

# Supplementary Document 1

## LIVE Teaching Unit Sheets

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### ***PREAMBLE***

This file is the supplementary document 1 for the project of the Erasmus Mundus Joint Master Degree “Leading International Vaccinology Education” (LIVE+). LIVE+ is submitted to the Erasmus Mundus call of Feb 15<sup>th</sup>, 2018.

This document contains:

- Figures and tables explaining the general organisation of the LIVE+ programme
- All the teaching unit sheets describing: Title, ECTS, hours, Head, programme, learning outcomes and assessment methods.
- Example of schedule and all the evaluation forms required to assess the Master thesis

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# LIVE general organisation

The students will study at higher level a **first specialisation** in immunology and immunopathology in Barcelona, then a **second specialisation** in infectiology including microbiology, virology and host-pathogen interactions in Antwerp and a **third specialisation** in vaccinology in Lyon/ Saint-Etienne, to reach the level for doing a master thesis.





Semester 1	 Immunology (12 ECTS)	Immunopathology (15 ECTS)			Language (3 ECTS)	
Semester 2	 Infectiology (12 ECTS)	Immuno-logy (3 ECTS)	Vaccinology (9 ECTS)	Animal Sc. or Adv. data analysis (3 ECTS)	Language (3 ECTS)	
Semester 3	 Vaccinology (12 ECTS)	Advertisement & public health policy (6 ECTS)	Immuno Pathology (3 ECTS)	Infectio-logy (3 ECTS)	Project manage-ment (3 ECTS)	language (3 ECTS)
Semester 4	 Masterthesis (27 ECTS including 10% bibliography report, 10% laboratory work, 40% written thesis, 40% oral defense)				Language (3 ECTS)	

Figure: General organisation and mobility during the LIVE master

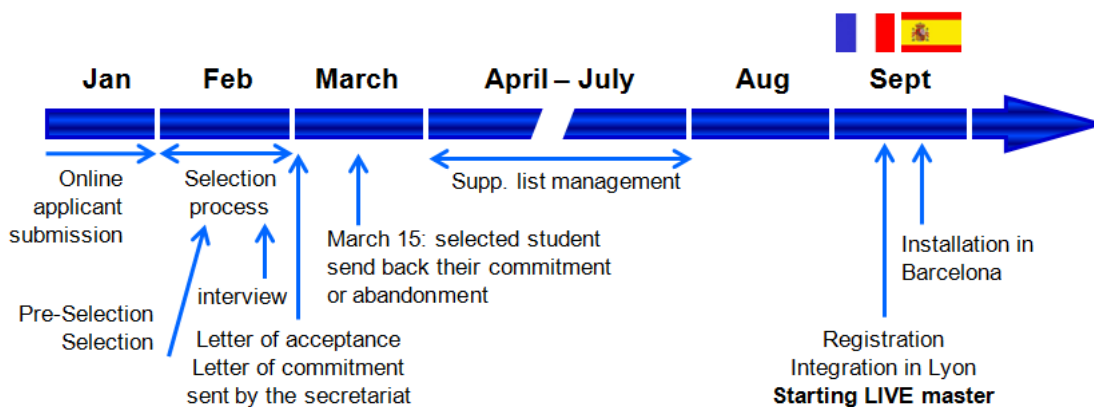


Figure: Selection process

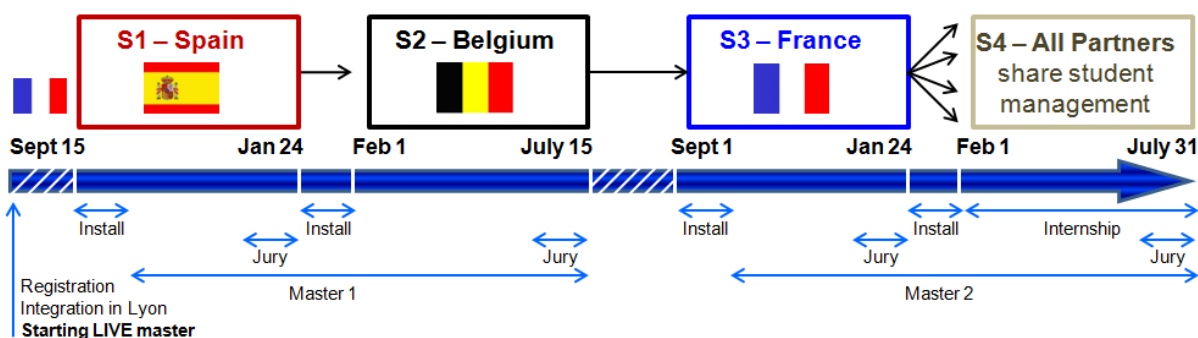
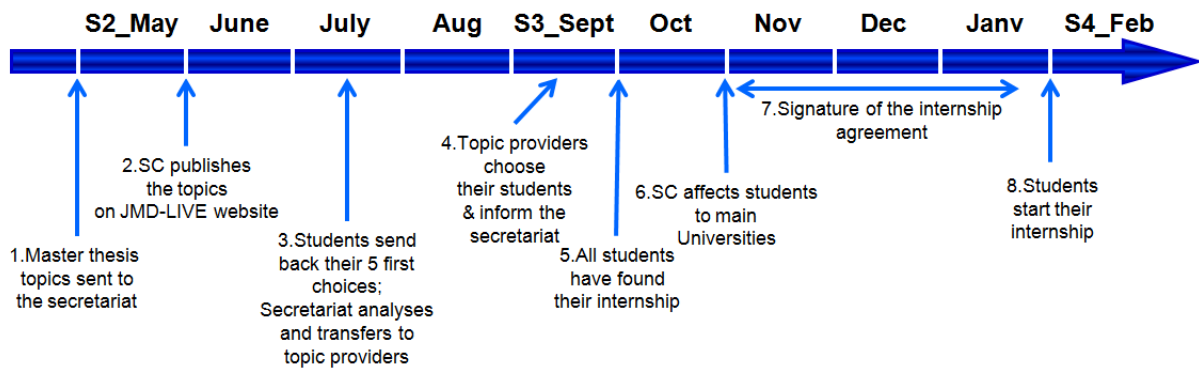
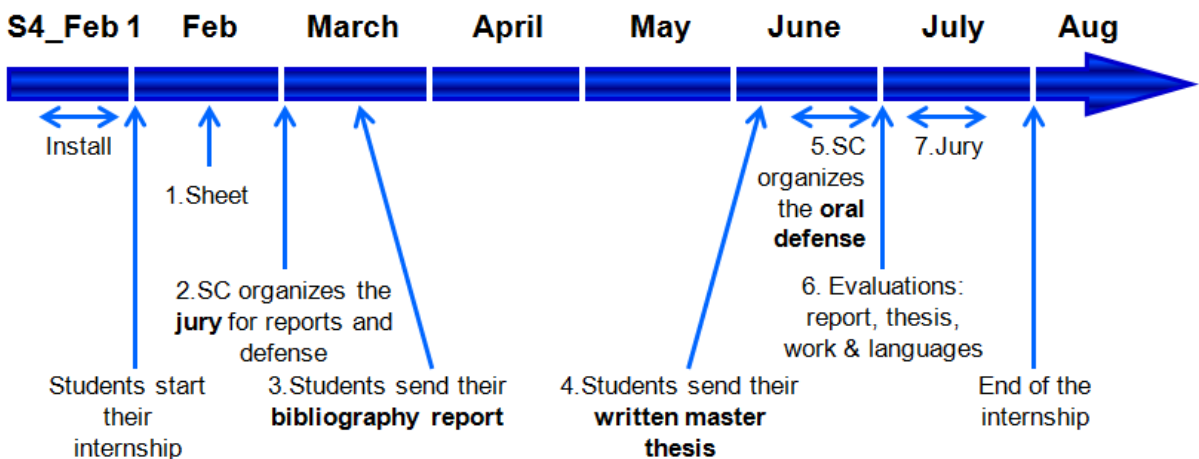


Figure: Mobility scheme



**Figure:** Management of the internship proposals



**Figure:** Management of internship

University	Semester Country	ECTS	% in master
Universitat de Barcelona (UB)	S1 + S4	4.5 + 4.5	7.5
Universitat Autònoma de Barcelona (UAB)	S1 + S4	25.5 + 4.5	25
University of Antwerp (AU)	S2 + S4	30 + 9	32.5
Université Jean Monnet Saint-Etienne (UJM)	S3 + S4	15 + 4.5	16.25
Université Claude Bernard Lyon 1 (UCBL)	S3 + S4	15 + 7.5	18.75
UB + UAB	Spain	39	32.5
AU	Belgium	39	32.5
UCBL + UJM	France	42	35
University of Florence	Italy	conferences	
Université Libre de Bruxelles	Belgium	conferences	
All universities	Mobility	120	100

**Table:** Contribution of European universities and countries in LIVE

Partner organizations		Management tasks
UCBL	<b>Central Manager (CM)</b> Christine DELPRAT	Programme secretariat, central management of the study programme, monitoring the awarding of the multiple national diplomas and future LIVE joint Diploma, editing the Diploma Supplement, monitoring interface with IT and iCAP dpt at UCBL: MyLIVE application, LIVE website and LIVE blog structure, MOOC dvpt, digital evaluation, e-learning; (ii) Central management of grants: recruitment of LIVE Assistant, payment of student allowances, distribution of the participation costs, financial agreements with associated partners...; (iii) Meeting organisation: AMB, SC, EliC, I-QAC, E-QAC, editing the CA and the student agreement validated by the AMB; (iv) business development and sponsoring management: recruitment of Business dvpt Manager; (v) Reporting to EACEA
UAB-UB	<b>Selection Managers (SeIM)</b> Dolores JARAQUEMADA Thomas STRATMANN	Organisation of the applicant selection procedures
UAntwerp	<b>Quality Assurance Manager (QAM)</b> Peter DELPUTTE	Organisation of the Quality Assurance (QA) according to the QA scheme
UJM	<b>Communication Manager (ComM)</b> Stéphane PAUL	LIVE communication, advertisement, LIVE blog & website contents

**Table:** Distribution of the executive functions

Topics	S1 ECTS Spain	S2 ECTS Belgium	S3 ECTS France	S4 ECTS SP-BE- FR	TOTAL ECTS / field	% in Master
(1) Immunology, immunopathology	21	3	3		27	22.5
(2) Infectiology, Epidemiology	6	12	3		21	17.5
(3) Research, Clinical & Industrial Vaccinology		9	12		21	17.5
(4) Multidisciplinary training, including languages	3	6	12	3	24	20
(5) Professional Internship, Master thesis				27	27	22.5
<b>Total ECTS / semester</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>120</b>	<b>100</b>
<b>(1-3) Core scientific knowledge</b>	<b>27</b>	<b>24</b>	<b>18</b>		<b>69</b>	<b>57.5</b>
<b>(4-5) Multidisciplinary aspects</b>	<b>3</b>	<b>6</b>	<b>12</b>	<b>30</b>	<b>51</b>	<b>42.5</b>

**Table:** Distribution of the main scientific topics between the four semesters

LIVE grading system Mention - explanation	LIVE, Belgian, French scores range 0-20	Spanish score ranges 0-10
Excellent – outstanding performance	$X \geq 18$	$X \geq 9$
Very Good – above the average standard but with some errors	$16 \leq X < 18$	$8 \leq X < 9$
Good – generally sound work with a number of notable errors	$14 \leq X < 16$	$7 \leq X < 8$
Satisfactory – fair but with significant shortcomings	$12 \leq X < 14$	$6 \leq X < 7$
Sufficient – performance meets the minimum criteria	$10 \leq X < 12$	$5 \leq X < 6$
Fail – some more work required before the ECTS can be awarded	$8 \leq X < 10$	$4 \leq X < 5$
Fail – considerable further work is required	$6 \leq X < 8$	$3 \leq X < 4$

**Table:** Common grading system for the LIVE students

Table 1 : Teaching unit title, heads and ECTS	Head of the teaching unit	S1	S2	S3	S4	TOTAL ECTS
Dynamics of innate and adaptive immunity (1)	VIDAL, Silvia CELADA, Antonio	3				3
Functional anatomy of the immune system (1)	ROURA-MIR Carme	3				3
Antigen recognition (1)	ALVAREZ Iñaki	3				3
Receptor signaling (1)	ESPEL Enric SOLER Concepció	3				3
Mechanisms of immunopathology (2)	PUJOL-BORRELL Ricardo	3				3
Autoimmunity (2)	PUJOL-BORRELL Ricardo	3				3
Immunodeficiencies (2)	HERNÁNDEZ, Manuel DE LA CALLE Oscar	3				3
Immune responses to pathogens (2)	JARAQUEMADA Dolores	6				6
Languages 1: French, Spanish (6)	PRATS-CARRERAS Sònia	3				3
Immune system in early life, pregnant women and elderly (1)	LEURIDAN Elke VAN DAMME Pierre		3			3
Description & variability of pathogens (3)	DELPUTTE Peter		6			6
Host-pathogen interactions (3)	KESTENS Luc, CALJON Guy		3			3
Clinical drug research (3)	VAN DAMME Pierre		3			3
Novel technologies, vaccine administration routes & adjuvants (4)	DELPUTTE Peter		3			3
Vaccine manufacturing & quality control, regulatory approval process (4)	DELPUTTE Peter		3			3
Advanced data analysis (option) (5)	LAUKENS Kris, MEYSMAN Pieter		3			3
Summer school on vaccinology (4)	LEURIDAN Elke VAN DAMME Pierre		3			3
Animal science e-learning (option) (5)	VAN GINNEKEN Chris		3			3
Languages 2: English, French, German, Italian, Spanish (6)	LE PAGE Els		3			3
Immunology & cancer (2)	DELPRAT Christine			3		3
Epidemiology (3)	VANHEMS Philippe			3		3
Vaccine formulation (4)	PAUL Stéphane			3		3
Clinical vaccine development (4)	LUCHT Frédéric			3		3
Immunomonitoring of preclinical and clinical vaccine trials (4)	ROCHEREAU Nicolas			3		3
Vaccine specific applications (4)	PAUL Stéphane			3		3
Communicating on vaccines & public health (5)	PAUL Stéphane, DELPRAT Christine			6		6
Project management (5)	GILBERT Christophe			3		3
Languages 3: English, French, German, Italian, Spanish (6)	PIGAT Joann			3		3
Master thesis (7)	Local coordinator				27	27
Languages 4: English, French, German, Italian, Spanish (6)	PIGAT Joann				3	3

