ECVP Examination:

How to be better prepared for [*Data analysis* and *Tox path* problems in] the *COMPREHENSIVE* section?

Edouard **REYES-GOMEZ**, Dipl. ECVP
Andrea **CAPPELLERI**, Dipl. ECVP
Francesco **GODIZZI**, Dipl. ECVP

ecvp
European College of Veterinary Pathologists

Disclaimer

- This presentation does not contain any material from previous or future ECVP examinations
- Examples are taken from previous Summer School Mock Exams or were made for illustration and do not necessarily reflect the difficulty of the examination
- Speakers are not involved in the preparation of questions for the 2025 ECVP Examination

Who are we?

Edouard REYES-GOMEZ

- Associate Professor, Alfort (Paris)
- Residency in Alfort **2006-2009**
- Dipl. ECVP, **2010**
- ECVP Examination Committee
  - Member, Exams **2018** to **2023**
  - Chair, Exams **2022** & **2023**
- Local Organizer of the ECVP Examination in Alfort, **2024 and 2025**

Andrea CAPPELLERI

- Post-doc, University of Milan (Lodi)
- Residency in Milan **2019-2022**
- Dipl. ECVP, **2024**
- PhD, University of Milan **2023**

Francesco GODIZZI

- Veterinary pathologist (diagnostic)
- Residency in Milan **2019-2022**
- Dipl. ECVP, **2024**
- PhD, University of Milan **2023**

General informations regarding the examination

ECVP Examination schedule: 5 sections in 3 days

	Monday	Tuesday	Wednesday
Morning	**Histopathology** 20 slides - 4h30	**General Pathology (Gen Path)** 70Q - 4h	**Comprehensive Pathology** 5Q - 4h30
Afternoon	**Gross Pathology** 60 slides - 2h	**Veterinary Pathology (Vet Path)** 35x2 + 35 = 105Q - 4h30	

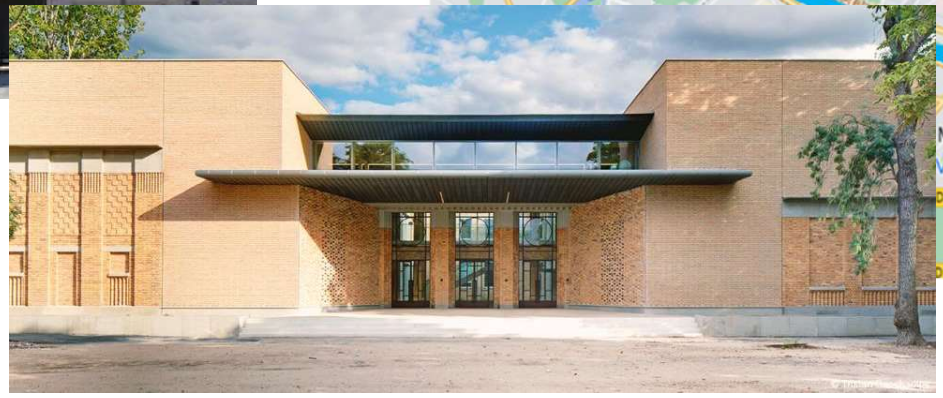
Practical parts

Theoretical parts

Examination 2025:

- **Site**: Alfort (Paris)
- **All sections including COMPREHENSIVE** will be **digital**, using ExamSoft/Examplify
- Possibility to **rent a microscope** (170 euros)


ECOLE VETERINAIRE D'ALFORT




Belgique
Luxembourg
France
Suisse
Monaco
Andorre


Paris
Alfort Vet School
Saint-Ouen-sur-Seine
Aubervilliers
Mairie de Clichy
Levallois-Perret
Cité des sciences et de l'industrie
CENTQUATRE-PARIS
La Villette
Pantin
PARIS 18E ARR.
MONTMARTRE
Parc Monceau
Parc des Buttes-Chaumont
Les Lilas
PARIS 10E ARR.
Arc de Triomphe
Palais Garnier
Auchan BAGNOLET
Musée d'Orsay
Tour Eiffel
Place de la Bastille
Parc André-Citroën
Panthéon
Jardin des Plantes
Les Catacombes de Paris
Saint-Mandé
PARIS 13E ARR.
Montrouge
Vache Noire
Arcueil
Charenton-le-Pont
VAL-DE-MARNE


ECVP Examination 2024
Exam room in Alfort
General Pathology

Read the Timetable

- Timetable is sent before the Examination
- Starting time is not the same from one day to the other!
  - 8h30 vs 9h00
- Candidate have to be in the Exam room BEFORE starting time
  - **Candidates should be in the examination room at the latest 30 min** before the examination starts
  - **Doors are closed 15 min** before the examination starts

ECVP EXAMINATION TIMETABLE 2024

Monday 29th January - Wednesday 31st January 2024
Maisons-Alfort, France

Exam venue: Ecole Nationale Vétérinaire d'Alfort (National Veterinary School of Alfort)
Agora Building
7 avenue du Général de Gaulle, 94700 Maisons-Alfort, FRANCE

Sunday, 28th January:

17:00 – 18:00	Set-up and evaluation of microscopes in the examination room (Agora TD 101-106)

Monday, 29th January:

08:00 – 8:30	Set-up microscopes in the exam room (Agora TD 101-106)
08:30	Registration of candidates and drawing of confidential candidate identification numbers (Agora TD 101-106)
09:00 – 13:30	**Histopathology*, ** ** - (Agora TD 101-106)
13:30 – 15:30	Lunch – candidates own arrangements
15:30 – 17:30	**Gross Pathology** ** - (Agora Amphi 001)

Tuesday, 30th January:

08.30 – 12:30	**General Pathology** ** - (Agora TD 101-106)
12:30 – 14:00	Lunch – candidates own arrangements
14:00 – 15:30	**Veterinary Pathology** ** **(Large)** - (Agora TD 101-106)
15:30 – 17:00	**Veterinary Pathology** ** **(Small)** - (Agora TD 101-106)
17:00 – 17:30	Break
17:30 – 19:00	**Veterinary Pathology** ** **(Minor: Labs, Exotics, Poultry)** - (Agora TD 101-106)

Wednesday, 31st January:

09:00 – 13:30	**Comprehensive Pathology** - (Agora TD 101-106)
13:30	Lunch – candidates own arrangement

*__Histopathology__: No break and time extension. Slides have to be shared between two candidates.
**__Histopathology, Gross Pathology, General & Veterinary Pathology__: Digital exams. You will need to bring your own laptop (with Examplify installed on it), your mouse (with scrolling wheel) and if necessary, a power plug adapter. We strongly advise you to arrive sufficiently in advance to set up your computer. Additional information can be found on the website: https://www.ecvpath.org/digital-exam/

Digital examination: ExamSoft/Examplify

- **ExamSoft** is the **brand** and **portal**
- **Examplify** is the **software** used by candidates to take the exam

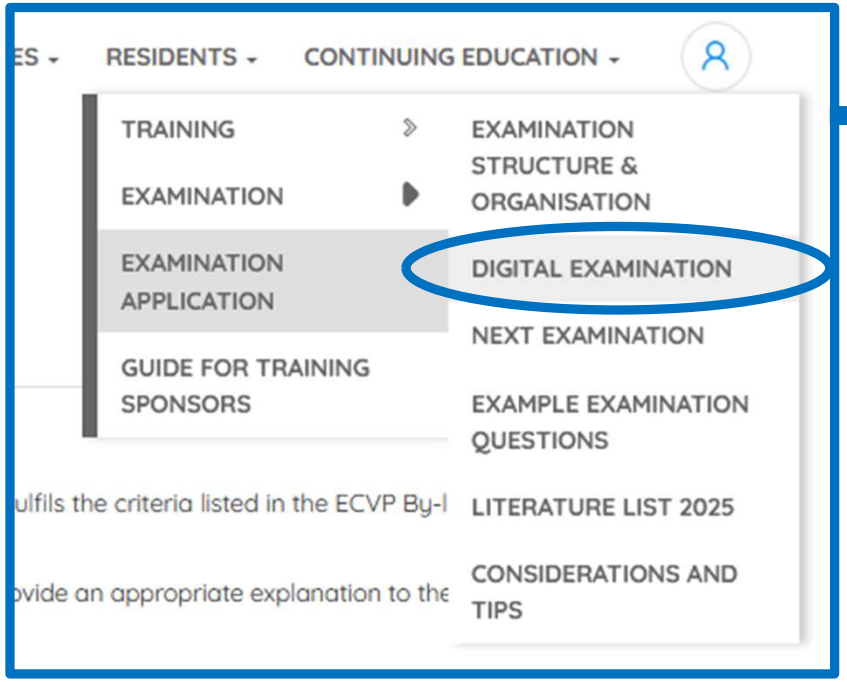
- **Specific training** given to candidates prior to the exam
  - Get familiar with the software
  - Check the compatibility of device

- **HISTO**: only descriptions are digital, glass slides and microscopes still used
- **GROSS**: pictures remained projected on a screen (not on laptops)

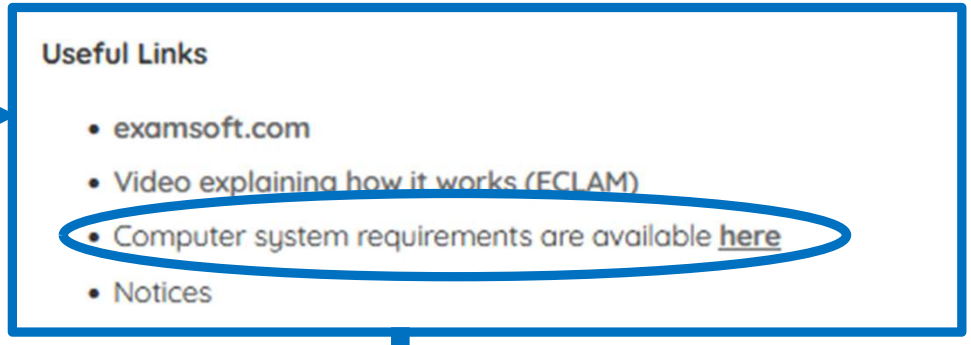
- Do not forget to take **an electric plug adaptator** (if needed) and a **mouse with a scrolling wheel**

