



Lakselus – Vaksineforskning

Frank Nilsen





Loss of control

Similar to the early 1990s



Utbredd resistens mot det meste



Scientists discover a new superbug.



Lice control

Feed supplements

Medicines

Salmon louse
biology

Lice dispersal

Immune control

Resistance monitoring

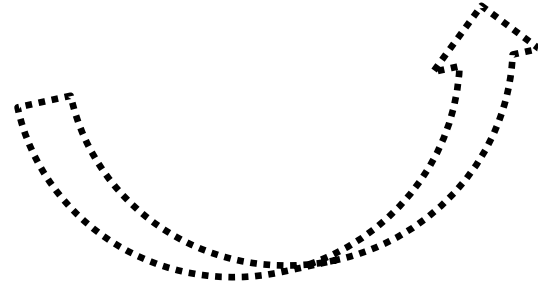
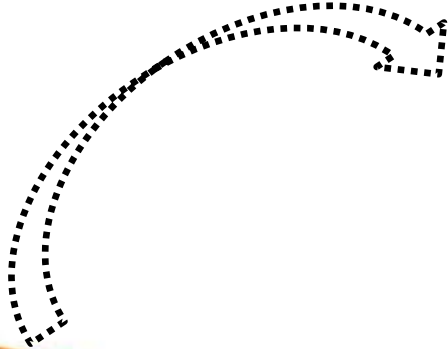
Mechanical delousing

Farm localisation

Reduced lice exposure

Is the current control sustainable?

Kommersiell lakselus vaksine





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IMMUNOLOGIC CONTROL OF A PARASITIC ARTHROPOD

Identification of a Protective Antigen from *Boophilus microplus*¹

PETER WILLADSEN,^{2*} GEORGE A. RIDING,* ROBERT V. McKENNA,* DAVID H. KEMP,*
ROSS L. TELLAM,* JANINE N. NIELSEN,* JELA LAHNSTEIN,[†] GARY S. COBON,[†] AND
JOANNE M. GOUGH*

- ✓ Started with 988 g (50 000) hand picked ticks
- ✓ Extensive purification of membrane bound proteins
- ✓ Identifying and using a ~86 kD protein
- ✓ Immunisation

Immunebasert kontroll av lakselus



Uspesifikk (immunostimulering)

- Forbasert
- Effekt 20-40%

Spesifikk - vaksinerings

- Minimum 50% effekt
- Treng gode "target(s)"

Gode metodar for å måle små forskjellar i lusetal/fisk

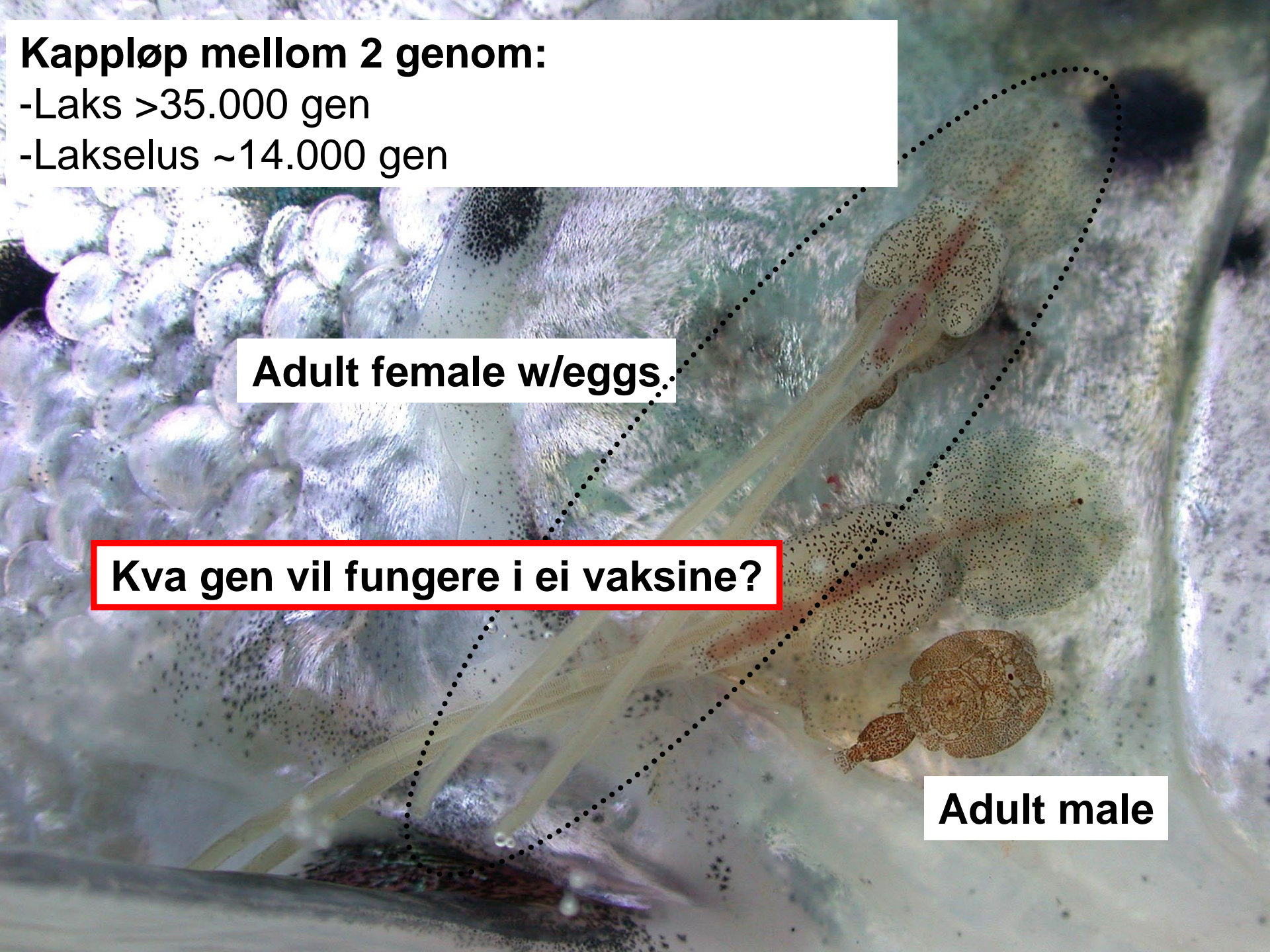
Kappløp mellom 2 genom:

- Laks >35.000 gen
- Lakselus ~14.000 gen

Adult female w/eggs.

Kva gen vil fungere i ei vaksine?

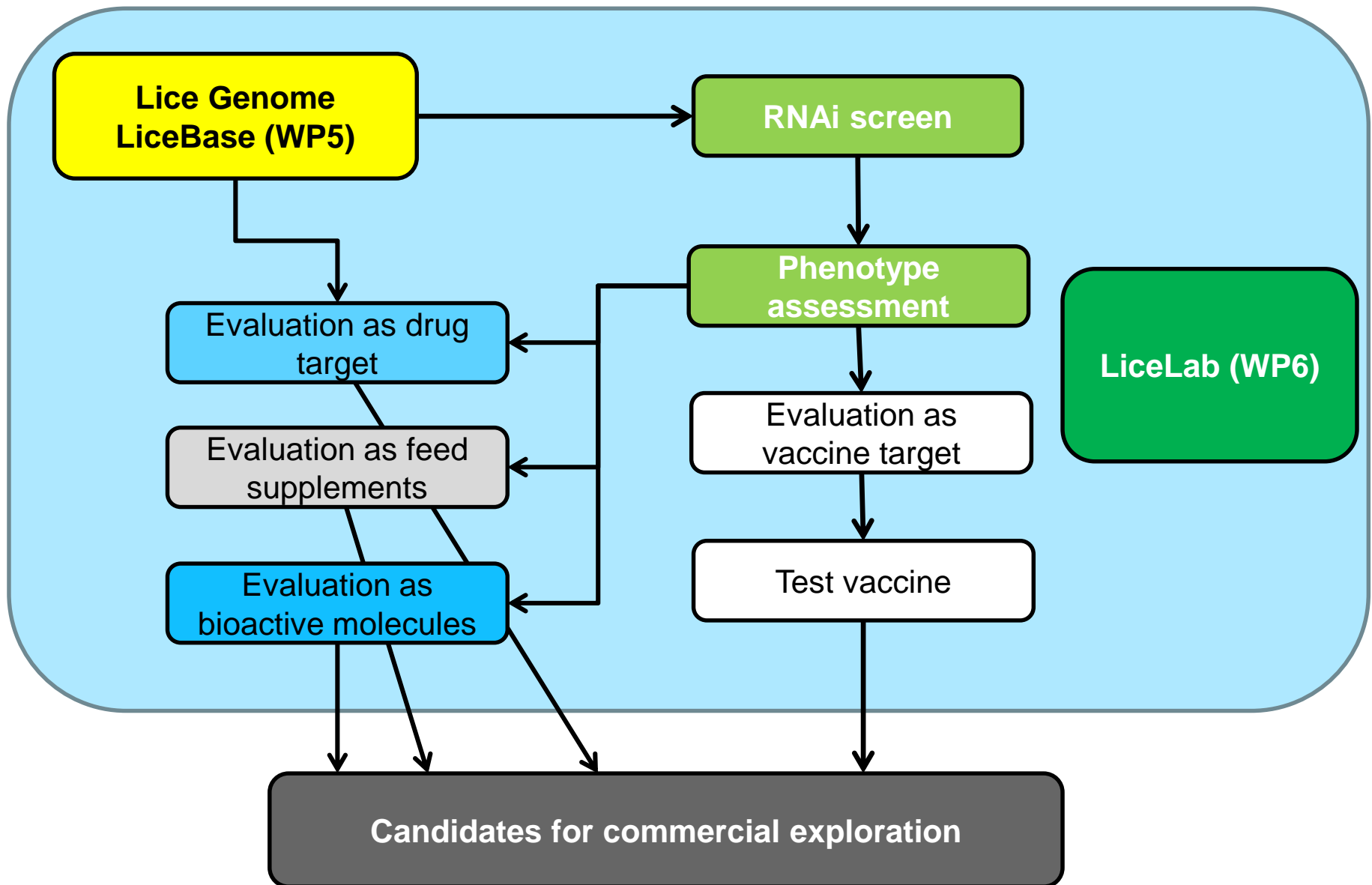
Adult male

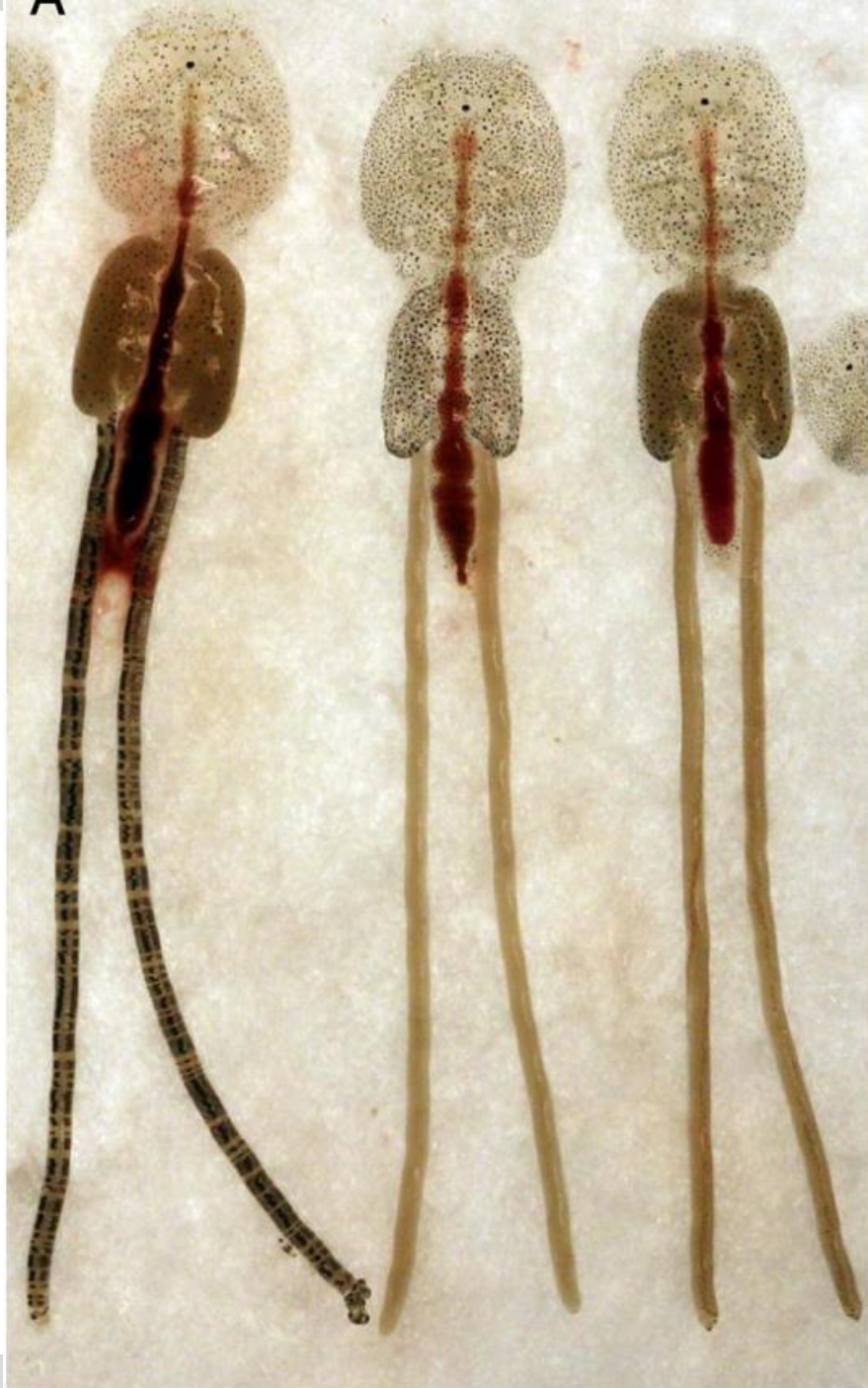