**Table:** Teaching unit title, head and ECTS

Field	ECTS	% in master
(1) Immunology	15	12.5
(2) Immunopathology	18	15
(3) Infectiology	15	12.5
(4) Research & clinical vaccinology	21	17.5
<b>(1-4) Core scientific knowledge</b>	<b>69</b>	<b>57.5</b>
(5) Transferable and multidisciplinary skills	12	10
(6) Languages	12	10
(7) Internship	27	22.5
<b>(5-7) multidisciplinary tasks</b>	<b>51</b>	<b>42.5</b>

**Table:** Languages and multidisciplinary achievements in LIVE

Teaching unit title	S1	S2	S3	S4	TOTAL ECTS
<b>Total ECTS / semester</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>120</b>
(1) Immunology, immunopathology	21	3	3		27
(2) Infectiology, Epidemiology	6	12	3		21
(3) Research, Clinical & Industrial Vaccinology		9	12		21
(4) Multidisciplinary training, including languages	3	6	12	3	24
(5) Professional Internship, Master thesis				27	27

**Table:** Main fields in the LIVE

University	Semester Country	ECTS	% in master
Universitat de Barcelona (UB)	S1 + S4	4.5 + 4.5	7.5
Universitat Autònoma de Barcelona (UAB)	S1 + S4	25.5 + 4.5	25
University of Antwerp (AU)	S2 + S4	30 + 9	32.5
Université Jean Monnet Saint-Etienne (UJM)	S3 + S4	15 + 4.5	16.25
Université Claude Bernard Lyon 1 (UCBL)	S3 + S4	15 + 7.5	18.75
UB + UAB	<b>Spain</b>	39	32.5
AU	<b>Belgium</b>	39	32.5
UCBL + UJM	<b>France</b>	42	35
University of Florence	<b>Italy</b>	conferences	
Université Libre de Bruxelles	<b>Belgium</b>	conferences	
All universities	Mobility	120	100

**Table:** Contribution of European universities and countries in LIVE

**SupDoc1 - Table 1:** Teaching units of the semester 1 in Barcelona (Spain)

**SupDoc1 - Table 2:** Teaching units of the semester 2 in Antwerp (Belgium)


**SupDoc1 - Table 3:** Teaching units of the semester 3 in Lyon / Saint-Etienne (France)

**SupDoc1 - Table 4:** Teaching units of the semester 4

**SupDoc1 - Table 5:** Assessment methods of teaching units



## ***S1 teaching unit sheets***

S1 Teaching Units (TU)	Immuno -logy	Immuno Pathology	Languages	TOTAL ECTS / TU
 Dynamics of innate and adaptive immunity	3			3
Functional anatomy of the immune system	3			3
Antigen recognition	3			3
Receptor signalling	3			3
Mechanisms of immunopathology		3		3
Autoimmunity		3		3
Immunodeficiencies		3		3
Immune responses to pathogens		6		6
Languages 1: French, Spanish			3	3
<b>Total ECTS / field</b>	<b>12</b>	<b>15</b>	3	30

**Table 1:** Teaching units of the semester 1 in Barcelona (Spain)

## DYNAMICS OF INNATE AND ADAPTIVE IMMUNITY

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
<b>3</b>	<b>35</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>

<b>Management Institute:</b>  <b>Teaching unit head</b> ( <i>NAME, surname</i> ): <b>Position:</b>	<b>PART 1</b> Universitat Autònoma de Barcelona <b>PART 2</b> Universitat de Barcelona <b>VIDAL, Silvia (Part 1) and CELADA, Antonio (Part 2)</b> <b>Associate Professor and Professor of Immunology</b>
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### *TEACHING UNIT PROGRAMME:*

**Contact:** Antonio CELADA

e-mail: [acelada@ub.edu](mailto:acelada@ub.edu)

**Keywords :** Natural defences; innate immune cells; innate receptors; innate effector mechanisms; inflammation; adaptive response; effector cells; adaptive effector mechanisms; immune regulation; tolerance; peripheral mechanisms of regulation; cytokines

**Aims:**

**PART 1**

1. Introduction: the immune system; 2. Cellular and molecular elements of the innate immune response; 3. From recognition to the effective destruction of pathogens
4. Components and phases of inflammation
5. How an innate immune response induces an adaptive immune response.
6. Cells, molecular elements and effector mechanisms of adaptive immune response
7. First barrier against pathogens: Mucosa as physical, chemical, microbial and immunological defence

**PART 2**

8. Regulation of the immune response. Overview
9. Cytokines I. General properties
10. Cytokines II. Innate and adaptive immune responses
11. Cytokines III. Th1, Th2, Th17 and friends
12. Treg cells
13. Other levels of regulation. Immunosenescence.
14. Seminars
15. Practical training: basic laboratory skills

**Teaching Staff:**

- Dr. Silvia Vidal, Head of Part 1, Associate Professor of Immunology, Department of Cell Biology, Physiology and Immunology and Research Group Leader, Institut de Recerca Hosp Sant Pau, UAB
- Prof. Antonio Celada, Head of Part 2, Professor of Immunology, Department of Cell Biology, Physiology and Immunology, UB. Group Leader, Biology of Macrophage Research Group, Parc Scientific of Barcelona
- Other speakers to be announced: tutorials will involve seminars given by experts and discussion with the students

**Learning outcomes:**

The course is intended for the students to achieve an understanding of the essentials of innate and adaptive immune responses and their regulation.

<b>Assessment methods</b>		
<input type="checkbox"/> Oral questioning	<input type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input checked="" type="checkbox"/> Other ( <i>specify</i> ): Multiple choice test		
<b>Teaching unit jury</b> ( <i>NAME, surname</i> )		
<b>1) VIDAL Silvia</b>	<b>2) CELADA Antonio</b>	

## FUNCTIONAL ANATOMY OF THE IMMUNE SYSTEM

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
3	18	6	6	0	0

<b>Management Institute:</b>	<b>Universitat Autònoma de Barcelona</b>
<b>Teaching unit head</b> (NAME, surname):	<b>ROURA-MIR Carme</b>
<b>Position:</b>	<b>Associate Professor</b>

### TEACHING UNIT PROGRAMME:

Contact: Carme ROURA-MIR  
e-mail : [carme.roura@uab.cat](mailto:carme.roura@uab.cat)

**Keywords** : primary and secondary immune organs, cell traffic, homing, lymphocyte development, tolerance induction, adaptive immune response in lymph nodes, spleen, mucosa, immunological memory

**Aims of “Functional anatomy of the immune response” :**

1. Anatomy of the immune system; 2. Histology of the immune system
3. Functional anatomy: primary organs. Lymphocyte development, selection, tolerance
4. The immune system and the lymphocyte traffic: homing
5. Functional anatomy: the adaptive immune response. Lymph nodes and spleen
6. Functional anatomy: the immune response in mucosa
7. Histology Laboratory Practicals; 8. Histology Laboratory Practicals; 9. Tutorial

**Speakers:**

Dr. Carme Roura-Mir, Head of the Teaching Unit, Senior Lecturer in Immunology, Department of Cell Biology, Physiology and Immunology (BCFI), UAB  
 Dr. Mercè Martí, Senior Lecturer in Immunology, BCFI, UAB  
 Dr. Ricardo Pujol-Borrell, Professor of Immunology, BCFI, UAB  
 Dr. Dolores Jaraquemada, Professor of Immunology, BCFI, UAB  
 Dr. Martí Pumarola, Professor of Histology, Department of Animal Surgery and Medicine, Faculty of Veterinary Sciences, UAB  
 Dr. Miguel Vicente-Manzanares, Senior Investigator, CSIC Cancer Centre, Salamanca

**Learning outcomes:**

The course is intended for the students to achieve a full understanding on the location, distribution, structure and function of the different anatomical components of the immune system and its interconnection with the rest of the body systems.

Assessment methods		
<input type="checkbox"/> Oral questioning	<input type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input checked="" type="checkbox"/> Other (specify) : assistance		
Teaching unit jury (NAME, surname)		
1) ROURA-MIR Carme	2) JARAQUEMADA Dolores	

## ANTIGEN RECOGNITION

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
3	21	6	6	0	0

<b>Management Institute:</b>	Universitat Autònoma de Barcelona, Faculty of Biosciences
<b>Teaching unit head</b> (NAME, surname):	ALVAREZ Iñaki
<b>Position:</b>	Associate Professor

### TEACHING UNIT PROGRAMME:

Contact: Iñaki ALVAREZ

e-mail : [inaki.alvarez@uab.cat](mailto:inaki.alvarez@uab.cat)

**Keywords** : MHC, HLA, H-2, T cell receptors, B cell receptors, immunoglobulins, NK receptors, immunobioinformatics

#### **Aims of “Antigen Recognition” :**

1. The B cell receptors: immunoglobulins;
  2. The T cell receptors
  3. The HLA system;
  4. The H-2 system and its use in research
  5. Antigen processing and presentation;
  6. Non classical antigen presenting molecules
  7. The KIR family of receptors;
- IMMUNOBIOINFORMATICS –
8. Introduction;
  9. Immunobioinformatics – practical applications to immunogenetics;
  10. Immunobioinformatics – practical applications to vaccine design;
  11. Modeling of molecule interactions;
  12. Modeling of molecule interactions

#### **Speakers:**

Teaching Staff Immunology from Universitat Autònoma de Barcelona.

Invited speaker: **Prof Yaqoub Ashhab**, Polytecnic University of Palestine, Hebron

**Prof Xavier Daura**, Bioinformatics Unit, IBB, UAB

Other speakers will be invited based on their excellence.

The tutorials will focus on the use of bioinformatic tools applied to Immunology and immunogenetics.

Resolution of bioinformatics problems will be part of the assessment (25%)

#### **Learning outcomes:**

Knowing the main structures of antigen recognition in the adaptive immune response and their genetics. Basic bioinformatics applied to the study of immunology;

### Assessment methods

<input type="checkbox"/> Oral questioning	<input type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input checked="" type="checkbox"/> Other (specify) :Resolution of Bioinformatics problem		

### Teaching unit jury (NAME, surname)

1) ALVAREZ Iñaki	2) DAURA Xavier	3) ASHHAB Yaqoub
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## RECEPTOR SIGNALLING

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
<b>3</b>	<b>12</b>	<b>6</b>	<b>8</b>	<b>0</b>	<b>0</b>

<b>Management Institute:</b> <b>Teaching unit head</b> ( <i>NAME, surname</i> ): <b>Position:</b>	<b>Universitat de Barcelona</b> <b>ESPEL, Enric and SOLER Concepció</b> <b>Senior Lecturer in Immunology</b>
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### **TEACHING UNIT PROGRAMME:**

Contact: Concepcio SOLER

e-mail : [concepciosoler@ub.edu](mailto:concepciosoler@ub.edu) Enric Espel e-mail : [eespel@ub.edu](mailto:eespel@ub.edu)

**Keywords** : Signal transduction, transcription factors, immune system

**Aims of “Receptor Signalling” :**

1. Signal transduction: molecules, pathways and systems
2. Signaling via tyrosine kinases and serine/threonine kinases
3. Adaptor molecules signaling
4. TGFβ signaling: SMADs
5. Signaling via NFκB
6. Signaling via NOTCH and WNT
7. Epigenetic regulation
8. TCR dynamics and signaling
9. Basic laboratory training

**Speakers:**

Teaching Staff from Faculty of Biology and Faculty of Medicine, Universitat de Barcelona (UB). Other speakers will be invited based on their excellence.

The tutorials will involve the discussion of articles covering various topics of this course.

**Learning outcomes:**

Students should know and understand the cell signalling as a process integrated multiple signals, the molecular mechanisms involved and the basis for its modulation in immune cells.

### Assessment methods

<input type="checkbox"/> Oral questioning	<input checked="" type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other ( <i>specify</i> ) :		

### Teaching unit jury (*NAME, surname*)

**1) SOLER Concepció**

**2) ESPEL Enric**

## MECHANISMS OF IMMUNOPATHOLOGY

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
<b>3</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

<b>Management Institute:</b>	<b>Universitat Autònoma de Barcelona</b>
<b>Teaching unit head</b> (NAME, surname):	<b>PUJOL-BORRELL, Ricardo</b>
<b>Position:</b>	<b>Professor of Immunology</b>

### **TEACHING UNIT PROGRAMME:**

Contact : Ricardo PUJOL-BORRELL e-mail: [ricardo.pujol@uab.es](mailto:ricardo.pujol@uab.es)

Eva M. MARTINEZ-CÁCERES e-mail: [emmartinez.germanstrias@gencat.cat](mailto:emmartinez.germanstrias@gencat.cat)

**Keywords:** Allergy, hypersensitivity, vasculitis, evasion mechanisms, opportunistic infection, AIDS, IVIG, HSTC.

**Aims of “Mechanisms of Immunopathology”:** To understand the immune response in the main pathological conditions

1. Mechanisms of Immunopathology;
2. Immune Response to infectious agents, tumours and allogeneic transplantation;
3. Hypersensitivity as cause of disease
4. Immunodeficiencies;
5. HIV: pathogenesis and the quest for a vaccine
6. Autoimmune and autoinflammatory diseases
7. The immune response in transplantation
8. Tumour immunology and immunotherapy
9. Main tools used in experimental immunopathology
10. Seminars of paper interpretation focusing on the above topics

#### **Speakers:**

Immunology Teaching Staff from Universitat Autònoma de Barcelona and the Hospital Vall d'Hebron and Germans Trias i Pujol. Other speakers will be invited based on their excellence.

The seminars will consist in live discussion of articles covering the main topics of the course, with the tutors' guidance.

#### **Learning outcomes:**

The students should be able at the of the course of interpreting the main mechanisms of immune-mediated diseases and situations.i.e., hypersensitivity, Immunodeficiencies including AIDs and autoimmunity in the graft rejection, and response to tumours. The students will be familiar with the main types of immunotherapy.

