



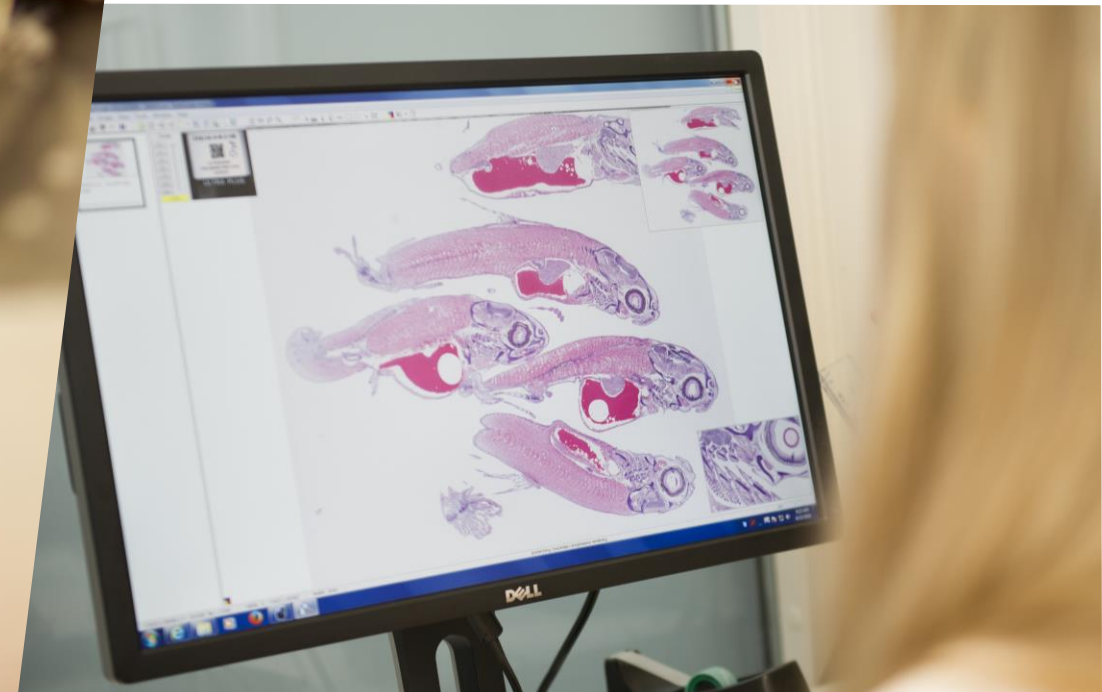
FishVet Group

 A Benchmark  
Company

# Smakebiter fra fiskepatologiens verden

OSLO, 2018

MARIANNE KRAUGERUD





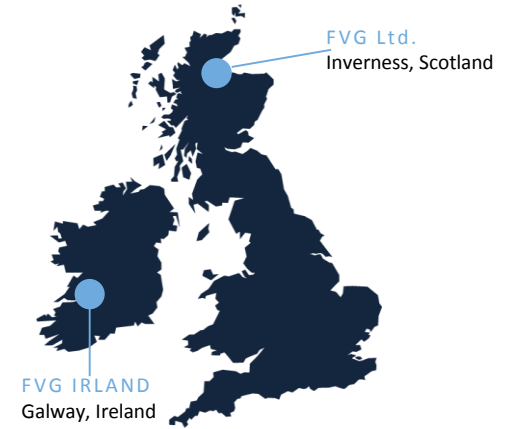
# BENCHMARK & FISH VET GROUP

## Our Locations – Our History

- Animal Health
- Sustainability Science
- Technical Publishing
- Breeding and Genetics
- Advanced Animal Nutrition

- 2000** → Benchmark Holdings Ltd established
- 2001** → Benchmark Sustainability Science division established in Oxford – relationship with McDonald's and retailers commences
- 2003** → Benchmark Technical Publishing division established with headquarters in Sheffield
- 2004** → Benchmark Animal Health division established with the purchase of Fish Vet Group (FVG)
- 2005** → Benchmark Technical Publishing expand into the US and China
- 2010** → Benchmark Animal Health expand FVG into new markets with offices and facilities established in the US
- 2012** → Benchmark Animal Health expands its health solution offering with purchase of Novartis plant, Braintree

- 2013** → FVG expand into the Norwegian aquaculture market with the opening of FVG Norway
- Benchmark purchase marine research facility in Ardtoe, Scotland
- Benchmark Holdings floats on the UK AIM Stock Exchange on 18 December
- 2013** → Benchmark's Fish Vet Group officially opens in Asia with state-of-the-art aquaculture diagnostic facility in Thailand
- 2014** → Breeding and Genetics division is added (Salmobreed & Stofnfiskur)
- 2015** → Tom Algae & Improve International acquired
- Akvaforsk Research Genetics Centre AS & Ascomber Ltd. Acquired
- INVE Aquaculture joins Dec. 2015
- 2016** → Opening of FVG in Chile





## FVG GLOBALT & FVG NORGE

- FVG GLOBALT
  - 7 kontorer, strategisk plassert i områder med produksjon innen akvakultur
- FVG NORGE
  - Oppstart 2013, lokalisert på Skøyen i Oslo, med avdelingskontor i Bergen og Sandnes
  - Laboratoriet er bygd opp fra grunnen av, designet med tanke på optimal flyt av prøver gjennom laben med minimal risiko for kontaminering
  - 15 ansatte: 5 histopatologer, 3 histoteknikere, 3 PCR-teknikere, 2 bakteriologiteknikere



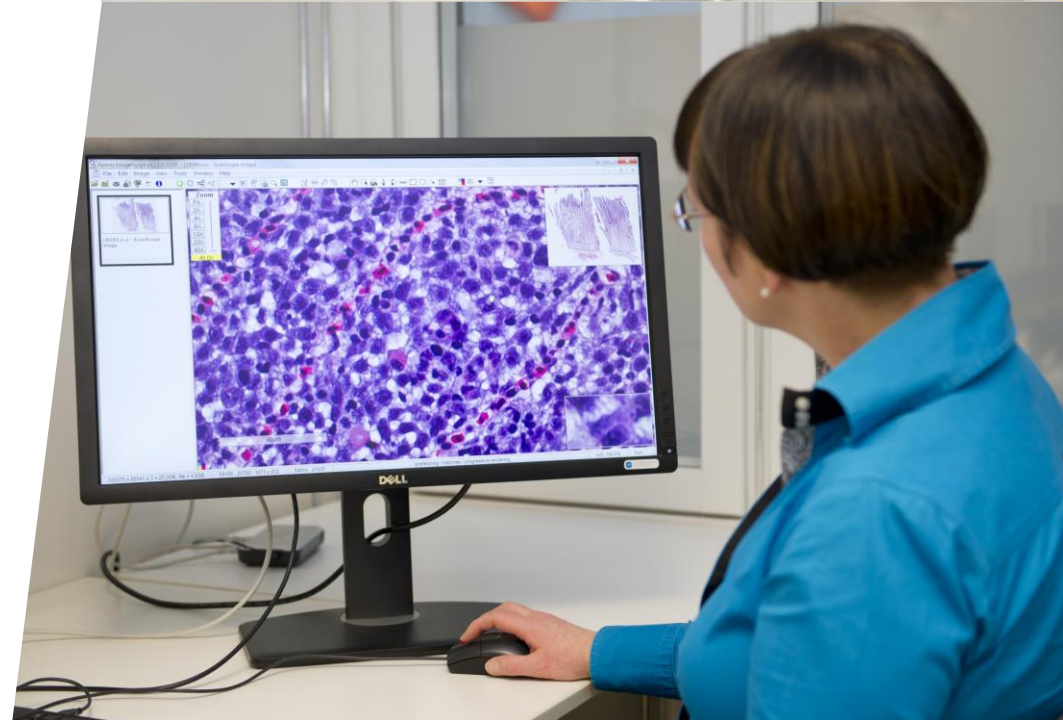




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## Aktiviteter

- Histopatologi
- PCR
- Bakteriologi
- Klinisk kjemi







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## Histopatologi labben

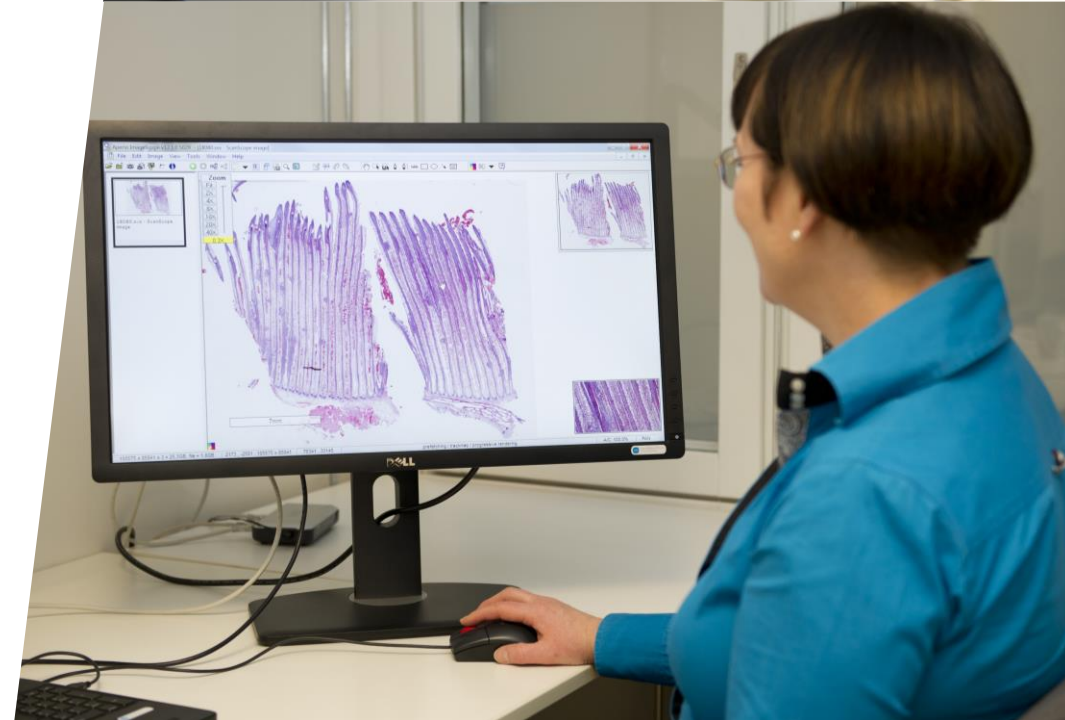
- Makrobeskjæring
- Fremføring
- Innstøping
- Snitting
- Farging
- Scanning





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## Histopatologi labben

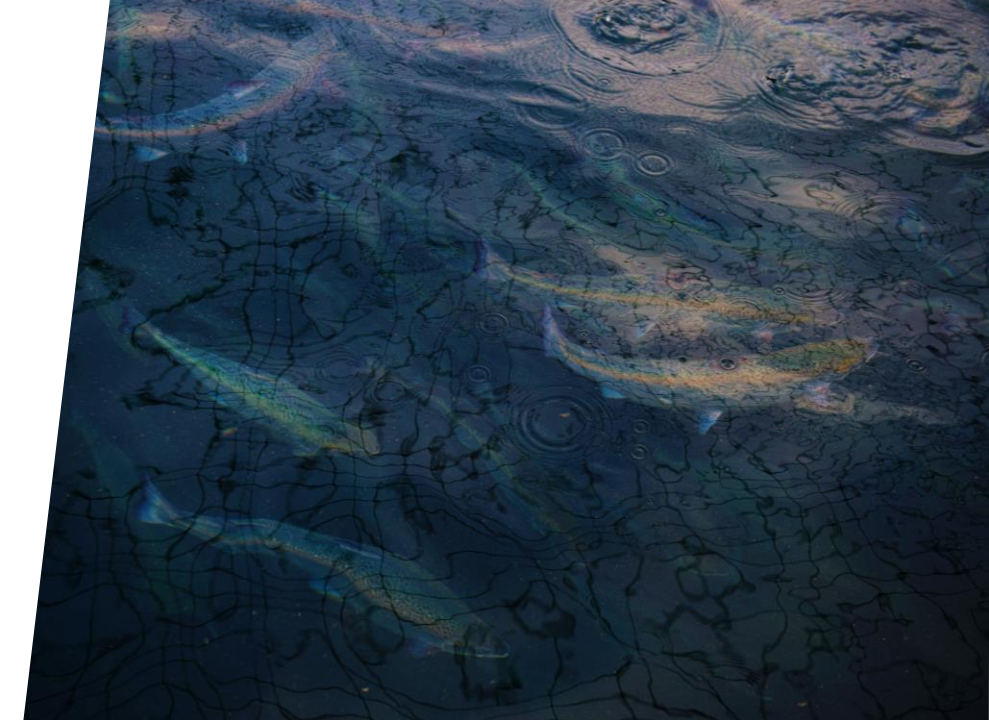






## FISH VET GROUP NORGE

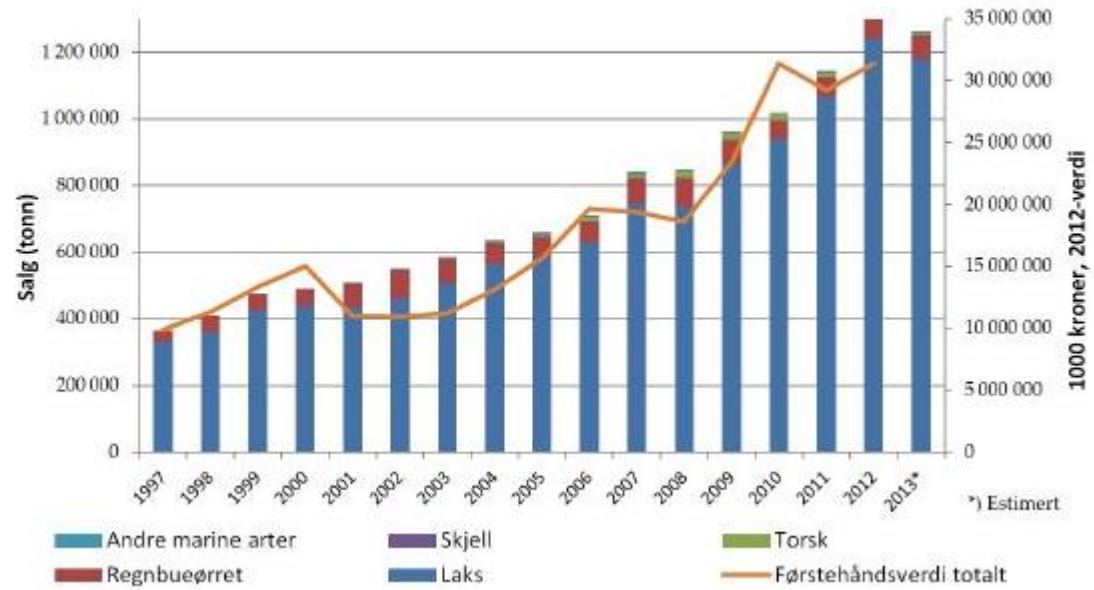
- Villfisk
  - Tosk
  - Makrell etc etc
- Oppdrett
  - Laks
  - Rensefisk
    - Rognkjeks
    - Berggylt etc
- Forsøksfisk
  - Sebrafisk
  - Medaka etc







## Akvakultur





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## Akvakultur: hva koster syk fisk?

