathematical softwares for analysis and simulations (most likely Mathematica).

As the groups will advance on their own project, we will progressively introduce tools for the study of dynamical systems (individual based simulation, stochastic models, deterministic models and their analysis).

The last sessions will be dedicated to summarize the tools and individual exercises.

7. Evolutionary applications (1 ECTS)

Code: HMBE2A3

Organization: Yannis Michalakis, yannis.michalakis@ird.fr

Contents: The course discusses cases where evolutionary biology based implementations provide invaluable insight in applied issues such as vector control, conservation biology or fish stock management.

8. Grant proposal writing (2.5 ECTS)

Code: HMBE2A4

Organization: Thomas Lenormand & Yannis Michalakis (thomas.lenormand@cefe.cnrs.fr; yannis.michalakis@ird.fr)

Contents: This one week course will be offered at least in winter 2020 (and in following years if independent funding can be secured). It will be organised as a retreat during which students will write in small groups grant proposals on Evolutionary Biology topics.

Evaluation

Some courses will have a final exam, the date of which is fixed with students. Marks in the French grading system go from 0 to 20 / 20. One needs not to have above 10 to pass, there is compensation between teaching units, but needs 10 or above on average for the whole semester.

Evaluation by teaching unit:

- Céline Devaux will give a written exam in statistics.
- Philippe Jarne will give a mark based on oral presentations and participation.
- Guillaume Martin will give a mark based on modelling projects.
- Yannis Michalakis will give a mark based on presence, participation, homework and/or written exam, for the three courses he (co)organizes.
- Oliver Kaltz will give a mark based on presence, participation and presentations.
- Renaud Vitalis and Raphaël Leblois will give a mark based on an oral presentation of a research paper and participation.

Students will be asked to evaluate each of the courses, as well as their semester overall. It is strongly recommended that they fill the evaluation forms, as it helps improving the courses.

Integration into French M2 courses

If their French is good enough, students may choose to follow courses that interest them in the local Master program in M2 (lectures from September to December, see https://biologie-ecologie.com/unites-enseignement-m1-m2-darwin/ for more information).

Report guidelines and deadlines:

Before a student starts a project

Before a student starts a project, a written description of the project has to be submitted to and agreed upon by the local coordinators, who will send projects sent to them (some not relevant) to the students. In particular, the project should be on some aspect of Evolutionary Biology (and not merely write that it might be relevant for evolution: we agree of course that "nothing in biology makes sense except in the light of evolution", but this does not mean that all biologists do evolutionary biology!), since the MEME programme is supposed to provide training in this discipline. This is a very important criterion and should not be overlooked or taken lightly. Experience shows that opinions may vary in what is part of Evolutionary Biology and what is not. A simple way to know if a project is within the scope of MEME is to ask whether if you were to write a paper on the project you would submit it to the journal "Evolution". If not, then it is probably not a good fit. If yes, then it is probably a good fit.

Convention of internship

Once a project has been approved, the student must fill the on-line convention (go to your "Espace numérique de travail" (ENT) which you will have once registered. It can be printed in English. It is compulsory and if you have an accident, your place of internship, not the Faculty, will be responsible.

This will be validated on-line by SM (she usually receives an automatic message and validates

immediately; if it is not validated within 7 days, students should write to her with their convention number). Once validated, the student must print it (4 copies), sign it and make it signed from his supervisor. You will then have to have a signature from IRD or CNRS, or… (your supervisor should know who is this administrative person for the host organization, the "Signataire"). Then you give it to SM to be signed and all conventions should then be given to the Bureau des Masters (Marjorie Aimar for M1 and Charlène Delauze for M2 (Bat 13 – 3 floor)), who will ask the Head of the Faculty of Sciences (currently, Alain Hoffman) to sign it. Conventions then get back to bat 13 and you will receive a mail stating that you can go there and get them.
"Caisse d'assurance": régimes spéciaux (étudiant étranger)
"Responsable pédagogique": SM
"Signataire": administrative person from IRD, CNRS,... (your supervisor will know)
"Tuteur professionnel": your supervisor
"Durée du stage": around 12 weeks for M1, around 24 weeks for M2.
You may use the following link to calculate the number of working days per month (do this with your supervisor): https://www.service-public.fr/simulateur/calcul/gratification-stagiaire
"Lieu du stage": place where you work
"Etablissement d'accueil": who pays you
You need a convention wherever you do research.