Finne nåla i høystakken

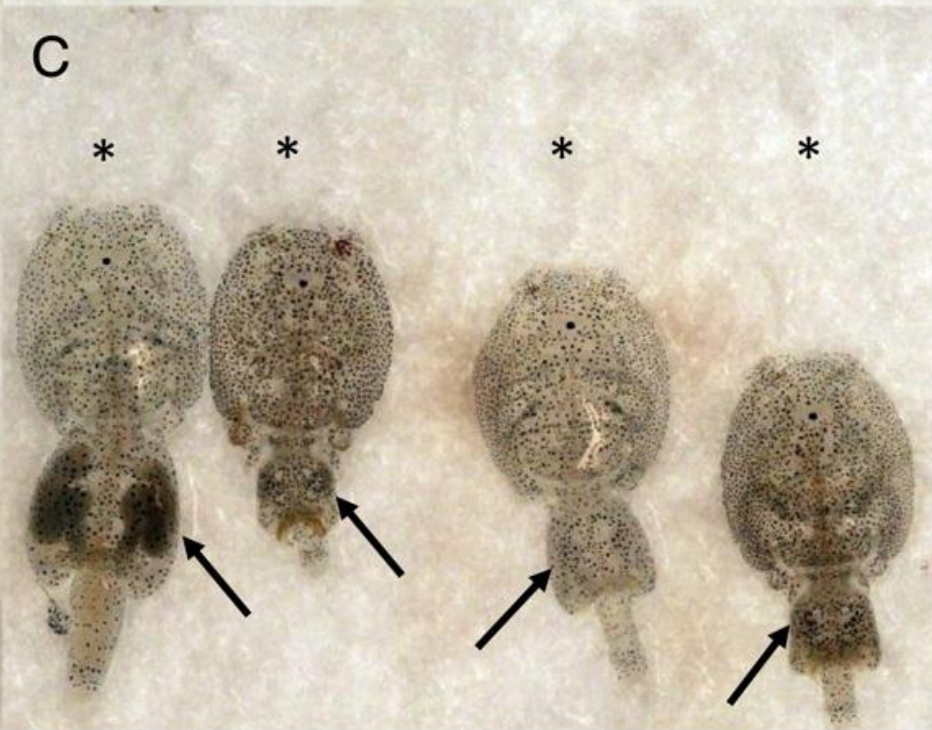


Candidate gene screening



A**B**

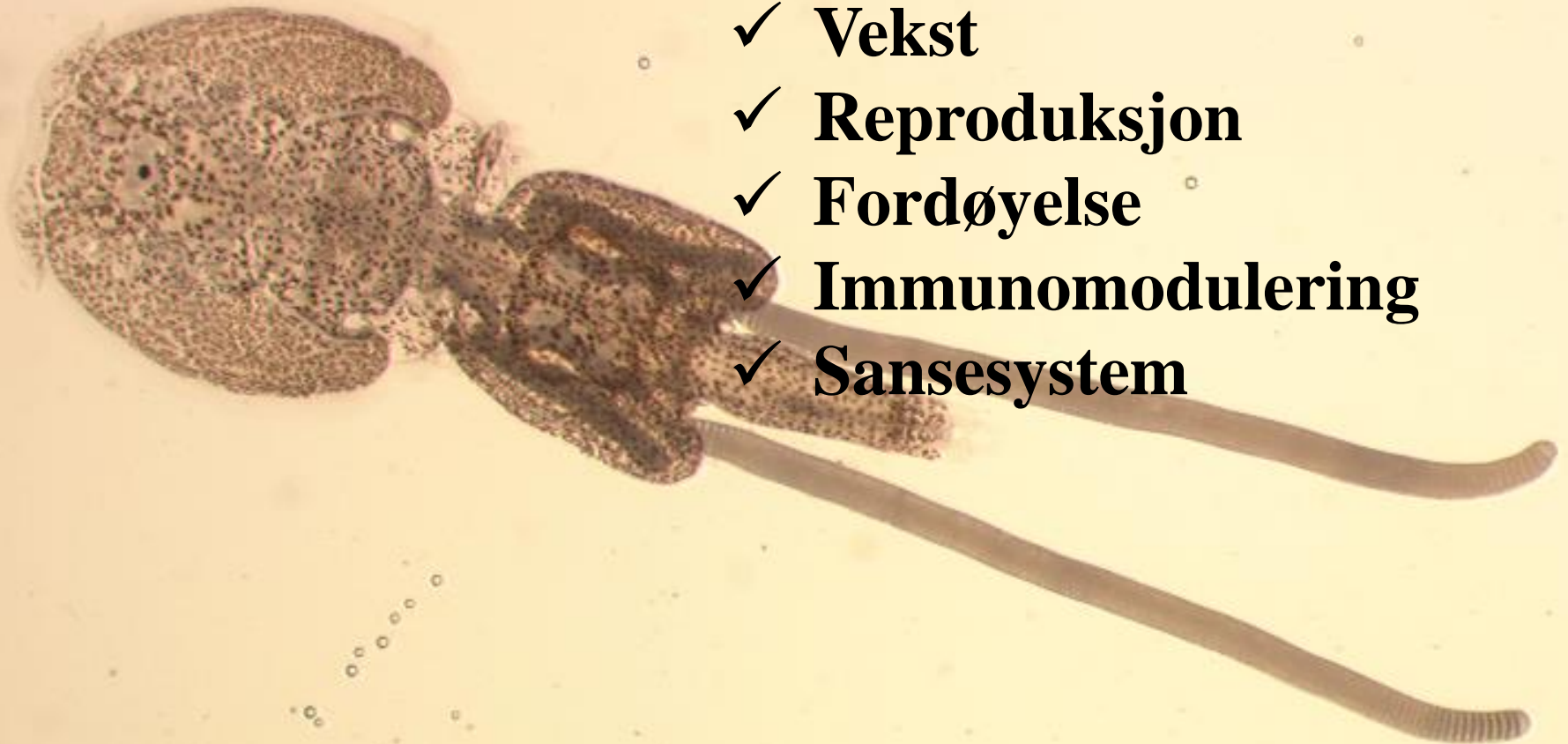
*Department of Biology, UiB

C

Tilnærming som aukar kunnskap om: Fysiologi, anatomi, vert/parasitt

1 mm

- ✓ Osmoregulering
- ✓ Endokrin/exokrin system
- ✓ Vekst
- ✓ Reproduksjon
- ✓ Fordøyelse
- ✓ Immunomodulering
- ✓ Sansesystem



