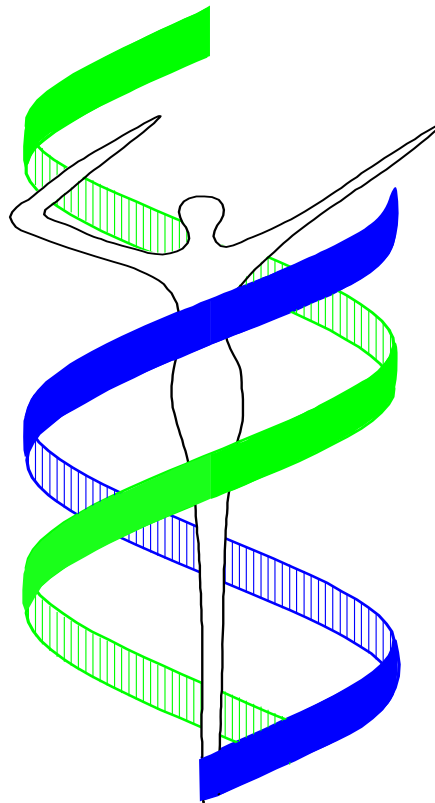


Graduate School

MEDICAL GENETICS CENTRE SOUTH-WEST NETHERLANDS

MGC

Teaching programme



for PhD students

Edition 2011 - 2012

The Centre is an initiative of the Erasmus Medical Center and the Leiden University Medical Center

1st edition autumn 1992
2nd edition November 1993
3rd edition September 1994
4th edition September 1995
5th edition September 1996
6th edition September 1997
7th edition September 1998
8th edition September 1999
9th edition September 2000
10th edition September 2001
11th edition September 2002
12th edition September 2003
13th edition September 2004
14th edition September 2005
15th edition September 2006
16th edition September 2007
17th edition September 2008
18th edition September 2009
19th edition September 2010
20th edition September 2011

PhD Teaching Programme Committee of the MGC
(MGC Onderwijscommissie)

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Note: For readability only the male nouns were employed in this text. When applicable, please, read she/her instead of he/his.

The Teaching Programme for PhD Students of the Medical Genetics Centre South West Netherlands

In October 1991, the Board of Directors of the MGC set up a committee with the specific task of proposing a teaching programme for PhD students. This booklet is the fruit of the efforts of this Committee and contains the programme as approved by the Board and as adapted later on. In 2011 a new Committee has been formed. Members of the committee are: Raymond Poot and Kerstin Wendt of the Erasmus MC and Dorien Peters, Harry Vrieling and Madeleine Nivard of the LUMC. The committee will focus primarily on evaluation of the existing course program and will advise on new courses or teaching activities. The first meeting of the committee will be on 22 September. (Contact email address: Nivard@lumc.nl)

Background

A research project is the central component of the work of a PhD student making up the main part of his training. A broad education, in addition to the usually super specialized research programme, is of great value for both the MGC and the PhD student who will attain a better 'market value' and will, thus, have a better chance on the job market. Consequently, the teaching programme of each PhD student should cover as much as possible the whole field of Medical Genetics.

Teaching obligation

It is required that a PhD student spends his working hours on research ($\geq 60\%$), *teaching* ($\leq 25\%$) and *attending* courses (about 15%) (see also the rules for PhD students as laid down by the Medical Faculties). Calculated in "working days" a PhD student will, on average, attend 30 days of "courses" a year (i.c. 120 days over the 4 year period). Approximately 20 of the 30 days will be taken up by the obligatory section, such as literature discussions, seminars and work discussions (see point 1 of the Programme on page 6). This implies that an average of 10 days per year is available for optional courses (see 2 & 3) which is approximately equivalent to participation in 2 of the MGC courses each year. Some courses, for instance on safety, are obligatory in the first year. It is recommended that the teaching load be minimized in the fourth year as the PhD student will then have to concentrate on finishing his research and writing his thesis. In summary it is advisable to take all courses in the first years of the PhD study.

The package of courses for the individual PhD student contains obligatory courses including the ones demanded by the Medical Faculties in Leiden (www.lumc.nl/home) and Rotterdam (www.erasmusmc.nl/onderwijs/onderzoekersopleidingen). These includes the courses on Presentation Techniques and English Writing and Communication which are considered to be very useful. Furthermore, each PhD student will take the course on safety in the laboratory, and PhD students that work with animals are supposed to take a course on treatment of laboratory animals.