- **Excellent feedbacks** from candidates regarding Examplify

Digital examination: check the Minimum System Requirements



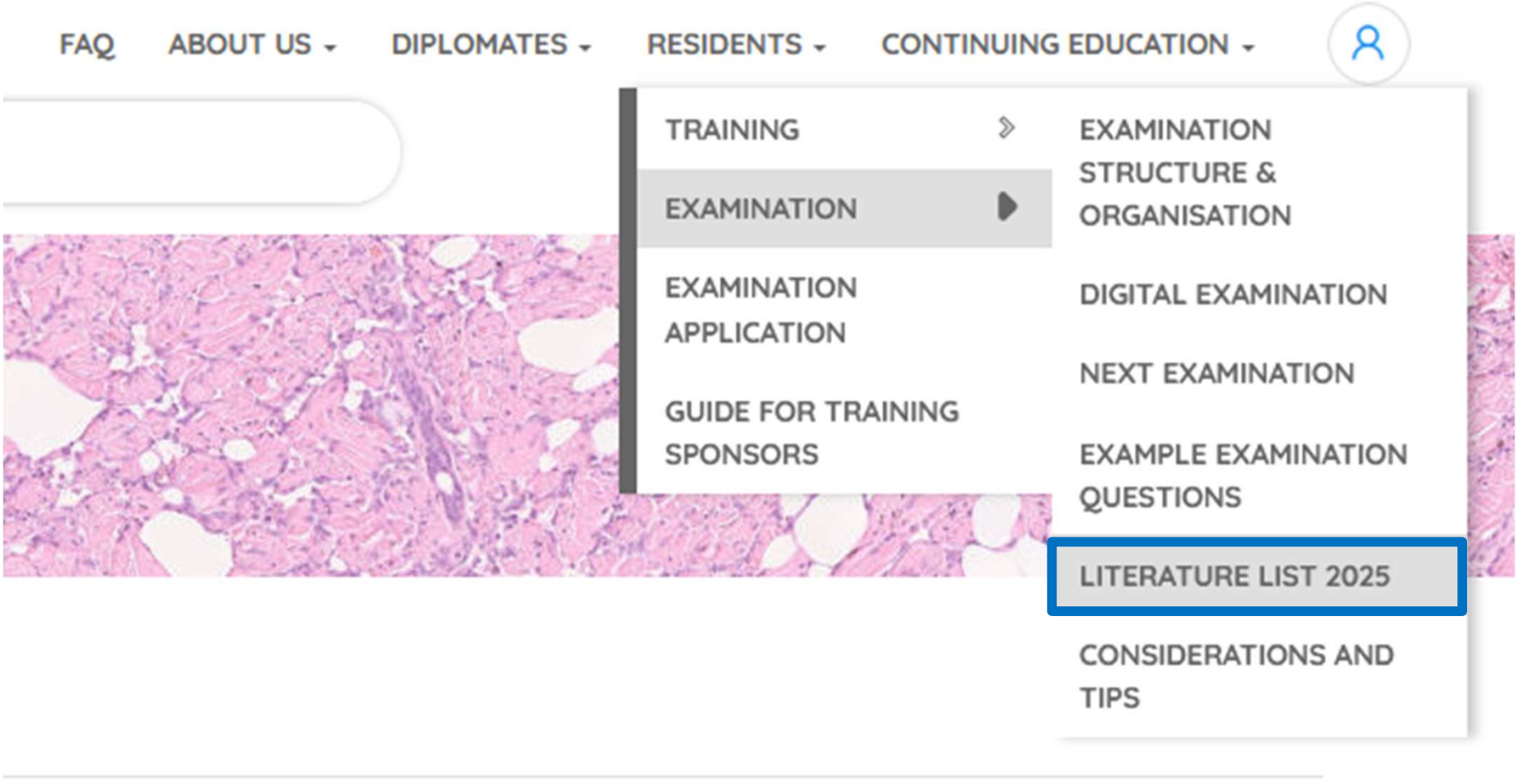
www.ecvpath.org



Comprehensive on ExamSoft/Examplify

- **2025** will be the first year with **« digital » Comprehensive**
- **Answers** will have to be **entered in the software**
- All questions will be in the **same Exam**
- Candidates will be able to **navigate freely** between them
- **Figures, tables and texts** will be **printed** and given to candidates
- Be careful with the **length of your answers**
  - Remember to be precise and concise
  - Do not write unnecessary details: you will lose time and not necessarily gain points

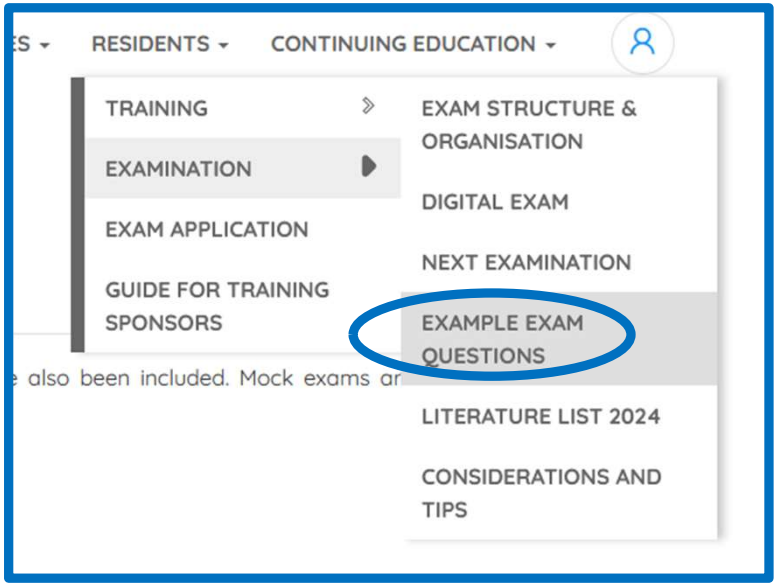
Reading list: check the ECVP website

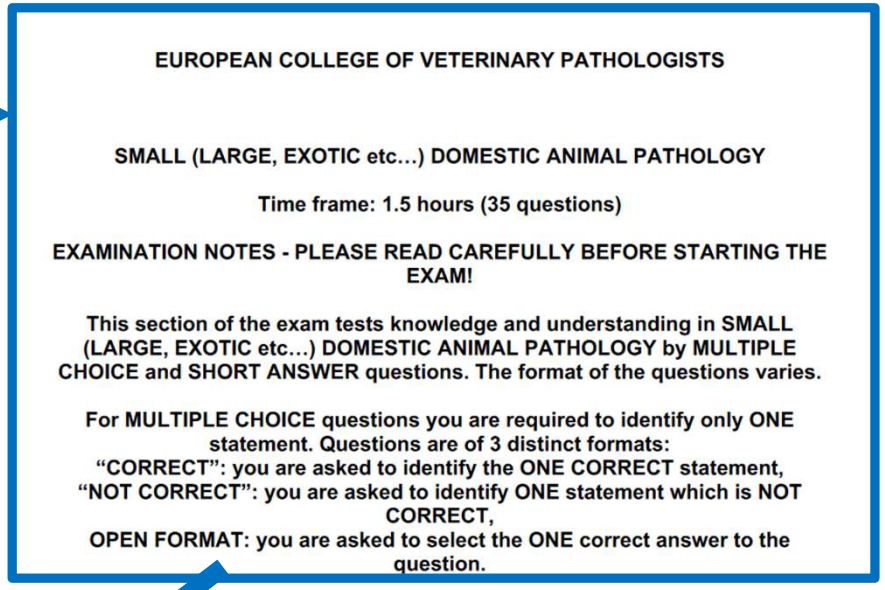


www.ecvpath.org

Useful ressources

Useful ressources on the Website: instructions & example of questions





EUROPEAN COLLEGE OF VETERINARY PATHOLOGISTS

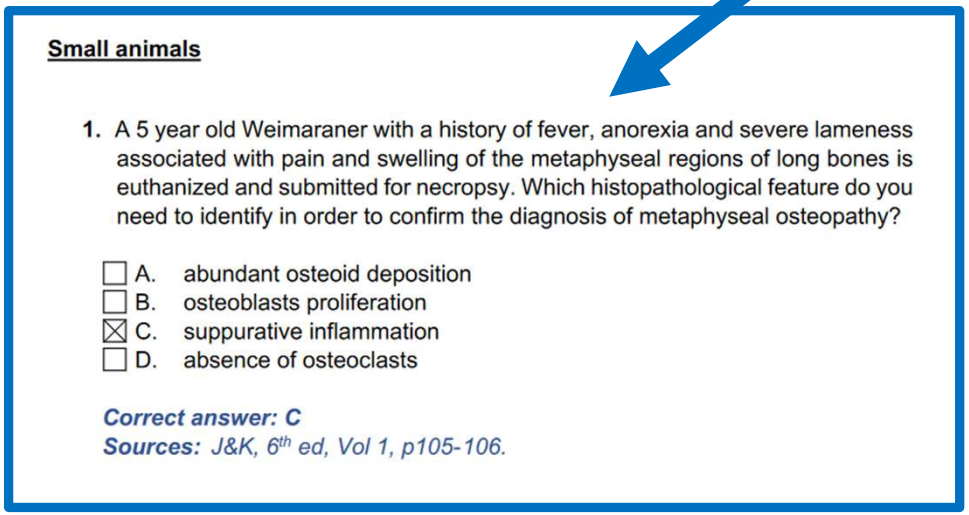
SMALL (LARGE, EXOTIC etc…) DOMESTIC ANIMAL PATHOLOGY

Time frame: 1.5 hours (35 questions)

EXAMINATION NOTES - PLEASE READ CAREFULLY BEFORE STARTING THE EXAM!

This section of the exam tests knowledge and understanding in SMALL (LARGE, EXOTIC etc…) DOMESTIC ANIMAL PATHOLOGY by MULTIPLE CHOICE and SHORT ANSWER questions. The format of the questions varies.

For MULTIPLE CHOICE questions you are required to identify only ONE statement. Questions are of 3 distinct formats:
"CORRECT": you are asked to identify the ONE CORRECT statement,
"NOT CORRECT": you are asked to identify ONE statement which is NOT CORRECT,
OPEN FORMAT: you are asked to select the ONE correct answer to the question.



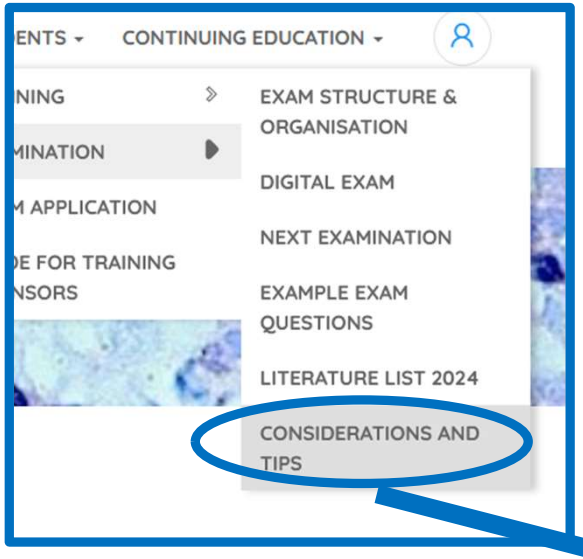
Small animals

1. A 5 year old Weimaraner with a history of fever, anorexia and severe lameness associated with pain and swelling of the metaphyseal regions of long bones is euthanized and submitted for necropsy. Which histopathological feature do you need to identify in order to confirm the diagnosis of metaphyseal osteopathy?

☐ A. abundant osteoid deposition
☐ B. osteoblasts proliferation
☒ C. suppurative inflammation
☐ D. absence of osteoclasts

Correct answer: C
Sources: *J&K, 6th ed, Vol 1, p105-106.*

Useful ressources on the Website: considerations and tips



Considerations and Tips

In General

The following points are meant to help candidates to become better prepared for the questions and getting some ideas about what is needed in order to pass the exam. Be prepared:

- If you are below the 50% rate you most likely sat the exam too early.
- The basis for your training should be at least 3 years of vigorous every-day training and studying, possibly accompanied by specific courses such as the ECVP summer school.
- Make all efforts to ensure your writing is legible. Any doubt in the clarity of the writing and subsequent understanding will result in no points.
- Do not use abbreviations, especially for morphological diagnosis (Transmissible Venereal Tumor, not TVT), etiology (Canine Parvovirus Type 2, not CPV-2 ; *Mycobacterium bovis*, not *bovis*), names of diseases (Feline Infectious Peritonitis, not FIP) ; otherwise you will not get points. Abbreviations should be restricted to the common scientific vocabulary (DNA, RNA, PCR) and genes.
- If you are asked **two** causes, only give **two**, not three.

Read the question carefully and be as precise as possible in your answers and descriptions.