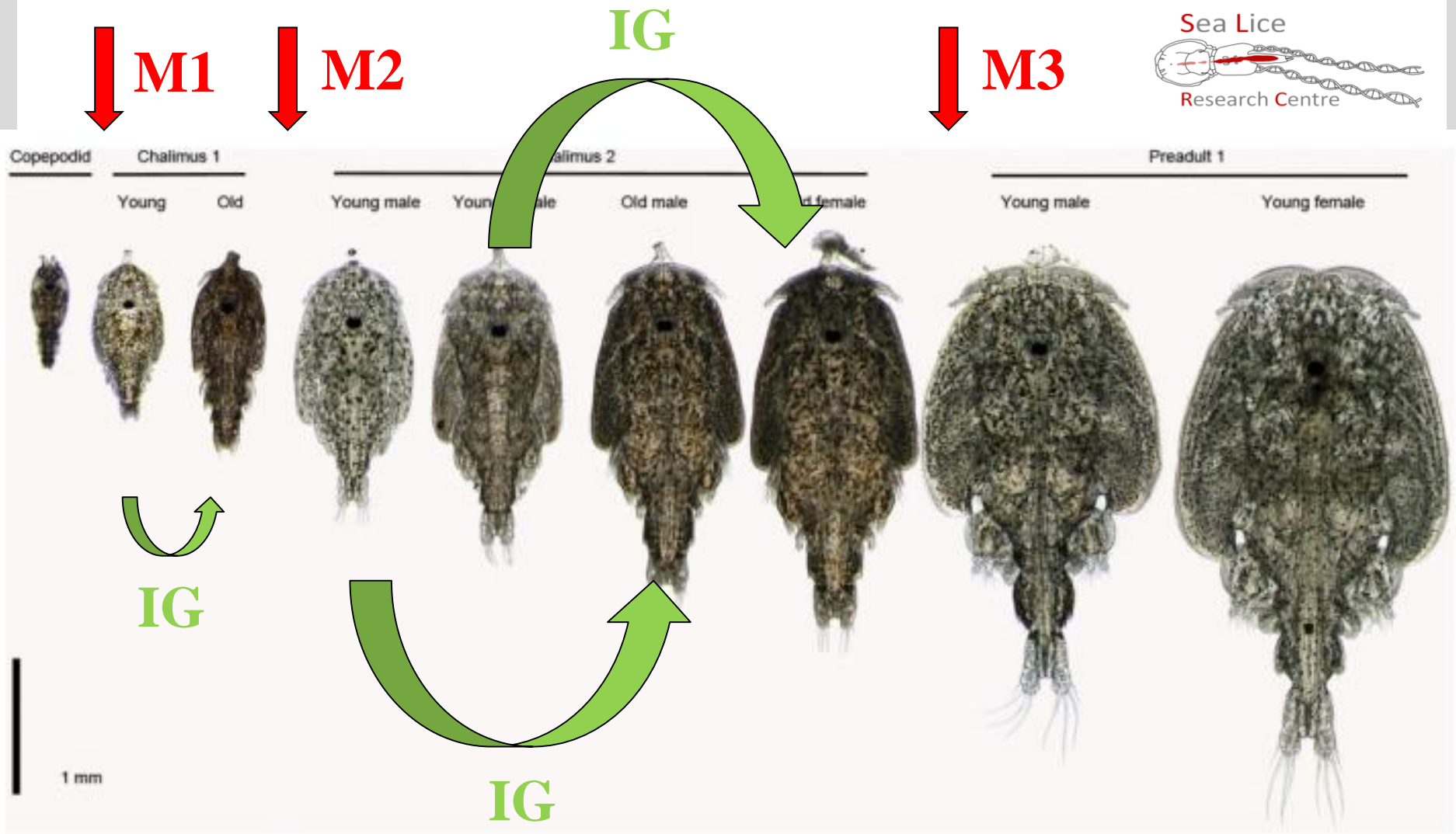


Fig. 8. Photographs showing the development of *Lepeophtheirus salmonis* from copepodid to the preadult 1 stage. Chalimus 1 = Ch1, chalimus 2 = Ch2.

Similar type of IG is seen in copepodids and ad females

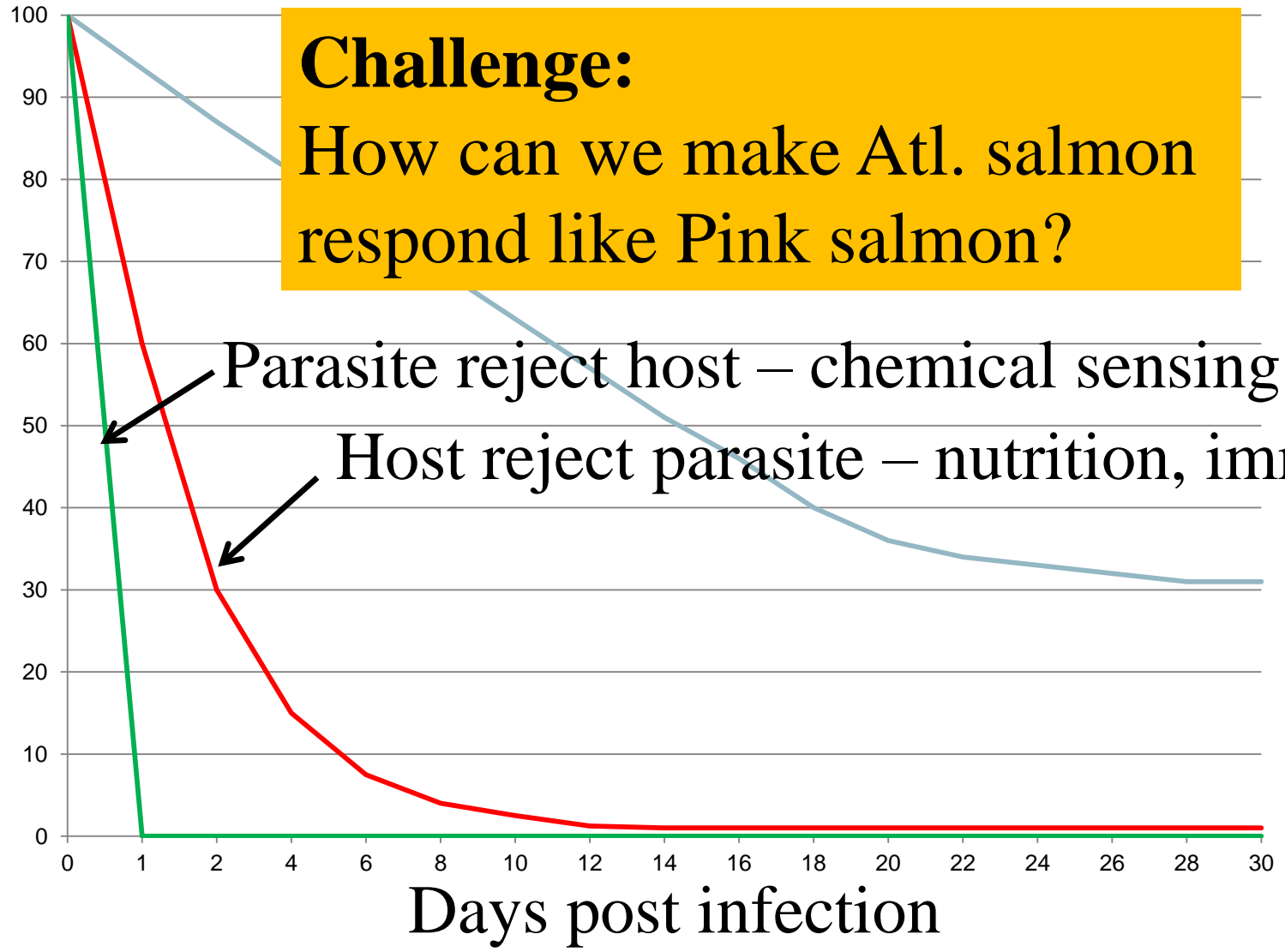
Kunnskap om laks & lus interaksjon for vaksineutvikling

- ✓ Kunnskap frå andre salmonider
- ✓ Forsøk med laks med ulik genetikk
- ✓ Kva skjer med lusa på “resistente” artar/Atlantisk laks med ulik genetikk?



— Atlantic salmon — Pink salmon — Non hosts

Challenge:
How can we make Atl. salmon respond like Pink salmon?

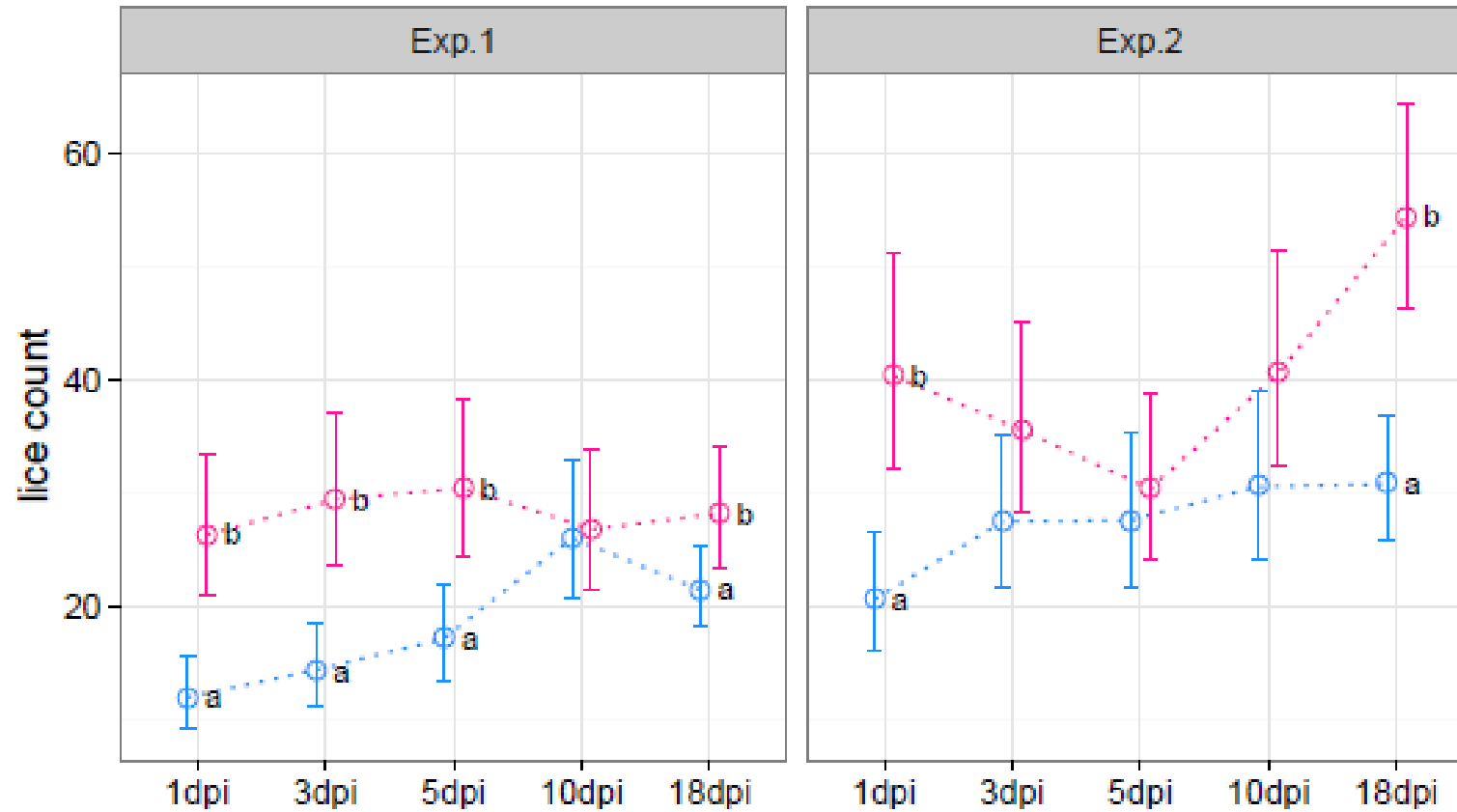


Parasite reject host – chemical sensing

Host reject parasite – nutrition, immune

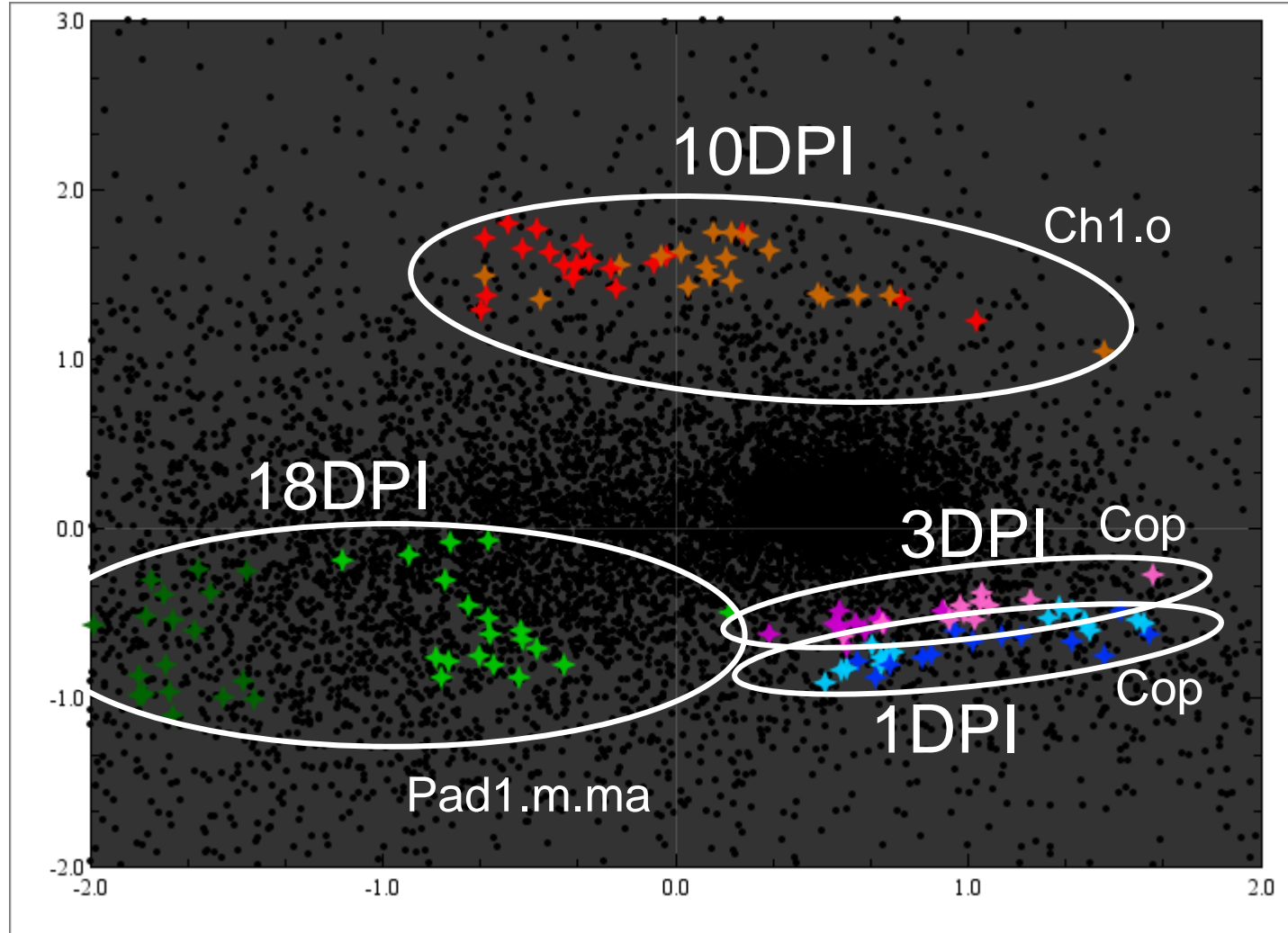
Days post infection

Kva med avl?





Correspondance analysis plot



- HR 18 DPI
- LR 18 DPI
- HR 10 DPI
- LR 10 DPI
- HR 3 DPI
- LR 3 DPI
- HR 1 DPI
- LR 1 DPI

Status SLRC



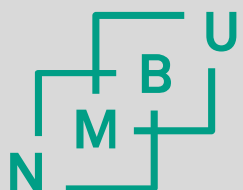
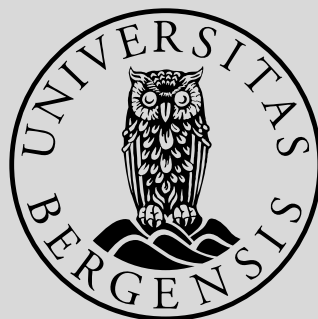
RNAi screen:

- Ca 100 gen/år

Test vaksine – kliniske studiar

- 12 testa i 2016
- Teste minst 10 i 2017

Når er me i mål?



Norges miljø- og
biovitenskapelige
universitet



Academic unit