With respect to the course on statistics it seems sensible to maintain the present obligation to take this course, but the obligation can be waived when a PhD student has received a substantial training in this area as an undergraduate.

With regards to informatics, it is desirable that all PhD students learn how to handle computers for the retrieval and handling of information. However, part of these techniques will be taught within the optional courses. In consultation with promotor and supervisor the PhD student shall have to choose from the above whatever is useful to him.

The programme

Participation in the MGC teaching programme is mandatory for all PhD students within the MGC. The student is free to compile his own individual programme as far as it concerns the noncompulsory part. It is recommended that the choices, made in consultation with his supervisor/promotor, are presented in the first year to the PhD Teaching Programme Committee of the MGC. This personal teaching programme will be registered on a form. The PhD student will receive a certificate after a course has been followed. Formal checks by way of tests or examinations seem out of place.

All PhD students that started after August 31, 1992 have to comply with this teaching programme.

Participation by others

The courses will generally be open to PhD students and other interested persons from outside the MGC. In case of a limited number of places the order of preference will be: 1. MGC PhD students and other PhD students from the Medical Faculties of the Leiden University (UL) and the Erasmus University Rotterdam (EUR); 2. PhD students from other institutions; 3. Non-PhD students.

Costs

Participation in the courses is free for all PhD students of the MGC and collaborating institutions. In general also the PhD students from the Medical Faculties of the UL and EUR will be able to participate without charge. PhD students from other institutions will be charged an average of € 50 per day; non-PhD students will pay more. For further information and conditions, please, refer to the description of the individual courses. For individual courses other rules may apply.

COACHING OF PHD STUDENTS

The MGC Board considers of great importance that the PhD students function optimally, and consequently, wants to ensure that their research projects come to fruition within the set time limits.

To reach this goal, formal coaching will take place along side the direct supervision of the promotor and daily supervisor. Considerations taken into account are, that the coaching:

- must, in the first place, be directed towards the interests of the PhD student
- must be informal
- can contribute to the scientific content of the project
- can contribute in cases of relational problems

For each PhD student a coaching group ('begeleidingscommissie') will be formed consisting of minimally 2 scientists that are familiar with the field of research of the student's project. These scientists are invited by the promotor and daily supervisor, from groups in the Netherlands. The scientists must be from outside the groups of the promotor and daily supervisor, but may be from the same institute, with the exception of the confidante ('vertrouwenspersoon') (see below). The members of the coaching group can, where possible, also be selected on their expertise which may be complementary to that of the promotor / daily supervisor. The PhD student will have a say in the choice of members of the coaching group. There will be no relationship between membership of the coaching group and that of the promotion or opposition committees which are normally formed at the end of the PhD project.

The coaching group will be formed immediately at the start of the appointment of PhD students.

Following dialogue with the PhD student, one member of the coaching group is assigned to act as confidante for the PhD student. This person will regard all information received from the PhD student as confidential. The PhD student can ask the confidante for assistance. Also the confidante can seek contact with the PhD student at any time. The confidante may call a meeting of the coaching group as he deems fit. The confidante can also talk (on a confidential basis) with the daily supervisor when necessary.

The PhD student will be invited by the coaching group to discuss the progress of his project and any problems encountered, before the end of the first year of his contract. This discussion will take place *without* the promotor/daily supervisor. The coaching group will give feedback to the promotor/daily supervisor. The daily supervisor will ensure that the discussion of his PhD students with their coaching groups, as well as the feedback, will take place. The person that acts as confidante is requested to make notes of the meeting that he will keep on file and send to the student and the other member(s) of the coaching group. [this is intended in the first place to help memories in case later on reference is made to the coaching group.]

The PhD student can request a second meeting to take place between the PhD student and his coaching group at the end of the second year of the student's project.

The Secretary of the Teaching Committee of the MGC will check to see if the procedures set out above are being followed.

This procedure for coaching is obligatory for all PhD students.

