Molecular and Digital Pathology training course

14-16 April 2026

Remote and/or Oniris, Veterinary School of Nantes, France

Organized by

SFPT & Oniris ÉCOLE NATIONALE VÉTÉRINAIRE, AGROALIMENTAIRE ET DE L'ALIMENTATION

In partnership with

European Society of Toxicologic Pathology estp

Course exclusively held in English.

The theoretical part of the program is also accessible via e-learning, while interactive workshops will only be conducted in person.

Maximum number of participants for onsite sessions: 40

Introduction and Learning Outcomes

MADPATH is a 3-day training course initially designed for veterinary pathology residents as well as pathologists and researchers who wish to discover, increase their skills and improve their knowledge in molecular and digital pathology techniques. This course has been prepared by the French Society of Toxicologic Pathology, and the Veterinary School of Nantes (Oniris) in partnership with the European Society of Toxicologic Pathology (ESTP) in order to meet the educational needs of the future generation of pathologists and scientists who are more and more involved in these techniques. The courses will be given by experts in the field who will present the state of the art in both complementary fields.

Learning Outcomes

On successful completion of the whole program, participants should be able to demonstrate an understanding / knowledge of the following:

- **Molecular pathology techniques including deep and thoughtful understanding of methods, troubleshooting and applications in immunohistochemistry (IHC), general knowledge on other molecular pathology techniques including in situ hybridization, multiplexing and tissue mass spectrometry,**
- **Digital pathology including foundation of whole slide imaging technology, IT infrastructure and validation strategies, image analysis and use of artificial intelligence.**

The distance learning sessions, identified as 'DL' in the program, will present the key concepts in molecular and digital pathology whereas advanced courses and practical workshops will be available only in presential sessions (identified as 'P' in the program).

Two practical workshops in small groups will be organised to allow interactivity and hands-on activities on the following topics: use of IHC in translational drug development and set up of an image analysis strategy.

A final assessment will allow evaluation of successful learning outcomes for in-person participants.

Day 1: Tuesday 14-April-2026 (morning)

Session 1-1: basics in molecular pathology techniques	
08:15 (P)	**Welcome coffee**
8:45 (P/DL)	**Introduction of participants** **Overview of training course and learning outcomes** **Florence BERNEX,** Coordinator (Associate professor, scientific manager and Investigative Pathologist RHEM & member of SFPT executive committee, France).
09:00 – 10:30 (P/DL)	**Introduction to Immunohistochemistry IHC & immunofluorescence IF** Learning objectives: To provide an understanding/knowledge of general principles of IHC. Key concepts: sample management (FFPE, frozen), antigen retrieval methods, antibodies, revelation/detection systems, automates, reagents, types of slides. **Anne-Laure BAUCHET** (IHC team manager & Translational medicine Lead, Sanofi, France)
10:30	Coffee Break
11:00 – 12:30 (P/DL)	**Other techniques Pot-pourri** Learning objectives: To provide an understanding/knowledge of a panel of other molecular pathology techniques Key concepts: different approaches of multiplexing, tissue mass spectrometry, light sheet microscopy, Duolink, proximity ligation assay, protein degradation **Stéphane LEZMI** (Investigative and Toxicologic Pathologist, Excilone, France)
12:30	Lunch

Day 1: Tuesday 14-April-2026 (afternoon)

Session 1-2: Advanced workshops in molecular pathology techniques

13:30 – 14:30

(P)

IHC troubleshooting

Learning objectives: To provide understanding/knowledge on IHC artefacts, their impact and troubleshooting strategy.
Key concepts: artefact, sample stability, fixation, background blocking, mouse on mouse

Stéphane LEZMI

14:30 – 15:45

(P)

TCR - work in 2 groups

Learning objectives: To provide an understanding/knowledge of key concepts on biomarkers and application to immunohistochemistry (IHC).
Key concepts: definition of the different types of biomarkers (stratification, pharmacodynamic, MOA…), presentation of the various approaches for the validation of biomarkers in IHC, precision, sensitivity, reliability and stability of reagents and sections, TCR,

Anne-Laure BAUCHET & Stéphane LEZMI

15:45 Coffee Break

15:30 – 17:15

(P)

Use of IHC in translational drug development – work in 2 groups

Learning objectives: To provide an understanding/knowledge of on- and off-target evaluation before the first use in human.
Key concepts: discussion about the use of IHC to support drug development from non-clinical to clinical phases. Example for a new therapeutic target.