HISTOPATHOLOGY +

GROSS PATHOLOGY +

GENERAL PATHOLOGY

Elements of good training

Elements of Good Training in Anatomic Pathology

L. Munson, L. E. Craig, M. A. Miller, N. D. Kock, R. M. Simpson, M. L. Wellman, L. C. Sharkey, and T. A. Birkebak, for the American College of Veterinary Pathologists Training Program Development Task Force[1]

Veterinary Pathology
47(5) 995-1002

DOI: 10.1177/0300985810377725
http://vet.sagepub.com

Table 6. Sample Study Plan for a 3-Year Anatomic Pathology Training Program[a]

Year 1	Read and summarize (outline, highlight, flash cards, etc) one general pathology textbook: • *Robbins and Cotran* (chapters 1–7) • McGavin and Zachary (section 1) Read and summarize one veterinary pathology textbook: • *Jubb, Kennedy, and Palmer's Pathology of Domestic Animals* • McGavin and Zachary's *Pathologic Basis of Veterinary Disease* (section 2) Read and summarize pathology of disease agent chapters in Jones, Hunt, and King's *Veterinary Pathology* (chapters 8–16) Read and summarize journal articles • File summaries by species, disease, organ system, or general pathology topic • Collect and compile electron micrographs from journal articles Read and summarize Cheville's *Ultrastructural Pathology* • Collect and compile electron micrographs Write weekly histological descriptions of previous Armed Forces Institute of Pathology cases • Read and summarize the write-ups • Practice 10- to 12-minute descriptions • File summaries with journal articles by species, system, etc (as above) Write 10- to 12-minute histological descriptions for current Armed Forces Institute of Pathology cases weekly Review gross images (Noah's Archive, Cornell website, etc) 1 hour weekly Read and summarize Duncan and Prasse's *Clinical Pathology* • Use case studies in the appendix as unknowns
Year 2	Read and summarize • The other general pathology textbook • The other veterinary pathology textbook • Percy and Barthold's *Pathology of Laboratory Animals*

General comments about the COMPREHENSIVE section

Be prepared to a pentathlon…

- COMPREHENSIVE comes after 2 intense days, and tuesday is a loooong day

- Keep some neurons and energy for Wednesday…

	Monday	Tuesday	Wednesday
Morning	Histopathology 20 slides - 4h30	General Pathology (Gen Path) 70Q - 4h	Comprehensive Pathology 5Q - 4h30
Afternoon	Gross Pathology 60 slides - 2h	Veterinary Pathology (Vet Path) 35x2 + 35 = 105Q - 4h30	

Practical parts

Theoretical parts

What to know?

❖ *This section of the examination tests **practical problem solving, data analysis and interpretation skills**, as well as **knowledge of common research techniques** in veterinary pathology. **(From ECVP website)***

❖ This is a **practical** section, not a theoretical one, **BUT**:

- Be familiar with **technics** (general method, goal, limits but no detailed protocols)
- Do not neglect basic knowledge in **General Pathology**
- Skills/knowledge in **Histo, Gross** and **Vet Path** are also be useful for Forensic & clinical case, abstract etc.
- Candidates taking the split format and/or retaking *Comprehensive* should have this in mind

Format and questions in COMPREHENSIVE

- Time = **4.5 hours**
- Total amount of point = **250 pts** (converted to 100%)
- There are **5 questions** (= parts) that are usually
  - *Abstract*
  - *Data analysis*
  - *Toxicological Pathology*
  - *Forensic Case*
  - *Clinical/second opinion case*
- Each question bears the same amount of points, i.e. **50 points**
- **Be careful: the time to be dedicated to each question is not equal!**
  - A suggested schedule is usually given by the Examination committee
- Each question is made of several **subquestions**
- Subquestions are **short answer questions**, **small essays**, occasionally **MCQ**

Be careful with time

Data analysis and Tox Path are usually the questions that require more time to be answered

General (personal) advices

❖ Read the instructions carefully

- Describe
- Summarize
- Interpret
- Formulate a hypothesis
- Etc.

These instructions do not ask for the same answer…

❖ Each time you start a new question (part), read it entirely before answering

- This will give you an overview of the whole problem/story
- This will help you to understand where we want to bring you (or not…)
- This will help you to better identify **what** we ask you and **when**: it should prevent you to answer subquestion *n+1* while in fact answering subquestion *n*

❖ Be careful with time!

Considerations and tips for COMPREHENSIVE

COMPREHENSIVE PATHOLOGY

- Read the questions carefully – are you requested to summarize some results or to interpret the meaning of the results?
- Be concise in your description and analysis.
- When asked to describe and interpret for example survival curves, do not interpret other data you may be presented with.
- Briefly means succinct and Do not waste time to fill the pages beyond the offered lines: the space we provide is mostly sufficient to answer the question.
- [redacted]
- Clearly distinguish between describing results (3 % decrease of survival rate) and interpretation (compound X administration does not alter survival rate after a 28-day study)

Useful links (these links are intended to help you in preparing yourself for the section, but they are not part of the reading list).

Veterinary Pathology, Volume 53, Issue 5 September 2016 Special Focus:

- Veterinary Forensic Pathology - https://journals.sagepub.com/toc/vetb/53/5
- WOAH manual online, Chapter 2.1.2 Biotechnology advances in the diagnosis of infectious diseases - https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-manual-online-access/

www.ecvpath.org

Abstract

- *This is often in the context of a review, for a grant application, a conference participation or a manuscript submission. The abstract usually has a length of 400-500 words and* ***contains errors that need to be identified*** *and* ***corrected****. This subsection requires the application of general and/or special veterinary pathology knowledge.* ***(From ECVP website)***

- You are ask to identify and correct **10 scientific errors** (no less, no more)
  - **ERRORS** are about facts, Gen Path and Vet Path knowledge, methodology, interpretation and conclusions
  - **IDENTIFY:** You should cite or summarize the wrong statement so graders can be sure of what you are referring to. You can indicate line or paragraph.
  - **CORRECT**: You should justify why the statement is wrong and replace by a correct one.
  - Examples:
    - *Line 2: canine distemper is not caused by a DNA virus but by an RNA virus*
    - *Paragraph 8: the results of the statistical test cannot prove a causal link but only an association between…..*

Abstract: do's and don'ts

❖ **DO'S**

- Read the abstract entirely before you start to answer
- Do not forget to justify/correct the errors

❖ **DON'TS**

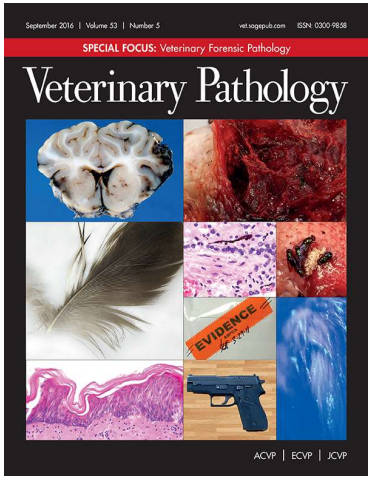
- It is not ask for acceptance or refusal of the abstract
- You might find more than 10 errors: just correct 10! No more!
- Errors are **not** about the format
- Examples of incorrect answers:
  - *"this sentence should be in the introduction"*
  - *"this paragraph is too long"*
  - *"this sentence is unclear"*
  - *"the methods are not developed enough/too detailed"*

Forensic, clinical and second opinion cases

- *This subsection can deal with a forensic case or clinicopathologic investigation. These questions **imitate real situations** in which the diagnostic veterinary pathologist is required to judge a specific situation. Data might include unknown or questionable morphologic diagnosis. Pictures of histologic and/or gross lesions and/or clinical data (including reference values) and/or special stains may be provided. The candidate is not asked to provide a detailed description of the histological changes, but is expected to provide a morphological and/or etiological diagnosis.* ***(From ECVP website)***

- Subquestions usually ask for interpretation of pictures, discussion of the results, additional tests etc.

- For Forensic case, **Special Forensic issue of Vet Path** is a useful ressource



Vet Pathol, 2016, Vol 53, n°5

Forensic, clinical and second opinion cases: do's and dont's

❖ **DO'S**

- Read the question (case) entirely before you start to answer. This will help you to understand the overall problem
- Put yourself in a real life situation. Most questions rely on pathology-related common sense.

❖ **DON'TS**

- Do not loose time trying to make a histological or gross description unless it is clearly asked

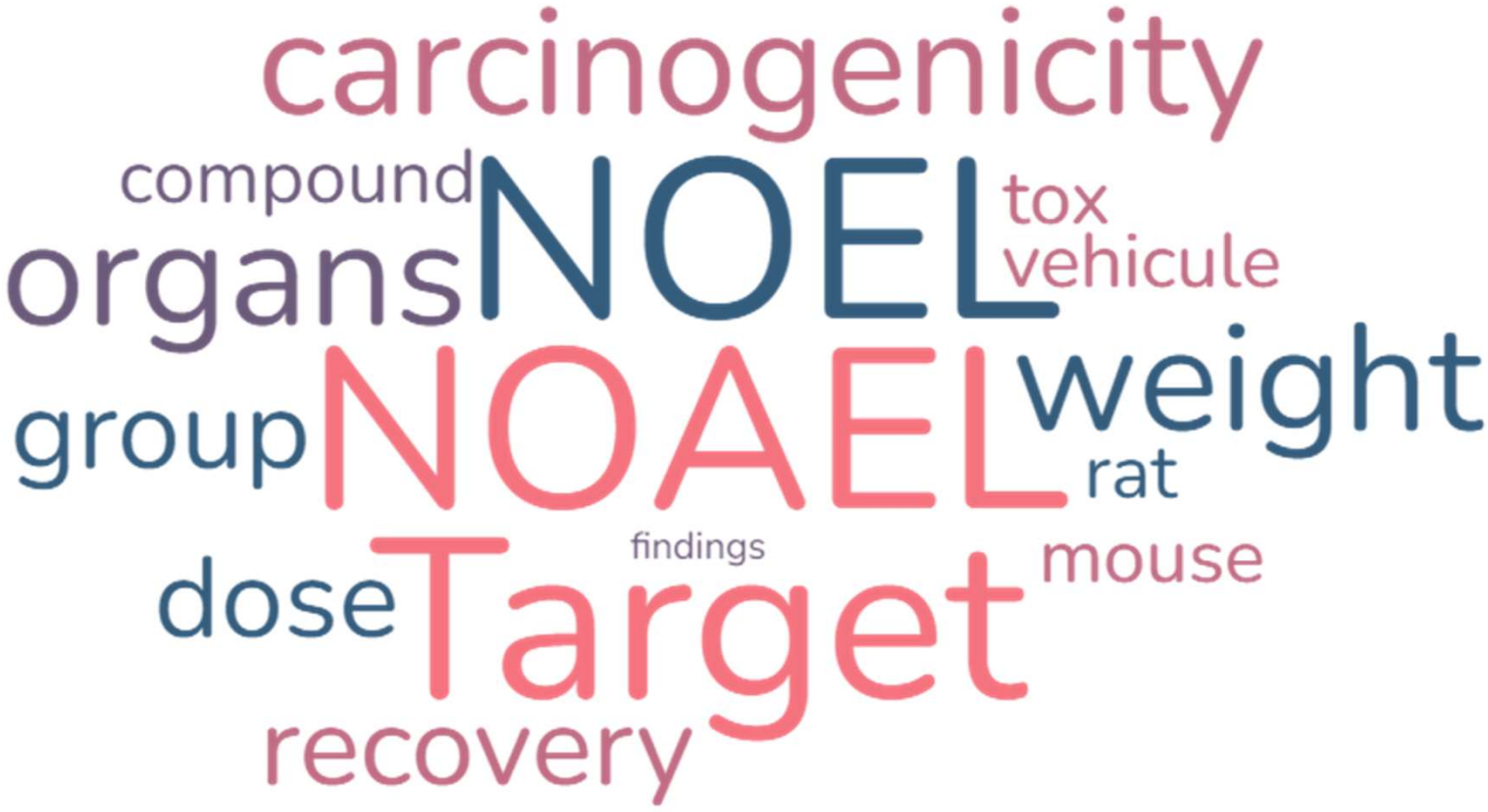
Data analysis

- *This subsection requires basic knowledge on molecular pathology, it is tested in the context of a **scientific study**. Research data are presented in various forms (e.g. graphs, blots) and require description and interpretation. This subsection usually also requires **knowledge about a technique that was applied in the study**. It is therefore expected that the candidates know the basic principles of frequently applied techniques. This includes molecular techniques to analyze DNA, RNA, proteins, epigenetic alterations, genetic modifications and reporter assays. This does not require knowledge about protocols (e.g. the pH of a certain buffer), but tests the basic understanding of techniques used to complement pathology findings. Candidates may also be asked to use the data to express a new hypothesis and suggest further experiments to be carried out. **(From ECVP website)***