Teaching Programme for PhD students

1 **Mandatory for each PhD student** (exemptions are possible in individual cases for 1.2-1.6)

1.1 **Safe Laboratory Techniques (Veilig werken in Laboratoria)**

A 'one day' course that is intended to refresh the memory and to supplement courses that may have been followed earlier. The following points will be addressed: safe microbiological techniques; radionuclides; carcinogenic agents; blood, viruses; radiation. This course has to be taken in the first year.

The course is also open for other new personal of the MGC.

The course will be given twice a year depending on the interest. The next courses will be planned in December 2010 (Dutch version) and spring 2011 (English version). The course will be given in collaboration with the Department VSM of the LUMC.

Apply through the MGC web site: www.medgencentre.nl or through the Boerhaave web site: www.boerhaavenet.nl

1.2 **Working with Test Animals (Proefdierkunde)**

For those PhD students that will work with test animals *in vivo*. The Medical Faculties of Leiden and Rotterdam are offering a course with official recognition. Apply to the LUMC in Leiden (<http://intranet.lumc.nl/kwo/scholing.htm>) or the faculty in Rotterdam (www.erasmusmc.nl/onderwijs/onderzoekersopleidingen).

1.3 **Presentation techniques**

This is a course by the Faculty. Apply to the LUMC in Leiden (for application or more information see www.phd-courses.leidenuniv.nl).

1.4 **English Writing and Communication**

This is a course by the Faculty. Apply to the Faculty in Leiden (for application of more information see www.phd-courses.leidenuniv.nl) or in Rotterdam (www.erasmusmc.nl/onderwijs/onderzoekersopleidingen).

1.5 **Informatics**

It is essential that all PhD students learn to retrieve and handle information using a computer. Basic knowledge is needed for literature searching (e.g. Medline), word processing, graphical presentation of data (e.g. Powerpoint) and, possibly, database management (e.g. DBase). PhD students can take the short courses offered, for example, by the University Library or the faculty in Leiden (<http://www.phd-courses.leidenuniv.nl/>). Apply directly to these institutions for further information. More special techniques are taught in the non-compulsory courses.

1.6 Statistics

Many PhD students have already taken a comprehensive course in statistics during their undergraduate studies. PhD students that were not educated in statistics can follow one of the existing courses of the LUMC (see <http://albinusnet.lumc.nl/home/org/die/1090/60207093302219/71204040034219/71211113406219>) or the medical faculty in Rotterdam (www.erasmusmc.nl/onderwijs/onderzoekersopleidingen).

1.7 'Caput colleges & colloquia'

These are activities within the own Institution. Pay attention to announcements and consult the supervisor.

1.8 Work and literature discussions

These are activities within the own Institution. For ErasmusMC PhD students the course 'Reading and Discussion Literature' (RDL) is compulsory.

1.9 MGC Promovendi workshop

PhD students of the MGC will present their work to each other followed by discussions. The format is a yearly four-day meeting outside town. The next workshop will take place in *spring 2011*. Further information will appear in the MGC-bulletin and on the website. Also, all PhD students will receive a personal invitation.

1.10 Philosophy of science ('Wetenschapsfilosofie')

This course is given by the Faculty in Rotterdam. For the time being it is only compulsory for the PhD students in Rotterdam. Ask for further information by the Medical Faculty in Rotterdam.

1.11 Biomedical Science

Only for new ErasmusMC PhD students there are three compulsory modules namely:

- Cell and Developmental Biology (CDB) course, January - February
- Genetics (G) course, April - May
- Biochemistry and Biophysics (BB) course, October - November

For more information, see http://www.erasmusmc.nl/medical_genetics/education/mgc/.

2 **Optional courses** offered by the MGC.

This is a flexible programme that will change with the progress of science and will be expanded whenever desirable. The courses may last from 1 day up to 2 weeks and are held once a year or once every two years. There are no formal examinations, but students wishing to attend are obliged to be present in all classes ('aanwezigheidsplicht'). On top of the attendance of lectures and demonstrations, the courses may demand an amount of self study, such that the time needed per course, as mentioned below, will be exceeded. Details for each course are given in the appendix. It also includes a preliminary schedule, that may help in planning.

The courses will be further announced in the MGC-Bulletin, which will appear 2 times per year, by posters and on the MGC website [www.medgencentre.nl].

At present the following courses are planned:

- 2.1 Basic and translational Oncology
- 2.2 Genome maintenance and cancer
- 2.5 Signal Transduction and Control of Cellular Proliferation
- 2.6 Development, Stem Cells and Disease
- 2.7 Transgenesis and Gene Targeting
- 2.12 Analysis of microarray gene expression data
- 2.13 In vivo imaging: from Molecule to Organism
- 2.14 SNP Course
- 2.15 Applied Bioinformatics: finding your way in biological information
- 2.16 Ensembl workshop
- 2.19 Epigenetic regulation
- 2.20 Technology Facilities
- 2.21 Next Generation Sequence data analysis

(Note: due to the development of this programme the numbering is not continuous.)

3 Other Possibilities

- 3.1 Courses and workshops of third parties, for example the EMBL. The individual PhD student is encouraged to seek for himself appropriate opportunities. The following site may help: <http://www.etplatform.eu/>.
- 3.2 Visits to congresses. It is strongly recommended that each PhD student visits one or more international congresses during his PhD study. The PhD student has to consult his supervisor as needed.

Appendix

OPTIONAL COURSES OFFERED BY THE MGC

For participation apply through the MGC web site:

www.medgencentre.nl

2.1 Basic and translational Oncology

Contact person: for more information see: www.molmed.nl

Date: February - March 2012

Location: Erasmus MC, Rotterdam

The aim of the course is to provide **a comprehensive introduction to the field of translational cancer research.**

The course is primarily organized for PhD students and postdocs of the Postgraduate Schools MGC and MolMed, but other participants (e.g., students and technicians of LUMC and ErasmusMC) are welcome on a first come first served basis.

Each day is dedicated to a specific **theme** relevant to cancer and is organized as follows:

- General introduction to the overall theme of the day
- Presentations on specific topics
- Technical talk, journal clubs or scientific debate

Every slot of a presentation includes Q & A time on the subject.

Topics (preliminary):

- **Pathology and Signal Transduction pathways in cancer.**
- **Biology of the cancer cell ; DNA, RNA, Epigenetics.**
- **Genetic susceptibility, invasion, and metastasis Epidemiology of cancer and medical decision making.**
- **Clinical practice: diagnostics, targeted therapies and end-of-life interventions.**
- **Translational research, epidemiology of cancer and future of cancer research.**

This is a combined course of the Medical Genetics Center South-West Netherlands (MGC) and the Molecular Medicine – postgraduate school (MM).

For current course fees and discounts see the MolMed site.

2.2 Genome Maintenance and Cancer

Contact person: Dr. M.J.M. Nivard, phone 071-5269605; e-mail: nivard@lumc.nl

Date: March - April, 2012

Location: LUMC, Leiden

Duration: 2 days

Preservation of genetic information (DNA) is of prime importance to all living systems. The aim of the course is to familiarize participants with the mechanisms that are involved in maintaining genome stability. In the environment humans are exposed to chemical agents and radiation, which threaten the integrity of the genetic material leading to risks for the induction of cancer and congenital malformation. To withstand the harmful effects of DNA damage and to maintain genome integrity, cells are equipped with an intricate network of DNA damage response pathways. Key players in these processes are protein complexes involved in DNA replication, DNA repair and chromosome segregation as well as regulators of the cell cycle and cell death.

This course will provide an up to date insight in the chain of reactions from exposure to the ultimate consequences. Lectures will deal with the basic principles of several cell biological aspects such as DNA damage formation, signalling pathways, DNA repair and mutation formation. A few lectures will deal with more applied research.

Content (preliminary):

- DNA replication associated mutagenesis
- Loss of heterozygosity and the importance for carcinogenesis
- Human DNA repair syndromes
- DNA repair mechanisms and cancer susceptibility
- UV-light and radiation induced cancer risk in human
- Oncogenes and senescence
- Cell cycle checkpoints, apoptosis
- Carcinogenesis studies with mice
- Functional screens to identify cancer relevant genes
- Application for drug discovery

There is a minimum of 14 and a maximum of 40 places.

The course is free for all PhD students from Erasmus MC, LUMC and MGC. Participants from outside these organizations pay € 150 for this course.