Anne-Laure BAUCHET & Stéphane LEZMI

17:30 Adjourn

Day 2: Wednesday 15-April-2026 (morning)

Session 2-1: Basics in molecular pathology techniques and digital pathology

09:00 – 10:00 (P/DL)

Techniques for detection of RNAs in tissue sections: technique & applications

Learning objectives: To provide an understanding/knowledge of techniques for detection of RNA *in situ* in tissue sections

Key concepts: including RNA scope, RNA seq/multiplexing by hybridization or antibodies; topographic analysis of the gene expression (up to 800 mRNA on a tissue section) NANOstring (DSP)

Dirk SCHAUDIEN, (Fraunhofer ITEM, Germany)

10:00 Coffee Break

10:30 – 12:00 (P/DL)

What covers digital pathology?

Learning objectives: Provide general understanding/knowledge of a digital pathology system

Key concepts: Foundations of Whole Slide Images (WSI) technology; slide scanners; hardware (including displays and input devices); software; IT infrastructure (including data integrity, life cycle management, storage/archival, databases, cloud, performance of data access); ancillary data (metadata, nomenclature/ontologies, annotations, classifiers, IA/AI results) + key concepts in image analysis and use of artificial intelligence.

Lise BERTRAND (EU Digital Pathology Lead, Charles River, France) **&**

Erio BARALE-THOMAS (Scientific Associate Director, Pathology – Janssen R&D, Belgium)

12:00 Lunch

Day 2: Wednesday 15-April-2026 (afternoon)

Session 2-2: Workshops in Digital pathology

13:00 – 15:00

(P)

How can digital pathology help drug development?

Learning objectives: To provide information on how digital can benefit to drug development

Key concepts: Background information on drug development, nonclinical studies and toxicologic pathology; demonstration of different Image Viewers (case-centric vs. study centric) and their use in discovery and nonclinical toxicity studies, and report writing

Lise BERTRAND & Erio BARALE-THOMAS

15:00 Coffee Break

15:30 – 17:00

(P)

How can AI help drug development?

Learning objectives: Provide an understanding/knowledge of the use of artificial intelligence during drug development.

Key concepts: Tools of artificial intelligence and application to selected use cases. (*e.g.* quality control, abnormality detection, quantification of selected features).

Lise BERTRAND & Erio BARALE-THOMAS

17:30 Adjourn

Day 3: Thursday 16-April-2026 (morning)

Session 3-1: image analysis theory and practical workshop

09:00 – 10:30 (P)

Image analysis, key concepts and tools

Learning objectives: To provide general understanding/knowledge of image analysis.
Key concepts: The most common tools used for both customisation (Fiji/ImageJ, ICY institut Pasteur) and high throughput computational pathology (QuPath, Visiopharm,) will be presented. One will highlight during this session the advantages/disadvantages of each platform and how to choose the right tool for the right analytical context. An overview of reference package/tools used for advanced computational pathology will also be provided.
Avantages inconvénients mécanismes à mettre en place

Lev STIMMER (Investigative Pathologist, Histomics, Institut du Cerveau, France) &
Nelly PIROT (RHEM team manager, IRCM, Inserm, France)

10:30 Coffee Break

11:00 – 12:30 (P)

Image analysis, key concepts and tools, applications (cont'ed)

Learning objectives: To provide practical knowledge on the potential strategies to set up image analysis in your projects

Lev STIMMER & Nelly PIROT

12:30 Lunch

Day 3: Thursday 16-April-2026 (afternoon)