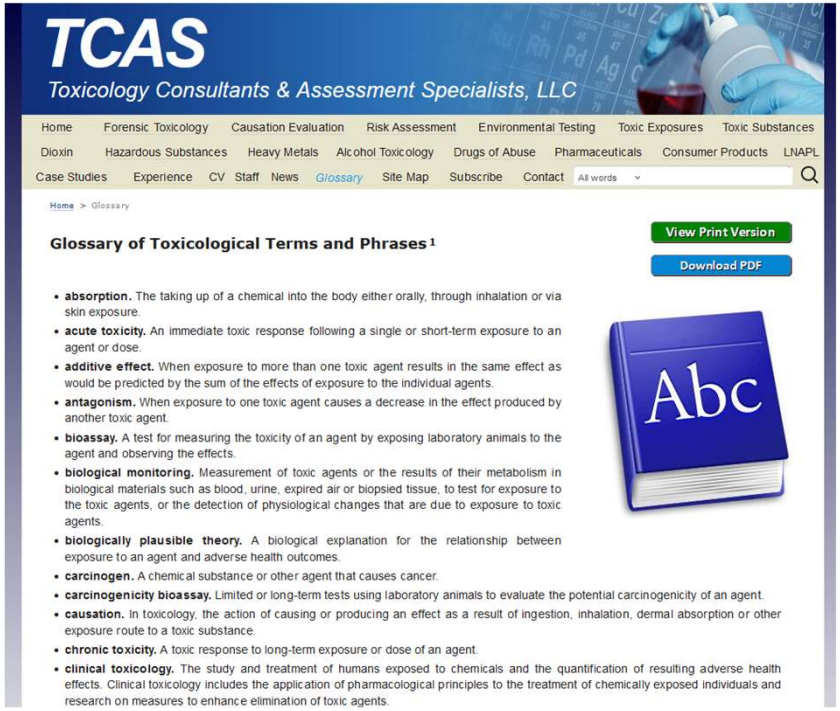
Toxicological pathology

- *For this subsection, a combination of selected gross and/or histology pictures, survival curves, organ weight tables, clinical pathology parameters, macroscopic and/or microscopic incidence tables can be provided and will require description and interpretation.* ***This subsection requires the application of knowledge on clinical and/or anatomic pathology findings in laboratory animals, based on the comparison of treated and untreated groups****. Basic knowledge about the* ***format of toxicologic pathology data*** *and the methodology as well as the* ***vocabulary*** *used in toxicology studies is helpful.* ***Background*** *observations and/or outlier values will have to be differentiated from test article-related findings, and candidates may be asked to draw conclusions or express hypotheses regarding the safety of the test article, the dose-dependency of effects, and putative mechanism of action; they may also be asked to suggest additional refinements to the study protocol..* ***(From ECVP website)***

Be familiar with the terminology in Tox Path



Be familiar with the terminology in Tox Path



https://experttoxicologist.com/tcas-glossary.aspx

https://webapps.ilo.org/static/english/protection/safework/cis/products/safetytm/glossary.htm

GLOSSARY OF TERMS ON CHEMICAL SAFETY

FOR USE IN IPCS PUBLICATIONS

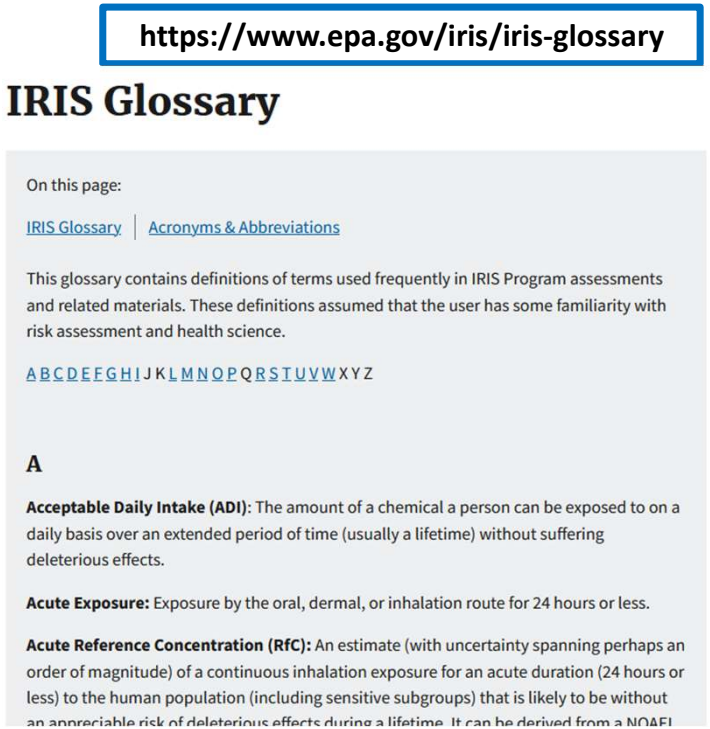
The International Programme on Chemical Safety (IPCS) is a joint venture of the United Nations Environment Programme, the International Labour Organisation, and the World Health Organization. The main objective of the IPCS is to carry out and disseminate evaluations of the effects of chemicals on human health and the quality of the environment. Supporting activities include the development of epidemiological, experimental laboratory, and risk-assessment methods that could produce internationally comparable results, and the development of manpower in the field of toxicology. Other activities carried out by IPCS include the development of know-how for coping with chemical accidents, coordination of laboratory testing and epidemiological studies, and promotion of research on the mechanisms of the biological action of chemicals.

INTRODUCTION

The language of chemical safety is drawn from many sources. These include medicine, toxicology, pharmacology, epidemiology, ecotoxicology and environmental pollution. Its terminology has developed in an unstructured manner with proliferation into multiple terms, some with overlapping, alternative, or even ambiguous meanings. This situation is a source of confusion to both authors and readers of publications on chemical safety and a cause of difficulty in translation into other languages.

To facilitate international communication and comprehension, economy should be exercised in the use of terms and definitions already formulated by various scientific bodies. However, this glossary is not, on the one hand, an exhaustive compilation nor, on the other, a

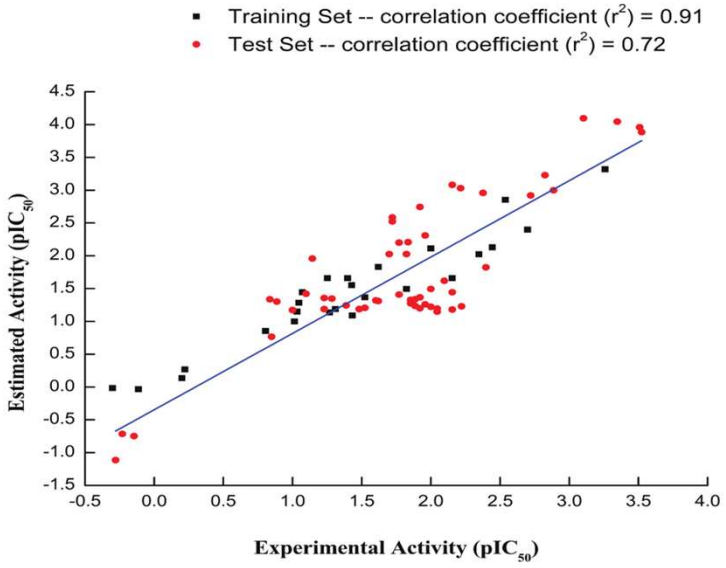
https://www.epa.gov/iris/iris-glossary

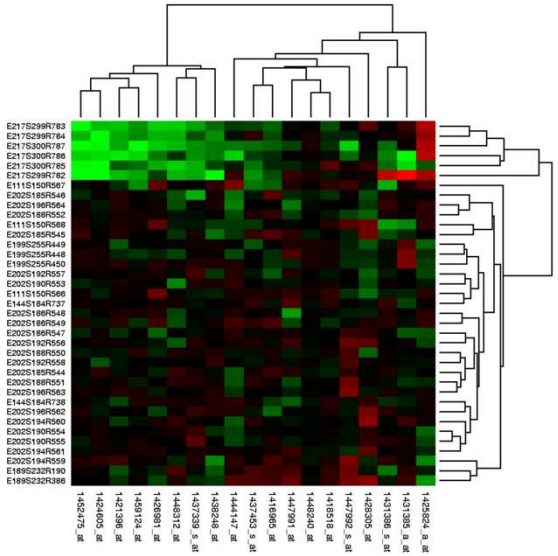


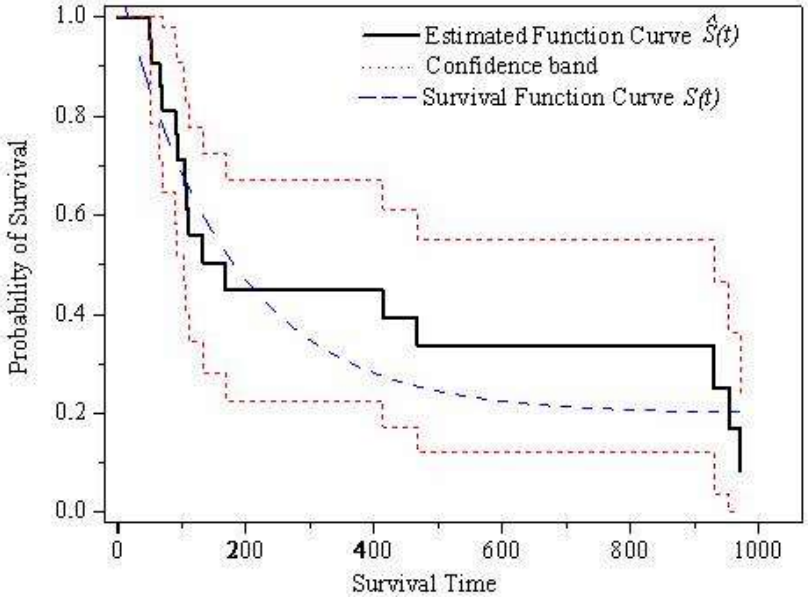
Data analysis: some tips

❖ Get familiar with the **main technics** used in pathology:

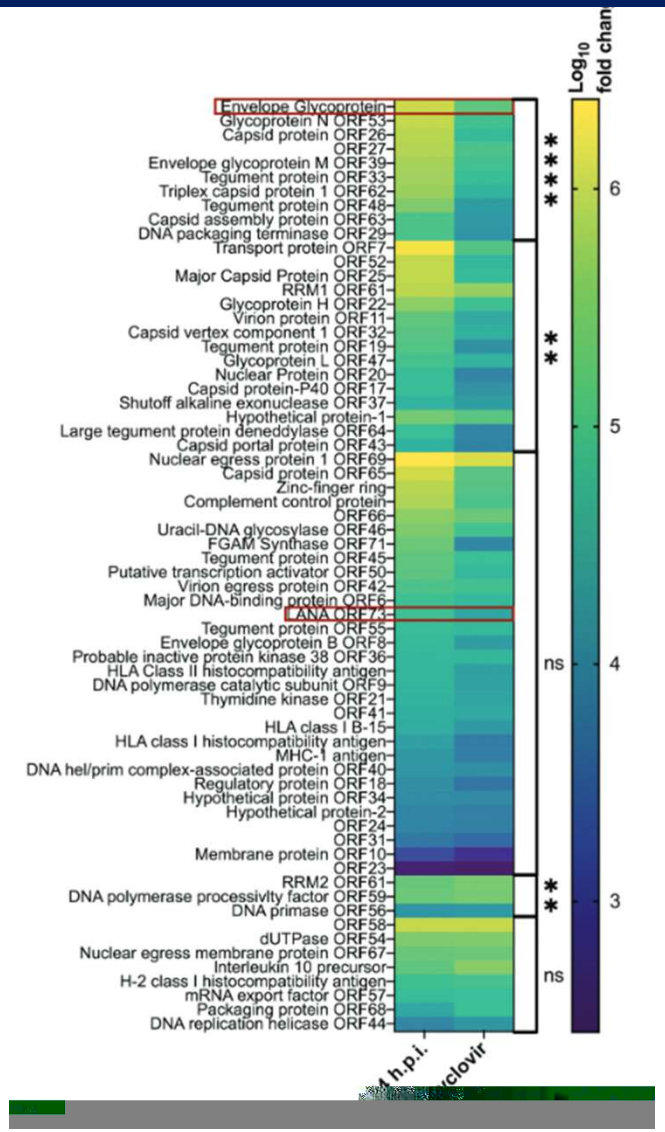
- When reading scientific papers, train yourself to understand results from the most common methods (PCR, Western blot, FACS, IHC, etc.) and also different types of graphs (correlation curves, heat map, Kaplan-Meier etc.)