Gratification

French law requires that labs give a small grant ("gratification") to each student spending more than two months in their (French) lab (about 550 euros per month of stage). This will be great for the student, but it represents a substantial amount of money for the lab. The first consequence of that is that some students will have trouble finding a research project and this is in particular why **students should contact potential supervisors a long time in advance**. The second consequence is that students are expected to work hard and be very committed. The third consequence is that if students have to travel somewhere for their work, it makes sense that they use this small grant, at least if they already have a grant from MEME, rather than ask for money from the lab.

Should a student stay or change?

Even though we strongly encourage students to take advantage of the large diverstity of research projects going on in Montpellier, and thus should they wish to spend more than one semester in Montpellier change projects and labs, doing more than one project in a given lab is not forbidden.

Where to perform a project? Some labs' website addresses and acronyms

(some are in French, but most websites are in English too):
CEFE Center for Functional and Evolutionary Ecology
ISEM Institut of Sciences for Evolution
MIVEGEC Infectious Diseases and Vectors: Ecology, Genetics, Evolution and Control
DGIMI Diversity, Genomes and Insects-Microorganisms Interactions
AMAP botAny and Modelling of Plant Architecture and vegetation
CBGP Center for Population Biology and Management
AGAP Genetic Improvement and Adaptation of Mediterranean and Tropical Plants
BGPI Biology and Genetics of Plant-Parasite Interactions

Evaluation of projects

Final evaluation is a single mark, that covers both the final report and the oral defence (presentation and answers to the questions).

Expectations for the projects

The students are expected to work hard, to perform a literature review of their subject, to be autonomous, to have good knowledge of science, to think well, to be motivated, to be well integrated into the lab, to take part in collective work, and, at least by the end of the research, to show technical skills, to write and speak well.

For M1 projects

The research is performed in April-May-June, the defence is at the end of June (on a date fixed in March) and consists in a 7-minute presentation in front of all students and a jury comprised of 4-7 people, of which at least two will have read the report (to be sent one week in advance). These two people will ask the student questions during 4-5 minutes, and the rest of the jury may ask their questions during 10 additional minutes.

Students also have to write a short report (4 pages) by the end of April containing the introduction, materials and methods, planned analyses and, of course, references. Please use line numbers. Students will get back written comments that should be taken into account for the final version. These intermediate reports are supposed to help the students to organize their project and make sure no one is on a wrong track.

The final report (June) should be kept below 4000 words of main text (i.e., excluding title, abstract, figures, tables and their legends, references, acknowledgements). Indicate after the abstract the number of words of your report. The font should be 11 - 12 points, the interval 1.5. Please use line numbers. Students may add an appendix, which is only meant to be used by the lab or other students willing to repeat the experiment(s) or willing to have the original data; appendix material will not be evaluated and probably will not be read by the defense committee. Reference citation should follow the Evolution or the American Naturalist models. Students will find, in the Appendix of this guide, some advice on how to write the report. For those students who do not respect the deadline for submitting the report, the mark will be lowered according to the number of days of delay. This may seem harsh, but being able to meet deadlines is very important in research.

For M2 projects

Research: September to mid-February or mid-February to mid-August.

Defence: mid-February or end of August (by Skype if absolutely necessary, but this should be avoided) in front of all students who are still in Montpellier. The presentation lasts 10 minutes. The jury is made up of 2-4 people, of which at least two will have read the report (to be sent one week in advance). Each of these two will ask questions during five minutes, the rest of the jury has 5-10 minutes.

Report: short version (5 pages) early October or early March, containing introduction, material and methods, planned analyses, and references, on which the student gets written comments that should be taken into account for preparation of the final version. Please use line numbers.

The final report is due in February or August. The report should be kept below 8000 words of main text (i.e., excluding title, abstract, figures, tables and their legends, references, acknowledgements). Indicate after the abstract the number of words of your report. The font should be 11 - 12 point, the

interval 1.5. Please use line numbers. Students may add an appendix, which is only meant to be used by the lab or other students willing to repeat the experiment(s) or willing to have the original data; appendix material will not be evaluated and probably will not be read by the defense committee. Reference citation should follow the Evolution or the American Naturalist models. Students will find, in the Appendix of this guide, some advice on how to write the report. For those students who do not respect the deadline for submitting the report, the mark will be lowered according to the number of days of delay. This may seem harsh, but being able to meet deadlines is very important in research.

Seminars

There are several research seminars each week, most of which are in English, and students (M1 and M2) should go to them whenever possible. They should ask questions —this is good training, and speakers like it! They are expected (*i.e.* it is compulsory) to go at least every Friday at 11:30, from October to June. See the website http://www.labex-cemeb.org for more information. This is usually a good occasion to meet other students, and is *the* richness of Montpellier.

Language courses

They are free for registered students and organized by the Faculty of Sciences. « Français langue étrangère » is headed by Hélène Morzadec, helene.morzadec@umontpellier.fr): students are grouped by levels and hence mixed with other students; these lessons usually occur once a week in the evening. Those who would like French lessons should say so to SM and Hélène Morzadec, and go to the courses... French courses will usually be available for the M1 S2 (spring semester of first year students) and the M2 S1 (fall semester of second year student) because M2 S2 students usually arrived too late to follow the spring course.

PhD

Having a proper evaluation mark for a research project by the end of May (M2S1) will allow a student to apply to a PhD grant from the French local doctoral schools (interviews for Montpellier are early July each year (but the mandatory registration is early May), there are few grants, but there are other opportunities. See the wiki for more details on doctoral schools, what they are and how to apply.
The local doctoral school is GAIA (see https://gaia.umontpellier.fr/) (in French)

Mentoring

French students usually do not have any mentor (they use their research supervisor as such). But if a student has any question (in particular regarding advice concerning projects), please ask YM and SM. To ensure that the projects of M2 students proceed appropriately, shortly after the comments on the short report have been returned to, students individual meetings are organized. If necessary or useful, these meetings are renewed at a frequency agreed by the student and the mentor.

Transcripts and DIPLOMA

The MEME coordinator in Groningen should have all marks, including those from Montpellier. SM or YM will send marks for research projects to the students as soon as possible.

Requirements for the diploma

MEME students need to be registered **at least one semester** at the University of Montpellier and to have defended their research there (either in person or by Skype). If a student goes to Harvard during M2, this student can be registered in Montpellier up to three semesters (M1S2, M2S1, and M2S2). As elsewhere, a student can be registered in Montpellier up to three semesters. Students who wish to have a diploma from University of Montpellier must have obtained the marks for all their semesters, including those during which they were not registered in Montpellier, before the end of their graduation year.

Diploma

The students do not need to do anything (other than getting their marks) to get the diploma. Once the UM administration has the marks for all the semesters; it produces within a few days a certificate of success, which is in principle sufficient for registering for a PhD degree anywhere. The diplomas themselves take a few months to be produced. By default they are sent to the MEME coordinator in Groningen who then dispatches them to students. The only alternative is that students physically pick them up at the UM. Students who wish to do this should notify SM and YM.