### Assessment methods

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Oral questioning               | <input type="checkbox"/> Presentation   | <input checked="" type="checkbox"/> Practice report |
| <input checked="" type="checkbox"/> Written examination | <input type="checkbox"/> Bibliography report                                    | <input type="checkbox"/> Internship unwinding       |
| <input type="checkbox"/> Report / thesis                | <input type="checkbox"/> Digital productions (video, poster, software, wiki...) |   |
| <input type="checkbox"/> Other (specify) :              |   |   |

### Teaching unit jury (NAME, surname)

1) MARTINEZ-CACERES Eva

2) PUJOL-BORRELL Ricardo

## AUTOIMMUNITY

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
3	12	60	12	0	0

<b>Management Institute:</b>	Universitat Autònoma de Barcelona
<b>Teaching unit head</b> ( <i>NAME, surname</i> ):	Faculty of Medicine, UD Hospital de Sant Pau (HSP)
<b>Position:</b>	PUJOL-BORRELL, Ricardo Professor of Immunology

### **TEACHING UNIT PROGRAMME:**

Contact : Ricardo PUJOL-BORRELL e-mail : [ricardo.pujol@uab.cat](mailto:ricardo.pujol@uab.cat)  
 Cándido JUÁREZ e-mail : [CJuarez@santpau.cat](mailto:CJuarez@santpau.cat)

**Keywords:** immune tolerance, autoimmune diseases, systemic autoimmunity, lupus, liver autoimmunity, bowel inflammatory diseases, skin autoimmunity, myopathies, experimental models, immunotherapy

**Aims:**

1. To understand the main mechanisms of tolerance relevant to autoimmune disease
2. To learn the epidemiology and the environmental factors postulated to trigger autoimmune disease
2. To know the main elements of autoimmune response
3. To understand present evidence on the contribution of genetic factors to autoimmune diseases
4. To be able to discuss current pathogenic hypothesis on autoimmunity
5. To Be familiar with the principal autoimmune diseases
6. To learn available tools to diagnose the main autoimmune diseases
7. To understand the principles of immunotherapies applied to autoimmune diseases
8. To be capable of interpret and discuss journal articles focused on autoimmunity, both on experimental models and clinical

**Speakers:**

Immunology Teaching Staff and clinicians from two of the UAB major Hospitals: Hospital de la Vall d'Hebron, and Hospital de Sant Pau. The seminars will consist in live discussion with the guidance of the tutors of articles covering the main topics of the course

**Learning outcomes:**

After the course students will be able to use immunopathology reasoning to understand clinical cases of autoimmunity; know which immunology tests can help in the diagnosis of the main autoimmune diseases; have the capability to discuss research results at a journal club or at a research meeting; be able to design a strategy to approach research in autoimmune diseases

<b>Assessment methods</b>		
<input type="checkbox"/> Oral questioning	<input type="checkbox"/> Presentation	<input checked="" type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other ( <i>specify</i> ):		
<b>Teaching unit jury</b> ( <i>NAME, surname</i> )		
1) JUAREZ Candido	2) PUJOL-BOREELL Ricardo	

## IMMUNODEFICIENCIES

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
3	20	10	0	0	0

<b>Management Institute:</b> <b>Teaching unit head</b> <b>Position:</b>	<b>Universitat Autònoma de Barcelona</b> <b>HERNÁNDEZ, Manuel, Associate Professor Immunology, HVH</b> <b>de la CALLE, Óscar, Associate Professor Immunology, HSP</b>
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### TEACHING UNIT PROGRAMME:

Contact: Oscar de la CALLE-MARTIN e-mail: [odelacalle@santpau.cat](mailto:odelacalle@santpau.cat)  
 Manuel HERNÁNDEZ GONZÁLEZ e-mail: [manhernandez@vhebron.nete](mailto:manhernandez@vhebron.nete)

**Keywords:** Primary and secondary Immunodeficiencies; innate immunity deficiencies, adaptive immunity deficiencies, diseases of immune dysregulation, acquired immunodeficiency syndrome

#### Aims of “Immunodeficiencies”:

1. Understand the main mechanisms of immunodeficiency diseases;
2. Be familiar with the main types of therapy applied to immunodeficiency diseases;
3. Know the laboratory tools for immunodeficiency diseases' diagnostic;
4. Understand the limitations, risks and diagnostic use of vaccines in immunodeficient individuals

#### Programme

1. Primary Immunodeficiencies (PID) definition, classification and epidemiology
2. Molecular basis of the PIDs. Present and future
3. Combined Immunodeficiencies. Treatment: hematopoietic stem cell transplantation, gene therapy
4. Predominantly antibody deficiencies. Treatment with immunoglobulins
5. Diseases of immune dysregulation. Familial hemophagocytic lymphohistiocytosis and PID syndromes with autoimmunity; 6. Complement deficiencies; 7. Congenital defects of phagocytes
8. Defects in innate immunity; 9. Advanced research techniques in primary immunodeficiencies diseases; 10. Acquired Immunodeficiency Syndrome

**Speakers:** Immunology Teaching Staff and clinicians from two of the UAB major Hospitals: Hospital de la Vall d'Hebron and Hospital de Sant Pau and other clinical centres. The tutorials will involve work by the students under the guidance of the different tutors

#### Learning outcomes:

After the course students will be able to use immunopathology reasoning to understand clinical cases of immunodeficiency; know which immunology tests can help in the diagnosis of the main immunodeficiency diseases; have the capability to discuss research results at a journal club or at a research meeting; know what they can expect from vaccination to immunodeficient individuals

### Assessment methods

<input type="checkbox"/> Oral questioning	<input checked="" type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other (specify):		

### Teaching unit jury (NAME, surname)

1) HERNANDEZ Manuel

2) CALLE-MARTÍN, OSCAR DE LA



## IMMUNE RESPONSE TO PATHOGENS

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
6	30	12	12	0	0

<b>Management Institute:</b>	Universitat Autònoma de Barcelona,
<b>Teaching unit head</b> (NAME, surname):	JARAQUEMADA, Dolores
<b>Position:</b>	Professor of Immunology

### TEACHING UNIT PROGRAMME:

**Contact:** Dolores JARAQUEMADA e-mail : [dolores.jaraquemada@uab.cat](mailto:dolores.jaraquemada@uab.cat)

**Keywords:** mucosa, immune response to bacteria, virus, fungi, parasites, microbial evasion, regulation, vaccines, tuberculosis, malaria, HIV

**Aims of “Immune response to pathogens”:**

1. MALT: immune response to pathogens in the mucosal surfaces
2. Immune response to bacteria:
  - 2.1 Bacteria-induced pathology;
  - 2.2 Immune response to S aureus, B anthracis, Salmonella spp;
  - 2.3 Specialist seminars: Infection by Mycobacterium tuberculosis;
  - 2.4 Specialist seminar: From basic research to vaccine development;
  - 2.5 Specialist seminar: Exploitation of the immune responses to Listeria monocytogenes in next generation of cancer immunotherapy
3. Immune response to fungi: Specialist seminar: Immunodeficiencies and infection by Candida spp
4. Immune response to parasites:
  - 4.1 Parasite-induced pathology;
  - 4.2 Specialist seminars: Infection by Plasmodium falciparum;
  - 4.3 Specialist seminars: Infection by Plasmodium falciparum;
  - 4.4 Specialist seminars: Infection by Trypanosoma cruzi;
5. Immune response to virus:
  - 5.1 Virus-induced pathology;
  - 5.2 Infection by Measles virus, Influenza virus, Cytomegalovirus;
  - 5.3 Specialist seminars: Infection by HIV
6. Group presentations by students

**Speakers:**

Immunology Teaching Staff from Universitat Autònoma de Barcelona. Other speakers will be invited based on their excellence. The tutorials involve review sessions and discussions covering various topics including the latest advances in specific pathogens.

**Learning outcomes:**

The course is intended for the students to achieve a full understanding of the relationship between the type of immune response and characteristics of the pathogen: the way and the anatomical site of entry, the effector mechanisms of response and evasion. Understanding the relationships between a potential pathogen and its host.

### Assessment methods

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Oral questioning               | <input checked="" type="checkbox"/> Presentation                               | <input type="checkbox"/> Practice report      |
| <input checked="" type="checkbox"/> Written examination | <input type="checkbox"/> Bibliography report                                   | <input type="checkbox"/> Internship unwinding |
| <input type="checkbox"/> Report / Thesis                | <input type="checkbox"/> Digital productions (video, poster, software, wiki..) |   |
| <input type="checkbox"/> Other (specify) :              |  |   |

### Teaching unit jury (NAME, surname)

1) JARAQUEMADA Dolores

2) MARTÍ Mercè

## LANGUAGES (Universitat Autònoma de Barcelona)

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
<b>3</b>	<b>20</b>	<b>2</b>	<b>23</b>	<b>0</b>	<b>0</b>

<b>Management Institute:</b>  <b>Teaching unit head</b> ( <i>NAME, surname</i> ): <b>Position:</b>	Universitat Autònoma de Barcelona Language Service PRATS-CARRERAS Sònia Director of Studies of the University's Language Service
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### **TEACHING UNIT PROGRAMME:**

Contacts: Sònia PRATS e-mail: [sonia.prats@uab.cat](mailto:sonia.prats@uab.cat)

**Keywords :** Spanish and French courses, different levels (in accordance with the [Common European Framework](#)): A1, A2, B1, B2.1, B2, C1.1, C1.2.

**Access:**

The student will be asked to take a placement test on arrival at the Language Service, to be placed in the adequate course, according to his or her level. **Aims of "language courses":** Improving the student's proficiency level, taking into account his or her previous knowledge of the language. The student is asked to take a placement test on arrival at the Language Service so as to be placed in the adequate course, according to his or her level.

**Aims:**

Improving the student's proficiency level, taking into account his or her previous knowledge of the language.  
 Promoting language exchanges between native speakers of Spanish and French


**Speakers:** experienced teachers at the Language Service. <http://www.uab.cat/servei-llengues/>

**Learning outcomes:**

Depending on the initial level of the student: a specific level at the end of the course is monitored by the final exam and attested by certificate of level attained.  
 Spanish and French will be taught presentially. Students with good level of Spanish and French, can study a different language online, following the Dexway platform

<b>Assessment methods</b>		
<input type="checkbox"/> Oral questioning	<input type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input checked="" type="checkbox"/> Other ( <i>specify</i> ): continuous assessment and final exam assessing the 4 linguistic skills (listening, speaking, reading and writing).		
<b>Teaching unit jury</b> ( <i>NAME, surname</i> )		
<b>Teachers at the University's Language Service</b>		

## S2 teaching unit sheets

S2 Teaching Units 	Immu no -logy	Infectio -logy	Research & clinical vaccino -logy	Transferable skills & options	Langua ges	TOTAL ECTS / TU
Immune system in early life, pregnant women and elderly	3					3
Description & variability of pathogens		6				6
Host-pathogen interactions		3				3
Clinical drug research		3				3
Novel technologies, vaccine administration routes & adjuvants			3			3
Vaccine manufacturing & quality control, regulatory approval processes			3			3
Advanced data analysis (option)				3		3
Summer school on vaccinology			3			3
Animal science e-learning (option)				3		3
Languages 2: English, French, German, Italian, Spanish					3	3
<b>Total ECTS / field</b>	<b>3</b>	<b>12</b>	<b>9</b>	<b>3</b>	<b>3</b>	<b>30</b>

**Table 2:** Teaching units of the semester 2 in Antwerp (Belgium)

## IMMUNE SYSTEM IN EARLY LIFE, PREGNANT WOMEN AND ELDERLY

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
<b>3</b>	<b>24</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>0</b>

<b>Management Institute:</b>	<b>University of Antwerp</b>
<b>Teaching unit head</b> (NAME, surname):	<b>LEURIDAN Elke, VAN DAMME Pierre</b>
<b>Position:</b>	<b>Associate Professor, Professor</b>

### **TEACHING UNIT PROGRAMME:**

Contact : Elke LEURIDAN Phone : +32 3 265 2885

e-mail : [elke.leuridan@uantwerpen.be](mailto:elke.leuridan@uantwerpen.be)

**Keywords** : ontogeny, early life, pregnancy, aging immune system

**Aims of “Immune system in early life, pregnant women and elderly” :**

1. Immunological changes during pregnancy, in general and in relation to vaccination and vaccination strategies
2. Ontogeny of the human immune system
  - Innate system
  - Adaptive immune system
3. Challenges for immunisation in early life
4. Immune changes in elderly
5. Effect of aging of the immune system on specific vaccine responses

**Speakers:**

Prof Pierre Van Damme , MD, PhD, UA; Prof Arnaud Marchant, MD, PhD, ULB; Prof Fabienne Willems MD, PhD, ULB; Prof Stanislas Goriely, MD, PhD, ULB; Delphine Sauce, MD, PhD/ Prof Victor Appay, PhD, French Institute of Health and Medical Research, Paris, France; Prof Heidi Theeten, MD, PhD, UA; Prof. Elke Leuridan, MD, PhD, UA

**Learning outcomes:**

Understand (i) the changing immunology in pregnancy, (ii) the impact of the changing immunology during pregnancy on vaccine responses, (iii) the rationale for vaccination strategies in pregnant women.

Knowledge on (i) ontogeny of the human immune system in general, (ii) specific ontogeny of the innate immune system, in general and in relation to vaccines administered during early life, (ii) specific ontogeny of the adaptive immune system in general and in relation to vaccines administered during early life.

Understand (i) what the future challenges and possible solutions are for immunization in early life, beyond the neonatal period, (ii) the impact of aging on the immune system, (iii) what the challenges and possibilities are for immunisation of the elderly population

<b>Assessment methods</b>		
<input type="checkbox"/> Oral questioning	<input checked="" type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input checked="" type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other (specify) :		
<b>Teaching unit jury</b> (NAME, surname)		
1) MARCHANT Arnaud	2) LEURIDAN Elke	

## DESCRIPTION AND VARIABILITY OF PATHOGENS

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
6	50	0	12	0	0

<b>Management Institute:</b> <b>Teaching unit head</b> ( <i>NAME, surname</i> ): <b>Position:</b>	<b>University of Antwerp</b> <b>DELPUTTE Peter</b> <b>Professor</b>
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### TEACHING UNIT PROGRAMME:

Contact : Peter DELPUTTE

e-mail : [peter.delputte@uantwerpen.be](mailto:peter.delputte@uantwerpen.be)

**Keywords** : microbiology, virology, bacteriology, parasitology

#### **Aims of “Description & variability of pathogens”:**

This course offers insight into the different types of micro-organisms. A systematic overview of micro-organisms is provided and the course deals successively with virology, bacteriology, parasitology and mycology.

For each type of micro-organism, the following aspects are discussed. The anatomy of micro-organisms, metabolism, reproduction, taxonomy, epidemiology, resistance and pathogenicity.

Next, a detailed overview is given of specific viruses, bacteria, parasites and fungi, with special focus on the epidemiological aspects and pathogenicity of the various genera.