3 examples from the last Vet Path issue



Useful ressources regarding common technics

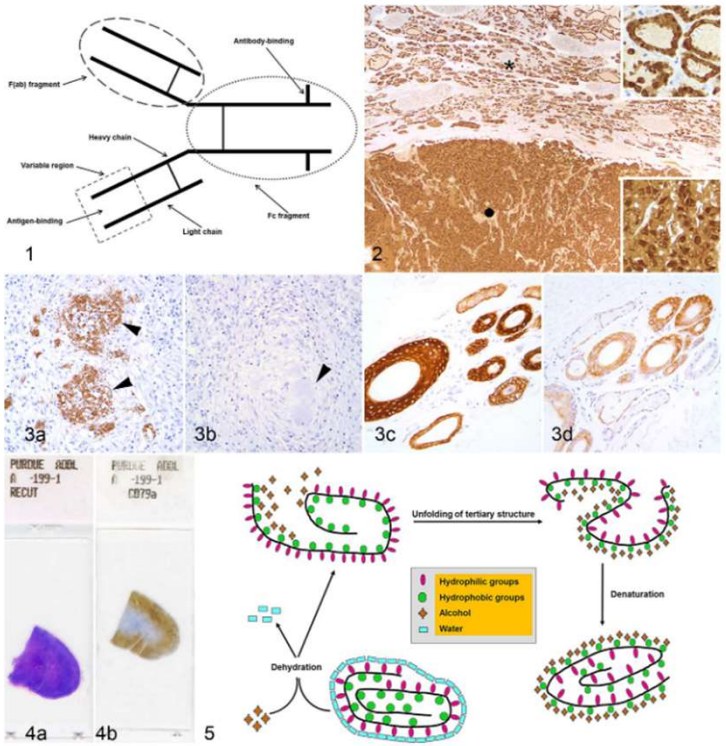
Article

When Tissue Antigens and Antibodies Get Along: Revisiting the Technical Aspects of Immunohistochemistry—The Red, Brown, and Blue Technique

Veterinary Pathology
2014, Vol 51(1) 42-87

DOI: 10.1177/0300985813505879
vet.sagepub.com

J. A. Ramos-Vara[1] and M. A. Miller[1]



Review

Clonality Testing in Veterinary Medicine: A Review With Diagnostic Guidelines

Veterinary Pathology
2016, Vol. 53(4) 711-725

DOI: 10.1177/0300985815626576
vet.sagepub.com

S. M. Keller[1], W. Vernau[2], and P. F. Moore[2]

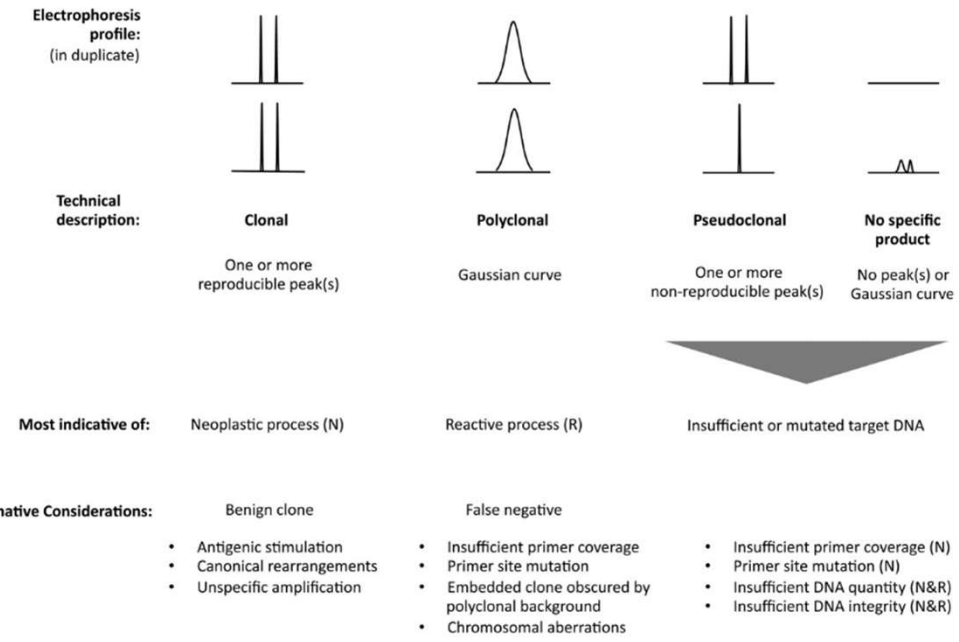


Figure 8. Archetypal electrophoresis patterns, their technical description, interpretation, and interpretational pitfalls.

Data analysis and Toxicological pathology: general instructions

❖ **The most common instructions are**

- **DESCRIBE**: We expect a description of one or more documents (figure, table etc.), i.e. you don't have to interpret and you should only report the information you can get from the document (no extrapolation). You should be precise and concise : imagine that you describe it to someone on the phone, and try to reflect the overall message from the document without going too much into details.
- It can also be asked to **SUMMARIZE** several figures/tables with too many informations to be described one by one (for example organ weights in a tox path exercise). A short and concise summary of the salient information should be given.
- *A good analogy would be a gross or microscopic description. Also, be methodic when you describe (controls vs testes animals, dose group effect ?, statistical significance ?)*

Example

Body and organ weights (g)	3-Methylfuran dose (mg/kg bw/day)							
	0.0	0.1	0.3	1.5	3.0	6.0	12.0	25.0
Body weight	210.5 ± 13.6	216.1 ± 11.8	206.3 ± 17.9	213.3 ± 10.6	205.5 ± 20.6	210.6 ± 15.4	206.4 ± 16.5	167.5 ± 9.3*
Brain	1.98 ± 0.06	2.01 ± 0.07	2.02 ± 0.11	1.98 ± 0.08	1.97 ± 0.05	2.00 ± 0.07	2.01 ± 0.09	1.89 ± 0.06
Liver	8.36 ± 0.66	8.62 ± 0.69	8.12 ± 1.03	8.49 ± 0.81	8.22 ± 0.95	8.91 ± 0.74	9.54 ± 0.98*	8.91 ± 0.93
Right kidney	0.63 ± 0.04	0.65 ± 0.05	0.61 ± 0.05	0.64 ± 0.06	0.62 ± 0.08	0.63 ± 0.06	0.62 ± 0.05	0.59 ± 0.05
Left kidney	0.63 ± 0.06	0.66 ± 0.04	0.62 ± 0.05	0.64 ± 0.06	0.63 ± 0.06	0.65 ± 0.06	0.64 ± 0.05	0.59 ± 0.05
Heart	0.57 ± 0.18	0.64 ± 0.03	0.61 ± 0.04	0.62 ± 0.05	0.61 ± 0.04	0.62 ± 0.05	0.59 ± 0.05	0.49 ± 0.04*
Adrenals	0.043 ± 0.004	0.044 ± 0.003	0.043 ± 0.006	0.046 ± 0.006	0.043 ± 0.005	0.040 ± 0.009	0.046 ± 0.007	0.041 ± 0.010
Spleen	0.51 ± 0.04	0.51 ± 0.03	0.49 ± 0.05	0.51 ± 0.03	0.50 ± 0.03	0.53 ± 0.03	0.51 ± 0.03	0.44 ± 0.03*
Thymus	0.33 ± 0.02	0.32 + 0.03	0.34 ± 0.02	0.34 ± 0.03	0.32 ± 0.02	0.33 ± 0.03	0.31 ± 0.03	0.25 ± 0.03*
Right testis	1.38 ± 0.04	1.41 ± 0.04	1.37 ± 0.10	1.42 ± .07	1.35 ± 0.13	140 ± 0.09	1.34 ± 0.09	1.24 ± 0.07*
Left testis	1.45 ± 0.06	1.40 ± 0.06	1.42 ± 0.10	1.46 ± 0.07	1.39 ± 0.14	1.43 ± 0.09	1.43 ± 0.07	1.23 ± 0.09*
Epididymides	0.55 ± 0.08	0.56 ± 0.05	0.52 ± 0.09	0.56 ± 0.05	0.53 ± 0.12	0.55 ± 00.08	0.54 ± 0.06	0.49 ± 0.04
Prostate	0.18 ± 0.05	0.15 ± 0.02	0.17 ± 0.05	0.18 ± 0.03	0.16 ± 0.06	0.17 ± 0.06	0.14 ± 0.02	0.12 ± 0.02
Seminal vesicles	0.50 ± 0.10	0.67 ± 0.21	0.56 ± 0.06	0.64 ± 0.11	0.47 ± 0.13	0.57 ± 0.15	0.57 ± 0.14	0.34 ± 0.09

Note. The number of animals for organ weights was between 8 and 10, except for reproductive organs, the number of animals available was 5.
*Significant in relation to the control ($p < .05$). One-way analysis of variance and or using Kruskal–Wallis test and Dunn's Multiple Comparison Test.
±Standard deviation.

Question B.4. Briefly describe (or summarize) the absolute organ weights of the rats of this study.

Absolute organ weights in the **high-dose** (25 mg/kg bw/day) group were significantly **decreased** for **heart** (14%), **spleen** (13%), **thymus** (24%), and right (10%) and left (15%) **testis**.
(4 points)
The absolute weight of the **liver** was significantly **increased** by 14% in the **12.0-mg**/kg bw/day group.
(1 point)

Data analysis and Toxicological pathology: general instructions

❖ **The most common instructions are**

- **INTERPRET**: You have to go beyond what you see and give an interpretation, i.e. an integration of all information in order to formulate a conclusion regarding an effect, a mechanism etc. This question usually comes after DESCRIBE but you can also be asked to directly interpret a document or a group of documents.
- *A good analogy would be a diagnosis (integration of clinical data and morphologic diagnosis).*

Example

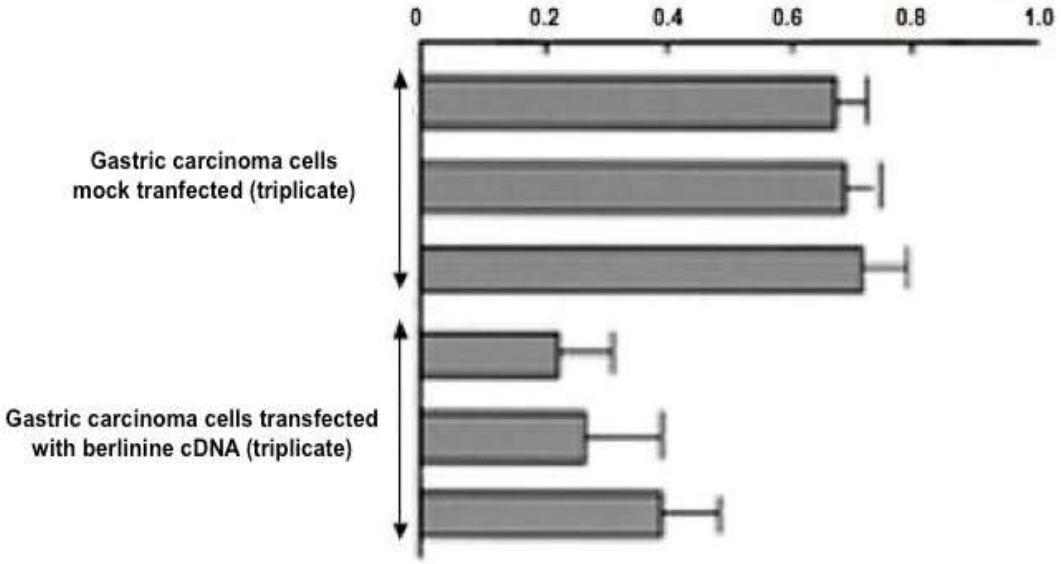


Figure 4. Calcium-dependent cell aggregation assay. Experiments were repeated three times (triplicate) for mock-transfected and berlinine cDNA-transfected gastric carcinoma cells with three different cultures for each condition.

Describe and interpret the data presented in Figure 4.

In mock-transfected gastric carcinoma cells cultures, nearly 70 to 75% of cells form clusters after Ca^{2+}-induced aggregation **(2.5 points)** *compared to only 20 to 40% in berlinine cDNA-transfected cells cultures* **(2.5 points)**.

Description

Ca^{2+}-dependent cell aggregation was down-regulated in berlinine cDNA-tranfectants compared with mock transfectants **(2.5 points)**.

Thus berlinine acts by inhibiting the calcium-dependent homophilic cell-cell adhesion process which is based upon the Ca^{2+}-dependent adhesion molecules called cadherins **(2.5 points)**.

Interpretation

Data analysis and Toxicological pathology: do's and don'ts

❖ **DO'S**

- Read the question entirely before you start to answer this will help you to understand the overall problem
- When information about statistical differences are available, then the description should be focused on the significant findings (or out of reference values).
- Put yourself in a real life situation. Most questions rely on pathology-related common sense.

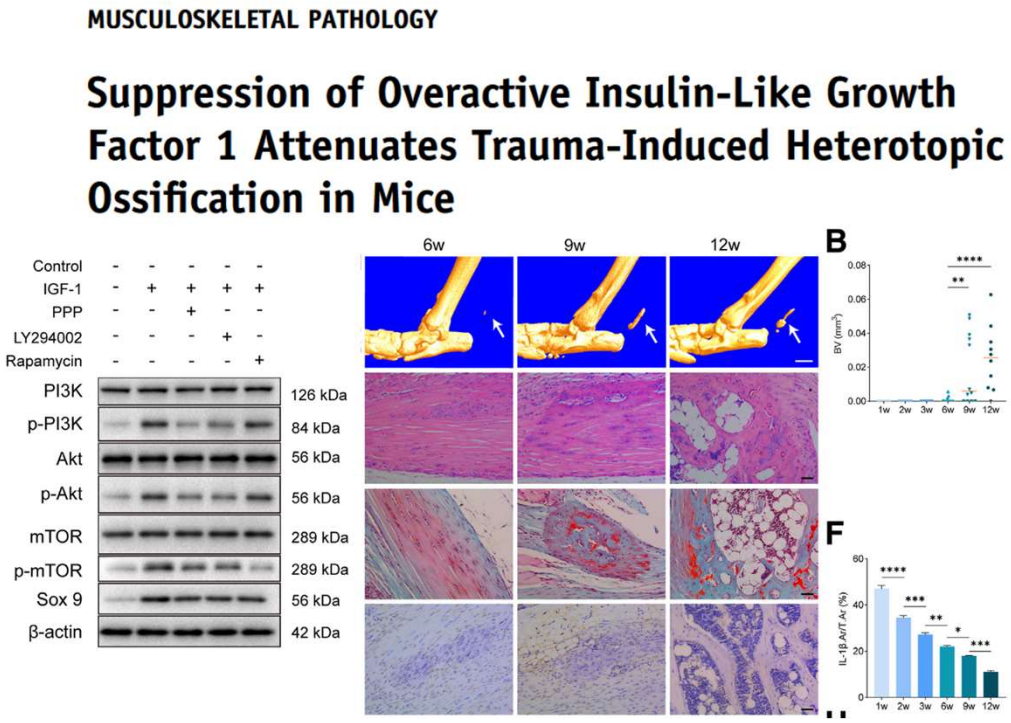
❖ **DON'TS**

- Do not loose time trying to describe every value, especially in Tox Path where there are large tables with organ weights etc.

Collaborate with other residents

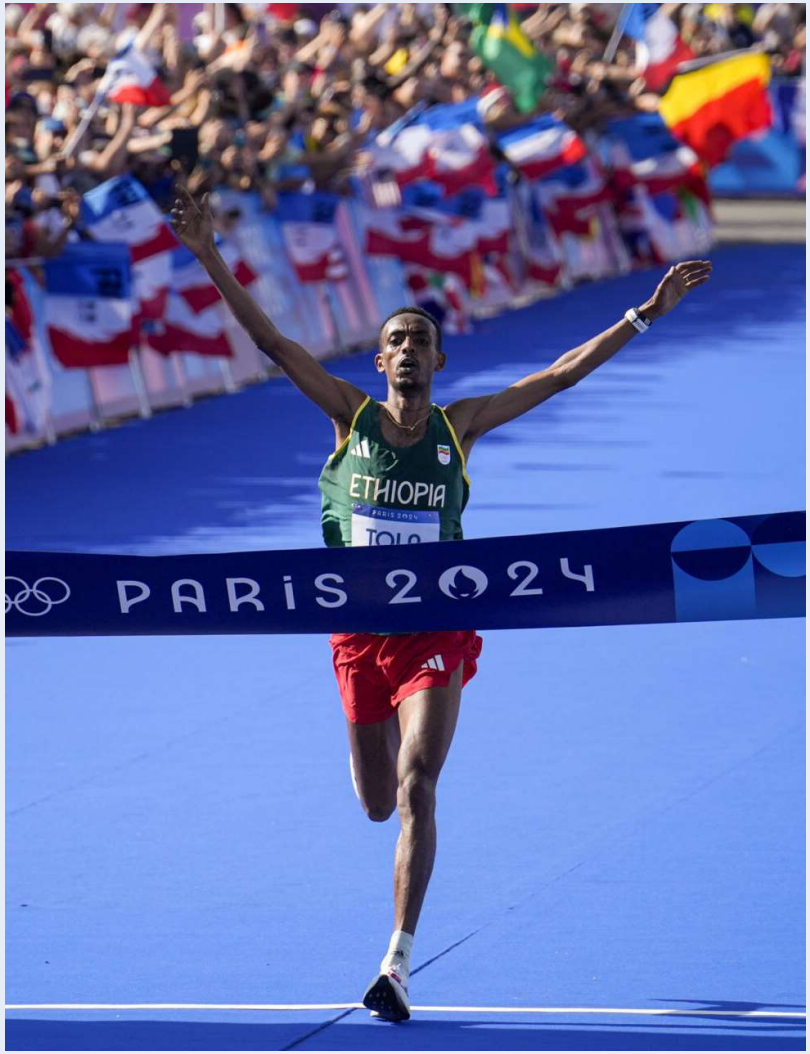
- ECVP residents have different background and trainings (clinical, PhD, tox path)
- These backgrounds are useful to create questions and Mock exams
- Questions can be create based on:
  - Necropsy cases
  - Diagnostic cases
  - Cases seen during externship or other trainings
  - Scientific papers (abstract, data analysis, tox path)

Example of a paper from the American Journal of Pathology that can be used to create a Data analysis question



Conclusion

- **COMPREHENSIVE** is not an easy section but it is **DO- ABLE**!
- **Regarding preparation**:
  - Basic pathology knowledge especially in Gen Path
  - Create questions you can share with other residents
- **During the examination**:
  - Go through the whole questions and carefully read the subquestions before answering
  - Use your common sense



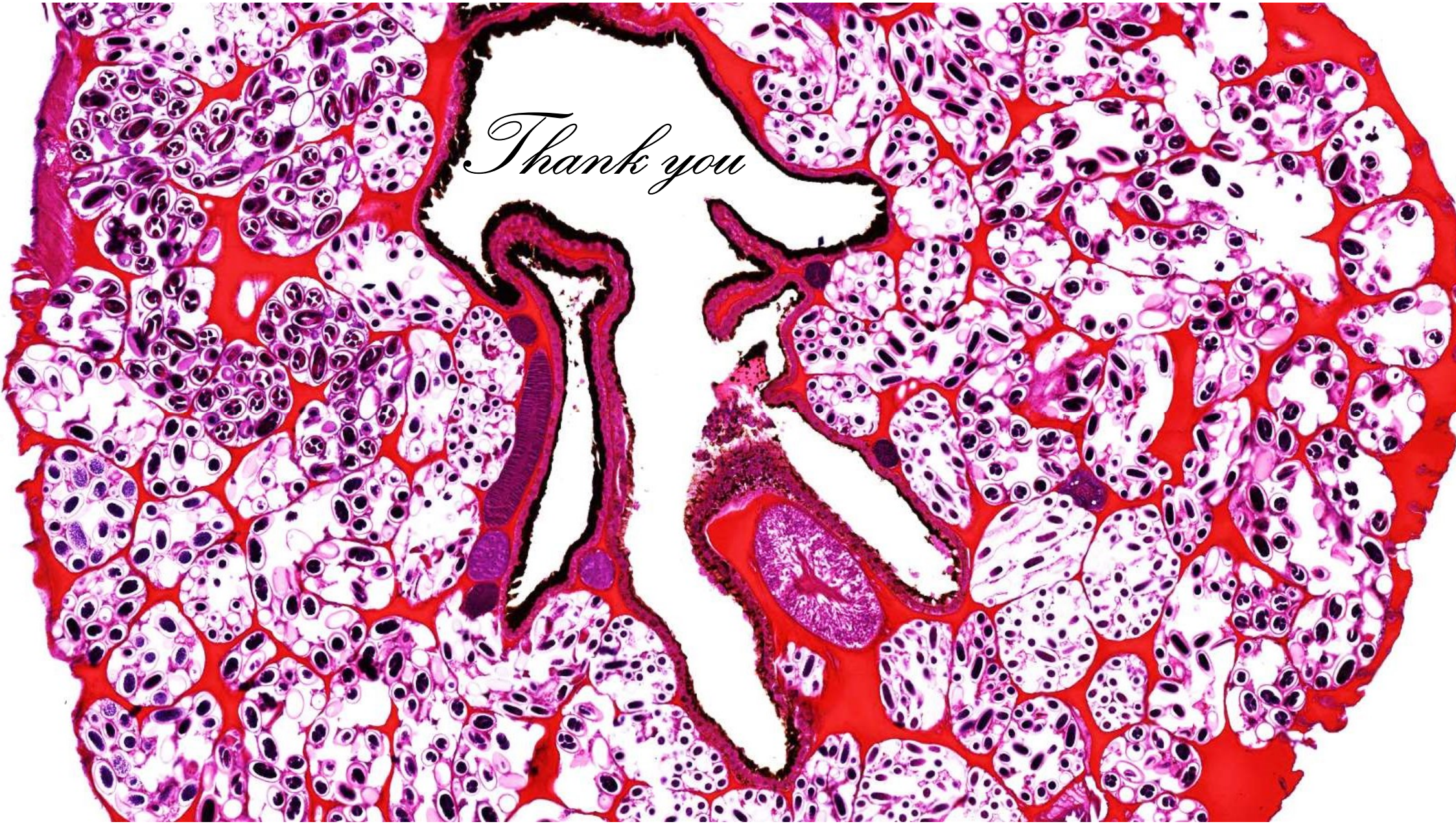
Acknowlegments

❖ **Frédérique Nguyen**, Dipl. ECVP, Nantes, France

- Material from Mock Examinations

❖ **Anna Domenech**, Dipl. ECVP, Barcelona, Spain

- Advices and suggestions


Thank you

ECVP Examination: an A-mazing Experience

5th Cutting Edge Pathology Congress, San Lorenzo de El Escorial, Madrid, Spain

28-31 August 2024

Andrea Cappelleri, DVM, PhD, dipl. ECVP

Francesco Godizzi, DVM, PhD, dipl. ECVP

ecvp
European College of Veterinary Pathologists

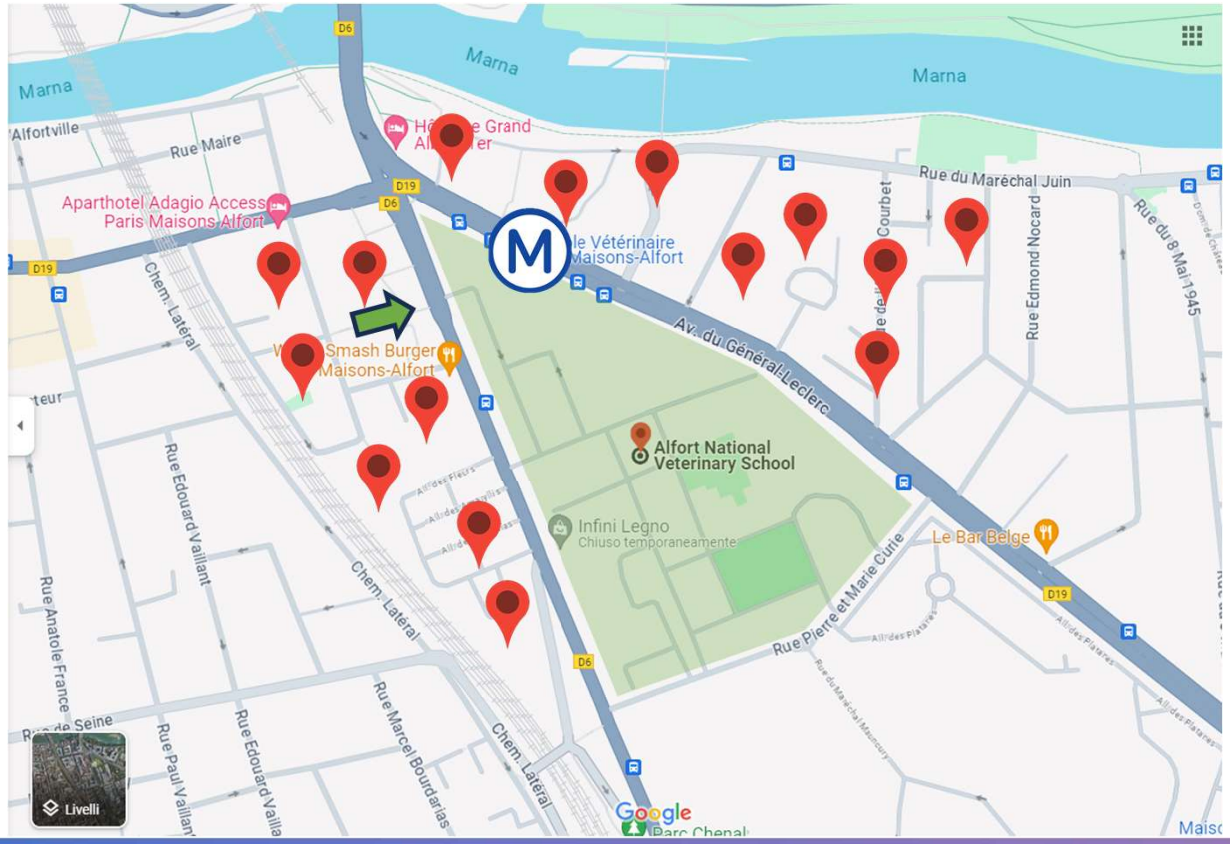
ECVP Exam Praparation – general tips

- **Study leave** = **3 months** suggested
- **Study in group**
  - 2/3 people
  - Zoom/Teams meetings
  - Take breaks
  - **HAVE FUN!!**
- **Study material collected** before the study leave
  - **+++ vet path/tox/JCP papers** completed and reviewed at least once
- Try to follow a **weekly schedule**
- **Our schedule**
  - 6/7 days a week
  - 8 – 12/12,30 – lunch – 14 – 18,30/19
  - Few evening histo/gross sessions

  (late in the day images only)
- (If you can) **Do not split the examination**

ecvp
European College of Veterinary Pathologists

ECVP Exam – general tips



Alfort National Vet School

Entrance

Accommodations

Maisons-Alfort Metro Station

ecvp
European College of Veterinary Pathologists

ECVP Exam – general tips

- Arrive **2 days in advance**
- Find apartment/hotel **close to exam venue**
- Shared accommodation???

ecvp
European College
of Veterinary Pathologists

ECVP Exam – general tips

- **Switch-off and reset** after each part!!!
- Microscope rental (highly recommended)
- Practice with **ExamSoft**
- (If you can) **Don't speak with anyone after each part**
- **DON'T PANIC AT ANY POINT!!!**

ecvp
European College of Veterinary Pathologists

ECVP Exam Praparation – comprehensive

- What to study: **basics** of gen path, clin path, vet path, histo + molecular & cell biology
- Take advantage of **mocks**: useful to learn the different **types of questions**

  (e.g. analyze/summarize/interpret)
- Prepare a summary of **laboratory techniques**
- Prepare a summary of **histo stainings**
- Practice answering while **saving time**

WESTERN BLOTTING (PROTEIN)

Aim: **detect and quantify** a specific **protein** in a sample.

Method: sample's **proteins separated** by agarose gel **electrophoresis** - separated proteins transferred to a **nitrocellulose membrane** - membrane exposed to an **antibody specific** to the target protein – membrane exposed to a **secondary antibody** linked to radioactive or chemical tag – **detection.**

OIL RED O: neutral triglycerides and lipids on frozen sections (red). Melamin crystals.

RETICULIN: reticular fibers (dark-brown to black) (+++ liver).

PICROSIRIUS RED: collagen fibers in tissues (red). Under polarized light to distinguish between type I (red) and type III collagen (green).

European College of Veterinary Pathologists

ECVP Exam – comprehensive

- **General rule: if you are prepared for the other parts, you are going to be fine!!!**
- **Time matters.** Try to stay within the **suggested schedule for each section** (projected on the wall)
- **Do not overthink it**!! Most of the times the **easy way** is also the **right one**
- Even if you do not know the meaning, just **describing will get you points**

ecvp
European College
of Veterinary Pathologists

ECVP Exam – comprehensive

- Answer **what you are asked** (nothing more, nothing less)
- **Go straight to the point**!!
- Make **your own strategy**: start with the section that you are more confident with/the longest/the most difficult
- **Scan the whole** part first! You might find the **answer to previous questions**!
- Read instructions and **background information carefully**. It often contains part of the answers!

ecvp
European College of Veterinary Pathologists

Abstract review

From ECVP website

This is often in the context of a review, for a grant application, a conference participation or a manuscript submission. The abstract usually has a length of 400-500 words and contains **errors** that need to be **identified** and **corrected**. This subsection requires the application of **general and/or special veterinary pathology** knowledge.

ecvp
European College
of Veterinary Pathologists

Abstract review

Requirements:

- Basic knowledge of **general and veterinary pathology**, **molecular analysis and techniques**

Tips:

- Be up to date with the **latest news** from the world

1) E-cadherin is a calcium-~~independent~~ -dependent cell–~~extracellular matrix~~ -cell adhesion glycoprotein
2) Canine parvoviruses are small ~~enveloped~~ non-enveloped ~~RNA~~ DNA viruses
3) IHC for ~~genes~~ proteins, PCR for ~~proteins~~ genes
4) Primary antibody made in mouse → secondary antibody anti-~~rabbit~~ -mouse
5) Conclusion: ~~the proposed grading system enables the identification of tumors with more aggressive biological behavior and can be applied in routine pathological examination.~~ The study is based on an inadequate number of cases (too few) and the follow-ups are incomplete so it is not possible to drawn this conclusion.

ecvp
European College of Veterinary Pathologists

Tox path

From ECVP website

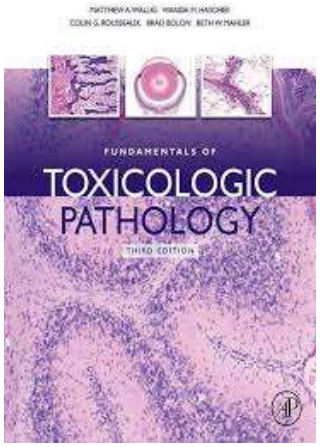
For this subsection, a combination of selected **gross and/or histology pictures**, **survival curves**, **organ weight tables**, **clinical pathology parameters**, **macroscopic and/or microscopic incidence** tables can be provided and will require **description** and **interpretation.** This subsection requires the application of knowledge on **clinical and/or anatomic pathology findings in laboratory animals**, based on the comparison of treated and untreated groups. **Basic knowledge about the format** of toxicologic pathology data and the methodology as well as the **vocabulary used in toxicology** studies is helpful. Background observations and/or outlier values will have to be differentiated from test article-related findings, and candidates may be asked to **draw conclusions or express hypotheses** regarding the safety of the test article, the dose-dependency of effects, and putative mechanism of action; they may also be asked to suggest additional refinements to the study protocol.

ecvp
European College
of Veterinary Pathologists

Tox path

Requirements:

- Basic knowledge of **general** and **veterinary pathology**, **histo** and **molecular analysis**
- Ability to handle **large amount of data**
- Summarizing skills



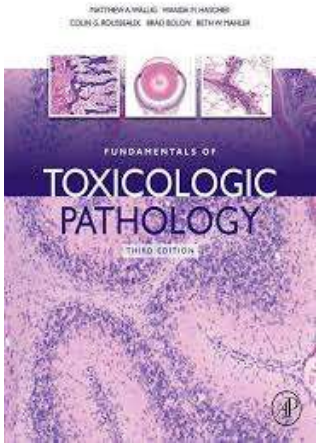
Tips:

- Use **abbreviations** (explained the first time), **lists** and **bullet points**
- Give priority to **statistically significant** values
- Differentiate **test item-related** effects from
  - Stress-related findings (e.g. adrenal cortex hypertrophy, thymus atrophy)
  - Procedure-related effects (e.g. blood inhalation)
  - Spontaneous/background findings (e.g. chronic progressive nephropathy in rats)

ecvp
European College
of Veterinary Pathologists

Tox path

- Always look at **high dose** first!
  - No difference: spontaneous/background finding
  - Difference: **test item-related** finding. Write it!!
- Move to lower doses
  - Are they affected as well?
  - Are the findings **dose-related** (or **time-related**??) in terms of incidence and severity
- Make **hypothesis** and **correlations** (when you are asked!!)
  - Hepatocellular hypertrophy in histo correlates with increased weight of liver
  - Compound that inhibits proliferation in a specific organ might act elsewhere
- Identify the **NOEL** (no observed adverse effect level)



ecvp
European College
of Veterinary Pathologists

Tox path

Example:

Compound x-related microscopic findings were seen in kidneys, with a **STATISTICALLY SIGNIFICANT** increase in incidence and severity of tubular degeneration in males at 10 mg/kg/day in comparison with controls (**DOSE RELATED-EFFECT**).

All other changes: NOT STATISTICALLY SIGNIFICANT ⟶ put a **"No other changes" sentence**.

Important: **group together "negative"** results to save time and space

ecvp
European College of Veterinary Pathologists

Data analysis

From ECVP website

This subsection requires **basic knowledge on molecular pathology**, it is tested in the context of a scientific study. Research data are presented in various forms (e.g. **graphs, blots**) and require **description** and **interpretation**. This subsection usually also requires knowledge about a technique that was applied in the study. It is therefore expected that the candidates know the **basic principles of frequently applied techniques**. This includes molecular techniques to analyze DNA, RNA, proteins, epigenetic alterations, genetic modifications and reporter assays. This does not require knowledge about protocols (e.g. the pH of a certain buffer) but tests the basic understanding of techniques used to complement pathology findings. Candidates may also be asked to use the data to **express a new hypothesis** and suggest **further experiments** to be carried out.

ecvp
European College
of Veterinary Pathologists

Data analysis

Requirements:

- Basic knowledge of **general pathology**, and **molecular pathology**, **statistics**, **lab techniques**
- Summarizing skills

Tips:

- Practice with **scientific papers** (e.g. description and interpretation of data)

ecvp
European College
of Veterinary Pathologists

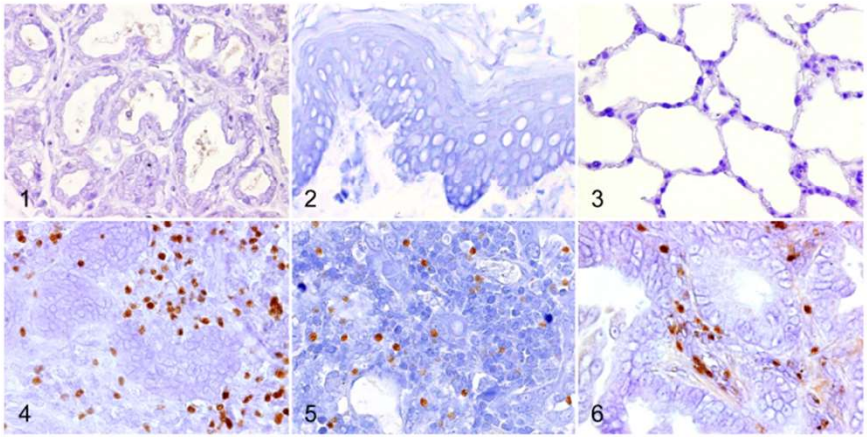
Veterinary Pathology
Volume 57, Issue 4, July 2020, Pages 497-506

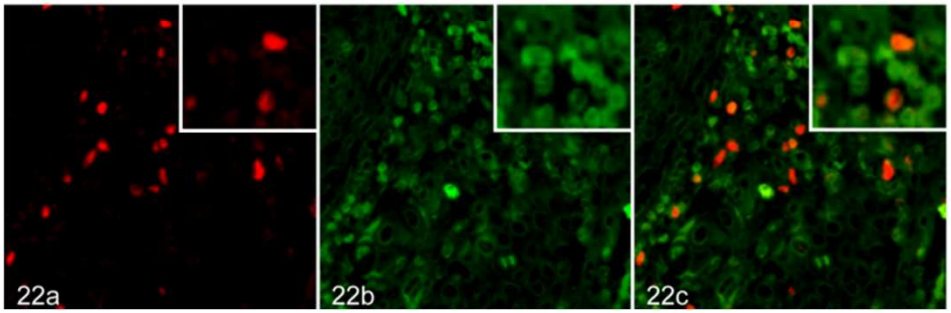
https://doi.org/10.1177/0300985820921535

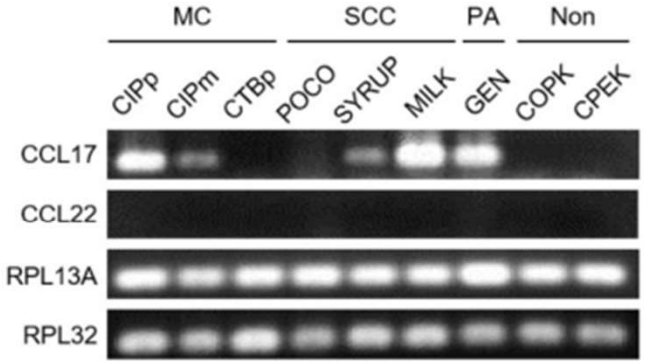
SAGE journals

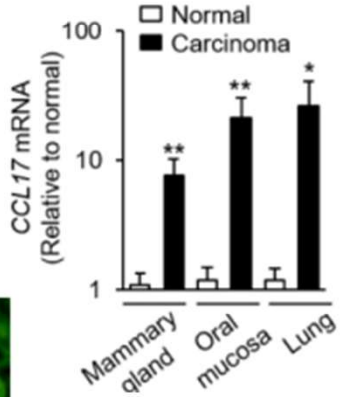
Oncology - Original Article

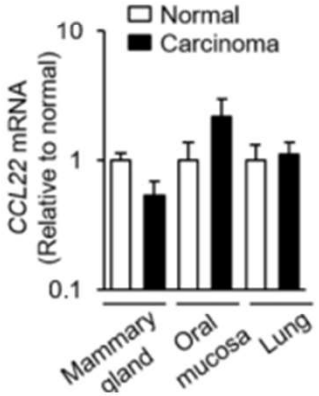
Foxp3^{+} Regulatory T Cells Associated With CCL17/CCR4 Expression in Carcinomas of Dogs

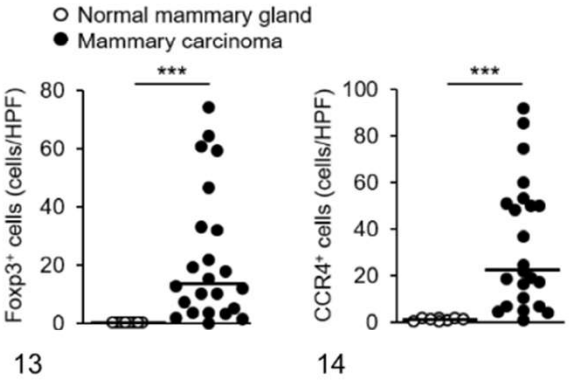










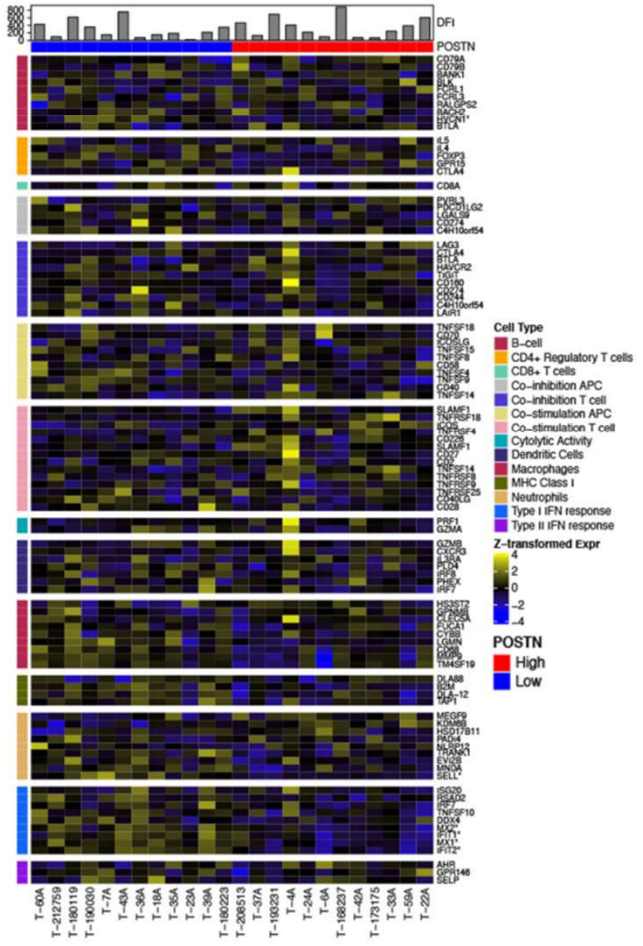


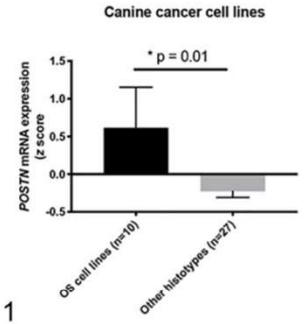
Special Issue: Diagnostic Veterinary Oncologic Pathology–Original Article

Role of Periostin Expression in Canine Osteosarcoma Biology and Clinical Outcome

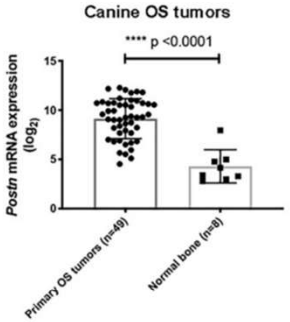
Veterinary Pathology
2021, Vol. 58(5) 981-993

DOI: 10.1177/0300985821996671
journals.sagepub.com/home/vet

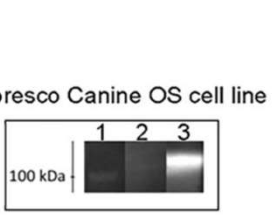




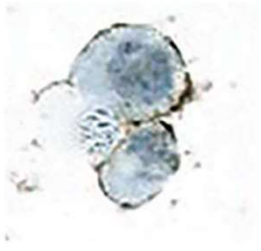
1



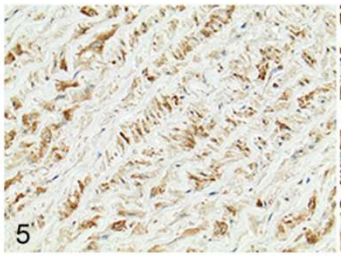
2



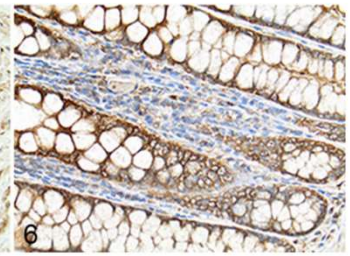
3



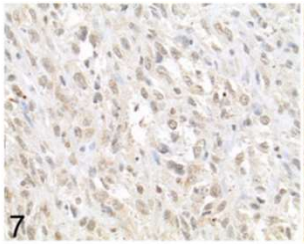
4



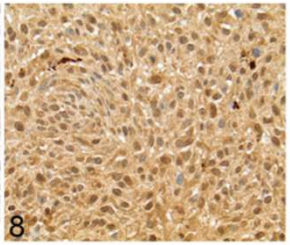
5



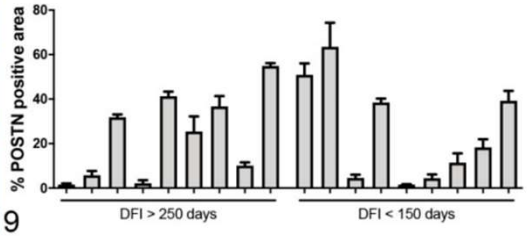
6



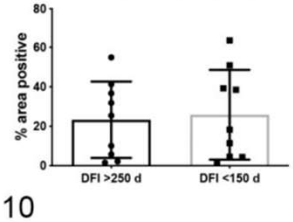
7



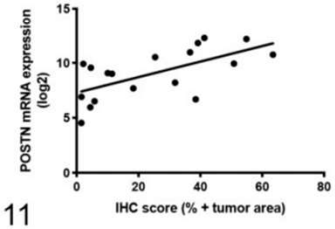
8



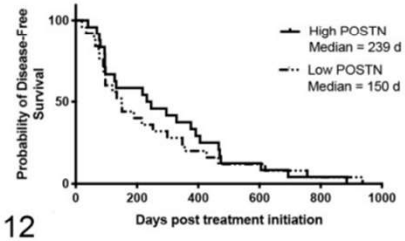
9



10



11



12

ecvp
European College of Veterinary Pathologists

Forensic case or clinicopathologic investigation

From ECVP website

This subsection can deal with a forensic case or clinicopathologic investigation. These questions imitate real situations in which the **diagnostic veterinary pathologist** is required to judge a specific situation. Data might include unknown or questionable **morphologic diagnosis**. Pictures of **histologic and/or gross lesions** and/or **clinical data** (including reference values) and/or **special stains** may be provided. The candidate is not asked to provide a detailed description of the histological changes but is expected to provide a morphological and/or **etiological diagnosis**.

ecvp
European College
of Veterinary Pathologists

Forensic case or clinicopathologic investigation

Requirements:

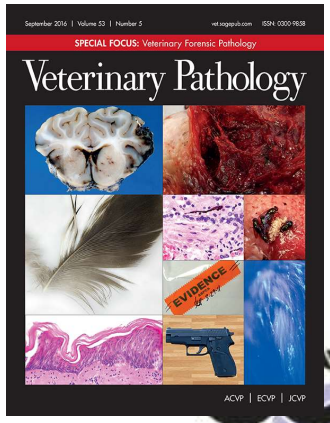
- Basic knowledge of **clinical pathology**, and **veterinary pathology**, **traumatology** (forensic)

Tips:

- Put yourself in the shoes of a **diagnostic pathologist** and be cautious with your diagnosis

(e.g. "round cell tumor, most likely lymphoma" is better than just "lymphoma")

- Be familiar with **modes of transmission** and **vectors** of main diseases
- Be familiar with **zoonotic potential** of diseases



Andrea Cappelleri, andrea.cappelleri@unimi.it
Francesco Godizzi, francesco.godizzi@gmail.com

European College of Veterinary Pathologists