2.5 Signal Transduction and Diseases

Contact persons: Prof. dr. P. ten Dijke, dr. H. van Dam (p.ten_dijke@lumc.nl; vdam@lumc.nl)

Date: spring, 2013

Location: LUMC, Leiden

Duration: 4 days

The aim of this course is to give an overview of intracellular signalling processes that are activated by hormones, cytokines and growth factors, as well as state-of-the-art technology used to study signal transduction in vivo and in vitro. Teaching will occur by state-of-the-art lectures and interactive tutorial.

General introduction into Signal Transduction

In vitro and in vivo visualization of signalling in cells and animal models

Signaling via transmembrane tyrosine (PDGF, EGF, FGF, IGF, etc.)

Signalling via serine/threonine kinase receptors (TGF- β and BMPs)

Wnt signalling, hedgehog signalling, Notch signalling, cytokine signalling

Cell cycle regulation

Role of protein kinase B in signalling and disease

Small GTP-binding proteins

Phospholipids

Integrin signalling

Transcription factors

Alterations of signalling in diseases like cancer, diabetes, osteoporosis and cardiovascular complications

Targeted therapy

This is a combined course of Graduate Schools Medical Genetics Center South-West Netherlands and Molecular Medicine (MM).

In alternating years (e.g. 2010, 2012), MM offers a complementary course on Clinical Genetics, Experimental Endocrinology and Immunoendocrinology.

Participants are expected to have a basal knowledge of cellular communication (Alberts et al., Molecular Biology of the Cell, chapter 15).

PhD students from outside the LUMC and Erasmus MC pay € 250 for this course.

2.6 Development, Stem Cells and Disease

Contact person: Prof. Dr. E.A. Dzierzak phone 010-7043172, Prof Dr. Ir. D.N. Meijer, phone 010-7044250

Date: March 2013

Location: Erasmus MC, Rotterdam

Duration: 3 days

The aim of this course is to discuss recent advances in our knowledge concerning the molecular and cellular mechanisms controlling the development of vertebrate embryos. Major insights have been obtained in the field of developmental biology in the last two decades and we now have a broad picture of how the complex pattern of the body plan arises during embryonic development, and how the major classes of regulatory genes operate in higher organisms. Nevertheless, many important questions still remain. For example, rather than simply a collection of differentiated cells, how do functional tissues and organs arise? Are stem cells the basis of all tissues? Can we understand how the interrelated form and function of a complex organ such as the brain arises?

In this course the mechanisms underlying early embryonic development (setting up the body plan) are discussed. Also discussed are aspects of the development of specific organ systems and the genetic basis of human congenital malformation syndromes.

Stem cells: embryonic; somatic; cancer; plant

Patterning: fluorescence tagging; axis formation; face and limbs

Gene regulation: X-chromosome inactivation, tissue specific regulation

Signalling: Hedgehog, TGF β , Notch, Wnt signalling.

Organ systems: Lung development; sex determination; muscle development; hematopoiesis; neuronal development; Axon-Glia interaction; Axon pathfinding.

There is a minimum of 15 and a maximum of 30 places.

This course is a combined course of Graduate Schools Medical Genetics Centre South-West Netherlands (Leiden), Molecular Medicine (Rotterdam), and Developmental Biology (Utrecht)

For current course fees and discounts see the MolMed site.

2.7 Transgenesis and Gene Targeting

Contact person: Dr. J.S. Verbeek , tel. 071-5269410

Date: June 2013

Location: LUMC Research Building Leiden

Duration: 5 days (3.5 days course + 1.5. days international workshop)

The ability to modify genomes at the level of the germ line by transgenesis has been crucial for our understanding of gene function.

Since transgenesis and gene targeting have become basic approaches for a wide area of research, this course will mainly deal with basic principles of how transgenic and knock-out (KO) mice are made.

Transgenesis, when combined with the recently developed technology of whole-animal cellular and molecular imaging (e.g. bioluminescence, MRI, fluorescence), allows direct visual access to complex biological processes in their native environment thus providing better insight into mammalian biology than ever before. The students will be offered an overview of the different in vivo imaging approaches currently operational in Leiden and Rotterdam.