#### **Speakers:**

Profs. Peter Delputte, Louis Maes, Paul Cos & guest speakers

#### **Learning outcomes:**

The student gains theoretical and practical insights in infectious diseases with an emphasis on pathogenesis and diagnostics. The course aims at providing the following skills:

1. The student can describe the structure and replication strategies of different pathogens.
2. The student knows the taxonomy of medically relevant viruses and bacteria
3. The student knows the most important fungi and parasites and their taxonomy.
4. The student can explain how viruses, bacteria and fungi can cause diseases.
5. The student has insights in the epidemiology of infectious diseases and can interpret prevention measures in a correct manner.
6. The student knows the different diagnostic methods and their advantages/disadvantages
7. The student can grow and identify bacteria.
8. The student can evaluate the activity of antibiotics and disinfectants.
9. The student can use a microbiological safety cabinet in a proper manner.
10. The student can work with cell cultures.
11. The student can make a primary cell culture.
12. The student knows how to isolate viruses on a cell culture and how to quantify viruses

<b>Assessment methods</b>		
<input type="checkbox"/> Oral questioning	<input checked="" type="checkbox"/> Presentation	<input checked="" type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other ( <i>specify</i> ) :		
<b>Teaching unit jury</b> ( <i>NAME, surname</i> )		
1) DELPUTTE Peter	2) COS Paul	

## HOST-PATHOGEN INTERACTIONS

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
3	8	0	12	0	0

<b>Management Institute:</b> <b>Teaching unit head</b> ( <i>NAME, surname</i> ): <b>Position:</b>	<b>University of Antwerp</b> <b>KESTENS Luc / CALJON Guy</b> <b>Professor / Professor</b>
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### **TEACHING UNIT PROGRAMME:**

Contact : Luc KESTENS

e-mail : [lkestens@uantwerpen.be](mailto:lkestens@uantwerpen.be)

**Keywords** : immunity, protection, host, pathogen, interaction

#### **Aims of “Host-pathogen interactions” :**

1. To predict theoretical potentially protective immune responses to any given pathogen based on life cycle data
2. To analyse the literature on host-pathogen interaction for a particular pathogen
3. To discriminate potential protective immune responses from immunopathology
4. To anticipate which type of vaccines could be potentially protective for a given pathogen

The student has already an advanced understanding of the immune defence and the different type of immune responses against viruses, bacteria, fungi and parasites. In this course each student compiles and presents, from literature, a detailed overview of the immunity, the known and documented immune (protective) effector mechanisms, related immunopathology, and the progress in vaccine development against a particular pathogen

#### **Speakers:**

Teaching Staff Immunology & microbiology from University of Antwerp

#### **Learning outcomes:**

An advanced understanding of the principles and mechanisms of immune protection against (tropical) infectious diseases. Knowledge to predict which immune responses are potentially essential in the defence against a particular pathogen. Justify the vaccine design against a particular pathogen. Acquired skill to give a comprehensive overview of the immunity against a particular pathogen.

### **Assessment methods**

<input type="checkbox"/> Oral questioning	<input checked="" type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other ( <i>specify</i> ):		

### **Teaching unit jury** (*NAME, surname*)

1) KESTENS Luc

2) CALJON Guy

## CLINICAL DRUG RESEARCH

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
<b>3</b>	<b>30</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

<b>Management Institute:</b>	<b>University of Antwerp</b>
<b>Teaching unit head</b> (NAME, surname):	<b>VAN DAMME Pierre / LEURIDAN Elke</b>
<b>Position:</b>	<b>Full professor / Professor</b>

### **TEACHING UNIT PROGRAMME:**

Contact : Pierre VAN DAMME / Elke LEURIDAN

e-mail : [pierre.vandamme@uantwerpen.be](mailto:pierre.vandamme@uantwerpen.be); [elke.leuridan@uantwerpen.be](mailto:elke.leuridan@uantwerpen.be)

**Keywords** : clinical development, clinical trial

#### **Aims of "Clinical drug research":**

- You get an overview of the whole process of Clinical Drug Research. Using the "standard" drug development as an example, some particular other settings (paediatric clinical trials, medical device studies, vaccine trials) are also discussed. The current rules and regulations are explained and put into a historical perspective.
- You get to know the different actors involved in clinical drug research, their respective roles and the way they interact between one another. Some standard documents and procedures are explained. This thanks to the involvement of guest speakers from the field of clinical trials (CRO-, pharma-, biotech-industry, chairman of the Ethics Committee ...).
- Near the end of the course we look into the role of the regulating bodies, the registration of new drugs, and into some future trends in clinical research.
- You will be allowed to get acquainted with a number of standard documents, to master clinical trial-related information and to report orally and in writing to different target audiences (= permanent evaluation during the semester)

**Speakers:** Pierre Van Damme, Elke Leuridan

Conferences concerning news items will be organized. Speakers will be invited based on their excellence.

#### **Learning outcomes:**

you will have (i) gathered insight in the complex process of the clinical phase of drug development and vaccine by pharmaceutical and biotechnological companies, (ii) knowledge on the different actors involved in this process, and you are capable of describing their specific roles (CRA, sponsor, research team, investigator, Ethics Committee, Regulatory Agencies, ...), (iii) thorough knowledge of the structure and the content of a clinical trial protocol and of the other documents involved in performing clinical trials, (iv) gained insight in the registration of (new) drugs, vaccines as well as medical devices

<b>Assessment methods</b>		
<input type="checkbox"/> Oral questioning	<input checked="" type="checkbox"/> Presentation	<input checked="" type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input checked="" type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other (specify) :		
<b>Teaching unit jury</b> (NAME, surname)		
1) VAN DAMME Pierre	2) LEURIDAN Elke	

## NOVEL TECHNOLOGIES, VACCINE ADMINISTRATION ROUTES & ADJUVANTS

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
<b>3</b>	<b>30</b>	<b>10</b>	<b>8</b>	<b>0</b>	<b>0</b>

<b>Management Institute:</b> <b>Teaching unit head</b> ( <i>NAME, surname</i> ): <b>Position:</b>	<b>University of Antwerp</b> <b>DELPUTTE Peter</b> <b>Professor</b>
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**TEACHING UNIT PROGRAMME:**

Contact : Delputte Peter  
 email : [peter.delputte@uantwerpen.be](mailto:peter.delputte@uantwerpen.be)

**Keywords :** novel technology, adjuvant, immunology, vaccine development, mode of action, toll-like receptor, route of administration, clinical research, vaccine safety

**Aims of “Vaccine administration routes & adjuvants”**  
 This course will be designed in close collaboration with our industrial partners

- Adjuvant definition Adjuvant families
- Role of adjuvants: Why do we need adjuvants?
- Matching the right one: Antigens may need help - why and when?
- General adjuvant mode of action (MoA): immunological interpretation, relationship between innate and adaptive immunity
- Pre-clinical and clinical experience using novel adjuvants in vaccine formulations, impact on immune response
- Clinical tolerability, safety considerations and current safety profile of adjuvanted vaccines
- Learning & challenges in developing, manufacturing and licensing AS-containing vaccines
- Considerations for use of adjuvanted vaccines in special populations
- Novel technologies, including routes of administrations
- Advances in Immunology and Vaccine Discovery: Considerations for future applications
- 

**Tutorials:** will involve the reading relevant articles covering various topics of this course. Series of didactic presentations and practical exercises through group work.

**Speakers:**  
 Marcelle Van Mechelen, Alberta Di Pasquale, Gérald Voss, Arnaud Didierlaurent, Fernanda Tavares Da Silva, Ozzie Berger, Jean Gilliard

**Learning outcomes:**  
 Strengthen capacity in vaccinology with comprehensive overview of the field, discuss recent scientific advances contributing to the progress of vaccine development, specifically related to adjuvants, novel technologies and routes of administrations

<b>Assessment methods</b>		
<input type="checkbox"/> Oral questioning	<input checked="" type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other ( <i>specify</i> ) :		
<b>Teaching unit jury</b> ( <i>NAME, surname</i> )		
1) VAN DAMME Pierre	2) DELPUTTE Peter	



## VACCINE MANUFACTURING & QUALITY CONTROL, REGULATORY APPROVAL PROCESSES

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
<b>3</b>	<b>30</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>

<b>Management Institute:</b> <b>Teaching unit head</b> (NAME, surname): <b>Position:</b>	<b>University of Antwerp</b> <b>DELPUTTE Peter</b> <b>Professor</b>
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### ***TEACHING UNIT PROGRAMME:***

Contact : Peter DELPUTTE  
 e-mail : [peter.delputte@uantwerpen.be](mailto:peter.delputte@uantwerpen.be)

**Keywords :** Vaccine development, Vaccine manufacturing, Vaccine quality, Vaccine evaluation, Vaccine standards, GMP, Vaccine regulation, Vaccine licensing, Vaccine prequalification programme, International supply chains

#### **Aims of “Vaccine manufacturing & quality control process”:**

This course will be designed in close collaboration with our industrial partners

Vaccine manufacturing and quality control

- Vaccine manufacturing: from working seed to filling and packaging
- Examples of vaccine production: viral and bacterial vaccines, recombinant protein vaccines
- GMP considerations
- Industry and new technologies: antigen sparing, cell-culture, thermostability
- Quality control and quality assurance: supply chain protection, monitoring and testing

Vaccine regulatory approval processes

- Laws, regulations, guidances
- CTD format: content and review
- From development to licensure: examples of EU, US and international procedures
- Approval, variations and renewals
- Specific requirements: pediatric population, risk management
- Role of supranational organisations in vaccine approval and distribution: WHO prequalification and article 58

The tutorials will involve the study of articles or patents covering various topics of this course. Technological monitoring of different subjects in these areas will be conducted in groups and presented during specific sessions

#### **Speakers:**

Karin Hardt, Christophe Saille, Alberta Di Pasquale.

#### **Learning outcomes:**

Explain vaccine manufacturing principles, rules and regulations related to vaccine development, manufacturing, assessment and release, explain regulatory process for vaccine review and approval, explain role of supranational organisation in vaccine registration and surveillance and how the expedited procedure fits into the existing legal framework for licensing of vaccines

<b>Assessment methods</b>		
<input type="checkbox"/> Oral questioning	<input checked="" type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other (specify):		
<b>Teaching unit jury</b> (NAME, surname)		
1) DELPUTTE Peter	2) VAN DAMME Pierre	

## ADVANCED DATA ANALYSIS

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
3	32	0	8	0	0

<b>Management Institute:</b> <b>Teaching unit head</b> ( <i>NAME, surname</i> ): <b>Position:</b>	<b>University of Antwerp</b> <b>LAUKENS Kris / MEYSMAN Pieter</b> <b>Professor / Doctor Assistant</b>
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### TEACHING UNIT PROGRAMME:

Contact : Kris Laukens / email : [kris.laukens@uantwerpen.be](mailto:kris.laukens@uantwerpen.be)

This course offers an introduction to the advanced computational analysis of complex and / or large biomedical datasets. The course addresses the foundations of the partially overlapping fields of multivariate statistics and data mining, both from a theoretical perspective as from an applied and practical hands-on point of view.

#### THEORY:

I. introduction to different data types and data mining problems: 1. A formal overview of different data types in biology and medicine, and more specifically vaccinology: quantitative data (e.g. coming from 'omics' platforms), string data (mainly DNA and protein sequences), longitudinal (temporal) data, (biomedical) text, graph data (networks), image data. 2. An introduction to the concepts and challenges of unsupervised and supervised data mining and machine learning.

II. Overview of data mining techniques: 1. Introduction: pre-processing and basic exploratory analysis (univariate statistics) of quantitative data: a revision of statistical concepts (only a revision in the context of the course). Unsupervised learning: clustering, PCA... 2. An introduction to classification methods: overview of classification systems, model validation (e.g. different cross-validation techniques); 3. Biomedical feature selection and dimensionality reduction; 4. Supervised learning techniques (a solid introduction to commonly used techniques and algorithms): regression techniques, discriminant analysis, support vector machines, random forests, ensemble classifiers, decision trees, neural networks, naive Bayes, association rule mining. Visual data mining

III. Biomedical data mining applications: In a number of case studies, and through real research results it will be shown how these techniques can be employed to extract novel insights from real world data in vaccination, immunology, infectious disease and epidemiology studies.

**PRACTICE:** The practical part will familiarize the students with the statistical programming language R. In the first place, students should be able to correctly read in a dataset, generate graphs and perform elementary data-manipulations. Subsequently, some techniques for statistical data-analysis (linear regression, ANOVA, multivariate techniques,) are illustrated, whereby the students should be able to use the help files and search the internet for the code to solve a particular problem. In the end, programming techniques including for-loops and custom-made functions will be illustrated to facilitate repetitive analyses.

#### Learning outcomes: The student

(i) gains insights in various data types and their associated challenges, in the context of the broad biomedical sciences, and more specifically in the context of vaccinology and infectious diseases.(ii) will understand how and which computational techniques can be used to address common challenges in molecular and biomedical data analysis.(iii) will understand the underlying principles of a selection of computational techniques for biomedical data mining, especially in the context of vaccine development. (iv) will be able to select the appropriate technique for a given problem. (v) The student will be able to interpret the results of typical data mining task.

Assessment methods		
<input type="checkbox"/> Oral questioning	<input checked="" type="checkbox"/> Presentation	<input checked="" type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input checked="" type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other ( <i>specify</i> ) :		
Teaching unit jury ( <i>NAME, surname</i> )		
1) LAUKENS Kris	2) MEYSMAN Pieter	

## SUMMER SCHOOL ON VACCINOLOGY

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
3	20	0	10	0	0

<b>Management Institute:</b>	<b>University of Antwerp</b>
<b>Teaching unit head</b> (NAME, surname):	<b>VAN DAMME Pierre / LEURIDAN Elke</b>
<b>Position:</b>	<b>Professor / Professor</b>

### TEACHING UNIT PROGRAMME:

Contact : Pierre VAN DAMME / Elke LEURIDAN

e-mail : [pierre.vandamme@uantwerpen.be](mailto:pierre.vandamme@uantwerpen.be); [elke.leuridan@uantwerpen.be](mailto:elke.leuridan@uantwerpen.be)

**Keywords :** Vaccinology summer course

#### Aims of “ Summer School on vaccinology”

1. Rationale, context and history of immunization; 2. Key aspects of immunology; 3. Key aspects of vaccines; 4. Vaccine preventable diseases; 5. Immunisation policy and schedules ;6. Future perspectives; 7. Communication; & Practical skills

During the training several teaching methods are used including different interactive teaching methods, lectures of experts, individual - and group works, group presentations as well as practical training.

#### Speakers:

Teaching Staff Vaccinology of the Centre for the Evaluation of Vaccination, University of Antwerp.