Session 3-2: Image analysis theory and practical workshop

13:30 – 15:30 (P)	**Workshop: set up of an image analysis strategy – work in groups** Learning objectives: To provide practical knowledge on the potential strategies to set up image analysis in your projects. Key concepts: Hands-on practical session to learn how to develop an image analysis solution. Taking into consideration the pre-analytics for image analysis. Practical example using QuPath for tuning and high throughput analysis of large-scale studies (Practical example on a small set of slides). Analysis of IHC results: nuclear marker such as Ki67, membrane marker such as EGFR, cytoplasmic marker such as Casp3c, counts, …. **Lev STIMMER & Nelly PIROT**
15:30	Coffee break
16:00 - 16:30 (P)	Wrap up, Q&A & survey, farewell **Florence BERNEX**
16:30	End of training

Attendance Fees

	Private	Public	Students
Distance learning only (6 h, Sessions 1-1 & 2-1)	250 €	250 €	**a**
Full program (in-person)	650 €	450 €	b

a: registration performed via the toxpath modular program coordinated by ESTP

b: Pre-paid invitation for students of the DESV available on request

Payments of a registration fee covers the cost to attend all courses, educational material, coffee breaks, and all lunches during the course.

Notice that this registration fee does not cover transportation nor accommodation fees.

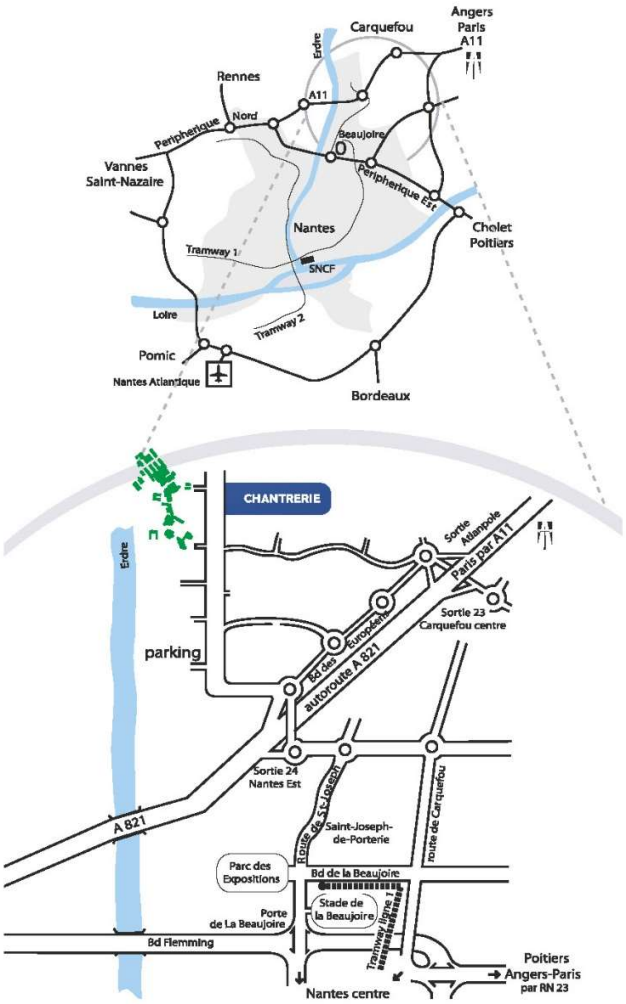
Venue

Oniris, Campus vétérinaire
Site de la Chantrerie
101, route de Gachet
CS 40706
44307 NANTES CEDEX 3 – France - GPS : 47°17'31''N - 1°31'21''O

Careful! Oniris has 2 teaching sites: Veterinary studies take place at the Chantrerie campus. Engineering studies take place at the Géraudière campus.

See the plan for access at the Chantrerie campus.
Choose accommodation ...