- Svinn på 53 millioner laks i 2017 (utgjør ca 13 250 mill NOK)
- 88% på grunn av skade eller sykdom

Kilde: Fiskehelse rapporten 2017





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## Obduksjon av fisk

<https://www.youtube.com/watch?v=7X0hq0ug9q4>

<https://vimeo.com/album/4925610>



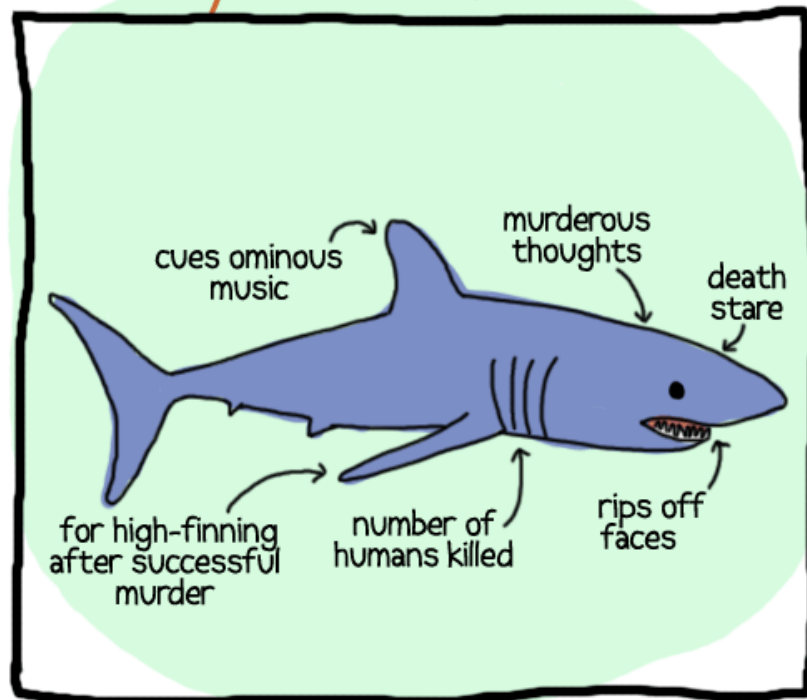




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Fisk normalanatomy

anatomy of a shark



pleated-jeans



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Normal gjelle



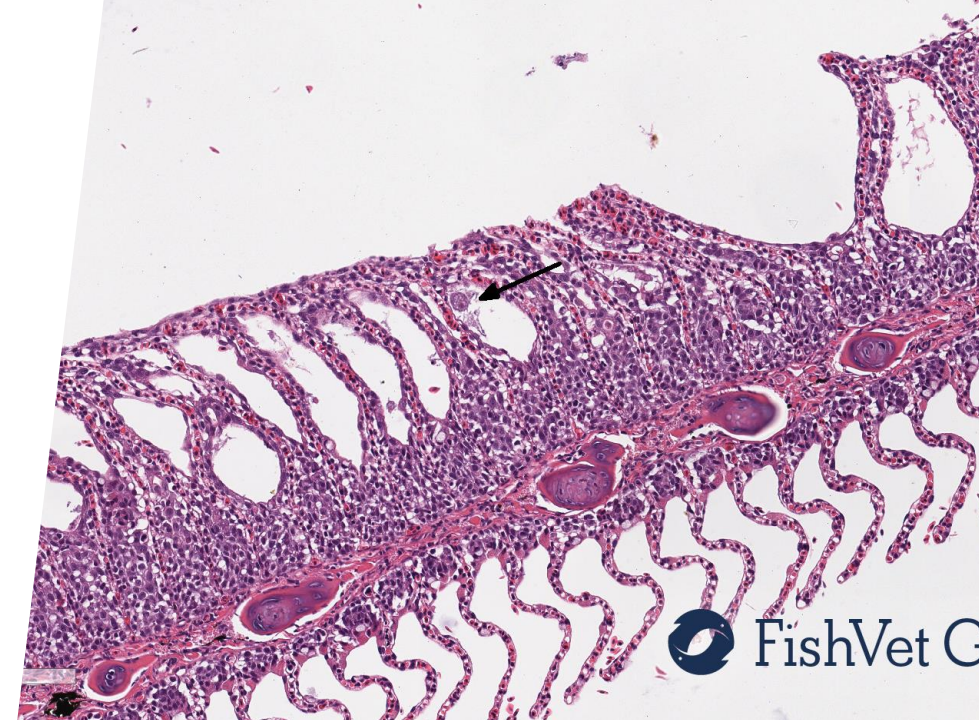




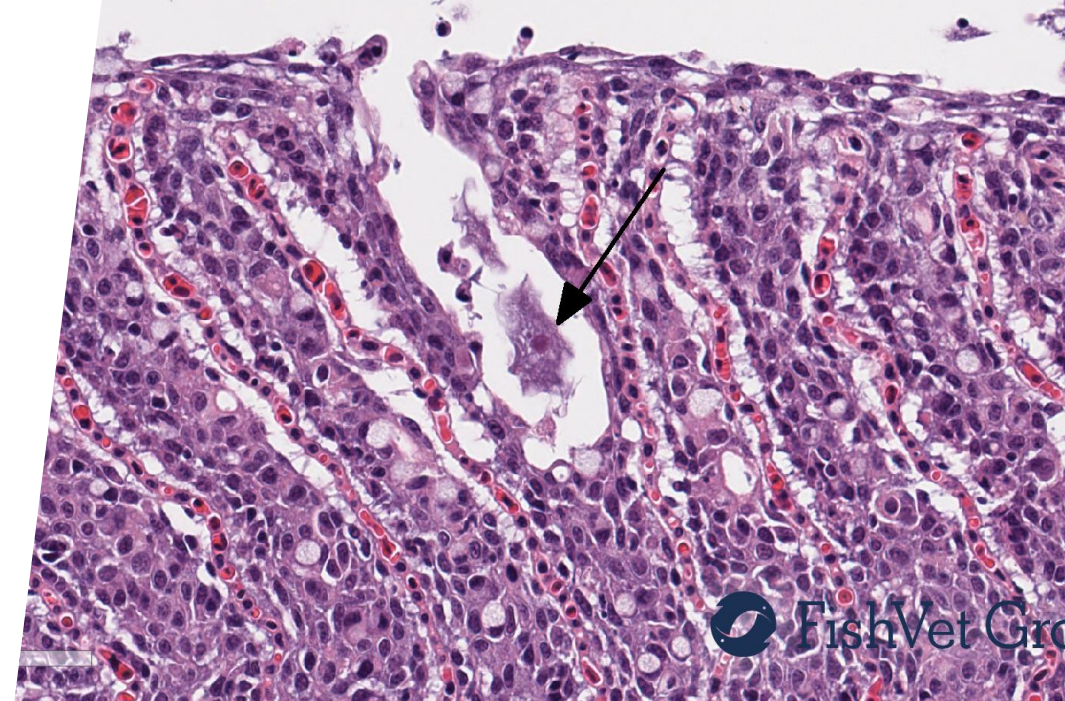
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## Patologi eksempel gjelle

- Amøbegjellesykdom
  - Infeksjon med *Paramoeba perurans*, en encellet amøbe (parasitt)



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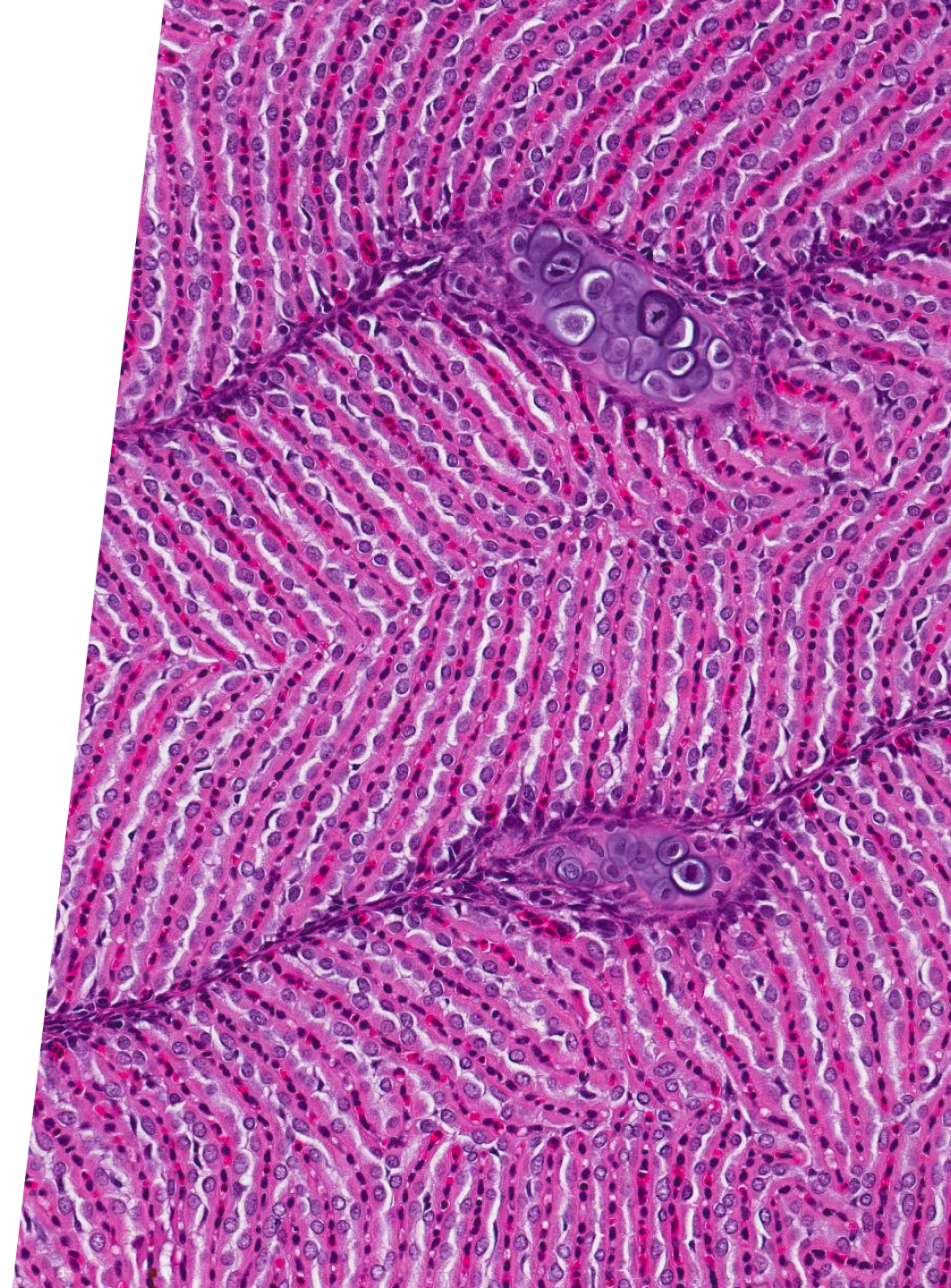
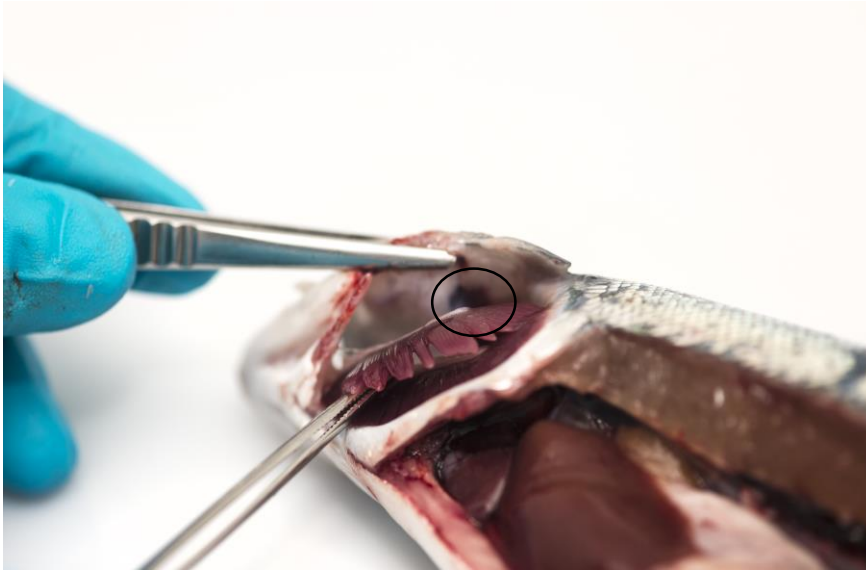
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## Normal pseudobranchie



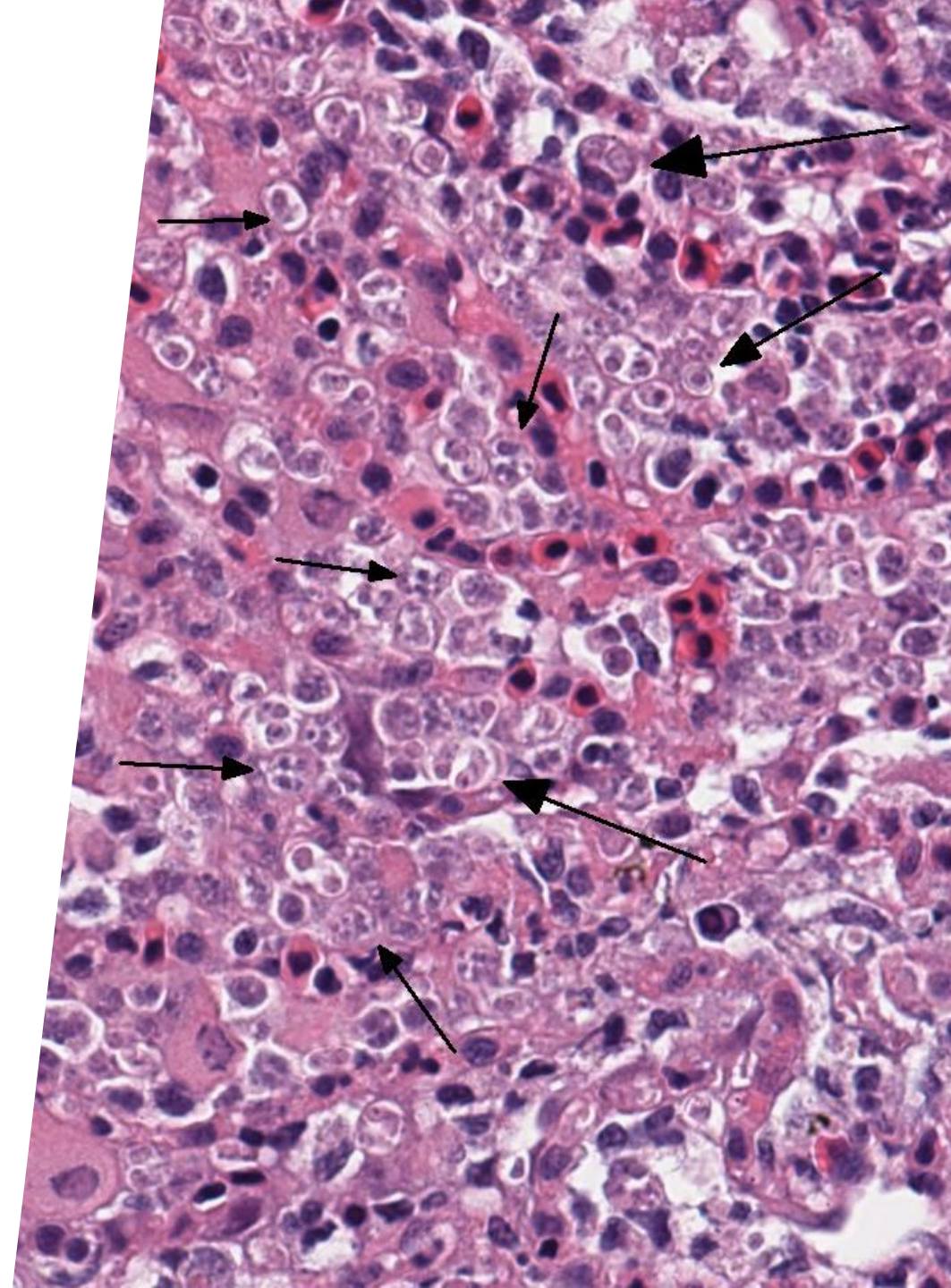




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## Patologi eksempel pseudobrankie

- Parvicapsulose
  - Infeksjon med *Parvicapsula pseudobranchicola*, en mikrosporidie (encellet parasitt)

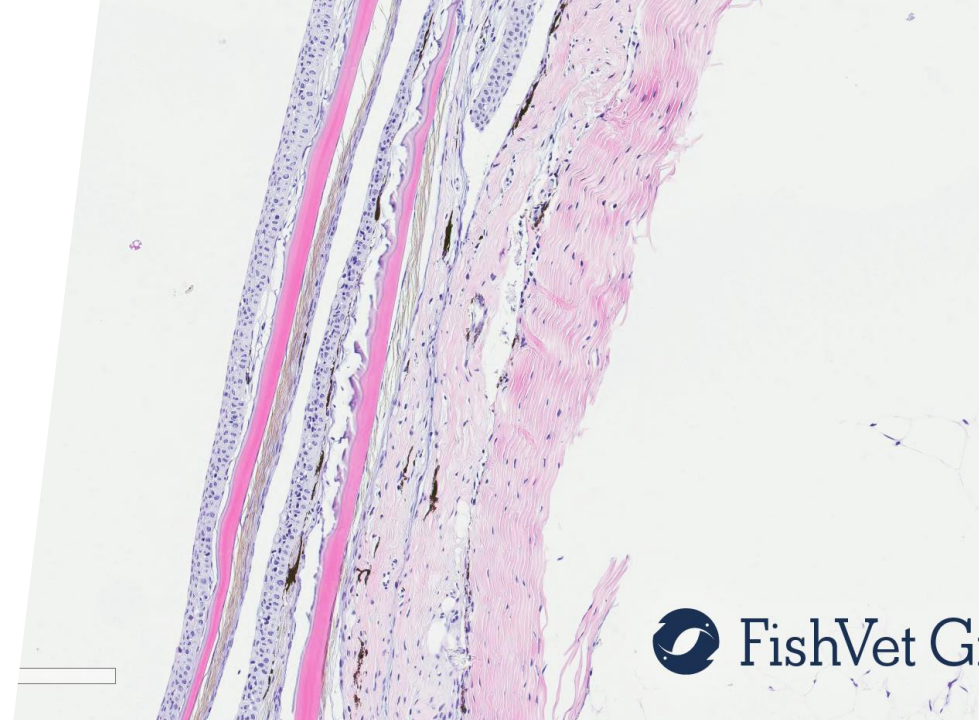
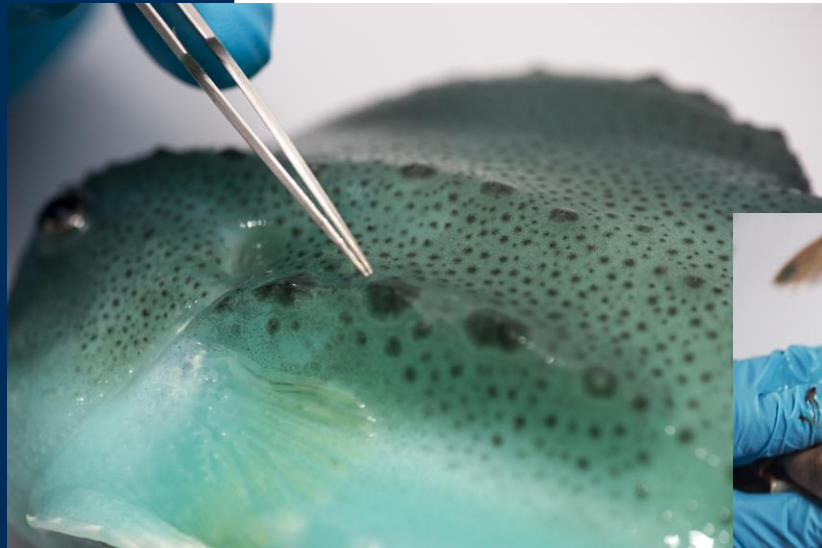




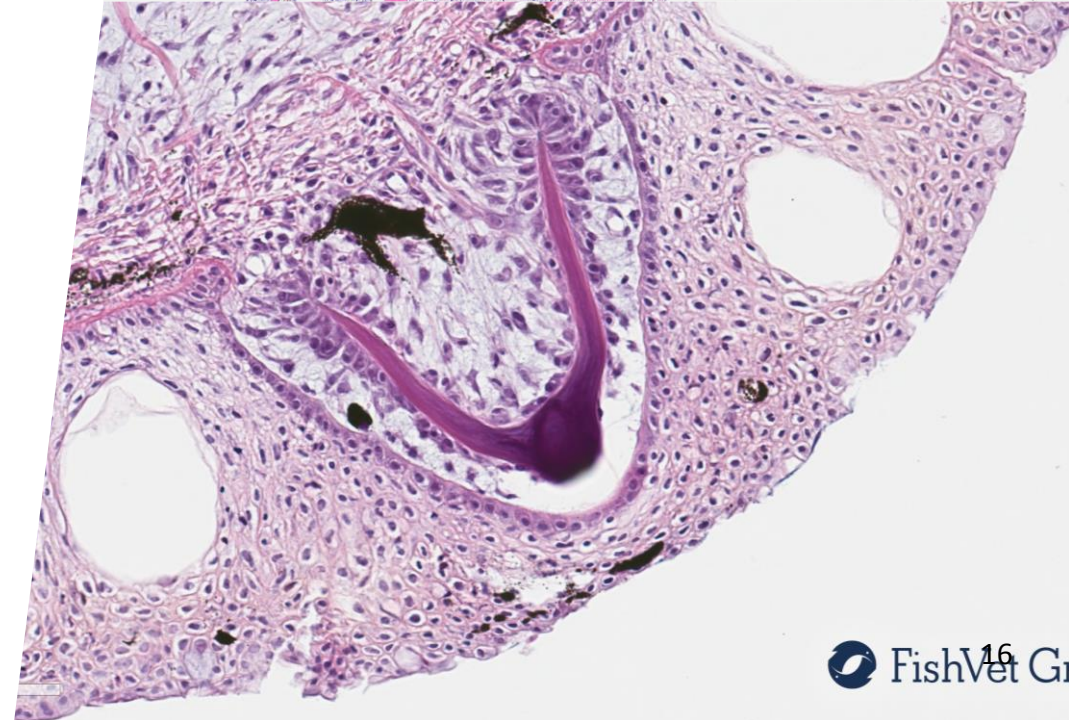


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## Normal histologi hud



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FishVet G

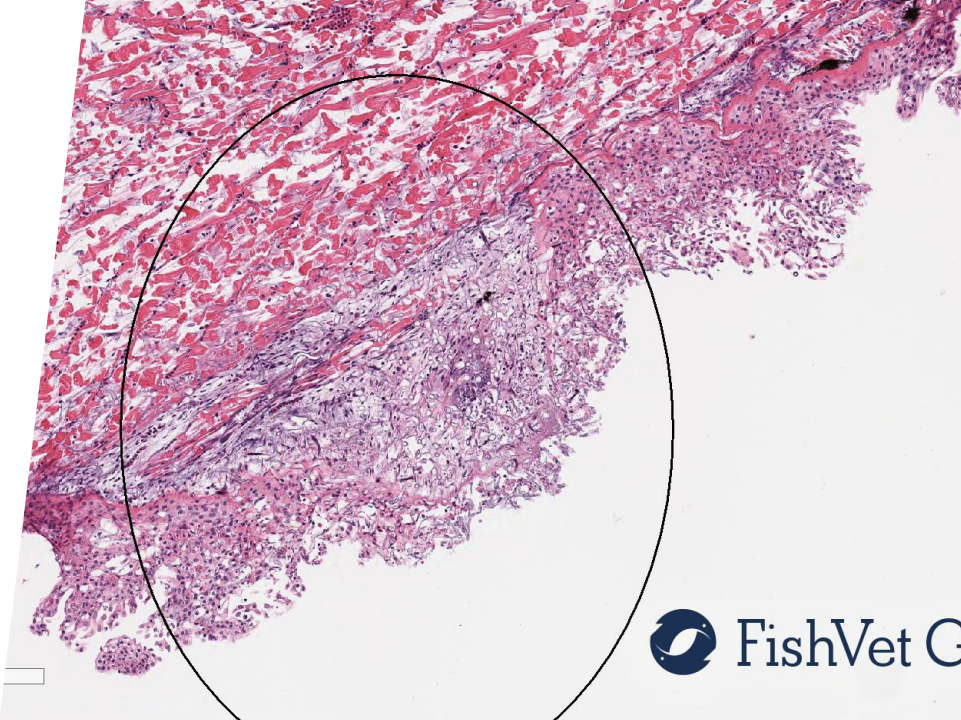




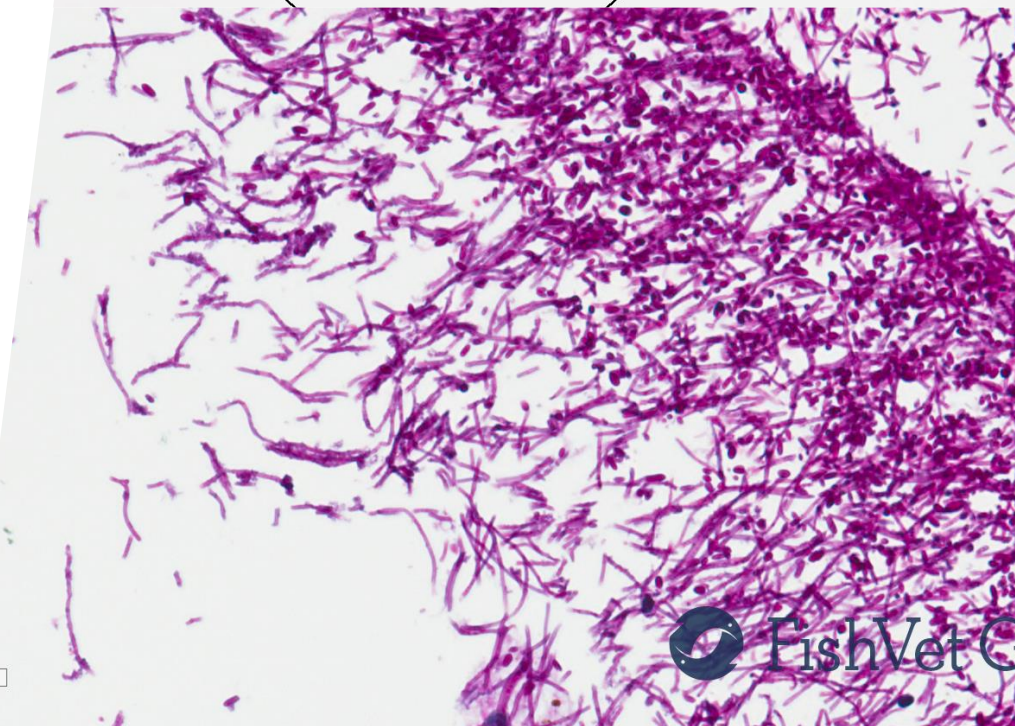
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## Patologi eksempel hud

- Mykotisk dermatitt
  - HE
  - PAS



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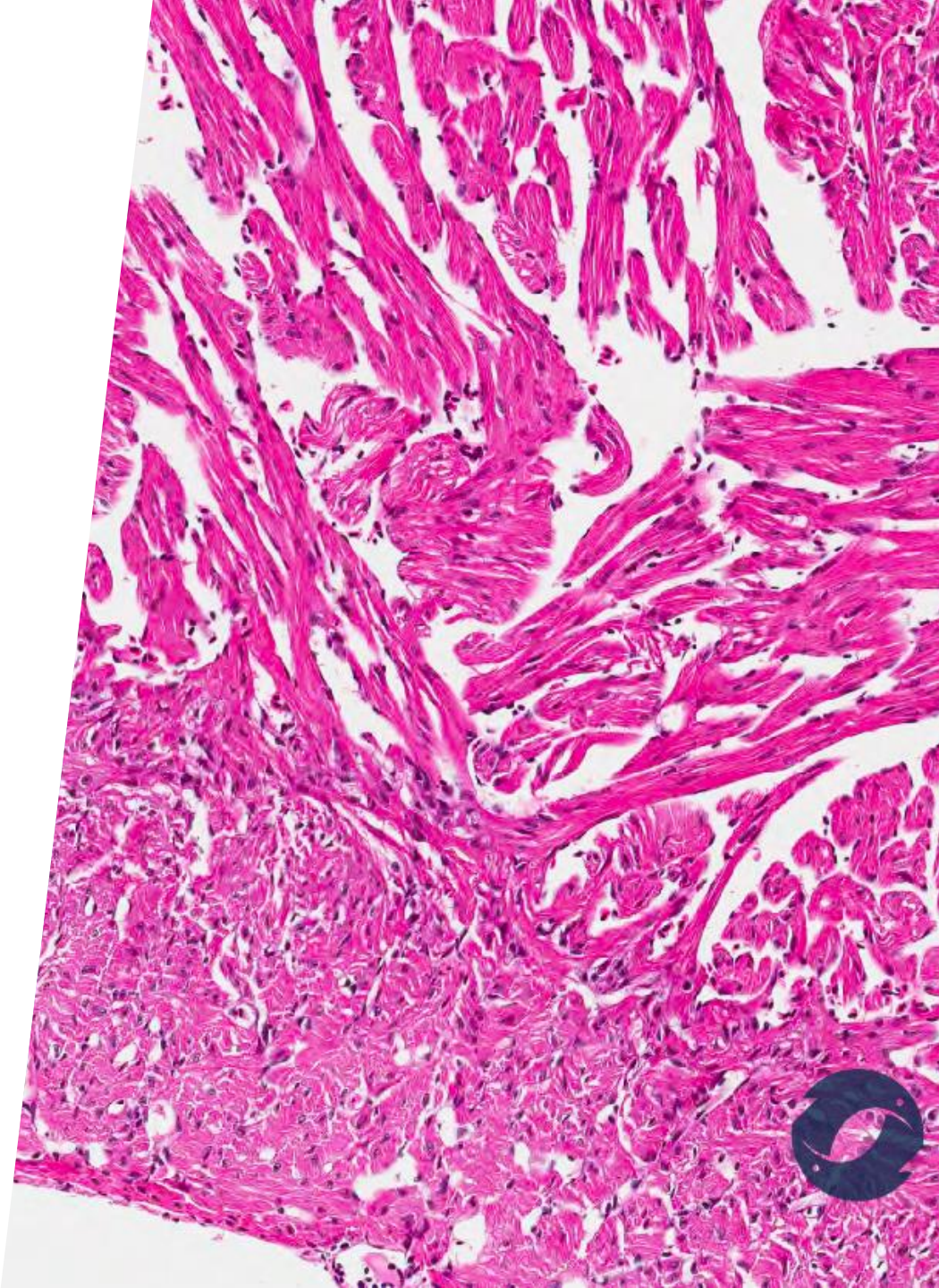
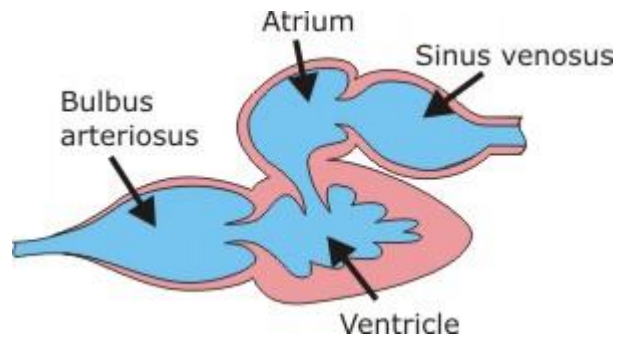
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## Normal histologi hjerte



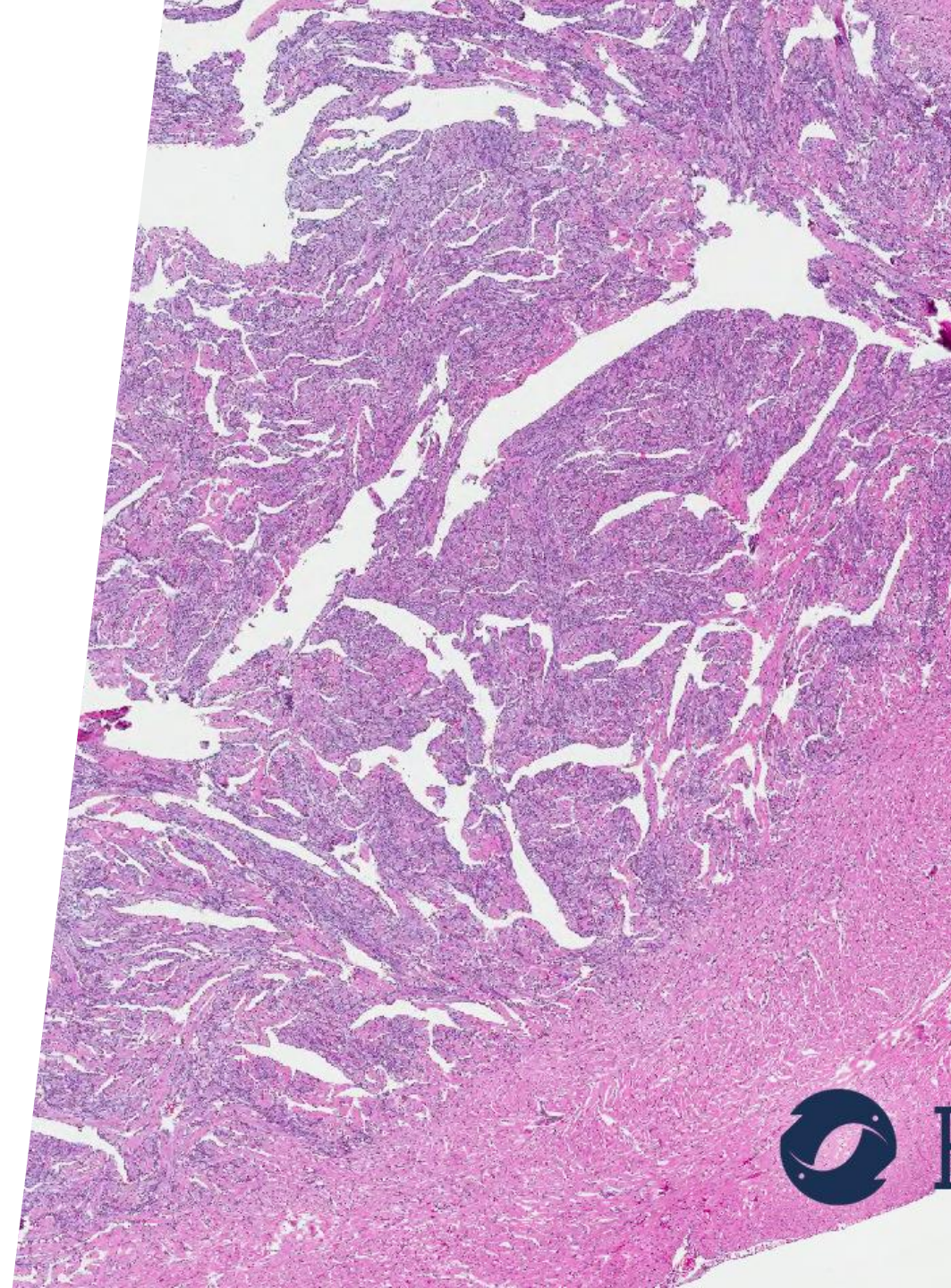




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## Patologi eksempel hjerte

- Kardiomyopati syndrom (CMS)
  - Piscint myoarditis virus (PMCV)

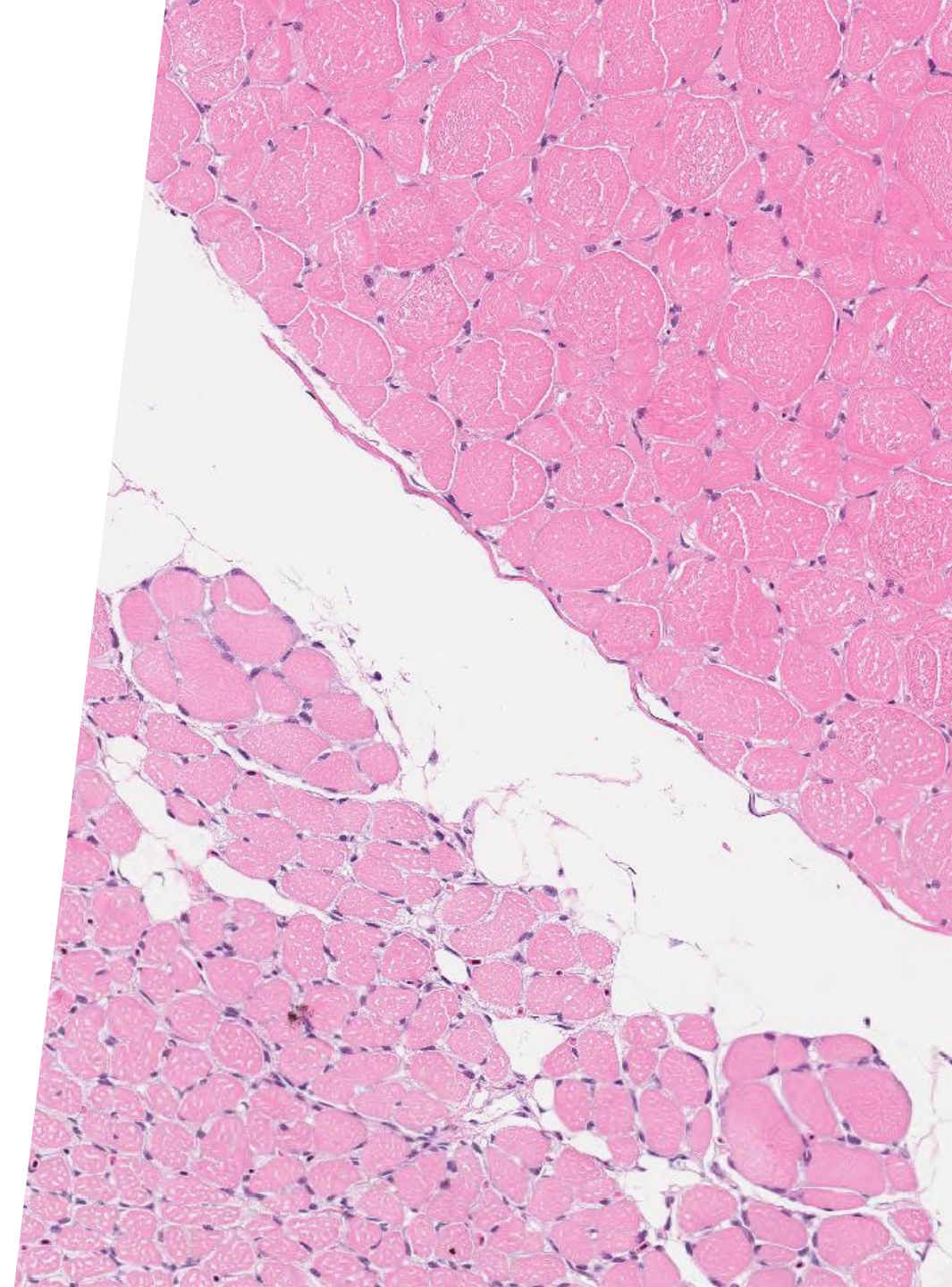






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## Normal histologi skjelettmuskel



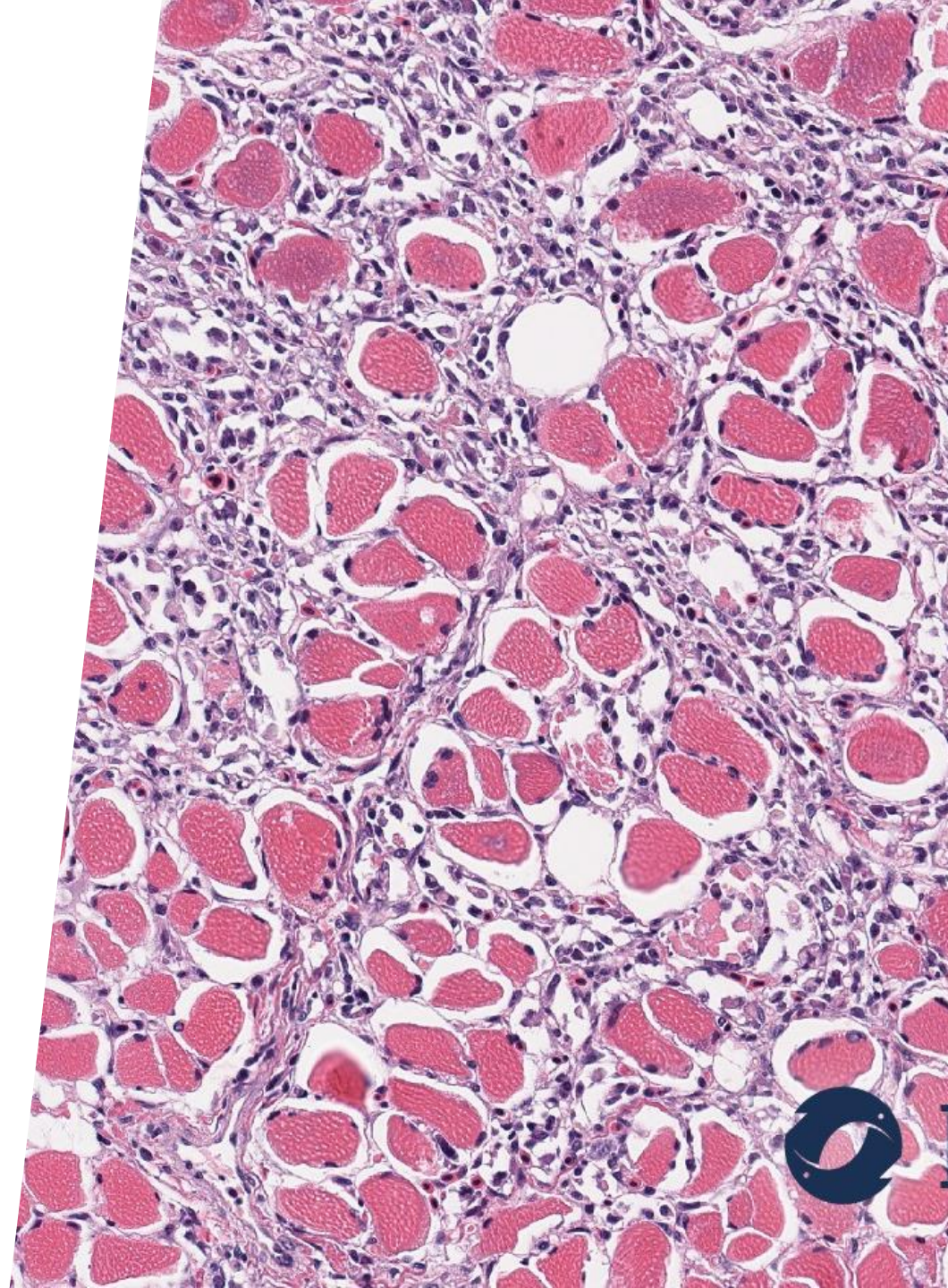




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## Patologi eksempel skjelettmuskel

- Hjerte- og skjelettmuskelbetennelse (HSMB)
  - Piscint reovirus

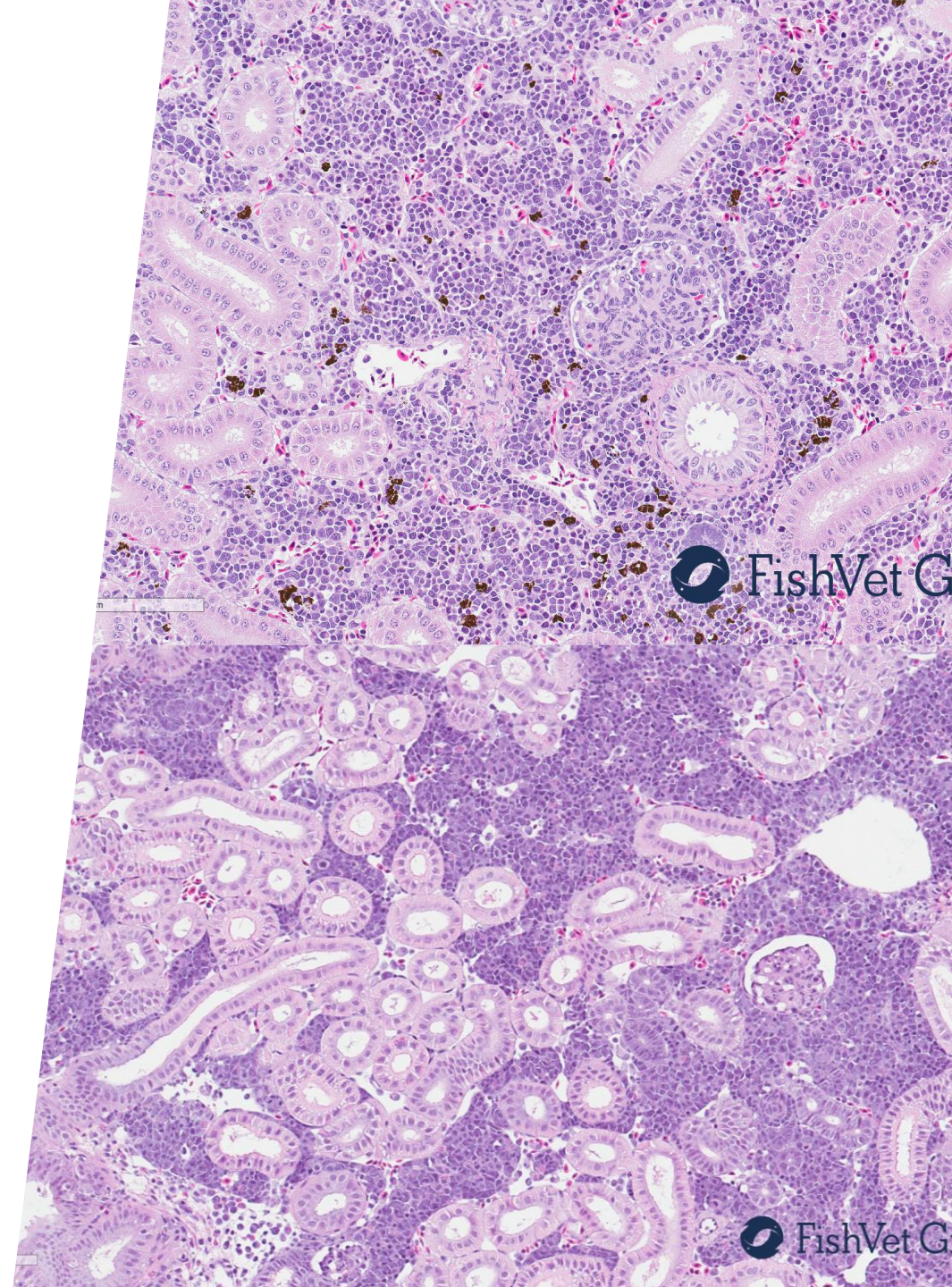
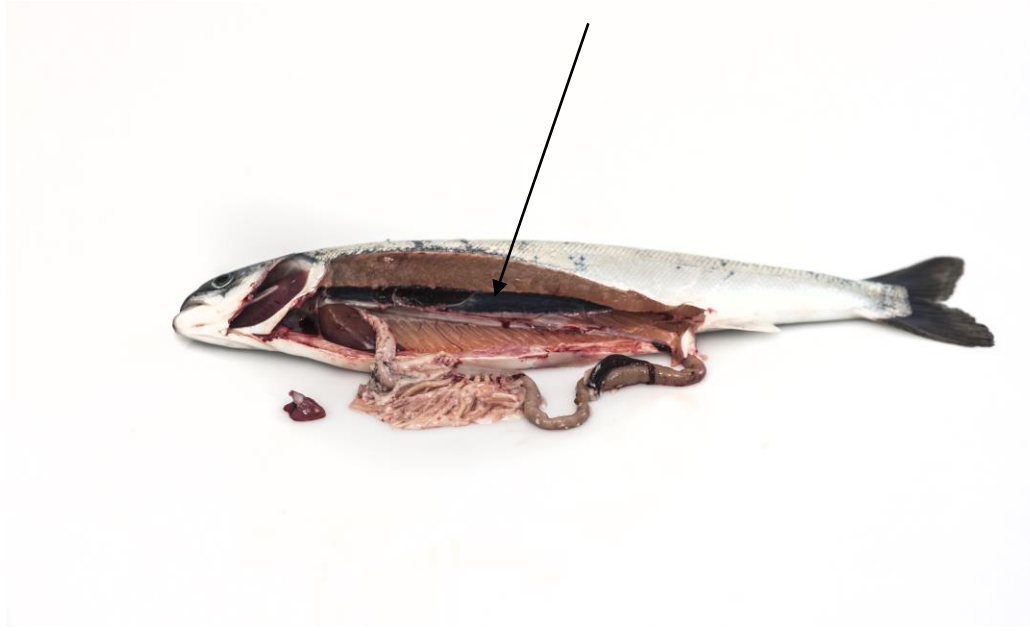






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## Normal histologi nyre



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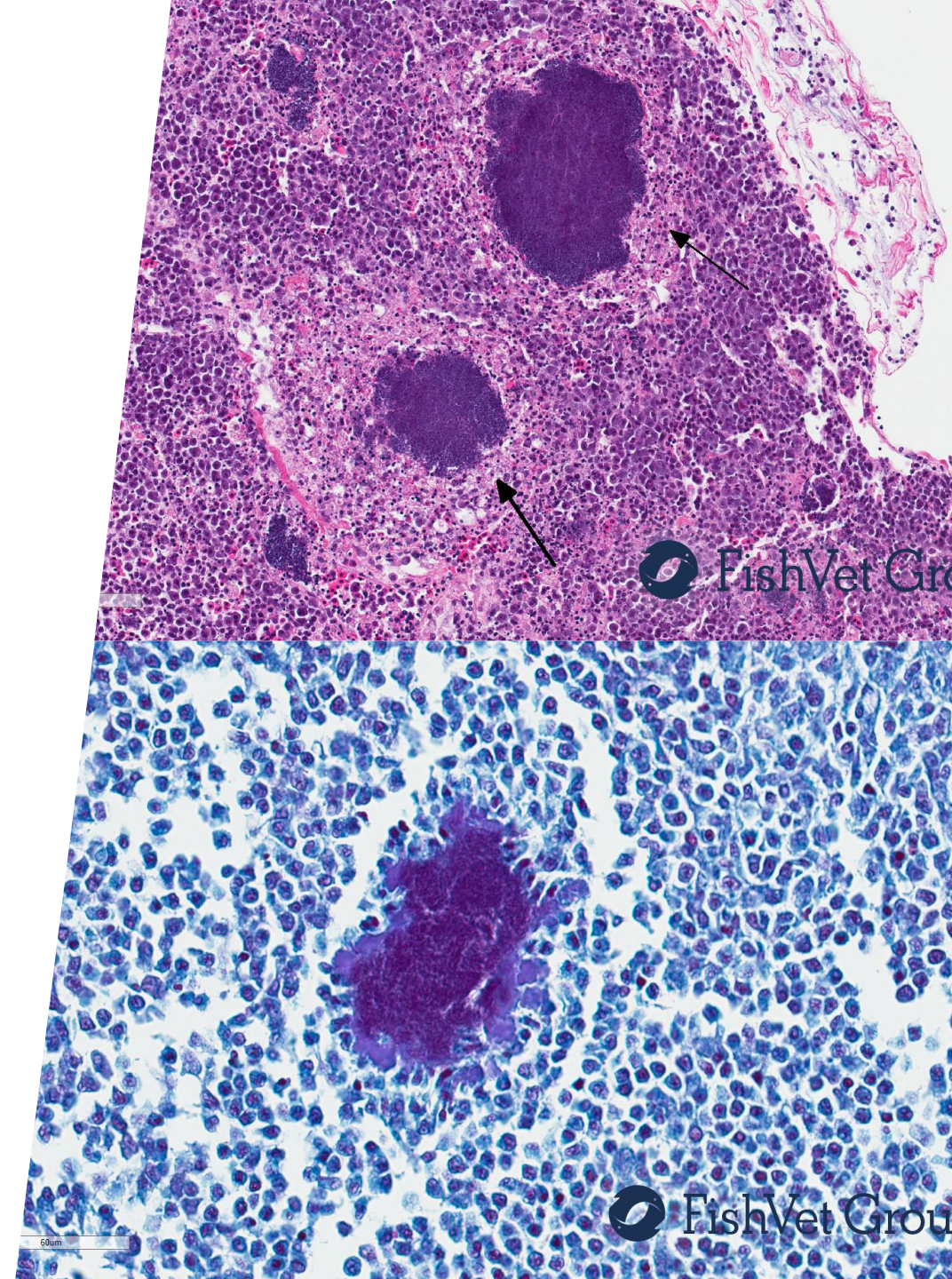


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## Patologi eksempel nyre

Systemisk bakterieinfeksjon (sepsis) hos rognkjeks

- Infeksjon med atypisk *Aeromonas salmonicida*



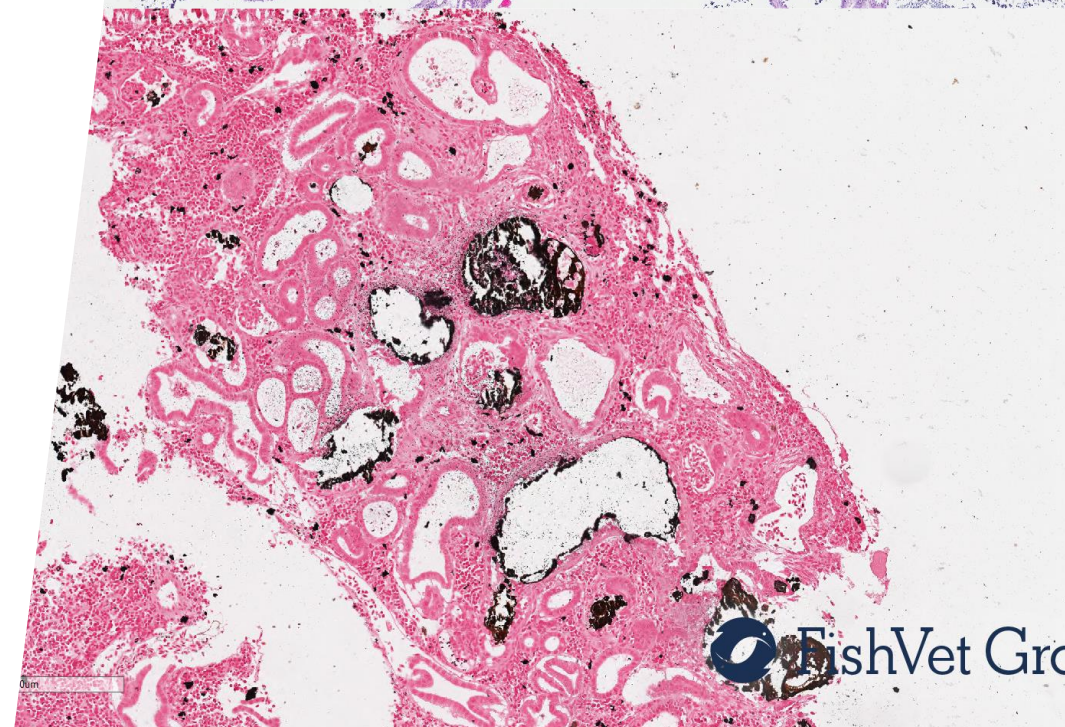
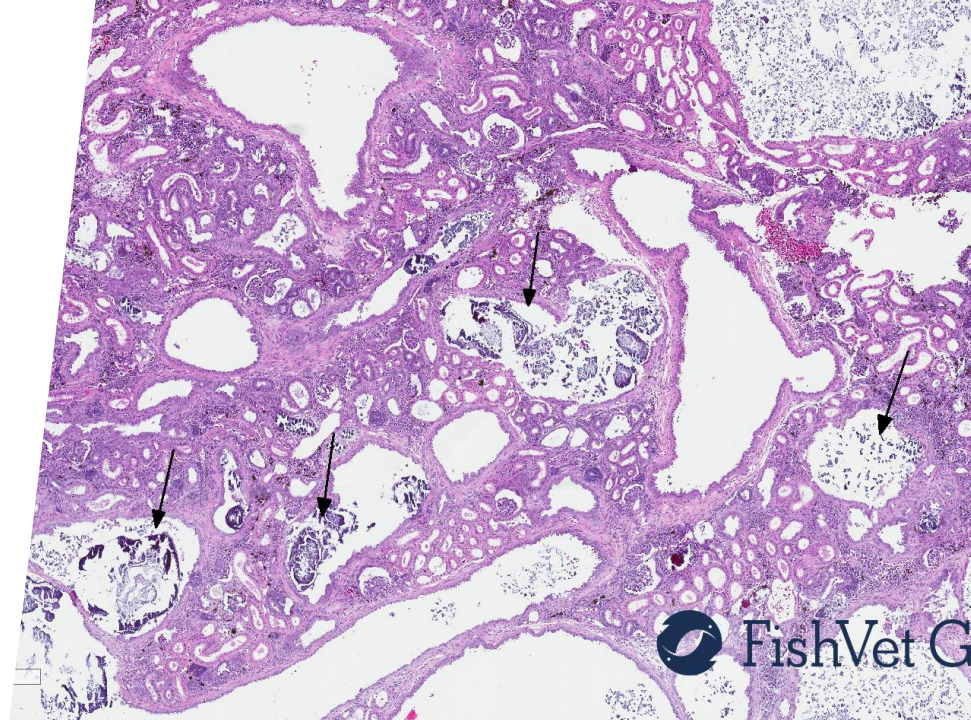




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## Patologi eksempel nyre

- Nefrokalcinose
  - HE
  - Von Kossa

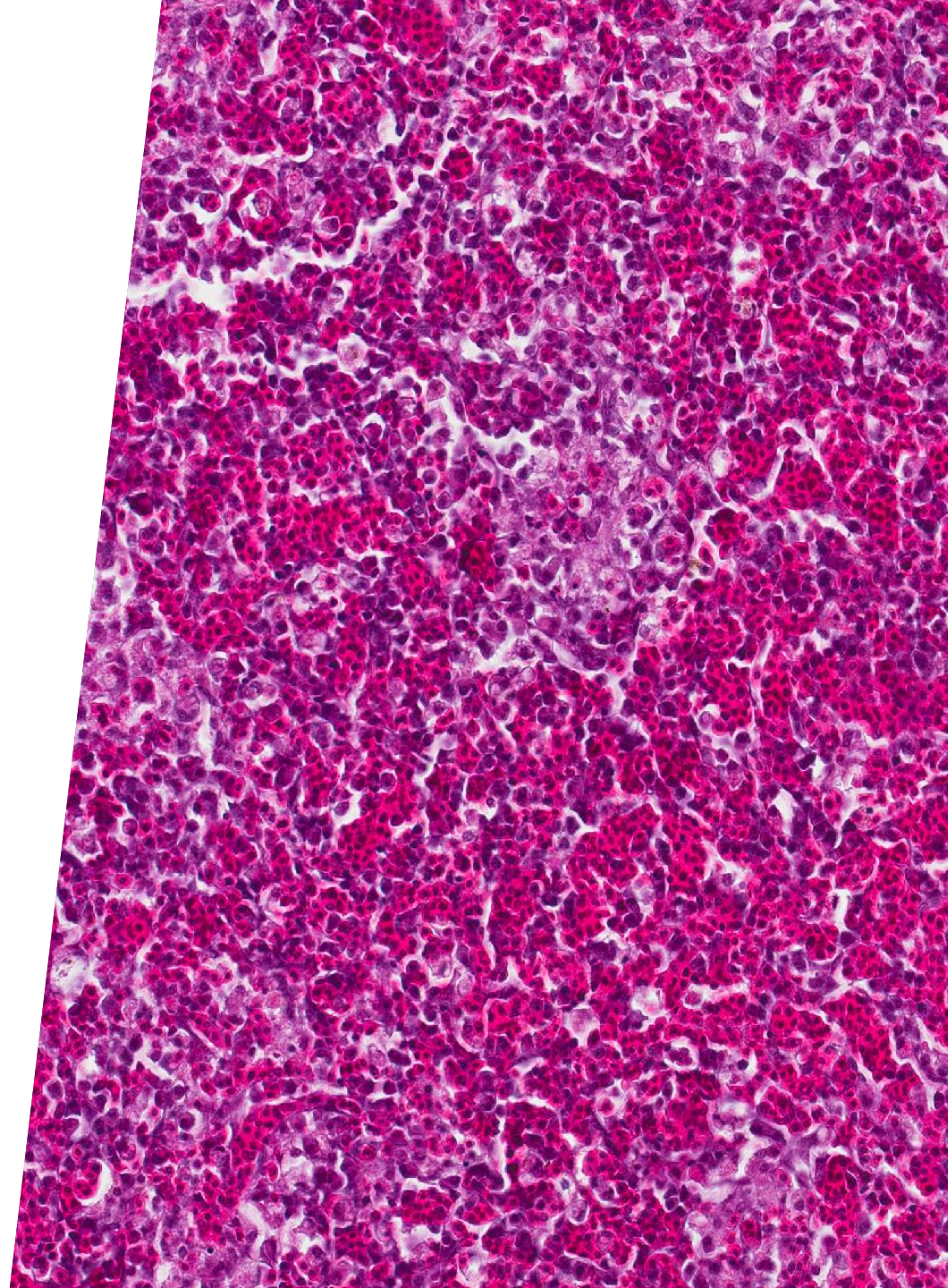






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Normal histologi milt



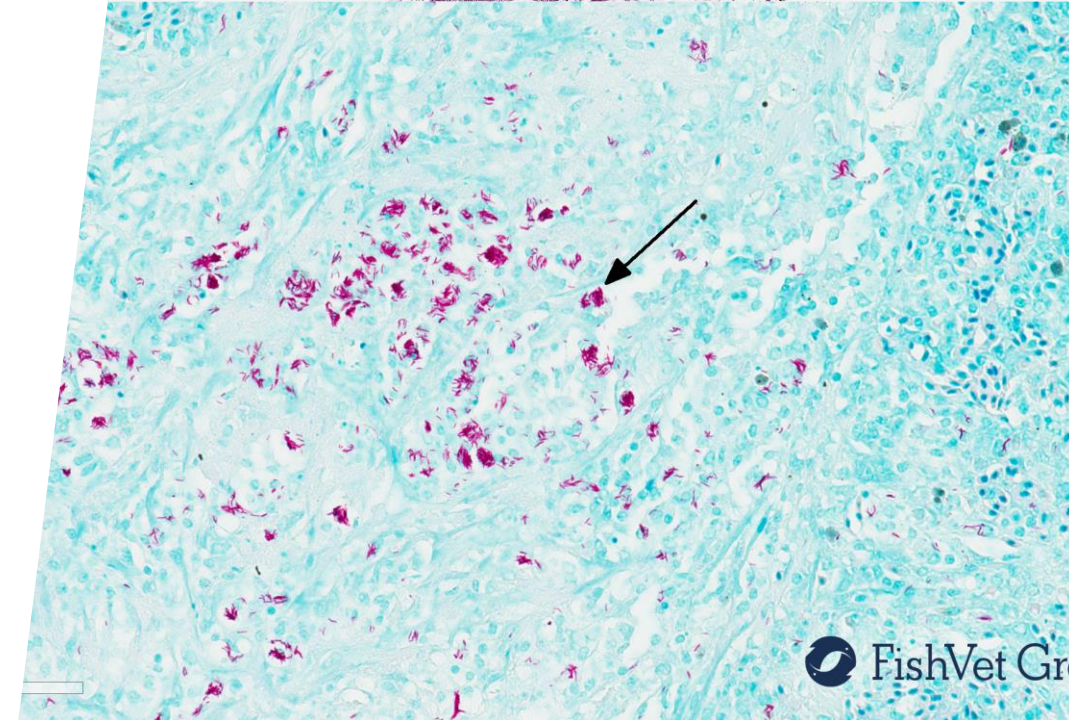
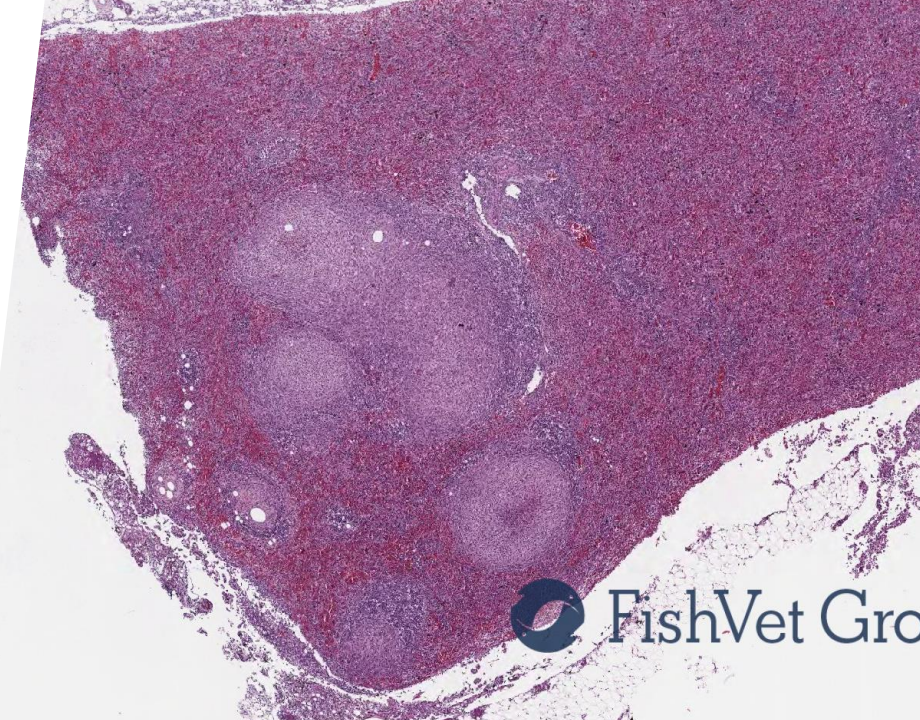




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## Patologi eksempel milt

- Mykobakteriose
  - HE
  - Ziehl-Neelsen







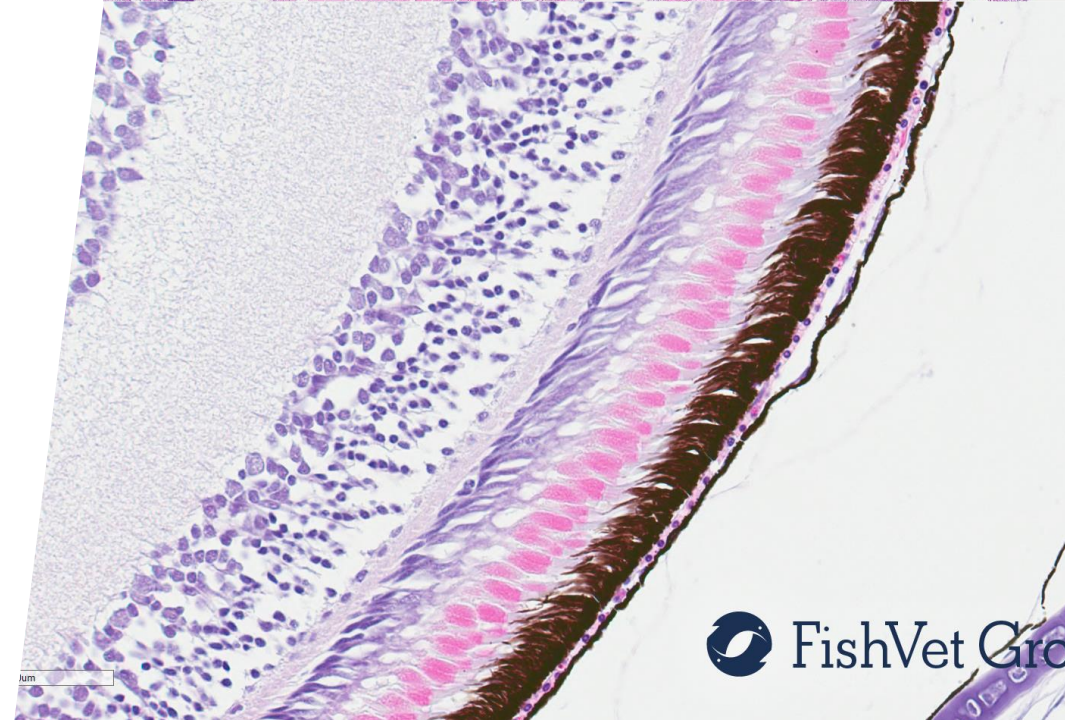
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## Normal histologi øye

- Rognkjeks
  - Hele øyet
  - Retina



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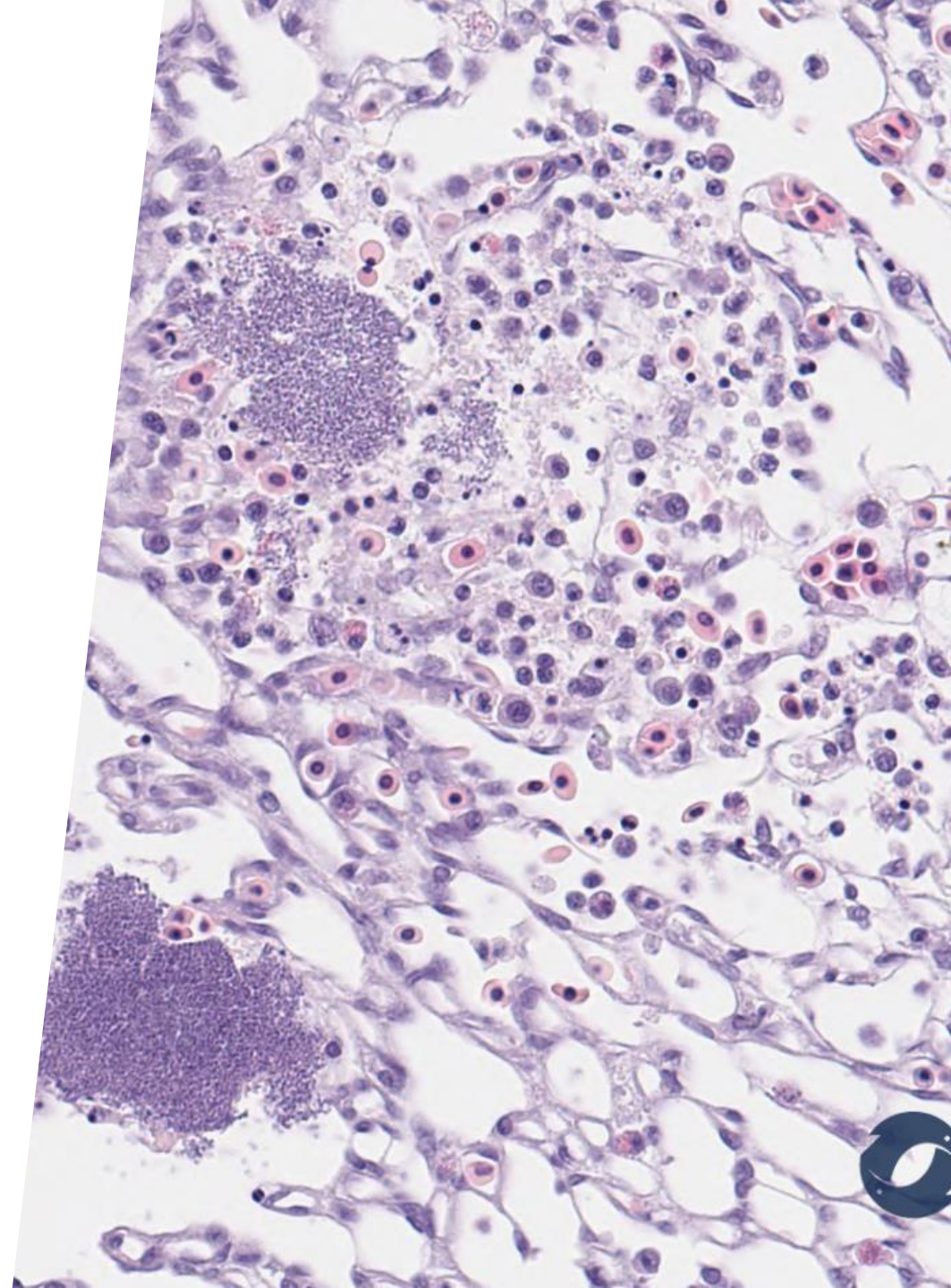




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## Patologi eksempel øye

- Bakterier i rete choroidea
  - *Aeromonas salmonicida*



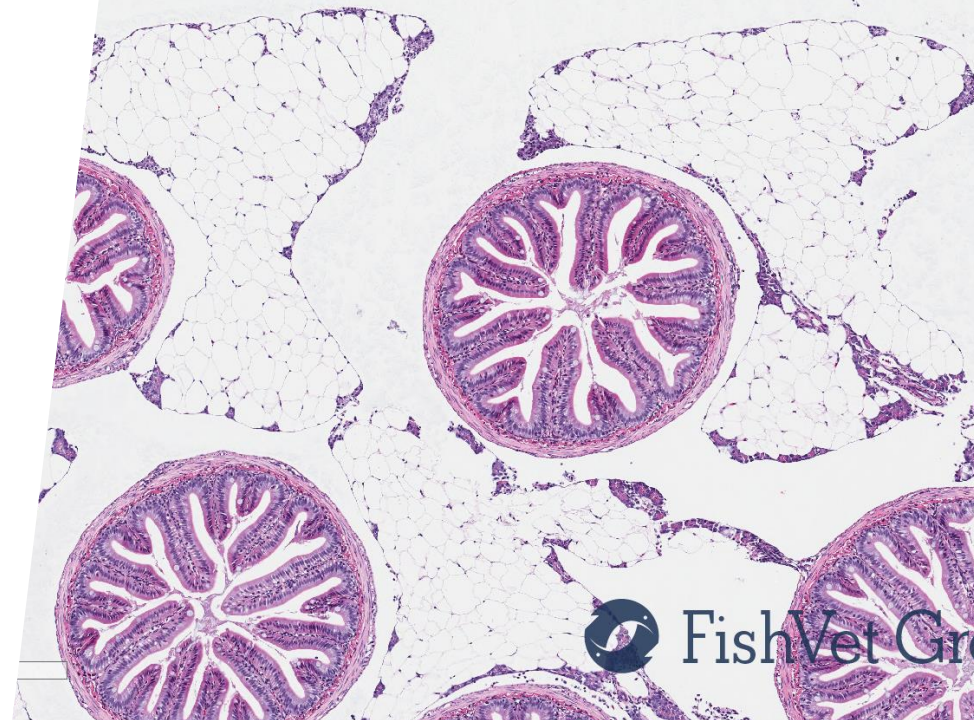




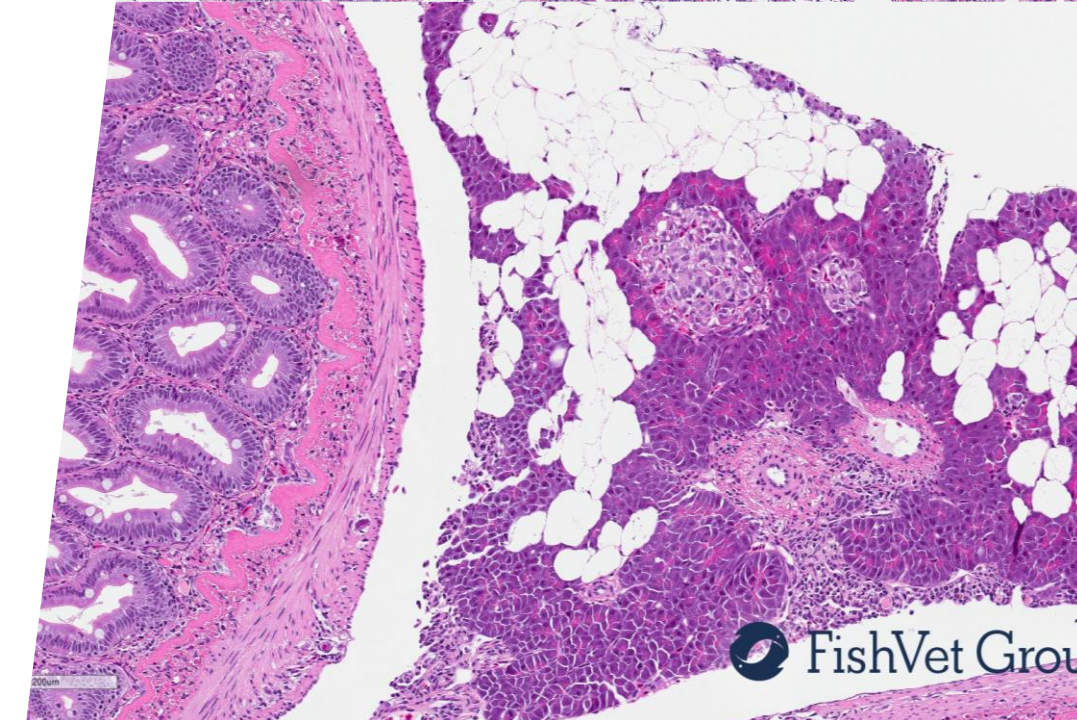
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## Normal histologi fisk

- Tarm og pankreas



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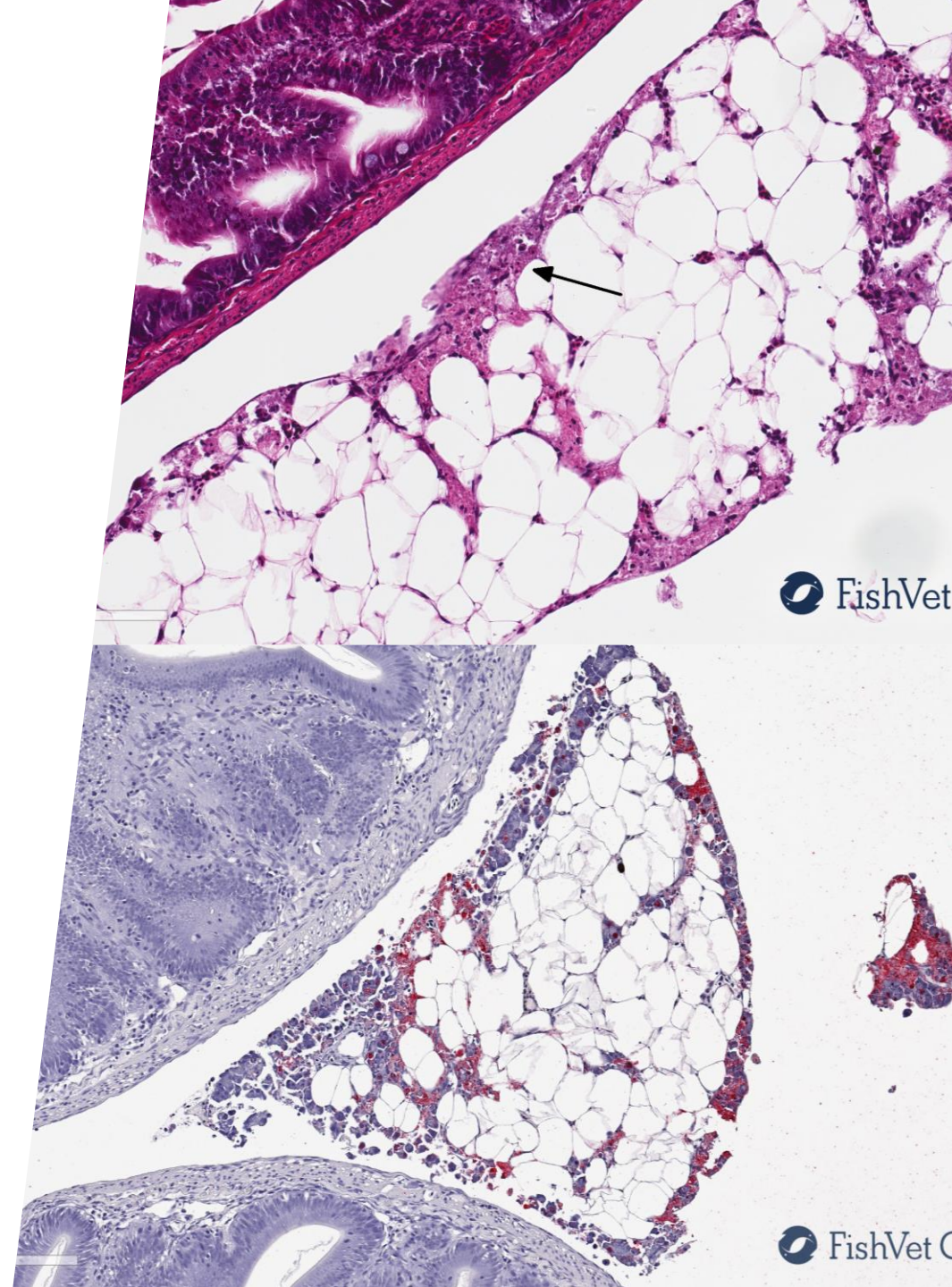




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## Patologi eksempel pankreas

- Infeksiøs pankreas nekrose
  - HE
  - IHK for infeksiøs pankreas nekrose virus (IPNV)





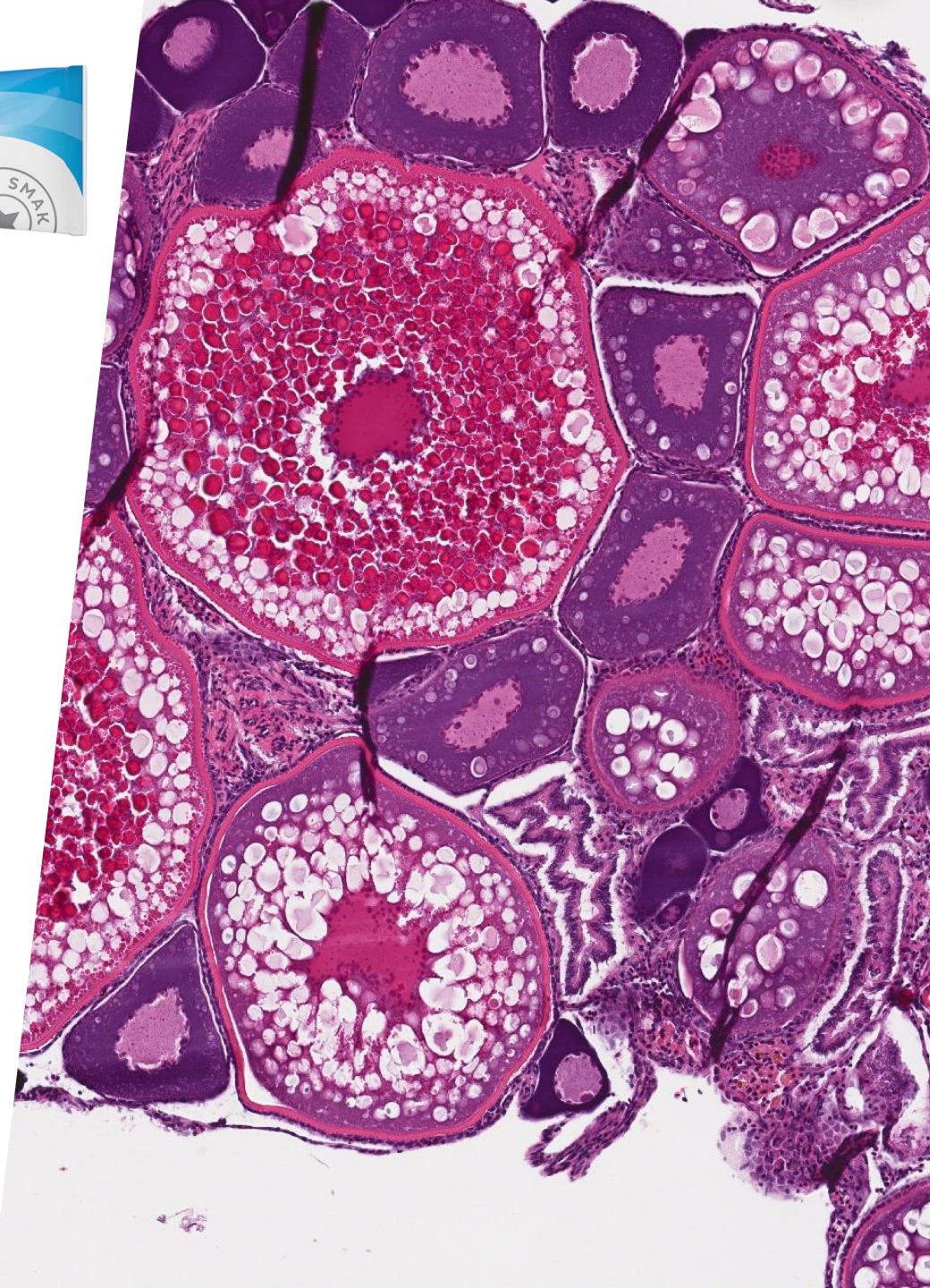


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## Normal histologi ovarie

- Ovarie sebrafisk



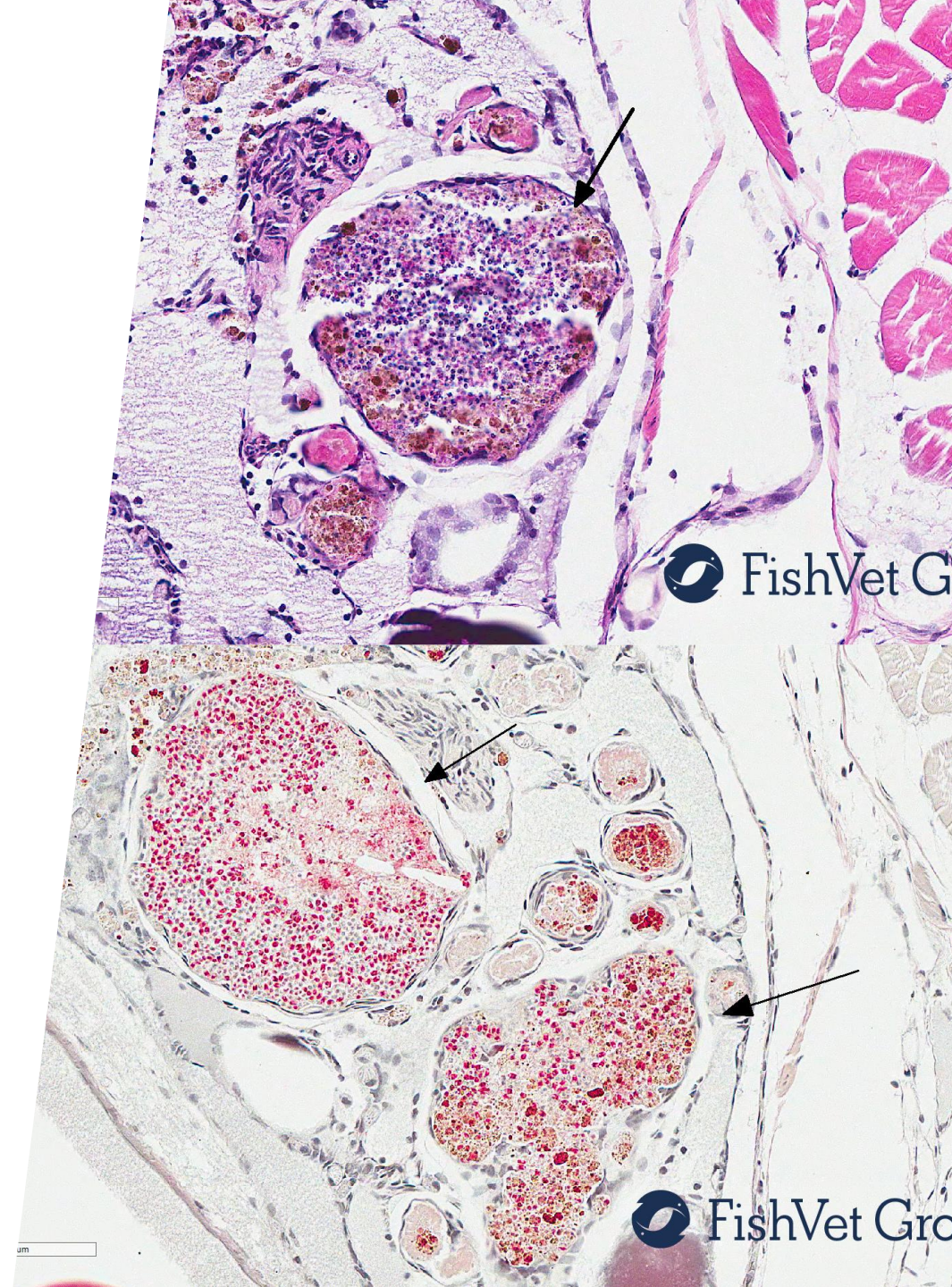




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## Patologi eksempel ovarie

- Parasittinfeksjon med *Pseudoloma neurophilia* (en mirkospordie parasitt)
  - HE
  - Luna farging



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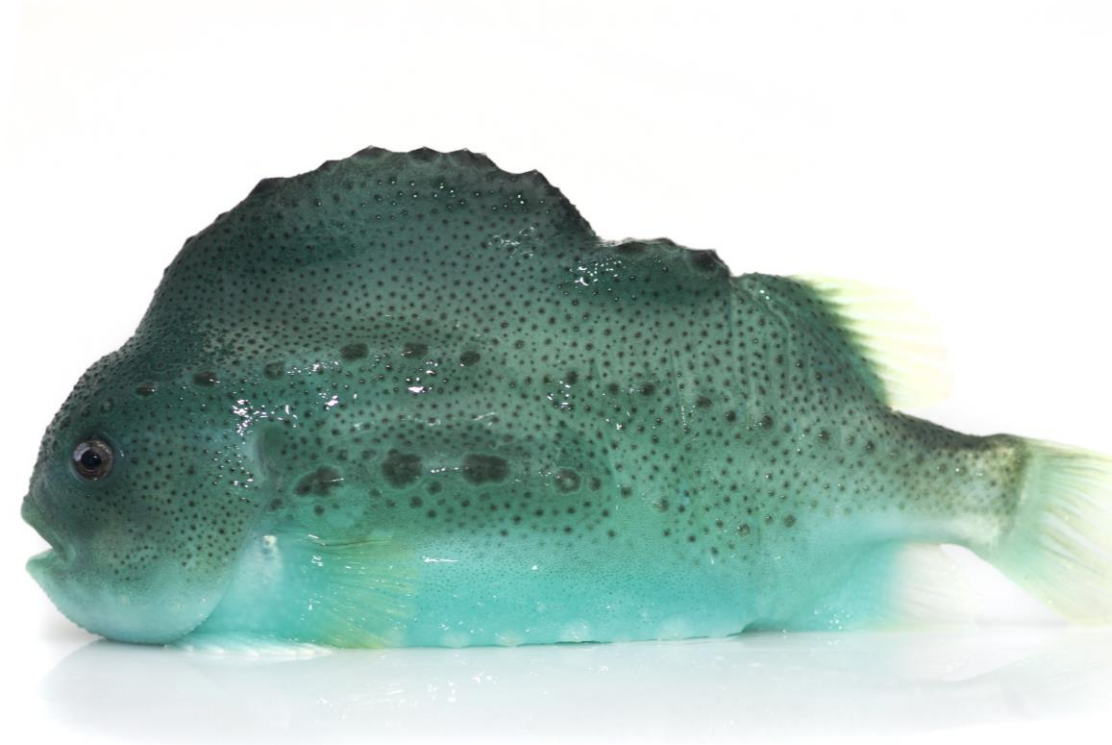
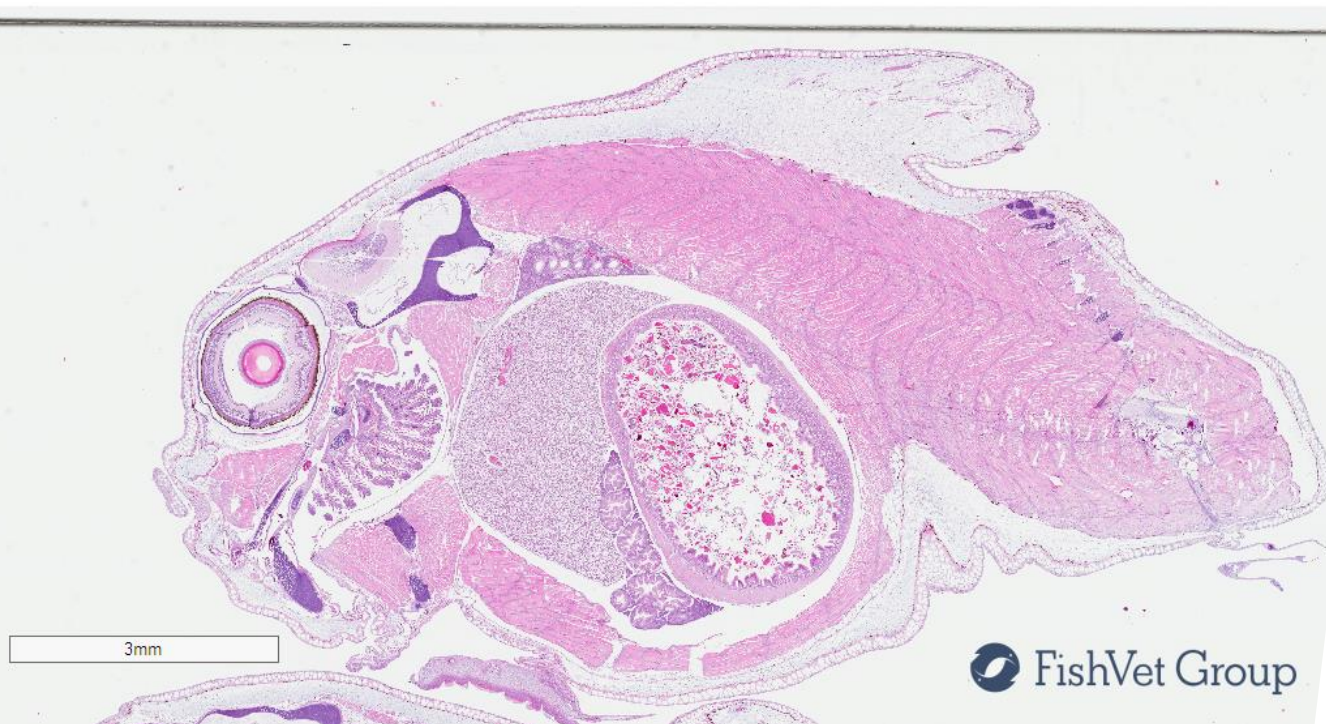
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## Normal histologi hel fisk

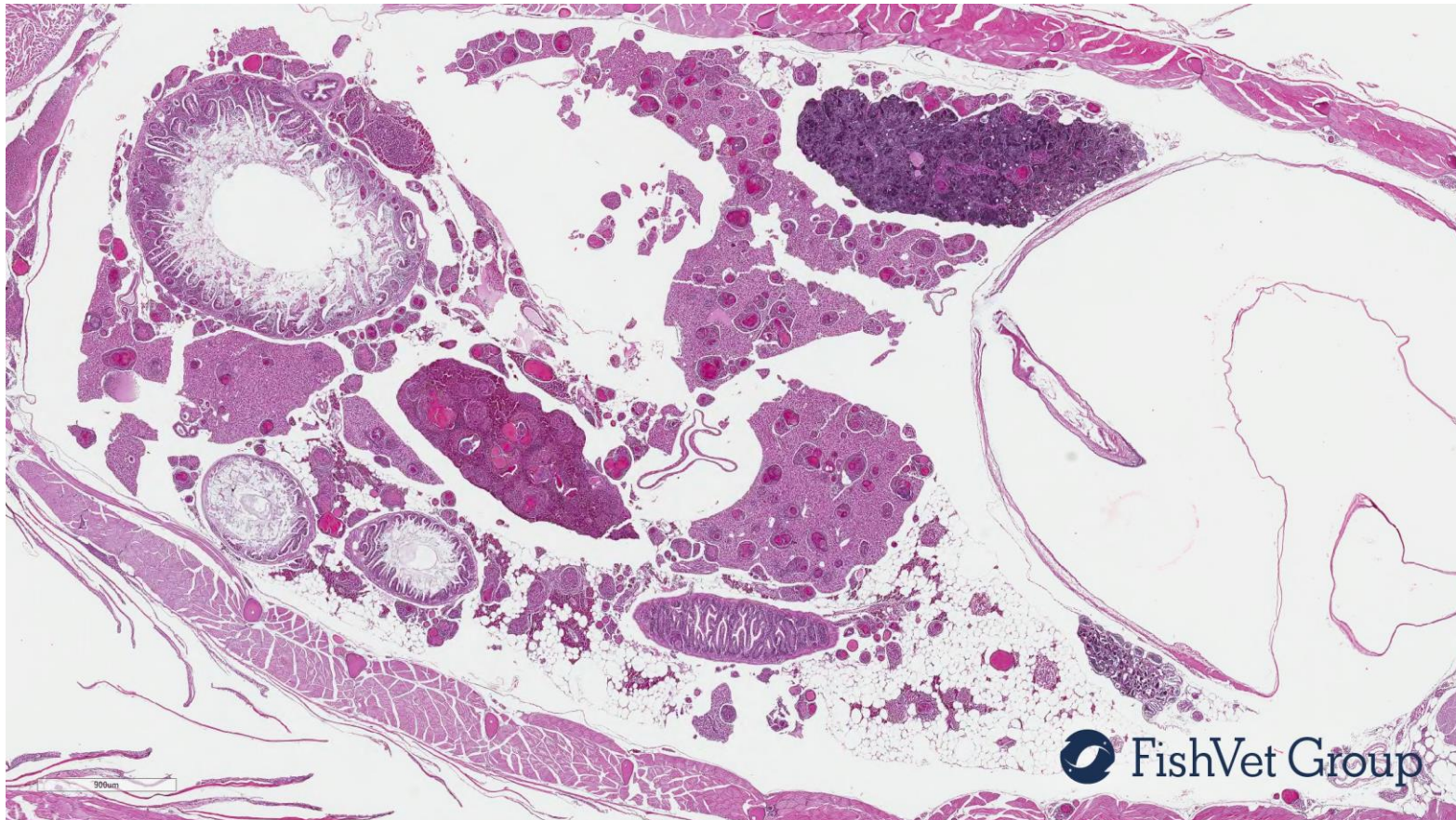




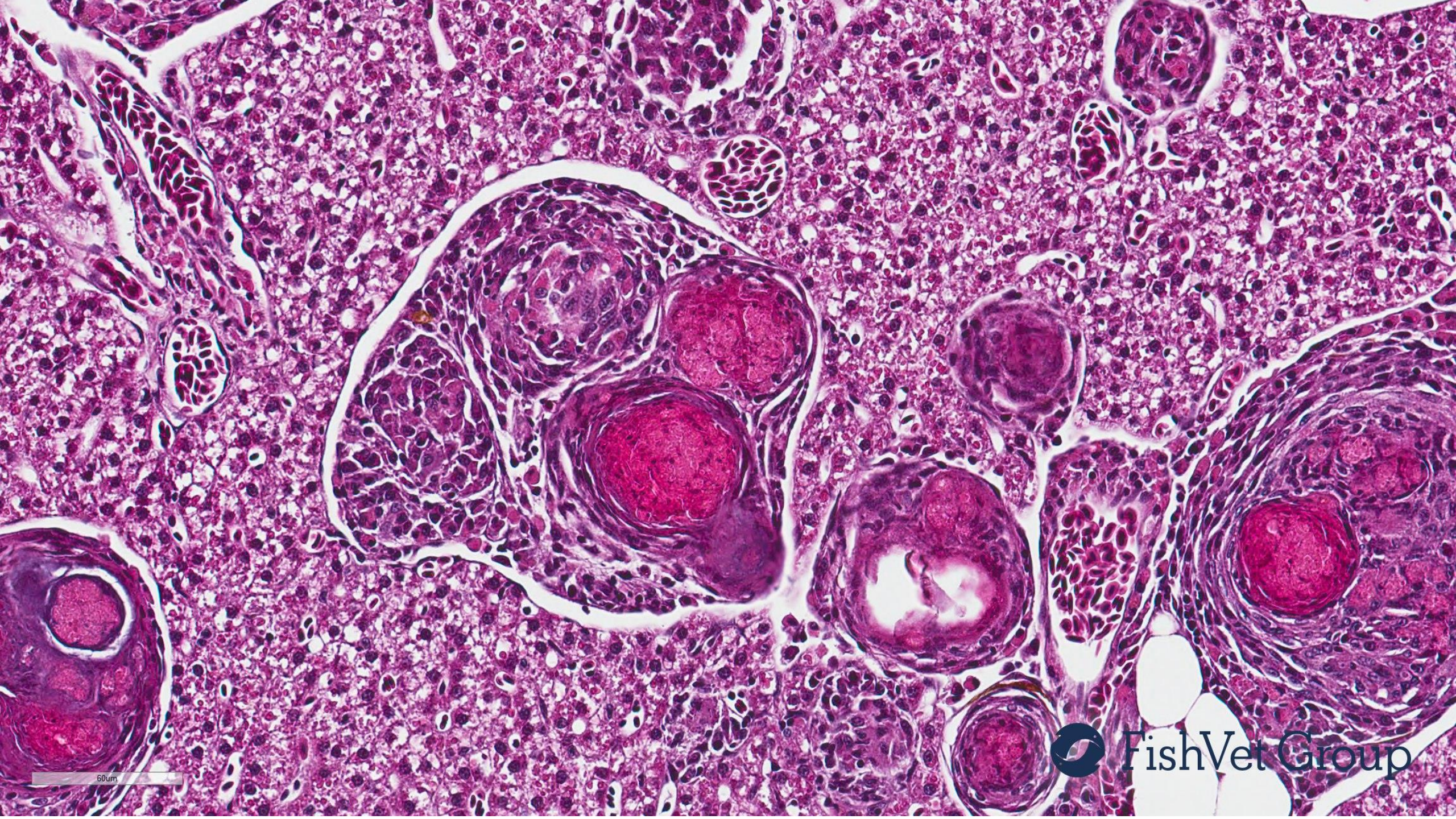


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## Patologi eksempel systemiske lidelser

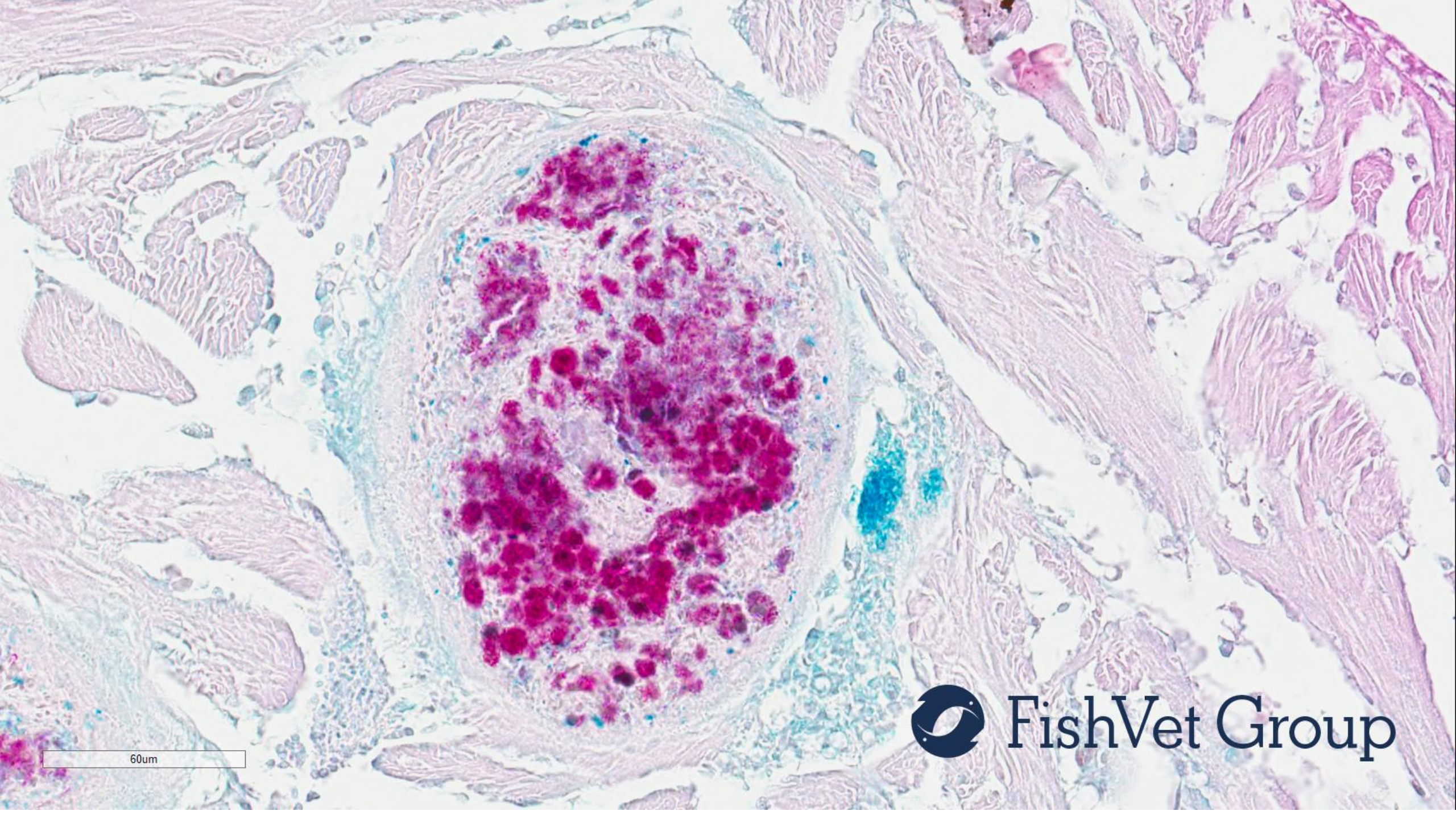






60µm





60um





[www.todayifoundout.com](http://www.todayifoundout.com)





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**Konklusjon:**

**Fiskepatologi er GØY!**





FishVet Group

**Takk for meg!**

