

Pathological Changes Observed in European Amphibians with Ranaviral Diseases



Dr. Ana Balseiro

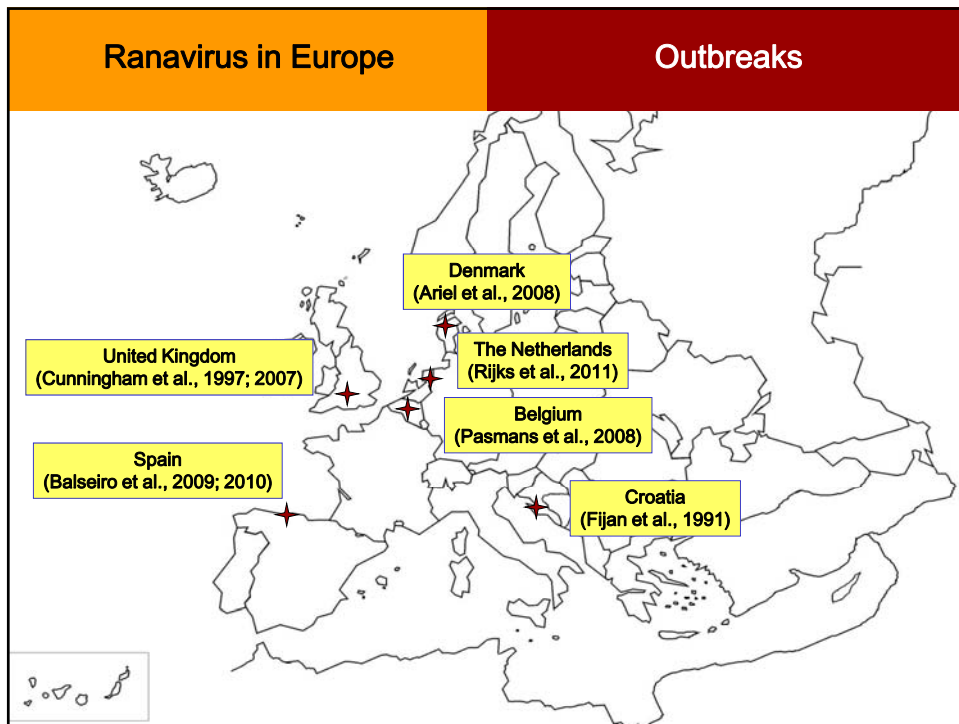


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Presentation contributors



- Amanda Duffus, Gordon College
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<h2>Mass mortalities in Europe</h2>	<h2>England</h2> <p>(Cunningham et al., 1997; 2007)</p>
 <p>> South East of England:</p> <ul style="list-style-type: none"> • Since 1985 • Ponds • Common frog (<i>Rana temporaria</i>), Common newt (<i>Triturus vulgaris</i>)... • Ranavirus United Kingdom (RUK) 	
 <p>Nature Diary</p>	 <p>Biopix</p>
 <p>NaturePhoto-CZ</p>	 <p>NaturePhoto-CZ</p>

<h2>Mass mortalities in Europe</h2>	<h2>Denmark</h2> <p>(Ariel et al., 2009)</p>
 <p>> Slagelse:</p> <ul style="list-style-type: none"> • 2008 • Shallow artificial pond • Wild edible frogs (<i>Pelophylax kl. esculentus</i>) • Pelophylax esculentus Virus (PEV DK-1 / PEV DK-2) 	
 <p>True Wild Life</p>	 <p>True Wild Life</p>  <p>True Wild Life</p>

Mass mortalities in Europe

Spain

(Balseiro et al., 2009)



> Picos Europa National Park (1st outbreak):

- 2007
- Permanent water trough
- Tadpoles of the Common midwife toad (*Alytes obstetricans*)
- Common Midwife Toad Virus (CMTV)



Mass mortalities in Europe

Spain

(Balseiro et al., 2010)



> Picos Europa National Park (2nd outbreak):

- Pond
- 2008
- Tadpoles of the CMT (*Alytes obstetricans*) / Juveniles of alpine newt (*Ichthyosaura alpestris*)
- Common Midwife Toad Virus (CMTV)



Mass mortalities in Europe

The Netherlands

(Rijks et al., 2011)



> Dwingelderveld Park:

- 2010
- Shallow artificial pond
- Edible frog and pool frog (*Pelophylax* spp) and newts (*Triturus cristatus* and *Lissotriton vulgaris*)
- Common Midwife Toad Virus (CMTV)



Herpetofauna



Dic.academic



Josef Hasek

Mortalities in Europe

Belgium

(Pasmans et al., 2008)