An international selected companion of several teachers has been involved in the past in the summer school programme (University of Bristol, University of Padova, University of Athens, University of Florence, Public health England, WHO-Euro...). Speakers are invited based on their excellence.

#### Learning outcomes:

**(A) Context and history:** Outline the historical impact of vaccine preventable diseases; Discuss the rationale for implementing immunisation programmes; Explain concepts of control, elimination and eradication; **(B) Immunology:** Explain innate and adaptive immunity, functions of B- and T cells, role of Ab and Ag, impact maternal Ab; Outline the role of immune response to a vaccine, active /passive vaccination, assess the capacity of immune system; **(C) Vaccines:** Definition, components and function, different types of vaccines and their expected side effects and contraindications; Stages in vaccine development, procedures of safety control and monitoring of efficacy; **(D) Vaccines preventable diseases:** Pathology, population at risk, available preventive measures for each disease; **(E) Policy and schedules:** Vaccines in immunisation schedule; Show historical impact of vaccination on epidemiology ; Spread of infections, herd immunity, role of modelling, economic evaluation; Factors informing policy decisions; Role of disease surveillance, vaccination coverage data; **(F) Future:** List new target diseases; Vaccines in the pipeline, new ways of administration; Current research on components and techniques; Discuss current developments for HIV, dengue, malaria, hepatitis C; **(G) Communication** Describe myths and facts relating to immunisation controversies, list common misconceptions, respond to objections of anti-vaccine movements; Critically evaluate media reporting, understand public perception; List key points for responding to parents' fear; Ethics of communication; how to respond to anti-vaccine lobbies; State advantages and risks that need to be communicated; Direct to other information sources; **(H) Practical skills:** immunization site, immunization techniques, vaccine reconstitution, cold chain, storage, conditions, prepare and dispose vaccine equipment, avoid needle stick injuries, recognize true contraindications, distinguish anaphylaxis and fainting.

Assessment methods		
<input type="checkbox"/> Oral questioning	<input checked="" type="checkbox"/> Presentation	<input checked="" type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other (specify) :		
Teaching unit jury (NAME, surname)		
3) VAN DAMME Pierre	4) LEURIDAN Elke	

## ANIMAL SCIENCE

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
3	0	5	0	0	30

<b>Management Institute:</b>	<b>University of Antwerp</b>
<b>Teaching unit head</b> ( <i>NAME, surname</i> ):	<b>Van Ginneken Chris</b>
<b>Position:</b>	<b>Professor</b>

### **TEACHING UNIT PROGRAMME:**

Contact : Van Ginneken Chris  
email : [chris.vanginneken@uantwerpen.be](mailto:chris.vanginneken@uantwerpen.be)

**Keywords** : laboratory animal sciences

#### **Aims of “Animal science”:**

The course is – except the written test – completely run electronically/digitalized. Students can view the e-lectures and make the associated assignments at their own pace. Nevertheless, several deadlines need to be respected in order to provide feedback on the assignments. On a 2-weekly basis, tutoring is provided to the students either face to face or via Skype.

**Speakers:** only e-recorded lectures, facultative study material is uploaded which can include recorded interviews (e.g. with Peter Singer).

#### **Learning outcomes:**

The course aims at teaching the students how to make optimal and scientifically founded use of animals in biomedical research and how this kind of research is conducted in accordance with Belgian and European legislation. The student is able to analyse a biomedical question, and can formulate a research strategy that uses animal experiments cfr. the state of the art (e.g. 3R, according to European directives and Belgian law, according to the ethical dossiers). The student can communicate in writing and orally in English about animal experimentation. He / she can reflect on the social and ethical implications of animal studies and has a lifelong learning attitude developed in order to follow up on the evolutions in this domain.

### Assessment methods

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Oral questioning               | <input type="checkbox"/> Presentation   | <input type="checkbox"/> Practice report      |
| <input checked="" type="checkbox"/> Written examination | <input type="checkbox"/> Bibliography report                                    | <input type="checkbox"/> Internship unwinding |
| <input checked="" type="checkbox"/> Report / thesis     | <input type="checkbox"/> Digital productions (video, poster, software, wiki...) |   |
| <input type="checkbox"/> Other ( <i>specify</i> ) :     |   |   |

### Teaching unit jury (*NAME, surname*)

1) VAN GINNEKEN Chris

2) DELPUTTE Peter

## LANGUAGES 2 (University of Antwerp)

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
<b>3</b>	<b>60</b>	<b>0</b>	<b>30</b>	<b>0</b>	<b>0</b>

<b>Management Institute:</b>	<b>University of Antwerp</b>
<b>Teaching unit head</b> ( <i>NAME, surname</i> ):	<b>LE PAGE Els</b>
<b>Position:</b>	<b>Linguistic and pedagogical Adviser for English</b>

### ***TEACHING UNIT PROGRAMME:***

Contact: Els Heughebaert (Language Courses Co-ordinator)

email: [els.heughebaert@uantwerpen.be](mailto:els.heughebaert@uantwerpen.be)

Keywords: English Language Course, trimester course, different levels

Aims of 'English Language Course': improving language skills in English, French, German, Italian or Spanish

#### **1. Active and communicative**

Communicative, interactive and task-oriented, continuous interaction between all the students and we in turn expect them to participate actively in class. We provide maximum speaking opportunities through numerous practice-oriented and functional language tasks, assignments in groups or pairs.

#### **2. Efficient and competency-focused**

We train the students in five language skills: reading, listening, writing, speaking and effective communication. The target language of the course is also the language of instruction.

The pace of our language courses is fast: students are required to absorb a lot of information in a short span of time. Consequently, they must process the course material before and after classroom sessions through self-study and distance learning. The students are also expected to train their language skills independently.

#### **3. Formal accuracy**

Besides focusing on the communicative aspect of language, we also pay attention to the formal accuracy of the student's usage: their speech and writing must be grammatically correct, so that their audience is able to understand them without strain or effort.

**4. Varied teaching methods:** the best approaches from old and new teaching methods to ensure that students are able to study aspects of the target language in the manner that most appeals to them.

**5. Homogeneous groups:** All course participants are highly qualified and have a comparable level of proficiency in the target language.

#### **6. Learning result and learning pleasure**

Our teaching approach offers a framework whereby the constant interaction of learning result and learning pleasure is aimed at. Both objectives are the driving forces that enable students to develop their language skills to the fullest)

### **Assessment methods**


- |   |   |   |
|---|---|---|
| <input checked="" type="checkbox"/> Oral questioning  | <input type="checkbox"/> Presentation   | <input type="checkbox"/> Practice report      |
| <input checked="" type="checkbox"/> Written examination   | <input type="checkbox"/> Bibliography report                                    | <input type="checkbox"/> Internship unwinding |
| <input type="checkbox"/> Report / thesis  | <input type="checkbox"/> Digital productions (video, poster, software, wiki...) |   |
| <input checked="" type="checkbox"/> Other ( <i>specify</i> ): Listening and reading examination |   |   |

### **Teaching unit jury** (*NAME, surname*)

1) LE PAGE Els

2) GINNY De Vos (Foreign Languages Team Co-ordinator)

## ***S3 teaching unit sheets***

S3 Teaching Units 	Immuno pathology	Infectio -logy	Research & clinical vaccino -logy	Transferable skills & options	Languages	TOTAL ECTS
Immunology & cancer	3					3
Epidemiology		3				3
Vaccine formulation			3			3
Clinical vaccine development			3			3
Immunomonitoring of preclinical and clinical vaccine trials			3			3
Vaccine specific applications (aging, immunodeficiency, pregnancy)			3			3
Communication on vaccines & public health				6		6
Project management				3		3
Languages 3:English, French, Italian, Spanish					3	3
<b>Total ECTS</b>	3	3	<b>12</b>	9	3	30

**Table 3:** Teaching units of the semester 3 in Lyon / Saint-Etienne (France)



## EPIDEMIOLOGY

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
<b>3</b>	<b>30</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

<b>Management Institute:</b>	<b>University of Claude Bernard Lyon 1</b>
<b>Teaching unit head</b> (NAME, surname):	<b>VANHEMS Philippe</b>
<b>Position:</b>	<b>Professor (PU-PH)</b>

### **TEACHING UNIT PROGRAMME:**

Contact : Philippe VANHEMS Phone : +33 4 78 77 70 31 / +33 4 72 11 07 19

e-mail : [philippe.vanhems@chu-lyon.fr](mailto:philippe.vanhems@chu-lyon.fr)

**Keywords** : epidemiology, clinical research, study design

**Aims of “Epidemiology” :**

Epidemiology is the study of the distribution and determinants of disease frequency in human populations. Human diseases and especially infectious diseases does not occur at random and then has causal and preventive factors that can be identified through systematic investigation in different populations, in different places or at different times. Vaccine is a key preventive factor in the process of transmission and infection. Then, it is an important determinant involved in the natural history of infectious diseases.

Sharing with the students the basic methodological concepts regarding epidemiology

Discussing the applications of epidemiological concepts in the field of diseases which can be prevented by vaccine.

1. Basic concepts: definition, study designs, measures of disease frequency
2. Types of epidemiologic studies: Descriptive studies, Case-control studies, Cohort studies, Intervention studies
3. Description and analysis of epidemiological data
4. Role of chance, Bias and Confounding
5. The epidemiology of vaccination
6. Epidemiology of infectious diseases, of non-infectious diseases
7. Design in the field of vaccination, vaccine effectiveness, impact of vaccination

**Speakers:**

Teaching Staff Epidemiology from University of Claude Bernard Lyon 1

Conferences concerning news items will be organized. Speakers will be invited based on their excellence.

**Learning outcomes:**

To know epidemiology and its main developments in health sciences. How to choose, justify and execute the appropriate study set up.

<b>Assessment methods</b>		
<input type="checkbox"/> Oral questioning	<input type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other (specify) :		
<b>Teaching unit jury</b> (NAME, surname)		
1) VANHEMS Philippe	2) BENET Thomas	







## IMMUNOMONITORING OF PRECLINICAL AND CLINICAL TRIAL

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
<b>3</b>	<b>10</b>	<b>0</b>	<b>30</b>	<b>0</b>	<b>0</b>

<b>Management Institute:</b>  <b>Teaching unit head</b> <i>(NAME, surname):</i> <b>Position:</b>	<b>Université Claude Bernard Lyon 1</b> <b>Université Jean Monnet Saint Etienne</b> <b>ROCHEREAU Nicolas</b> <b>Assistant professor (MCU)</b>
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### **TEACHING UNIT PROGRAMME:**

Contact : Nicolas ROCHEREAU Phone : +33 4 77 42 14 67

e-mail : [rochereau.nicolas@gmail.com](mailto:rochereau.nicolas@gmail.com)

**Keywords :** animal models, immunomonitoring, preclinical, clinical

**Aims of “Immunomonitoring of preclinical and clinical vaccine trial”:**

Practical work will teach the students how to monitor humoral and cellular immune response in mice, how to measure immune diversity. Practical immunology includes multi-parameter flow cytometry analysis, elispot assay, elisa, route of administration in mice, mouse immunology.

1. Methods of immunisation in mice, uptake of organs and secretions

2. Multiparameter flow cytometry

3. In vivo imaging

4. Monitoring of B cell responses (elispot, antibody titers)

5. Monitoring of T cells (cytometry, polyfunctionality, elispot)

6. Transcriptomic, Proteomic and Glycomics tools of the measure of vaccine efficiency

7. New methods as the measure of immune diversity

8. Management of samples for vaccine trial (AQ)

9. Choice of the good animal model and correlate of protection or efficiency

**Speakers:**

Teaching Staff Immunology from University of Jean Monnet Saint-Etienne directed by J. Lisfranc. Conferences concerning news items will be organized. Speakers will be invited based on their excellence.

Practical training for preclinical immunomonitoring will be done with the CEA in Fontenay aux Roses (2 days) and University of Jean Monnet Saint-Etienne.

**Learning outcomes:**

How to monitor vaccine efficiency in animal models and in humans.

<b>Assessment methods</b>		
<input type="checkbox"/> Oral questioning	<input checked="" type="checkbox"/> Presentation	<input checked="" type="checkbox"/> Practice report
<input type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other (specify):		
<b>Teaching unit jury</b> <i>(NAME, surname)</i>		
1) ROCHEREAU Nicolas	2) PAUL Stéphane	

## VACCINE SPECIFIC APPLICATIONS

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
3	30	0	0	0	0

<b>Management Institute:</b>  <b>Teaching unit head</b> <i>(NAME, surname):</i> <b>Position:</b>	<b>Université Claude Bernard Lyon 1</b> <b>Université Jean Monnet Saint Etienne</b> <b>PAUL Stéphane</b> <b>Professor-hospital practitioner (PU-PH)</b>
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### **TEACHING UNIT PROGRAMME:**

Contact : Stéphane PAUL Phone : +33 4 77 82 89 75  
 e-mail : [stephane.paul@chu-st-etienne.fr](mailto:stephane.paul@chu-st-etienne.fr)

**Keywords** : infectious disease, cancer, allergy, immunocompromised

**Aims of “Vaccine-specific applications”:**

1. Infectious diseases-specific vaccines (Flu, Pneumococcal, TB, HPV, HIV)
2. Cancer-specific vaccines
3. Parasite-specific vaccines (Malaria, Schistosomiasis, Leishmaniasis.)
4. Allergy-based vaccines/immunotherapy
5. Veterinary-specific vaccines
6. Immunization routes
7. Vaccines for other diseases (neurological, autoimmunity.)

**Speakers:**

Teaching Staff Immunology from University of Jean Monnet Saint-Etienne directed by J. Lisfranc. Conferences concerning news items will be organized. Speakers will be invited based on their excellence.  
 Two days' session on Veterinary vaccines will be organized in Boehringer Ingelheim facility (Lyon)

**Learning outcomes:**

Application of the vaccination in the prophylactic and therapeutic ways against pathogens.