- **ViaMichelin**
- **Google Maps**
- **Hotels.com**
- **Booking.com**
- **AirBnB**



Campus of **Chantrerie**

VETERINARY SCHOOL AREA

Reception: +33 (0)2 40 68 77 77

University Veterinary Hospital

Appointments/medical consultations:

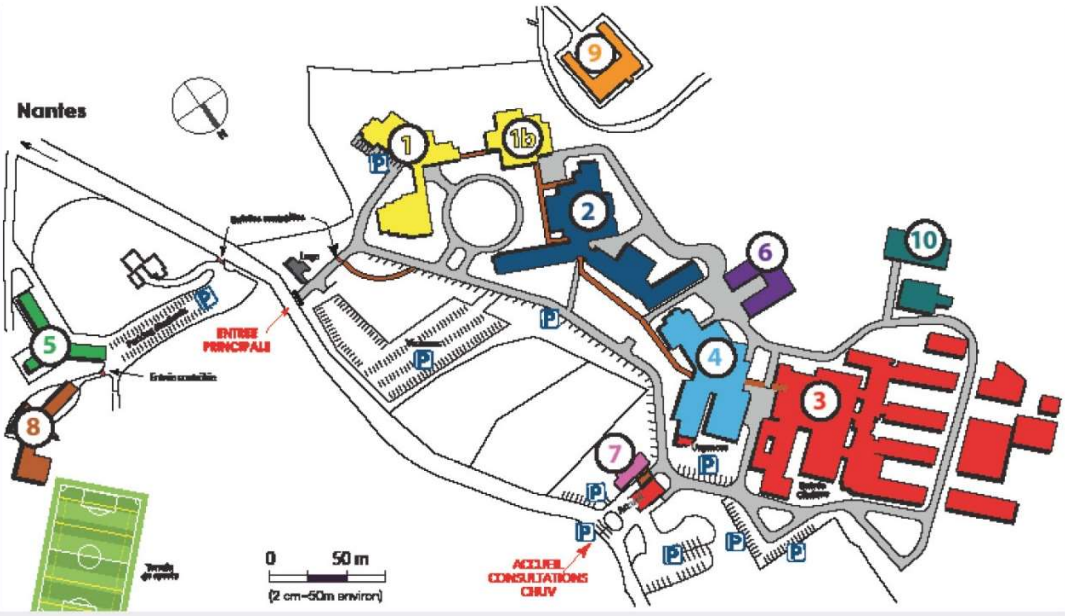
02 40 68 76 22

COME TO ONIRIS-VETERINARY SCHOOL

By car, from 'Paris' direction.
Via A11 highway, exit Number 23. On the roundabout (Bd des Européens), take the second exit right towards 'chemin de la Boisbonnière'. Follow the road until a second roundabout, then turn left on 'route de Gachet' to join the main entrance of the school or turn right on 'route de Gachet' to join the Hospital reception.

By car, from 'Rennes, Vannes' direction, take the way to 'Paris'.
Exit Number 24 (Nantes-Est). On the roundabout, take left on 'Rue Émile Borel'. At the second roundabout, take left on 'Route de Gachet'. On this road, the first entrance on the left is the main entrance of the school. The hospital reception is 500 meters further.

By public transports:
Bus 75 towards 'Charbonneau', bus station 'Ecole Vétérinaire'
Chronobus C6 Chantrerie-Grandes Ecoles - Terminus (then 12 minutes on foot)



Contact and further information

Organiser and responsible for the programme

MADPATH scientific and organizing committee (SFPT):

- Florence Bernex (coordination)
- Erio Barale-Thomas
- Elie Dagher
- Béatrice Gauthier
- Sébastien Laurent
- Stéphane Lezmi

  With collaboration of Jérôme Abadie (Oniris)

  With contribution of Simone Tangermann and Ingo Gerhauser, on behalf of ESTP

Société Française de Pathologie Toxicologique, non-profit organization (J.O. du 22 mars 2003)

- BP 563 27005 Evreux cedex France
- Web : https://toxpathfrance.org/

With sponsorship of the European Society of Toxicologic pathology

Oniris, Continuing education department

Contact only by email administrative assistant Hélène KIRCHE

- Email : helene.kirche@oniris-nantes.fr
- Web : https://connectpro.oniris-nantes.fr **veterinary field section short courses**

Registration link:

- https://connectpro.oniris-nantes.fr/mod/page/view.php?id=7680

Registration deadline: 30 March 2026