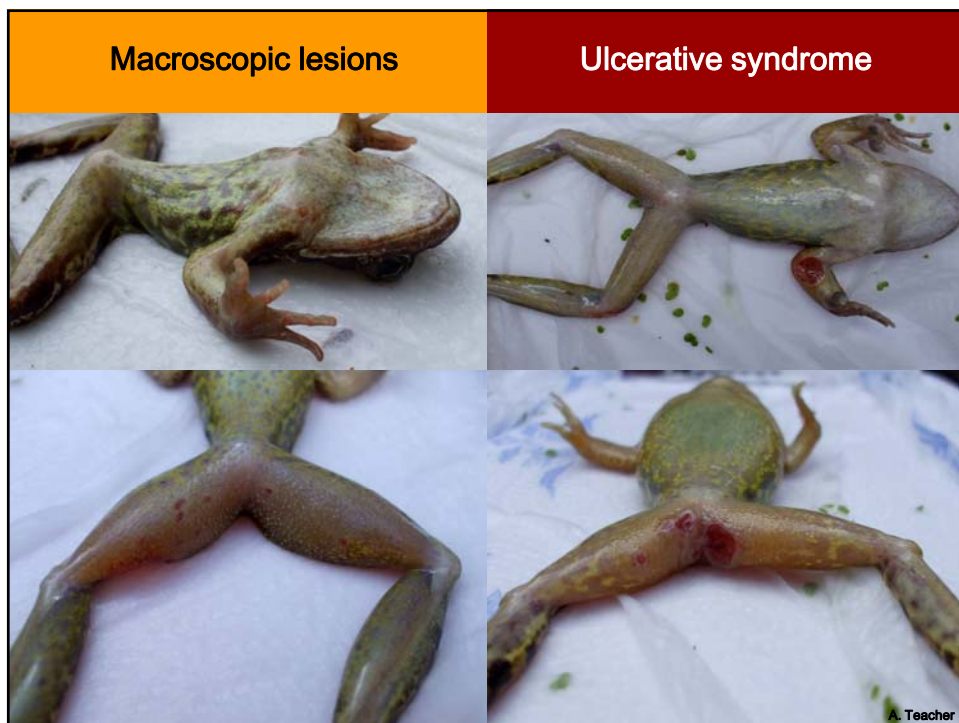
> Belgium:

- 2004
- Pet shop
- Red tailed knobby newts (*Tylotriton kweichowensis*)
- Frog virus-3 (FV3)



Henk Wallays

Pathology	Macroscopic lesions
<p><u>TWO MAIN SYNDROMES:</u></p> <p>➤ <u>Ulcerative skin syndrome (CHRONIC)</u></p> <ul style="list-style-type: none"> o Adults and tadpoles – England and Belgium o No obvious internal lesions <p>➤ <u>Haemorrhagic systemic syndrome (ACUTE)</u></p> <ul style="list-style-type: none"> o Tadpoles and juveniles - Spain o Adults, tadpoles and juveniles - England, Croatia and The Netherlands o Haemorrhages in most internal organs <p>➤ <u>Ulcerative and haemorrhagic syndrome</u> - England</p>	



Macroscopic lesions

Ulcerative syndrome



Macroscopic lesions

Ulcerative syndrome



Macroscopic lesions

Ulcerative syndrome



Pathology

Macroscopic lesions

TWO MAIN SYNDROMES:

➤ Ulcerative skin syndrome (CHRONIC)

- Adults and tadpoles – England and Belgium
- No obvious internal lesions



➤ Haemorrhagic systemic syndrome (ACUTE)

- Tadpoles and juveniles - Spain
- Adults, tadpoles and juveniles - England, Croatia and The Netherlands
- Haemorrhages in most internal organs



➤ Ulcerative and haemorrhagic syndrome - England

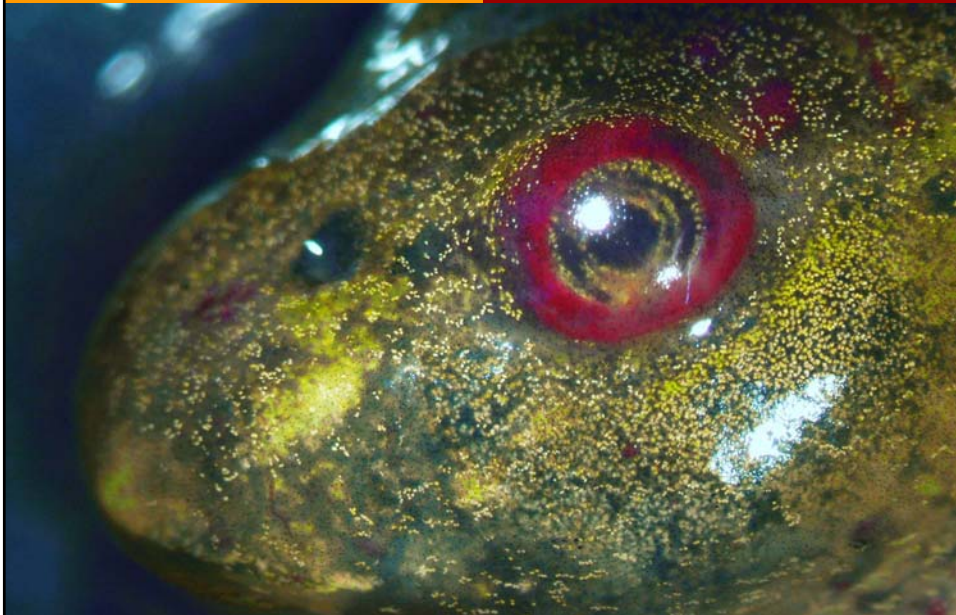
Macroscopic lesions

Haemorrhagic syndrome



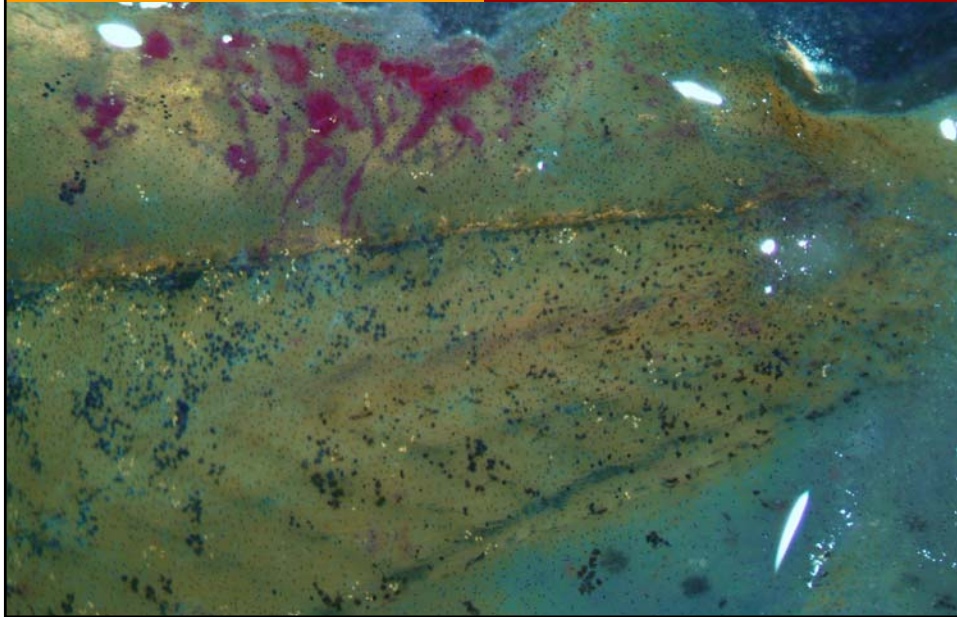
Macroscopic lesions

Haemorrhagic syndrome



Macroscopic lesions

Haemorrhagic syndrome



Macroscopic lesions

Haemorrhagic syndrome



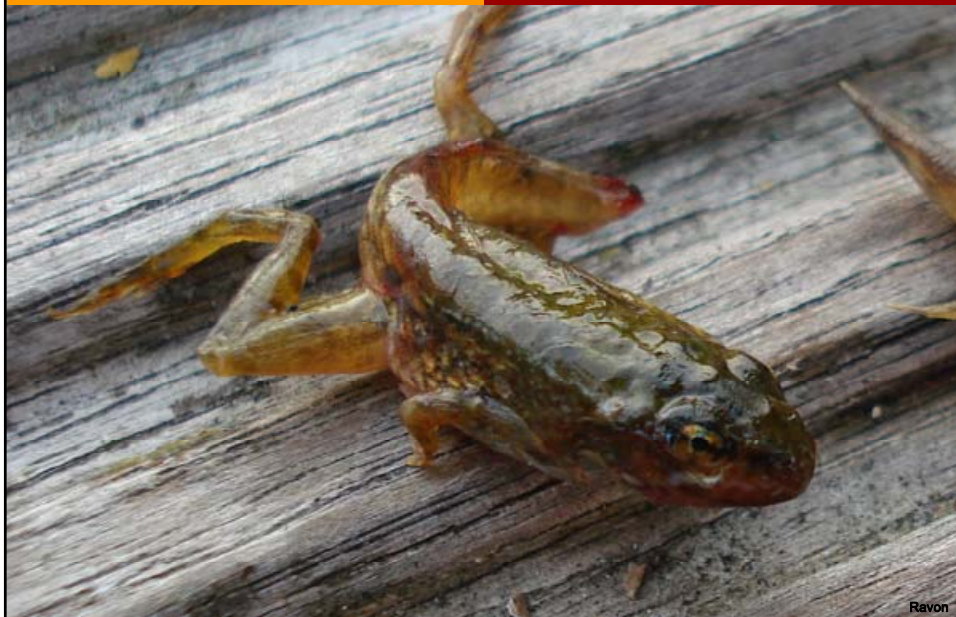
Macroscopic lesions

Haemorrhagic syndrome



Macroscopic lesions

Haemorrhagic syndrome



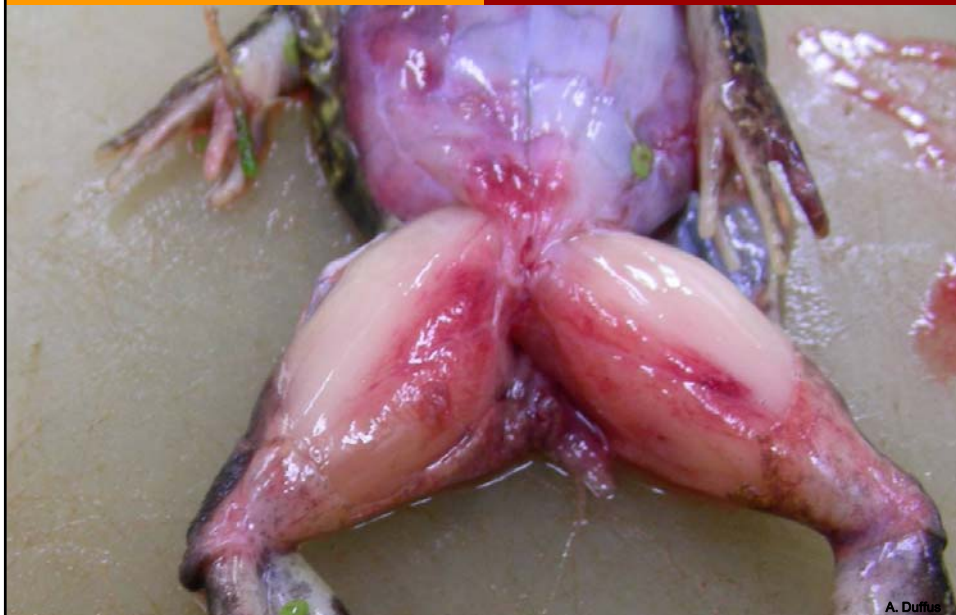
Macroscopic lesions

Haemorrhagic syndrome



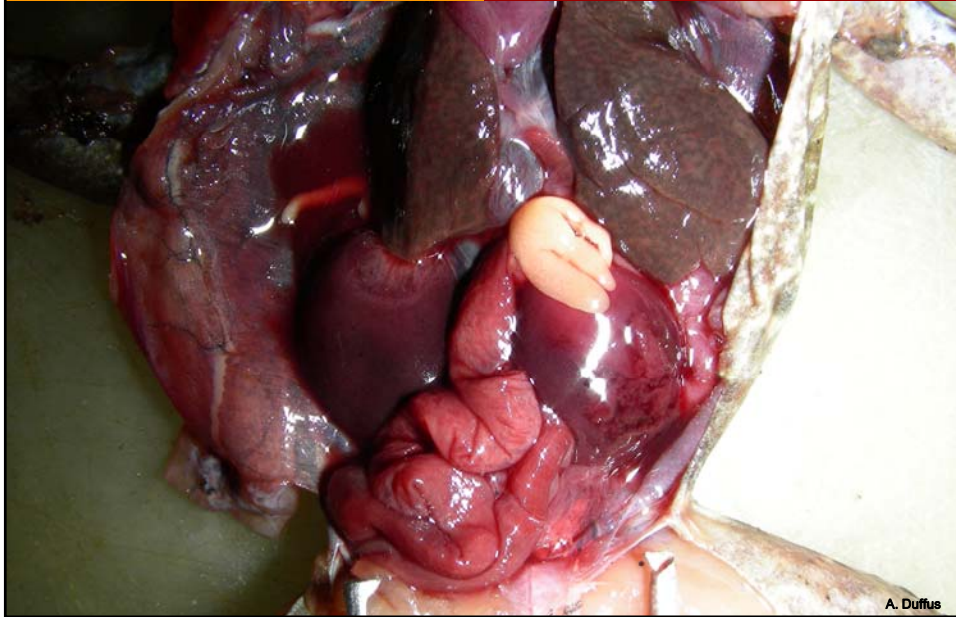
Macroscopic lesions

Haemorrhagic syndrome



Macroscopic lesions

Haemorrhagic syndrome



Pathology

Microscopic lesions

- Haemorrhagic systemic syndrome > Ulcerative syndrome -

- Skeletal muscle: haemorrhages / degeneration
- Skin: Epidermal thickening / necrosis of the deeper layers

Foci of necrosis

- Intracytoplasmic viral inclusions

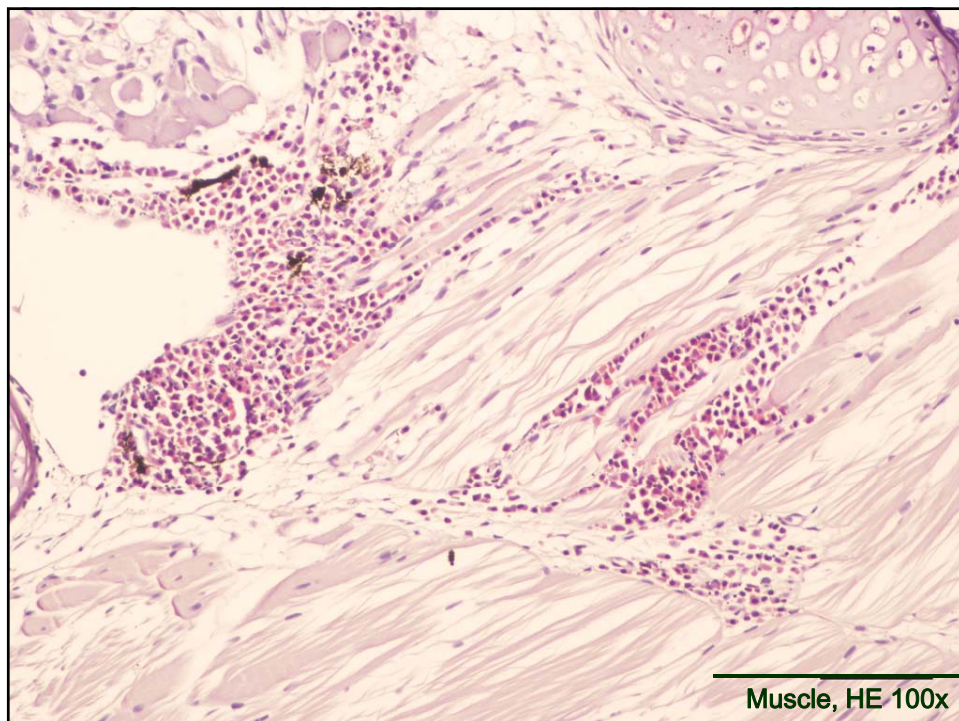
Pyknotic nuclei




- Spleen
- Liver
- Kidney
- Intestine
- Pancreas

*Also demonstrated by immunohistochemistry

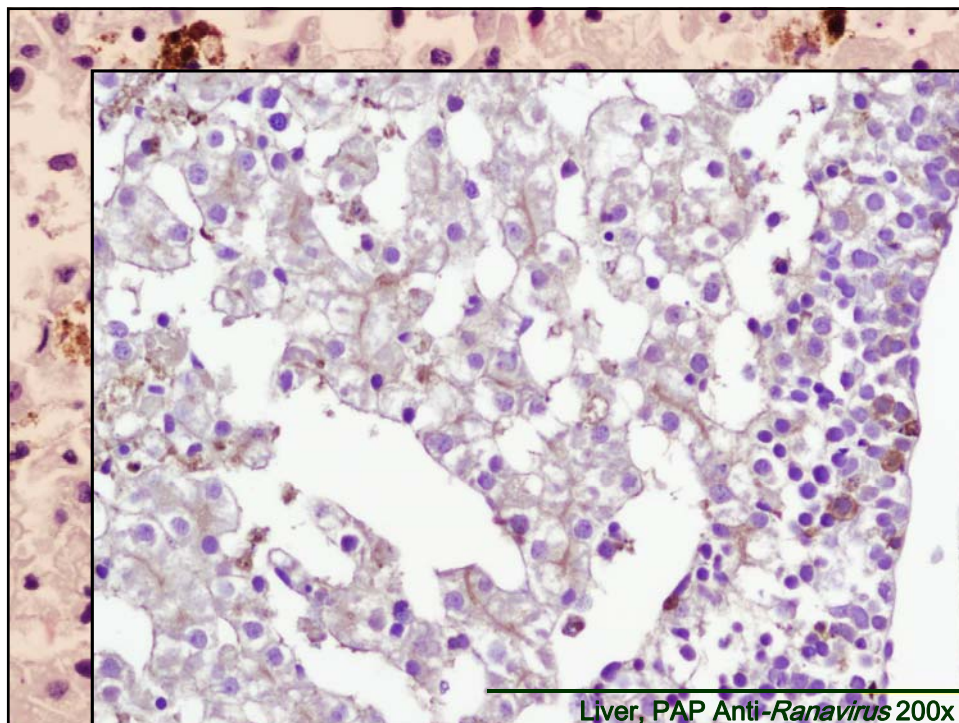
Pathology	Microscopic lesions
<p>- Haemorrhagic systemic syndrome > Ulcerative syndrome -</p> <p>➤ Skeletal muscle: haemorrhages / degeneration</p> <p>➤ Skin: Epidermal thickening / necrosis of the deeper layers</p> <p>Foci of necrosis</p> <p>➤ Intracytoplasmic viral inclusions</p> <p>Pyknotic nuclei</p> <p>*Also demonstrated by immunohistochemistry</p>	
	<p>➤ Spleen</p> <p>➤ Liver</p> <p>➤ Kidney</p> <p>➤ Intestine</p> <p>➤ Pancreas</p>

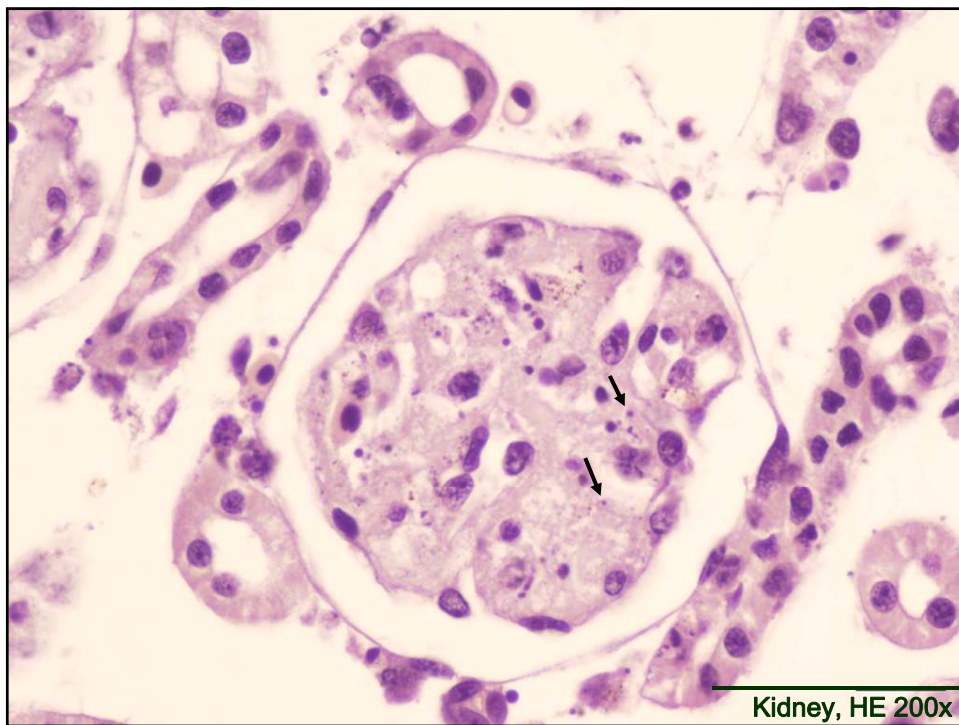
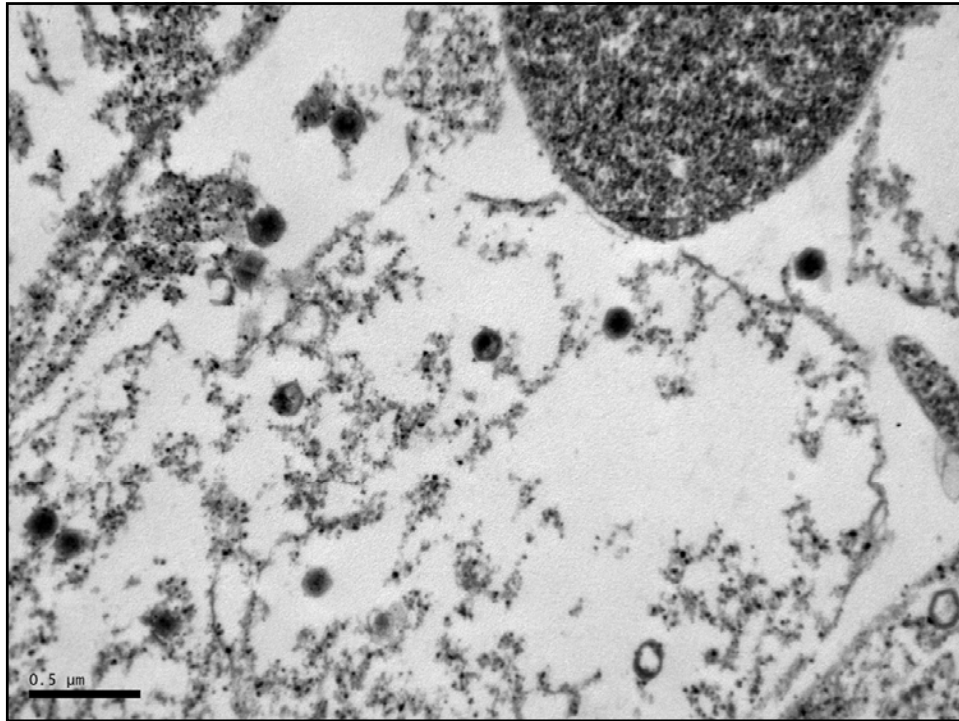


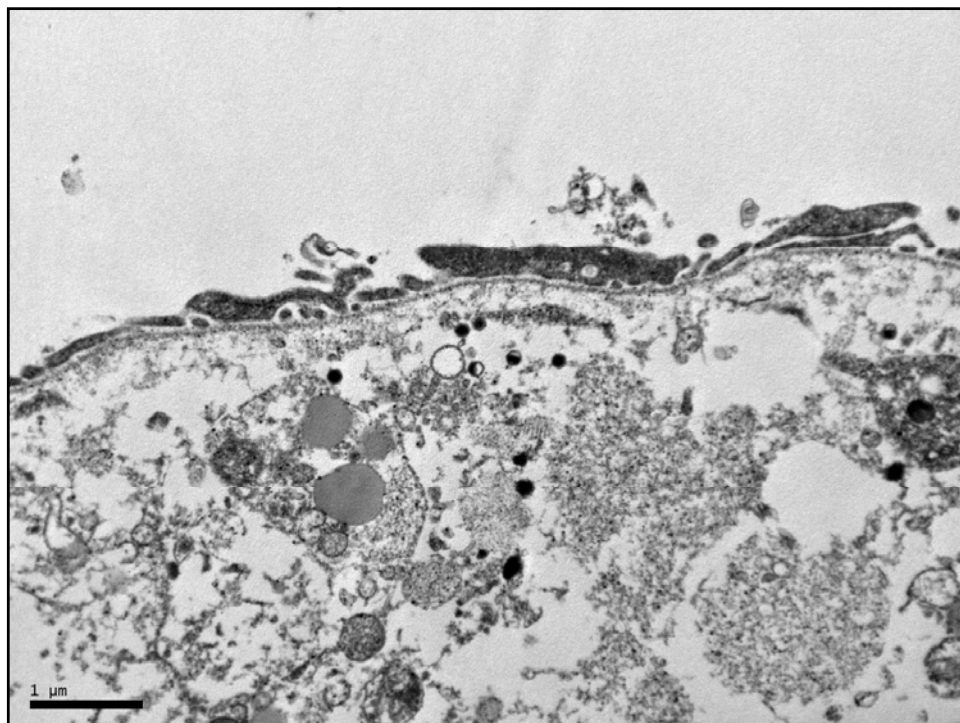
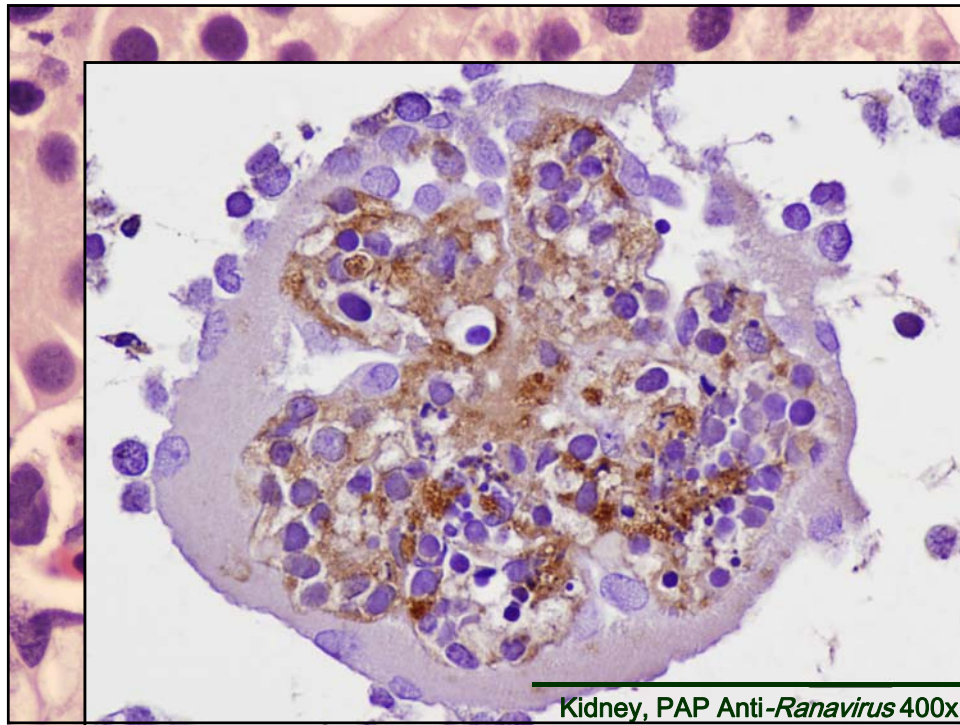
Pathology	Microscopic lesions
<p>- Haemorrhagic systemic syndrome > Ulcerative syndrome -</p> <ul style="list-style-type: none"> ➤ Skeletal muscle: haemorrhages / degeneration ➤ Skin: Epidermal thickening / necrosis of the deeper layers 	
<p>Foci of necrosis</p> <ul style="list-style-type: none"> ➤ Intracytoplasmic viral inclusions Pyknotic nuclei 	 <ul style="list-style-type: none"> • Spleen • Liver • Kidney • Intestine • Pancreas
<p>*Also demonstrated by immunohistochemistry</p>	

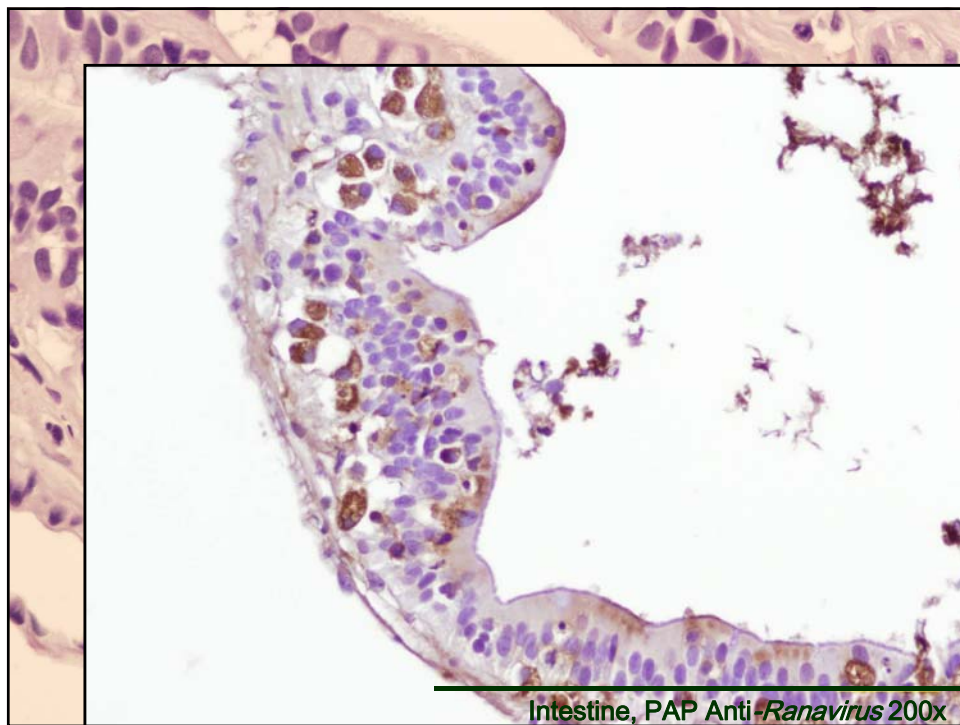
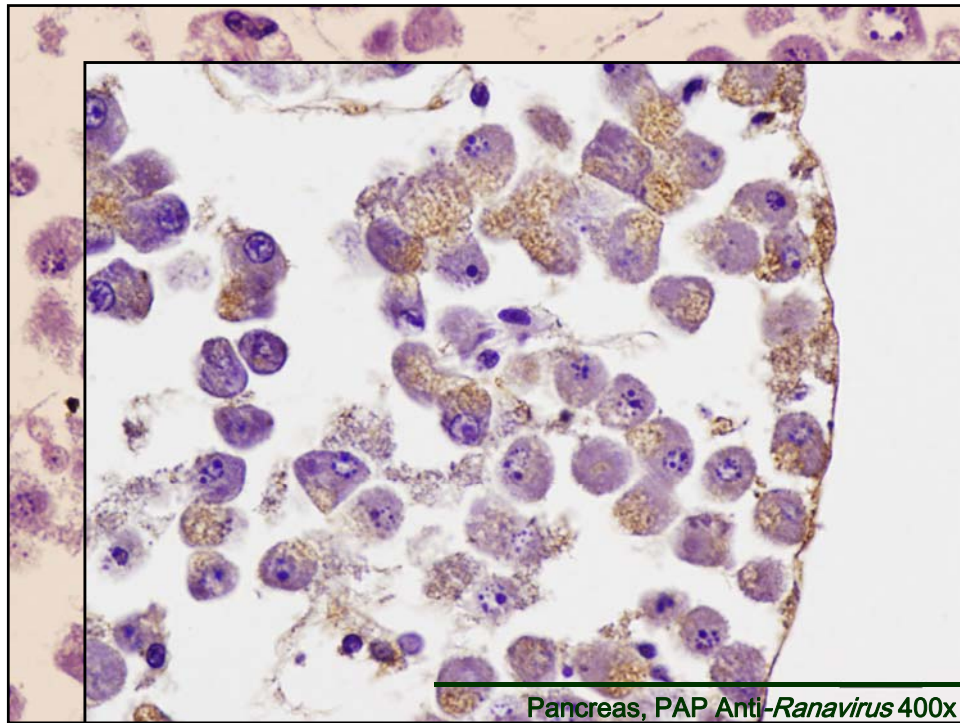


Pathology	Microscopic lesions
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<p>Foci of necrosis</p> <p>➤ Intracytoplasmic viral inclusions</p> <p>Pyknotic nuclei</p>	<p>• Spleen</p> <p>• Liver</p> <p>• Kidney</p> <p>• Intestine</p> <p>• Pancreas</p>
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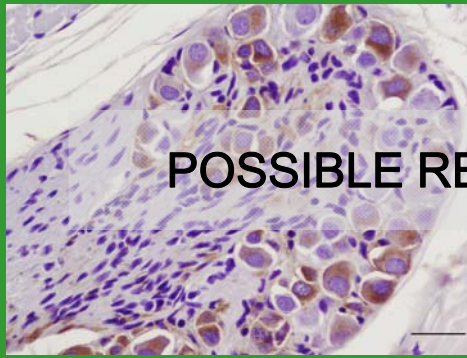




Healthy adult amphibians from Spain-positive
immunolabelling!!

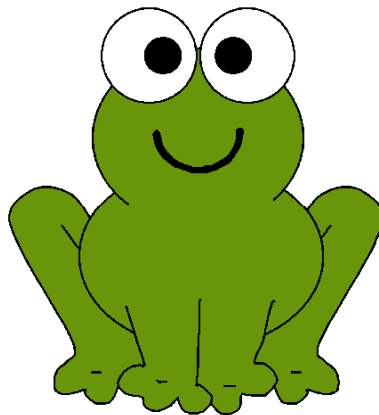
Newts-Ganglia

Toads-Kidneys



POSSIBLE RESERVOIRS??

THANK YOU FOR YOUR ATTENTION!



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