<b>Assessment methods</b>		
<input type="checkbox"/> Oral questioning	<input type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input checked="" type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other <i>(specify)</i> :		
<b>Teaching unit jury</b> <i>(NAME, surname)</i>		
<b>1) PAUL Stéphane</b>	<b>2) ROCHEREAU Nicolas</b>	

## COMMUNICATING ON VACCINES AND PUBLIC HEALTH

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
6	30	5	25	0	0

<b>Management Institute:</b>  <b>Teaching unit head</b> ( <i>NAME, surname</i> ):  <b>Position:</b>	Université Claude Bernard Lyon 1 Université Jean Monnet Saint Etienne PAUL Stéphane & DELPRAT Christine  Professor-hospital practitioner (PU-PH) & Professor (PU)
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### **TEACHING UNIT PROGRAMME:**

Contact: Stéphane PAUL Phone : +33 4 77 82 89 75

e-mail : [stephane.paul@chu-st-etienne.fr](mailto:stephane.paul@chu-st-etienne.fr)

**Keywords:** perception, health, communication, epidemiology

**Aims of “Advertising on vaccines and public health”:** Vaccines have been and remain a major tool for public health strategies. But the growing complexity of current vaccine agendas for children, the ongoing introduction of new vaccines (conjugate vaccines, programs targeting adults or the aging, addressing chronic or non-infectious diseases) have made decision-making more complex for vaccine producers and authorities in public health and blurred the meanings and purposes of vaccination for the general public. Accordingly, it appears important to provide all apprentices and professionals dealing with vaccines with knowledge pertaining to social sciences as well as biomedical sciences. **(1)** History of vaccination and vaccines; **(2)** Epidemiology and vaccination; **(3)** The place of vaccination in public health decisions; **(4)** Social factors influencing vaccine policies and strategies in different countries; **(5)** Anthropology of vaccine acceptance and rejection; **(6)** Public and media perception of vaccination and vaccines; **(7)** Health economics and vaccines; **(8)** The future of vaccinology.

**Practices:** students will build a Massive Open Online Course (MOOC) related to vaccination, being managed by the MOOC managers of the TU “Project management” developing digital skills and networking capacities

**Speakers:**

Teaching Staff Immunology from University of Jean Monnet Saint-Etienne, University of Claude Bernard Lyon 1 and from the CNRS supporting partner “SPHERE”.

Conferences concerning news items will be organized. Speakers will be invited on specific subjects, selected for their excellence.

**Learning outcomes:**

How to collect information and communicate on vaccination and vaccines, and elaborate recommendations to authorities for education, information of the public.

<b>Assessment methods</b>		
<input type="checkbox"/> Oral questioning	<input checked="" type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input checked="" type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other ( <i>specify</i> ):		
<b>Teaching unit jury</b> ( <i>NAME, surname</i> )		
1) PAUL Stéphane	2) DELPRAT Christine	

## PROJECT MANAGEMENT

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
<b>3</b>	<b>30</b>	<b>15</b>	<b>15</b>	<b>0</b>	<b>0</b>

<b>Management Institute:</b>	Université Claude Bernard Lyon 1
<b>Teaching unit head</b> ( <i>NAME, surname</i> ):	Université Jean Monnet Saint Etienne
<b>Position:</b>	GILBERT Christophe Assistant Professor

### **TEACHING UNIT PROGRAMME:**

Contact : Christophe GILBERT

e-mail : [christophe.gilbert.bio@univ-lyon1.fr](mailto:christophe.gilbert.bio@univ-lyon1.fr)

**Keywords** : analyse, plan, organize, motivate, execute and control

**Aims of "Project management" :**

Learning and experimenting the benefits to manage a project to achieve specific goals in the international context of a scientific and multidisciplinary challenge in vaccinology.

1. **Life of a project:** from the initiation to the closing including all the planning and executing processes related to the project and the risk analysis
2. **Specific project management expertise** e.g. Managing a project in a P4 laboratory
3. **Risk management**, case-studies
4. **Virtual international project development:** e.g. "Streptococcus pneumoniae and pneumococcal vaccines", recommendations, research aims, research development, regulations, scale-up, GMP production, pre-clinical safety and toxicity studies in animal models, clinical phase I-II-III, industrial production, cost-effectiveness analysis, commercialization
5. **Project management Methods:** Five W's, brainstorming, Ishikawa diagram, SWOT, SMART, GANTT, PERT, DESC, PDCA...
6. **Practices** corresponds to **reality international projects** such as vaccinology MOOC production or annual Research Instructive Workshop or of the VaxInLive Symposium or... other reality projects decided by the teaching team each year. Groups of (student) managers are organized either horizontally or vertically in a mini-enterprise to lead the project... innovative project pedagogy: enjoy your project progress sheets from one week to another!

**Speakers:**

Teaching Staff from UCBL : Viktor Vochkov for P4 pathogens infectious problem in laboratory and in the natural environment, Emilie Bourdonnay, Mathias Faure and Christine Delprat to frame the practices. Conferences concerning real past project management on infectious problems and vaccines will be illustrated by industrial staff from LIVE Associated partners: Sanofi Pasteur, Boehringer Ingelheim/Merial, Butantan Institute...

**Learning outcomes:**

How to analyse, plan, execute and control a scientific and multidisciplinary project linked to vaccinology.

<b>Assessment methods</b>		
<input checked="" type="checkbox"/> Oral questioning	<input checked="" type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input checked="" type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other ( <i>specify</i> ) :		
<b>Teaching unit jury</b> ( <i>NAME, surname</i> )		
1) GILBERT Christophe	2) VOLCHKOV Viktor	

## LANGUAGES 3 (University of Claude Bernard Lyon 1)

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
3	20	0	20	0	0

<b>Management Institute:</b>  <b>Teaching unit head</b> <i>(NAME, surname):</i> <b>Position:</b>	<b>Université Claude Bernard Lyon 1</b> <b>Université Jean Monnet Saint Etienne</b> PIGAT Joann Coordinator of language teaching units for Master's degrees at the Common Service Language Department
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### **TEACHING UNIT PROGRAMME:**

Contact for French: Solange Talavera-Goy  
 e-mail : [solange.talavera-goy@univ-lyon1.fr](mailto:solange.talavera-goy@univ-lyon1.fr)

**Keywords :** language courses, different levels: A1, A2, B1, B2.1, B2, C1.1, C1.2.

**Aims of "language courses":**

Improving the student's proficiency level, taking into account his or her previous knowledge of the language in English, French, Spanish, Italian

**Aims:** The student will be placed in the adequate course, according to the level he/she reached after the first two semesters in Barcelona and Antwerp.

The language level is defined in accordance with the [Common European Framework](#)

**A language user at A1 level:** Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. Can introduce himself/herself and others and can ask and answer questions about personal details.

**A language user at A2 level:** Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography and employment). Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters.

**A language user at B1 level:** Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise whilst travelling in an area where the language is spoken. Can produce simple connected text on topics which are familiar or of personal interest.

**A language user at B2 level:** Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisation. Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party.


**A language user at C1 level:** Can understand a wide range of demanding, longer texts, and recognise implicit meaning. Can express fluently and spontaneously without much obvious searching for expressions. Can use language flexibly and effectively for social, academic and professional purposes.

**Speakers:** experienced teachers at the UCBL Service Commun des Enseignements de Langues

**Learning outcomes:** to improve language skills

<b>Assessment methods</b>		
<input type="checkbox"/> Oral questioning	<input type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input checked="" type="checkbox"/> Other <i>(specify)</i> : continuous assessment and final exam assessing the 4 linguistic skills (listening, speaking, reading and writing).		
<b>Teaching unit jury</b> <i>(NAME, surname)</i>		
1) PIGAT Joann	2) TALAVERA-GOY Solange	

## **S4 teaching unit sheets**

S4 Teaching Units Integrated Master Thesis programme	Master thesis	Langua ges	TOT AL ECTS
			
Bibliography report	10%		
Professional work	10%		
Master thesis	40%		
Oral defence	40%		
<b>Total master thesis ECTS</b>	<b>27</b>		<b>27</b>
Languages 4:English, French, Italian, Spanish		3	3
<b>Total ECTS</b>	<b>27</b>	3	<b>30</b>

**Table 4:** Teaching units of the semester 4



## LANGUAGES 4 (University of Claude Bernard Lyon 1)

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
3	30	0	30	0	0

<b>Management Institute:</b>  <b>Teaching unit head</b> ( <i>NAME, surname</i> ): <b>Position:</b>	<b>Université Claude Bernard Lyon 1</b> <b>Université Jean Monnet Saint Etienne</b> PIGAT Joann Coordinator of language teaching units for Master's degrees at the Common Service Language Department
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<b>TEACHING UNIT PROGRAMME:</b>
Contact for French: Solange Talavera-Goy e-mail : <a href="mailto:solange.talavera-goy@univ-lyon1.fr">solange.talavera-goy@univ-lyon1.fr</a> <b>Keywords</b> : language courses, different levels: A1, A2, B1, B2.1, B2, C1.1, C1.2. <b>Aims of "language courses"</b> : Improving the student's proficiency level, taking into account his or her previous knowledge of the language in English, French, Spanish, Italian <b>Aims</b> : The student will be placed in the adequate course, according to the level he/she reached after the first two semesters in Barcelona and Antwerp. The language level is defined in accordance with the <a href="#">Common European Framework</a> <b>A language user at A1 level</b> : Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. Can introduce himself/herself and others and can ask and answer questions about personal details. <b>A language user at A2 level</b> : Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography and employment). Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. <b>A language user at B1 level</b> : Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise whilst travelling in an area where the language is spoken. Can produce simple connected text on topics which are familiar or of personal interest. <b>A language user at B2 level</b> : Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisation. Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. <b>A language user at C1 level</b> : Can understand a wide range of demanding, longer texts, and recognise implicit meaning. Can express fluently and spontaneously without much obvious searching for expressions. Can use language flexibly and effectively for social, academic and professional purposes. <b>Speakers</b> : experienced teachers at the UCBL Service Commun des Enseignements de Langues <b>Learning outcomes</b> : to improve language skills

<b>Assessment methods</b>		
<input type="checkbox"/> Oral questioning	<input type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input type="checkbox"/> Written examination	<input type="checkbox"/> Bibliography report	<input type="checkbox"/> Internship unwinding
<input type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input checked="" type="checkbox"/> Other ( <i>specify</i> ): continuous assessment and final exam assessing the 4 linguistic skills (listening, speaking, reading and writing).		
<b>Teaching unit jury</b> ( <i>NAME, surname</i> )		
1) PIGAT Joann	2) TALAVERA-GOY Solange	

## MASTER THESIS

ECTS	Lectures (hours/student)	Tutorials (hours/student)	Practical work (hours/student)	Internship (weeks/student)	Digital learning
<b>27</b>	<b>0</b>	<b>27</b>	<b>0</b>	<b>24-26</b>	<b>0</b>

<b>Management Institute:</b>	Universitat Autònoma de Barcelona / Universitat de Barcelona / University of Antwerp / University of Jean Monnet Saint-Etienne / University of Claude Bernard Lyon 1
<b>Teaching unit head</b> (NAME, surname):	MARTINEZ Paz / STRATMANN Thomas / DELPUTTE Peter / PAUL Stéphane / DELPRAT Christine
<b>Position:</b>	Professor / Professor / Professor / Assistant professor-hospital practitioner (MCU-PH) / Professor (PU)

### TEACHING UNIT PROGRAMME:

Contact (Barcelona UAB): Dolores JARAQUEMADA Phone: +34 93 5812804

e-mail : [Dolores.Jaraquemada@uab.cat](mailto:Dolores.Jaraquemada@uab.cat)

Contact (Barcelona UB): Thomas STRATMANN Phone: +34 93 4021533

e-mail : [thomas.stratmann@ub.edu](mailto:thomas.stratmann@ub.edu)

Contact (Antwerp): Peter DELPUTTE Phone : +32 3 265 26 21

e-mail : [peter.delputte@uantwerpen.be](mailto:peter.delputte@uantwerpen.be)

Contact (Saint-Etienne): Stéphane PAUL Phone : +33 4 77 82 89 75

e-mail : [stephane.paul@chu-st-etienne.fr](mailto:stephane.paul@chu-st-etienne.fr)

Contact (Lyon): Christine DELPRAT Phone : +33 4 26 23 59 80

e-mail : [christine.delprat@univ-lyon1.fr](mailto:christine.delprat@univ-lyon1.fr)

**Keywords** : knowledge review, practical skills, professional expertise

**Aims of "Master thesis" :**

The students will have the chance to investigate research or clinical or industrial or public health environment in vaccinology at the forefront of current knowledge and expertise.

1. Overview of specific knowledge through a bibliography report
2. Acquire professional experience in labour environment
3. Learn how to conduct experimental research or industrial project or clinical trials or health policy
4. Write a practical professional report
5. Acquire the ability to present and report his/her own professional work, in front of an international specialized audience

**Supervisors:**

Internship tutor and master teaching staff from Barcelona, Antwerp, Saint-Etienne or Lyon

**Learning outcomes:**

How to be productive in a professional environment and communicate his/her production and conclusions in written and oral international context.