Deadlines

To inform SM and YM that you will be coming the following semester:

M1: mid-November
M2S1: mid-June
M2S2: mid-November

Arrival dates

M1: early February
M2S1: early September
M2S2: early February, early March at the latest

Short report

M1: end of April
M2S1: early October
M2S2: March or later, depending on arrival date (mid-April at the latest)

Final report

M1: mid-June
M2S1: early February
M2S2: mid-August

Doctoral school competition for thesis grants

mid-June (but there are other grants, *e.g.* INRA)

Appendix

General guidelines for the research

Many students have difficulty in writing up their first research papers, in particular with knowing what information to put into the introduction *vs* what goes into the discussion. The notes below are given as general guidelines for what information should go into each section. The following is modified from a handout prepared by Professor Camille Parmesan for a class she was teaching to graduate students at the University of Texas (Austin) on how to write a research manuscript - therefore many of the wording examples are drawn from climate change.

Introduction

The introduction should provide the reader with the necessary background to understand the context of the research being presented in the paper - so why you did what you did and why someone from outside this area of research should care about your results. It's helpful to think of the introduction as addressing the following key issues:

Set the Stage: Present the state of the field and state the broad question any biologist should be interested in. This should be framed as broadly as you can

- Why is this topic important?
- Is it important in different ways to different audiences? If so, you often have to choose which audience you are targeting.

The Set up = Place your study in the context of the broad stage that you built in the preceding text. Present gaps in knowledge on this topic, weaknesses in understanding, *etc.* This section should provide the "set-up" that justifies the specific research you did.

The hole = State how your study helps to fill this gap or helps to address the broader question in a novel way, or addresses a novel aspect of the broader question.

The last paragraph is often a "road map" that lays out your specific research being presented in this paper. For example, you might end with the following sentence:

- "Here we present an analysis of data from 2000 species in 35 studies which contained data on both biotic and climatic constraints operating at the boundaries of species' distributions."
- Note that you should be careful NOT to give your results in the introduction. You should present your specific question and research design used to address that question, but not the answers you got.

Methods

Your study system: This should have enough information for the reader to understand why your system is good for addressing the question you are addressing - this may be because of a lot of previous research on this species/system, which provides a good context for your own research - or it may include ease of manipulation - or it may just provide some background that helps the reader to have a vision of the study organism and field situation as they read through the experiments. Here you should also make clear any constraints you might have had in using this specific species or system - so include modifications to the "perfect" experimental design that you had to make because of some aspects of working with or raising this species.

Describe your experimental design and how you analyzed it. This should be detailed

enough that the reader could duplicate your study. If this is very complex, authors often give a general description of the study here, but put complexities into an appendix. Provide details and justification of the methods you used, not a raw list of software packages.

Results

Results = Specific findings from your statistical analyses. This can also include graphical exploration if that led to key insights.

Give all numbers you think are important, and present key graphs/tables here. You might also end up presenting graphics or tables in the discussion, but your main findings should first appear in the "results" section, while more derived or synthetic findings might first appear in the discussion.

Your assessments of the quality of the information should be embedded in your reporting. If you think there were any problems with the data, say so (and why).

The results can end with a summary of results, but you usually save any synthetic or summary statements about results for the beginning of your discussion.

Discussion

Synthesis of conclusions which follows from your synthesis of results. In other words, what do you feel the different pieces of evidence and different angles presented by all the different analyses and graphical presentations all add up to?

Novelty: Clearly present which aspects of your study follow from what's known and which you feel are truly novel.

Discuss some of the problems remaining, holes in knowledge, data or general information.

You might include a section that has some of your own ideas about what should be done next, or where research should be going, or priorities for funding, *etc*. This is where to highlight your own insights that have formed over the course of reading up on this topic.

The big picture: You should end your discussion with a statement of the "big picture".

This should be a clear statement of the broader impacts of your results

What is the deep, underlying meaning?

What are the bigger impacts your results/conclusions could have on the field?

It is often helpful to define impacts in terms of a broader field or a different field. For example, you might conclude your paper with a statement similar to the following:

- "Our results provide an important contribution to the continuing debates about how species might respond to continued global warming." OR
- "This conclusion has important implications for conservation planning in the face of future global warming."