Vaccine against *Sphaerospora molnari*

**Unique model = unique opportunities**

ParaFishControl Workshop “North European Fish Parasite Management Strategies in Aquaculture Farms”

Berlin, 9th October 2019

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Challenges and impact

- Nile tilapia
- Freshwater fishes
- Atlantic salmon
- Roho labeo
- Milkfish
- Pangas catfish

Other: 49%

Carps and cyprinids:
- Grass carp: 22%
- Silver carp: 20%
- Common carp: 16%
- Bighead carp: 14%
- Carassius: 12%
- Catla carp: 10%

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Myxozoa infections of carp

➢ Myxozoans = extremely reduced cnidarians
➢ Common carp being a host to more than 50 species
➢ Some asymptomatic, others (Thelohanellus kitauei, Sphaerospora molnari, Myxobolus cerebralis) can decimate whole ponds
➢ Prevention and therapy missing
Our model and our approach

➢ *Sphaerospora molnari*:
  destroys respiratory epithelia in the gills of carp

➢ Blood stages enable continuous *in vivo* model of disease
Understanding the life cycle

Days post infection (dpi) by intracoelomic injection with *S. molnari*

- Blood
- Gills
- Kidney
- Liver
- Muscle

Average relative parasite numbers
Understanding the pathology of parasite infection.
Understanding host responses

Immune responses

Antibody responses

 SDS-PAGE  WES

M  PL  M  21

250kDa
100kDa
70kDa
55kDa
35kDa
25kDa
15kDa
10kDa

Specific antibody titer

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 634429. This output reflects the views only of the author(s), and the European Union cannot be held responsible for any use which may be made of the information contained therein.
Understanding protection

Serum killing capacity

% survival

Serum conc %

0 20 40 60 80 100 120

100 50 25 12.5 6.25 3

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Conclusions

• We established continuous *in vivo* model for the study of myxozoan biology allowing:
  • In depth understanding of the disease pathology
  • Understanding of the role of innate and adaptive immunity
  • Identification of candidate antigens
  • Prevention of disease through vaccines and immunostimulants / additives.
Thank You

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