### Assessment methods

<input checked="" type="checkbox"/> Oral questioning	<input type="checkbox"/> Presentation	<input type="checkbox"/> Practice report
<input type="checkbox"/> Written examination	<input checked="" type="checkbox"/> Bibliography report	<input checked="" type="checkbox"/> Internship unwinding
<input checked="" type="checkbox"/> Report / thesis	<input type="checkbox"/> Digital productions (video, poster, software, wiki...)	
<input type="checkbox"/> Other (specify) :		

### Teaching unit jury (NAME, surname)

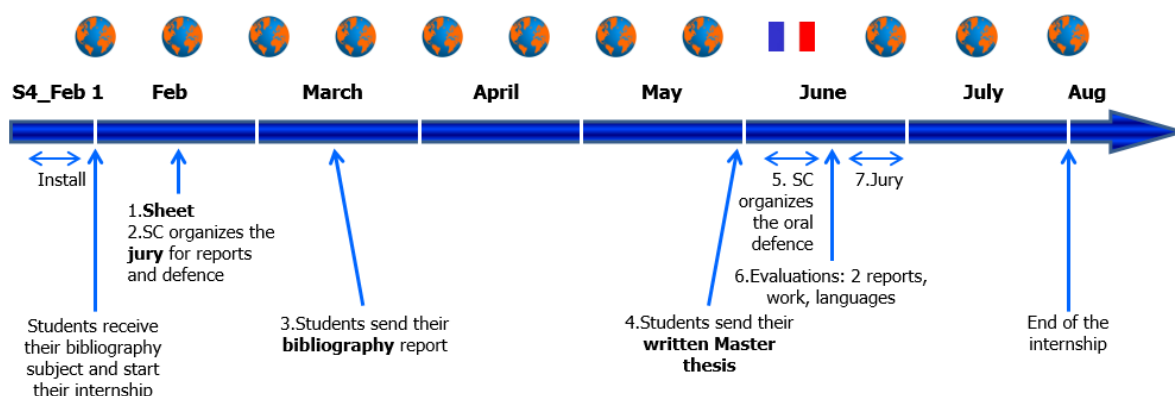
- 1) Dolores JARAQUEMADA 2) Thomas STRATMANN 3) Peter DELPUTTE  
4) Stéphane PAUL 5) Christine DELPRAT

**Table: Assessment methods of teaching units**

Teaching unit title	Oral exam	Presentation	Practice report	Written exam	Bibliography report	Internship unwinding	Report/thesis	Digital production	Others
S1 - Innate immunity				X					Multiple choice test
S1 - Functional anatomy of the immune system				X					Assistance
S1 - Antigen recognition				X					bio informatics
S1 - Receptor signaling		X		X					
S1 - Mechanisms of immunopathology			X	X					
S1 - Autoimmunity			X	X					
S1 - Immunodeficiencies		X		X					
S1 - Immune responses to pathogens		X		X					
S1 - Languages 1: French, Spanish	X			X					Continuous LSRW
S2 - Immune system in early life, pregnant women and elderly		X		X			X		
S2 -Description & variability of pathogens	X		X	X					
S2 - Host-pathogen interactions		X		X					
S2 - Clinical drug research		X	X	X			X		
S2 - Novel technologies, vaccine administration routes & adjuvants		X	X	X					
S2 - Vaccine manufacturing & quality control, regulatory approval processes		X		X					
S2 -Advanced data analysis (option)		X	X	X					
S2 -Summer school on vaccinology		X	X	X					
S2 - Animal science e-learning (option)				X			X		
S2 – Languages 2: English, French, German, Italian, Spanish	X			X					Continuous LS
S3 - Immunology & cancer		X		X					interactivity

Teaching unit title	Oral exam	Presentation	Practice report	Written exam	Bibliography report	Internship unwinding	Report/thesis	Digital production	Others
S3 - Epidemiology				X					
S3 - Vaccine formulation			X	X					
S3 - Clinical vaccine development		X		X					
S3 - Immunomonitoring of preclinical and clinical vaccine trials		X	X						
S3 - Vaccine specific applications				X					
S3 - Communication on vaccines & public health	X	X						X	
S3 - Project management	X	X						X	
S3 – Languages 3: English, French, Italian, Spanish									Continuous LSRW
S4 - Master thesis	X				X	X	X		
S4 - Languages 4: English, French, Italian, Spanish									Continuous LSRW

## Master Thesis (example year 2017-18) schedule, guidelines & evaluation



1. By **Jan 30**, the Internship Supervisor sends the subject of the **Bibliography report** to the Academic Supervisor. This subject should be in line with the practice of the Student. On **Jan 31**, the Academic Supervisor sends this subject to the **student** by email with copy to the **LIVE Secretariat** [claire.douet@univ-lyon1.fr](mailto:claire.douet@univ-lyon1.fr).
2. By **Feb 15**, the **student** sends the **Internship installation sheet (handbook p10)**, signed by the Internship Supervisor, to the Academic Supervisor with copy to the **LIVE Secretariat**.
3. By **Feb 15**, the Academic Supervisor appoints 2 reviewers / report from the national Masters supporting the Master LIVE and sends their First name, Last name, Institution, Function and email address to the **LIVE Secretariat**.
4. By **March 15**, the **student** submits electronically his/her **Bibliography report** to the Academic Supervisor with copy to the **LIVE Secretariat**.
5. By **May 31**, the **student** submits electronically his/her **Master thesis** to the Academic Supervisor with copy to the **LIVE Secretariat**.
6. By **June 10**, the **student** submits electronically his/her PDF show on Claco in the Directory "M2S4 BIO2500M\_Master thesis / Resources / PDF defence show".
7. From **June 12 to 15**, the Steering Committee with the LIVE Secretariat organizes the **Oral defence** of the **students** in **Lyon**, in front of **6 jury members** who are academic professors from the national Masters supporting the Master LIVE. The Internship Supervisor cannot attend the presentation of his/her student. At the end of the defence, the jury transmits the **Master defence evaluation form (handbook p16)** to the **LIVE Secretariat**. The defence will be open or not, depending on Confidential Disclosure Agreement.
8. By **June 15**, the reviewers send the **Bibliography report evaluation form (handbook p11)** and the **Master thesis evaluation form (handbook p13)** to the **LIVE Secretariat**. In case the two reviewer scores are very different (SD score >20%), the LIVE Steering Committee (five members) will study the report to provide a third assessment.
9. By **June 20**, the 3<sup>rd</sup> reviewer sends the scores of the **report** to the **LIVE Secretariat** and the Internship Supervisor sends the **Professional work evaluation form (handbook p15)** of the students to the **LIVE Secretariat** with copy to the Academic Supervisor.
10. The **final LIVE diploma jury** in France is held at S4 on **June 25**.

## Criteria for Bibliography Report

### ❖ Warning:

Automatic plagiarism detection will be applied to the student reports (bibliography and Master thesis) with the powerful tool available at UCBL: text recognition and anti-plagiarism online server covering the web. More than 20% of plagiarism is not authorized in your text and will turn into 0 your score. Therefore, pay attention to elaborate your thought with your own sentences in your reports.

### ❖ Objectives

The objectives for the bibliography report are as follows:

- The student situates the subject within the scientific context.
- The student understands the scientific questioning around this subject.
- The student looks up and selects relevant information from the scientific literature.
- The student synthesizes and presents the relevant information in a written organized report following the provided guidelines.
- The student notices the questions to solve around this subject.

### ❖ Formatting requirements for the bibliography report

The bibliography report shall comprise maximum 10 pages, including tables and figures, excluding title page, summary and references. The bibliography report is conforming to the same formatting requirements as the Master thesis.

The language shall be English.

- Situate the topic within the scientific context
- Introduce the main concepts, vocabulary and questions
- Announce the terms of the development in the introduction
- Review the questioning and results concerning this subject, with a critical analysis of the methods used and of the conclusions published
- Along the report, present figures with legends and/or tables related to the main well-established knowledge
- Finally, write a specific section to underline the open questions for the next future related to the topic

## Criteria for the Master thesis

### ❖ Objectives

The objectives of the master thesis are as follows:

- The student looks up and selects relevant information from the scientific literature.
- The student synthesizes the relevant information and report it in writing.
- The student conducts scientific research under supervision.
- The student performs various techniques correctly and accurately.
- The student demonstrates critical thoughts on the information collected, the research conducted and the results obtained.
- The student clearly reports in writing in accordance with current academic standards following guidelines.

- The student presents and defends the professional work conducted in a clear and comprehensible manner.

### ❖ Formatting requirements for the Master Thesis

The Master thesis shall be a self-written text in which the student demonstrates the ability to apply specific methods and techniques characteristic to the field, as well as the ability to process the results of scientific papers.

It is not an absolute requirement that the student shall make an original contribution to the advancement of science. This is the objective of the doctoral thesis. The student must demonstrate, however, the ability to use the education received in order to address a problem in a scientific manner, related to the courses studied during the academic programme. It shall be the responsibility of the Internship Supervisor to work with the student to develop a schedule of tasks to be performed and to follow the elaboration of the topic. As a rule, the Master thesis shall be structured as a scientific article.

The Master thesis shall be written in English with the following components:

- The Master thesis comprises maximum 30 pages, including tables and figures, excluding title page, summary and references.
- A **title page** listing the following: title, author, professional site, name of the Internship Supervisor, name of the Academic Supervisor, date of defence, academic year and the statement: “Master thesis submitted in completion of the Joint Master Degree Leading International Vaccinology Education”
- A **summary** of maximum 250 words in English contains the essential details regarding objective, materials and methods, results and conclusions.
- The **introduction** includes a positioning of the scientific problem and a clear statement of the research question.
- The **material and method** chapter comprises a description of the methods, including a list of equipment, materials, animals, cell lines or other resources used.
- The **result** chapter describes the student’s own observations and findings.
- The **discussion** should not re-iterate the observations; it compares them with the background of the international literature.
- The **literature references** are arranged at the end of the text, conforming to the following formatting requirements (according to the journal *Cell*):

Journal article: Sondheimer, N., and Lindquist, S. (2000). Rnq1: an epigenetic modifier of protein functions in yeast. *Mol. Cell* 5, 163–172.

Article from a book: King, S.M. (2003). Dynein motors: Structure, mechanochemistry and regulation. In *Molecular Motors*, M. Schliwa, ed. (Weinheim, Germany: Wiley-VCH Verlag GmbH), pp. 45–78.

Book: Cowan, W.M., Jessell, T.M., and Zipursky, S.L. (1997). *Molecular and Cellular Approaches to Neural Development* (New York: Oxford University Press).

Journal titles are abbreviated according to *Chemical Abstracts* or *Index Medicus*. In-text references are cited by indicating in brackets the first author, followed by the date. For example: (Coppens et al., 1998) or by number (1).

- List of **abbreviations** used is placed at the beginning of the text. Common abbreviations for important biochemical substances (e.g. ATP, NADH, DNA and amino acids in proteins) should not be explained. The names of enzymes are usually not abbreviated, except for those substrates that are customarily abbreviated. For example: ATPase, RNase. The trivial and systematic names shall be those recommended by international Gene Nomenclature Committee such as HUGO (<http://www.genenames.org/>).

### **Layout of the text:**

- The text is produced in A4 format with 2.5 cm margins, single-spaced. The font may be chosen from the following: Times New Roman (12 point), Verdana (10 point) or Calibri (11 point).
- Tables or figures are inserted into the text, inasmuch as they are directly related to or clarify the text. Each table and figure must be accompanied by a number, title and legend. Text accompanying tables and figures should appear in the same font, but can be one size smaller.
- The reference number shall not exceed 50.

## **Defence**

### **Objectives**

The objectives of the defence are as follows:

- The student creates a PowerPoint show with current academic standards.
- The student presents and defends the professional work conducted during the Master internship in a clear and comprehensible manner, respecting allowed time.

### **Format of the Master thesis defence**

The student shall defend the Master thesis through a public oral defence. This must include a PowerPoint presentation of **no more than 15 minutes**, after which questions can be raised, primarily by the jury and by other audience members, as time allows with **no more than 15 minutes questioning**.

The PowerPoint presentation should be submitted electronically no later than two working days prior to the defence to the LIVE secretariat.

### **Confidentiality**

As a rule, the defence shall be public and accessible to all interested parties. Exceptions may be made for students completing their dissertation research in a research site in which strict confidentiality must be observed with regard to the results (e.g. in the context of a patent application). Only in this case shall the defence be closed to the public, and only in the presence of the jury members, all of whom must also follow a confidentiality agreement. The request for such a 'closed' defence must be submitted to the secretariat by the student, and with approval/explanation of the Internship Supervisor, no later than June 7. Such closed defences shall be allowed only in exceptional cases. The fact that unpublished data are to be presented is not sufficient reason to organize a closed defence.



## ***EVALUATION FORM AND SHEETS PROVIDED***

List of the documents:

- The internship installation sheet
- Professional work Evaluation form
- Bibliography report Evaluation form & criteria
- Master thesis report Evaluation form & criteria
- Master defence Evaluation form



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Antwerpen



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JEAN MONNET  
SAINT-ÉTIENNE



Université Claude Bernard  
Lyon 1

## 2016-2018 INTERNSHIP INSTALLATION SHEET

The student must fill out and send this document by email to [claire.douet@univ-lyon1.fr](mailto:claire.douet@univ-lyon1.fr) and his/her Academic Supervisor with the following title: 2018\_ internship installation sheet\_ YOURNAME.  
**Deadline: February 15**

Student Name:

Email:

Address:

Phone:

Internship address:

Legal Representative, name:

Department, Service, Laboratory:

Internship Supervisor (IS) Name:

Grade:

Email:

Date and signature of the IS:

Academic Supervisor Name:

### KEYWORDS: tick words defining your topic

<input type="checkbox"/> Immunology	<input type="checkbox"/> Immunopathology	<input type="checkbox"/> Oncology
<input type="checkbox"/> Molecular Biology	<input type="checkbox"/> Biochemistry	<input type="checkbox"/> Bioinformatics
<input type="checkbox"/> Microbiology	<input type="checkbox"/> Virology	<input type="checkbox"/> Host-pathogen interactions
<input type="checkbox"/> Vaccinology	<input type="checkbox"/> Vaccine formulation	<input type="checkbox"/> Vaccine manufacturing
<input type="checkbox"/> Adjuvants	<input type="checkbox"/> Quality control process	<input type="checkbox"/> Immunomonitoring
<input type="checkbox"/> Epidemiology	<input type="checkbox"/> Infectiology	<input type="checkbox"/> Diagnosis
<input type="checkbox"/> Preclinical trial	<input type="checkbox"/> Clinical trial	<input type="checkbox"/> Public health
<input type="checkbox"/> Vaccine advertisement	<input type="checkbox"/> Other (specify):	

**Title of the research project:**



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SAINT-ETIENNE



Université Claude Bernard  
Lyon 1

## 2016-2018 BIBLIOGRAPHY REPORT EVALUATION FORM

The student must attach this evaluation form to his/her Bibliography report and send them in one PDF by email to [claire.douet@univ-lyon1.fr](mailto:claire.douet@univ-lyon1.fr) and to his/her Academic Supervisor, with the following title: 2018\_ Bibliography report\_ YOURNAME. Submission deadline: March 15.