Stem cells, their in vitro and in vivo manipulation, and their applications in basic and translational research will represent the second main theme of the course. The course will consist of lectures covering general topics (i.e. the generation of conventional transgenic mice by pronuclear injection, homologous recombination in embryonic stem cells, etc.), and by a series of presentations by renowned national and international scientists on specific applications of transgenesis, gene targeting, and embryonic and adult stem cells in different areas of biomedical research. Practical demonstrations will be given on the main and crucial steps in the generation of transgenic and KO mice, as well as on the principles of in vivo imaging.

This introductory course is aimed to PhD students with little or no experience in the field of transgenesis and in vivo imaging, and to those already working with existing animal models but wishing to apprehend more on the above technologies and their applications in biomedical research.

Conventional transgenesis.

Inducible gene expression.

Gene targeting, gene replacement and conditional gene targeting.

In vivo imaging

Promoters and regulators of gene transcription.

Mouse genetics.

In vivo siRNA

In vitro and in vivo stem cell differentiation.

Stem cells: clinical applications

Presentations on applications in cardiovascular disorders, cancer, immunology etc.

PhD students from outside the LUMC and Erasmus MC are charged a € 250 enrolment fee.

2.12 Analysis of microarray gene expression data

Organizers: Dr. Judith Boer (Erasmus MC, 010-7043570; j.m.boer@erasmusmc.nl) and Prof. Peter van der Spek

Planned date: May-June 2012

Location: Rotterdam

Duration: 5 days

The course is intended for researchers (not only PhD students) with lab experience with microarray/DNA chip gene expression experiments and / or data analysis. The course is not an introductory to microarrays. The course will consist of 2.5 day theory and 2.5 day computer practicals. Lectures cover the following topics related to the analysis of expression profiling experiments using DNA-chips and micro-arrays: experimental design; data processing and quality control; normalization; finding differential expression; clustering; classification; testing groups of genes, functional annotation and interpretation, networks. Programmes used in the practicals include R, Spotfire, Anni, and Cytoscape. Previous experience with R and/or the "Introduction to R" course are required.

A maximum of 40 places are available. For more information and (pre)registration: www.molmed.nl. The course lectures and practicals are available for self-study.

For current course fees and discounts see the MolMed site.

2.13 In vivo Imaging: from molecule to organism

Organizer: Optical Imaging Centre (OIC), MolMed together with MGC.

For more information check the website www.molmed.nl

Dates: 31 October – 4 November 2011

Location: Erasmus MC, Josephine Nefkens Institute, Room Ae 4.06, Rotterdam

Duration: 5 days

The course consists of lecture sessions in the morning and practical work in small groups in the afternoon. On Monday and Thursday there will also be evening sessions including dinner. In a final session participants present and discuss the results of the practical work.

Subjects are: Introduction to (optical) Microscopy; image analysis; novel probes for microscopy; time-lapse microscopy; FRAP; FRET; 2-photon FLIM; STED; single molecule imaging; STORM; Deconvolution; SIM; data analysis; intravital imaging; SR single molecule and Microtubule tips & tricks.

A maximum of 20 places are available.

For current course fees and discounts see the MolMed site.

2.14 SNP Course

Organizer: For more information check the website www.molmed.nl
Dates: 21 - 25 November 2011
Location: Erasmus MC, Josephine Nefkens Institute, Room Ae 4.06,
Rotterdam
Duration: 5 days

The analysis of DNA polymorphisms, in particular Single Nucleotide Polymorphisms (SNPs), is becoming a standard research approach to understand causes of disease, in particular the so-called "complex" diseases such as diabetes, osteoporosis, cancer, etc.

The aim of this course is to give a broad introduction in SNP techniques and applications. The course is primarily organized for PhD students and postdocs of the Erasmus Postgraduate School Molecular Medicine, Nihes and MGC. Other participants, e.g. students and technicians from other universities working in this field, are also welcome. The total number of participants is limited to 75.

It is recommended for the participants **to have basic knowledge of the central molecular biological dogma's** (such as DNA and gene structure, DNA encodes RNA encodes protein, etc.) and of basic genetic principles. Those who have not are advised to follow the course '**Genetics for Dummies**' that is organised the first time on September 30st and October 1st, 2010 by MolMed. At the start of the course, a comprehensive reader will be issued. The course will deal with several topics, which are put in logical order:

- **Study design; Bio informatics for SNP's and hands-on training**
- **Genotyping techniques and DNA management**
- **Data analysis; population identification and forensics**
- **HapMap; Bio informatics for SNP's and GWA, hands-on training**
- **Applications in diseases and genetic risk factors.**

During the course, 7 keynote lectures will be given by well known researchers from the UK and the USA.

All participants will be requested to send a short presentation or description of their own research and field of interest in advance to the course organisation (email to: molmed@erasmusmc.nl). In this way we get to know your research topics, to better prepare the topics of the course. A selection of the candidates will be asked to present their own research topics on Monday and Tuesday.

On the 1st and 4th day, "learning-by-doing" sessions on the bio-informatic applications in this field are organised.

The subscription fee of the course is € 600, but all participants from Erasmus MC, MGC and Nihes get a discount of 50%. Other PhD students and Post docs also receive a discount.

2.15 Applied Bioinformatics 'Finding your way in biological information'

Organizer: For more information check the website www.molmed.nl

Dates: nog niet bekend

Location: Erasmus MC, Bioinformatics department, Rotterdam

Duration: 2 days

Bioinformatics is the key technology to collect information about different aspects of molecular and classical biology. The prerequisite for this course is general knowledge of molecular biology/genomics and a basic experience with genes and biological data files.

The aim of this course is to provide a comprehensive introduction in the field of applied bioinformatics. The course is primarily organized for PhD students and postdocs of the Erasmus MC, Postgraduate School Molecular Medicine and MGC. Other participants, e.g. students and technicians from other universities working in this field, are also welcome on a "first- come-first-served" basis. The total number of participants is limited to 18.

The workshop is based on the logic order of the following three main topics:

- **Retrieving information about facts you know**
- **Finding information about novel facts**
- **Managing your information**

For current course fees and discounts see the MolMed site.

2.16 Ensembl workshop

Organizer: For more information check the website www.molmed.nl

Dates: 22 - 23 September 2011

Location: Erasmus MC, Room C00-6, Rotterdam

Duration: 1½ day

The Ensembl project provides a comprehensive and integrated source of annotation of, mainly vertebrate, genome sequences. This one-and-a-half-day workshop offers participants the possibility of gaining lots of hands-on experience in the use of the Ensembl genome browser but also provides them with the necessary background information. This workshop will be given by Giulietta Spudich from the European Bioinformatics Institute (E.B.I.).

The aim of this course is to provide general knowledge of molecular biology/genomics and a familiarity with web browsers. The workshop is primarily organized for wetlab researchers. The only prerequisite is general knowledge of molecular biology/ genomics and a familiarity with web browsers in general. The total number of participants is limited to 20.

The workshop consists of the following modules. Most modules consist of a presentation, followed by the opportunity to do exercises. Participants are encouraged to bring problems/questions about their research to try to tackle these during the workshop using Ensembl.

- **Introduction to Ensembl**
- **Worked example of the Ensembl website**
- **Data mining with BioMart**
- **Hands-on BioMart**
- **Variations: SNP's**
- **Comparative genomics and proteomics**
- **Ensembl regulation**
- **Advanced access**
- **Custom annotation**

The registration fee for this course is € 125,00. However, it is free of charge (100 % discount) for members of the Erasmus MC and the MGC Research School at the Erasmus MC.

2.19 Epigenetic regulation in health and disease

Organizers: Prof. S. van der Maarel (LUMC) en Dr. R. Poot (Erasmus MC)

Dates: Spring 2012

Location: LUMC building 1, Leiden

Duration: 2 days

More information about the program and topics will be available soon on the website of the MGC (www.medgencentre.nl)

The course consists of lecture sessions in the morning and in the afternoon. Some of the topics included are: genome wide methylation profiling, genetic and epigenetic pathways in health and disease, transcription factors, chromatin and the DNA damage response, X-inactivation, stem cells.

The course is free of charge for all PhD students from MGC, LUMC, and Erasmus MC. Participants from outside these organisations pay €150 for this course including lunch.

2.20 Technology Facilities

Contact person: Dr. M.J.M. Nivard, phone 071-5269605; e-mail: nivard@lumc.nl

Date: January - February, 2012

Location: LUMC, Leiden

Duration: 3 days

The course will deal with three topics:

1. Genomics and Transcriptomics

Organizers: Dr. W. van IJcken, ErasmusMC, Rotterdam and Prof. Dr. J. den Dunnen, LUMC, Leiden

2. Proteomics

Organizers: Dr. J. Demmers, ErasmusMC, Rotterdam and Dr. P. Hensbergen, LUMC, Leiden

3. Imaging

Organizers: Dr. A. B. Houtsmuller, Erasmus MC, Rotterdam and Prof. Dr. C. Lowik, LUMC, Leiden

The course is meant for PhD students who just started their research or are not familiar with the different topics.

There is a minimum of 20 and a maximum of 40 places.

The course is free of charge for all PhD students from MGC, LUMC, and Erasmus MC. Participants from outside these organisations pay €200 for this course including lunch.

2.21 Next generation Sequence data analysis

Contact person: Dr. J. Laros (e-mail j.f.j.laros@lumc.nl), Dr. Judith Boer (e-mail J.M.Boer@lumc.nl), Prof. J.T. den Dunnen
Date: September 5 –7, 2011 (5th edition), Autumn 2012 (6th edition)
Location: LUMC building 1, Leiden
Duration: 3 days

This course aims at PhD students, postdocs and senior researchers who are interested in, planning, or already working with next-generation sequencing. We welcome researchers from both the genomics and bioinformatics fields. Currently available technologies as well as hardware solutions will be presented and discussed. The focus of the course will be on data and ways to analyse the data.

There is a maximum of 60 places.

The course is free of charge for PhD students from MGC. Participants from outside these organisation pay €400 for this course including lunch. Participants from the academic world receive a discount.

Preliminary Schedule of MGC Courses for PhD students for the years 2011-2015:

	<i>Title</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>
1.2	<i>Safe Laboratory Techniques (Risicobeheersing in Laboratoria)</i>	<i>June December</i>	<i>June December</i>	<i>June December</i>	<i>June December</i>	<i>June December</i>
1.10	<i>AIO workshop</i>	<i>spring</i>	<i>spring</i>	<i>spring</i>	<i>spring</i>	<i>spring</i>
2.1	<i>Basic and translational Oncology Δ</i>		<i>February/ March</i>	<i>February/ March</i>	<i>February/ March</i>	<i>February/ March</i>
2.2	<i>Genome Maintenance and Cancer</i>		<i>March/ April</i>		<i>March / April</i>	
2.5	<i>Signal transduction Δ</i>	<i>spring</i>		<i>spring</i>		<i>spring</i>
2.6	<i>Development, stem cells and disease</i>	<i>spring</i>		<i>spring</i>		<i>spring</i>
2.7	<i>Transgenesis and Gene targeting</i>	<i>June</i>		<i>spring</i>		<i>spring</i>
2.12	<i>Analysis of microarray gene expression data</i>	<i>June</i>	<i>June</i>	<i>June</i>	<i>June</i>	<i>June</i>
2.13	<i>In vivo Imaging: from molecule to organism Δ</i>	<i>autumn</i>	<i>autumn</i>	<i>autumn</i>	<i>autumn</i>	<i>autumn</i>
2.14	<i>SNP CourseΔ</i>	<i>November</i>	<i>November</i>	<i>November</i>	<i>November</i>	<i>November</i>
2.15	<i>Finding your way in biological information Δ</i>	<i>spring</i>	<i>spring</i>	<i>spring</i>	<i>spring</i>	<i>spring</i>
2.16	<i>Ensembl workshop Δ</i>	<i>autumn</i>	<i>autumn</i>	<i>autumn</i>	<i>autumn</i>	<i>autumn</i>
2.19	<i>Epigenetic Regulation</i>		<i>spring</i>	<i>December</i>		<i>spring</i>
2.20	<i>Technology Facilities</i>	<i>February</i>	<i>February</i>	<i>February</i>	<i>February</i>	<i>February</i>
2.21	<i>Next Generation Sequence data analysis</i>	<i>5-7 Sept.</i>	<i>autumn</i>	<i>autumn</i>	<i>autumn</i>	<i>autumn</i>

Δ *In collaboration with Graduate School Molecular Medicine.*