Evaluation deadline: June 15

Student Name:

Academic Supervisor Name:

Reviewer Name:

Criteria	<10 fail mark	10- 12 pass	13-14 honors	15-16 high honors	17-18 highest honors	19-20 highest honors +
<b>1. Critical scientific approach (70 %)</b>						
a. Is the topic situated well within the broader scientific context?						
b. Is relevant, original and recent research cited and discussed critically?						
c. Is specific vocabulary clearly defined and appropriately used?						
d. Formulation of the concepts and questioning						
e. Does the student adopt a critical analysis of the applied methodologies?						
f. Does the student adopt a critical analysis of the published conclusion?						
g. Are relevant open questions proposed for the next future?						
<b>2. Structure of the final document (30 %)</b>						
h. Is there a clear and logical structure?						
i. Linguistic usage						
j. Quality of the figures, legends and display of references (and footnotes if applicable)						

Thank you kindly comment on the report below:

Date:

Reviewer signature:

## Bibliography report evaluation criteria

	Critical scientific approach		Structure of the final document
	Introduction, concepts, terms	Results reported, critical analysis of methods and conclusions, open questions	
<b>19-20 highest honours +</b>	<p>a. Exceptionally good situation of the subject within the broader scientific context</p> <p>b. The cited research is relevant, original and recent; the literature is critically interpreted and processed by the student</p> <p>c. The vocabulary used demonstrates exceptional insight into the topic, the introduction is structured from an original but very functional perspective</p> <p>d. The concepts and questioning are formulated in a very clear manner and are challenging but feasible within the time frame of the study</p>	<p>e. The methods reported are very clearly defined; the relevance of the applied methods for achieving the objectives is clearly analysed</p> <p>f. Conclusions are very clearly reported and limitations are very clearly analysed</p> <p>g. It is very clear that open questions for the future were sought, and the selection is highly relevant</p>	<p>h. Exceptionally smooth and pleurably readable text, logical and coherent structure</p> <p>i. Perfect linguistic usage</p> <p>j. Perfect use of references and perfect settings of figures and their legends</p>
<b>17-18 highest honours</b>	<p>a. Outstanding situation of the subject within the broader scientific context</p> <p>b. The cited research is relevant and recent; most of the cited literature is critically interpreted and processed by the student</p> <p>c. The vocabulary used demonstrates outstanding insight into the topic</p> <p>d. The concepts and questioning are clearly formulated and feasible within the time frame of the study</p>	<p>e. The methods reported are clearly defined; the relevance of the applied methods for achieving the objectives is analysed</p> <p>f. Conclusions are clearly reported and limitations are clearly analysed</p> <p>g. It is clear that open questions for the future were sought, and their selection are largely relevant</p>	<p>h. Smoothly readable text with a logical and coherent structure</p> <p>i. Very good linguistic usage</p> <p>j. Very good use of references, very good settings of figures and their legends</p>
<b>15-16- high honours</b>	<p>a. Very good situation of the subject within the broader scientific context</p> <p>b. The cited research is relevant and recent; a portion of the cited literature is critically interpreted and processed by the student</p> <p>c. The vocabulary used demonstrates very good insight into the topic</p> <p>d. The concepts and questioning are clearly defined</p>	<p>e. The methods are reported</p> <p>f. Conclusions are reported and limitations are analysed to a lesser extend</p> <p>g. Open questions for the future were sought, and most of them are relevant</p>	<p>h. Easily readable text, logically structured</p> <p>i. Good linguistic usage</p> <p>j. Good use of references, good settings of figures and their legends</p>
<b>13-14 honours</b>	<p>a. The subject is well situated within the broader scientific context</p> <p>b. The cited research is largely relevant; the literature is critically interpreted by the student to a limited extent</p> <p>c. The vocabulary used demonstrates good insight into the topic</p> <p>d. The concepts and questioning are formulated</p>	<p>e. The methods used are present but only briefly defined</p> <p>f. Conclusions are reported but limitations are not analysed</p> <p>g. Open questions for the future are only briefly mentioned. Most of them are relevant</p>	<p>h. Easily readable text with a largely logical structure</p> <p>i. Occasional grammatical errors</p> <p>j. Good use of references but some errors or off-topic in figures or their legends</p>
<b>10-12 pass</b>	<p>a. The subject is insufficiently situated within the broader scientific context</p> <p>b. The cited research is not completely relevant or recent; the literature is not sufficiently interpreted by the student</p> <p>c. The vocabulary used demonstrates limited insight into the topic</p> <p>d. The concepts and questioning are unclear/incomplete</p>	<p>e. The applied methods are present but reported with some minor errors</p> <p>f. Conclusions are not sufficiently reported</p> <p>g. Open questions for the future are only briefly mentioned. Some of are relevant</p>	<p>h. Text is acceptable, but not easily readable and has no clear structure</p> <p>i. Multiple grammatical errors</p> <p>j. Limited use of references and some errors or off-topic in figures or their legends</p>
<b>&lt;10 fail mark</b>	<p>a. The subject is barely, not or incorrectly positioned within the broader scientific context.</p> <p>b. The cited research is nearly irrelevant; the literature is barely interpreted by the student at all</p> <p>c. The vocabulary used demonstrates very limited insight into the topic</p> <p>d. The concepts and questioning are barely stated or not stated correctly</p>	<p>e. The applied methods are not reported correctly or are not present</p> <p>f. Conclusions are barely stated or incorrectly stated</p> <p>g. Open questions for the future are not mentioned or inappropriate to the topic</p>	<p>h. Very unclear text</p> <p>i. Frequent grammatical errors</p> <p>j. Incorrect use of references and multiple errors or off-topic in figures or their legends</p>



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Université Claude Bernard  
Lyon 1

## 2016-2018 MASTER THESIS EVALUATION FORM

The student must attach this evaluation form to his/her Master Thesis and send them in one PDF by email to [claire.douet@univ-lyon1.fr](mailto:claire.douet@univ-lyon1.fr) and to his/her Academic Advisor, with the following title: **2018\_ Master Thesis\_ YOURNAME**. **Submission deadline: May 31.**  
**Evaluation deadline: June 15**

Student Name:
Academic Supervisor Name:
Reviewer Name:

Criteria	<10 fail mark	10- 12 pass	13-14 honors	15-16 high honors	17-18 highest honors	19-20 highest honors +
<b>1. Critical scientific approach (40 %)</b>						
a. Is the topic situated within the broader scientific context?						
b. Is relevant, original and recent research cited and discussed critically?						
c. Insight into the topic						
d. Formulation of the objectives						
e. Definition of the applied methodology						
f. Does the student adopt a critical view of the applied methodology?						
<b>2. Results (40 %)</b>						
g. Are the results processed and analysed in a correct and critical manner?						
h. Are the results presented clearly?						
i. Are the results interpreted within a broader context?						
j. Structure and readability of the discussion						
k. Are the results processed and analysed in a correct and critical manner?						
<b>3. Structure of the final document (20 %)</b>						
l. Is there a clear and logical structure, with coherence between the various components?						
m. Linguistic usage						
n. Quality of tables/figures and graphs						
o. Quality of the summary						
p. Display of references and footnotes						

Thank you kindly comment on the report below:

Date:

Reviewer signature:

## Master thesis evaluation criteria

	1. Critical scientific approach		2. Results and discussion	3. Structure of the final document
	Introduction and objectives	Materials and methods		
<b>19-20 highest honours +</b>	<p>a. Exceptionally good positioning of the topic within the broader scientific context; the literature is critically interpreted and processed by the student</p> <p>b. The literature cited is relevant, original and recent</p> <p>c. The structure of the introduction demonstrates exceptional insight into the topic, the introduction is structured from an original but very functional perspective</p> <p>d. The objectives are formulated in a very clear manner and are challenging but feasible within the time frame of the study</p>	<p>e. The applied methods are exceptionally well defined</p> <p>f. The relevance of the applied methods for achieving the objectives is demonstrated clearly; limitations of the methods are stated exceptionally well</p>	<p>g. The results obtained are processed exceptionally well and analysed critically, and the analysis is of an exceptionally high level</p> <p>h. The results are presented in an exceptionally clear and logical manner, and only the relevant results are displayed</p> <p>i. The discussion places the obtained results within a broader scientific context and shows exceptional insight into the background of the research</p> <p>j. The discussion is pleasant to read, comprehensive, yet 'to the point'</p>	<p>k. Exceptionally smooth and pleasurable readable text, logical and coherent structure</p> <p>l. Perfect linguistic usage</p> <p>m. Tables, figures and graphs of exceptional quality and perfectly integrated into the text</p> <p>n. Perfect use of references</p> <p>o. High-quality summary that very clearly reflects the structure and conclusions of the study</p>
<b>17-18 highest honours</b>	<p>a. Outstanding positioning of the topic within the broader scientific context, most of the cited literature is critically interpreted and processed by the student</p> <p>b. The cited research is relevant and recent</p> <p>c. The structure of the introduction demonstrates outstanding insight into the topic</p> <p>d. The objectives are clearly formulated and feasible within the time frame of the study</p>	<p>e. The applied methods are very clearly defined</p> <p>f. The relevance of the applied methods for achieving the objectives is demonstrated; limitations of the methods are stated very clearly</p>	<p>g. The results obtained are processed in an outstanding manner and analysed critically, and the analysis is of an outstanding level</p> <p>h. The results are presented clearly and logically, and only the relevant results are displayed</p> <p>i. The discussion places the obtained results within a broader scientific context and shows good insight into the background of the research</p> <p>j. The discussion is pleasant to read and comprehensive</p>	<p>k. Smoothly readable text with a logical and coherent structure</p> <p>l. Very good linguistic usage</p> <p>m. Tables, figures and graphs of very good quality and very well integrated into the text</p> <p>n. Very good use of references</p> <p>o. High-quality summary that clearly reflects the structure and conclusions of the study</p>
<b>15-16-high honours</b>	<p>a. Very good positioning of the topic within the broader scientific context; a portion of the cited literature is critically interpreted and processed by the student</p> <p>b. The cited research is relevant</p> <p>c. The structure of the introduction demonstrates very good insight into the topic</p> <p>d. The objectives are clearly defined</p>	<p>e. The applied methods are clearly defined</p> <p>f. The limitations of the method are discussed clearly to a certain extent</p>	<p>g. The results obtained are processed and analysed very well</p> <p>h. The results are presented clearly, but some of the results presented are not relevant</p> <p>i. The discussion demonstrates insight into the background of the research</p> <p>j. The discussion is pleasant to read</p>	<p>k. Easily readable text, logically structured</p> <p>l. Good linguistic usage</p> <p>m. Tables, figures and graphs of good quality and well integrated into the text</p> <p>n. Good use of references</p> <p>o. Good summary</p>
<b>13-14 honours</b>	<p>a. The topic is well situated within the broader scientific context, and the literature is interpreted critically to a limited extent by the student</p> <p>b. The cited research is largely relevant</p> <p>c. The structure of the introduction demonstrates good insight into the topic</p> <p>d. The objectives are formulated</p>	<p>e. The applied methods are present and defined to a limited extent</p> <p>f. The limitations of the method are discussed to a minimal extent</p>	<p>g. The results obtained are processed and analysed well</p> <p>h. The results are presented clearly enough, but not all of the presented results are relevant</p> <p>i. The discussion demonstrates limited insight into the background of the research</p> <p>j. The discussion is pleasant to read, but lacks some essential points or is not always clear</p>	<p>k. Easily readable text with a largely logical structure</p> <p>l. Occasional grammatical errors</p> <p>m. Tables, figures and graphs can be clearer and better integrated (more info ...)</p> <p>n. Good use of references</p> <p>o. Solid summary</p>
<b>10-12 pass</b>	<p>a. The subject is situated within the broader scientific context to a limited extent; the literature is barely interpreted by the student</p> <p>b. The cited research is not entirely relevant or recent</p> <p>c. The structure of the introduction demonstrates limited insight into the topic</p> <p>d. The objectives are unclear/incomplete</p>	<p>e. The applied methods are present but not clearly defined</p> <p>f. The limitations of the method are not discussed</p>	<p>g. The results obtained are insufficiently processed and analysed</p> <p>h. The results are presented incorrectly in part</p> <p>i. The discussion demonstrates very limited insight into the background of the research</p> <p>j. The discussion is difficult to read and misses essential points or is not clear</p>	<p>k. Text is acceptable, but not easily readable and has no clear structure</p> <p>l. Multiple grammatical errors</p> <p>m. Tables, figures and graphs can be clearer and are not well integrated into the text</p> <p>n. Limited use of references</p> <p>o. Summary does not accurately reflect the structure and conclusions of the research</p>
<b>&lt;10 fail mark</b>	<p>a. The topic is incorrectly situated within the broader scientific context; the literature is not interpreted by the student</p> <p>b. The cited research is not relevant</p> <p>c. The structure of the introduction demonstrates very limited insight into the topic</p> <p>d. The objectives are not reflected accurately</p>	<p>e. The applied methods are not presented correctly or they are missing</p> <p>f. The limitations of the method are discussed incorrectly</p>	<p>g. The found data are not processed and analysed, or they are processed and analysed incorrectly</p> <p>h. The results are presented incorrectly</p> <p>i. The discussion demonstrates incorrect insight into the background of the research</p> <p>j. The discussion is very difficult to read and misses essential points or is not clear</p>	<p>k. Very unclear text</p> <p>l. Frequent grammatical errors</p> <p>m. Tables and figures and graphs are unclear or incorrect</p> <p>n. Incorrect use of references</p> <p>o. Summary is unclear or absent</p>

## 2016-2018 PROFESSIONAL WORK EVALUATION FORM

The student must timely provide this evaluation form to his/her Internship Supervisor. The Internship Supervisor will fill out and send it by email to [claire.douet@univ-lyon1.fr](mailto:claire.douet@univ-lyon1.fr)

**Evaluation deadline: June 20**

Student Name:

Internship Supervisor Name:

Criteria	<10 fail mark	10-12 pass	13-14 honors	15-16 high honors	17-18 highest honors	19-20 highest honors +
<b>1. Practice (20 %)</b>						
a. Quality in protocol preparation						
b. Precision in the execution of the experiments						
c. Writing laboratory notebooks						
d. Computer use						
e. Learning new methods quickly						
f. knowledge of how devices work						
<b>2. Laboratory life (20 %)</b>						
g. Apply Good Laboratory Practice						
h. Communication with researchers and students						
i. Questioning in discussions and seminars						
j. Initiatives in contacts outside the laboratory						
<b>3. Aptitude for research (60 %)</b>						
k. General knowledge in biology						
l. Precision and critical reading of papers						
m. Classify and prioritise information						
n. Level of critical analysis of the results						
o. Fluency in writing						
p. Tenacity						
q. Quality and originality of the results obtained						
r. Display of references and footnotes						
s. Ability to pursue doctoral studies						

Thank you kindly comment on the behaviour of the student in the workspace:

Date:

Internship Supervisor Signature:



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## 2016-2018 MASTER DEFENCE EVALUATION FORM

The jury will fill out this evaluation form and send it by email to [claire.douet@univ-lyon1.fr](mailto:claire.douet@univ-lyon1.fr)  
**Evaluation deadline: June 15**

Student Name:  
Jury Member Names:

Criteria	<10 fail mark	10- 12 pass	13-14 honors	15-16 high honors	17-18 highest honors	19-20 highest honors +
<b>1. Presentation (50 %)</b>						
a. Structure of the presentation & time control						
b. Knowledge: quality & quantities						
c. Quality of the slides						
d. Linguistic usage						
e. Interactive behaviour						
f. Structure of the presentation & time control						
<b>2. Questions (50 %)</b>						
g. Accuracy of the response						
h. Correctness of the answer						
i. Critical point of view						
j. Linguistic usage						
k. Dynamic behaviour						

Thank you kindly comment below:

Date:

Jury Member signatures: