



University of Idaho

Aquaculture Research Institute

AQUACULTURE RESEARCH INSTITUTE:

**ON-CAMPUS FACILITIES,
RESEARCH, AND SERVICES**

KEN CAIN

**Professor and Associate Director
Aquaculture Research Institute and Department
of Fish and Wildlife Sciences**

University of Idaho

email: kcain@uidaho.edu



AQUACULTURE RESEARCH INSTITUTE

- **Mission:** Advance sustainable aquaculture at state, regional, national and global levels.



AQUACULTURE RESEARCH INSTITUTE (ARI) SUBUNITS



Hagerman Fish Culture Experiment Station

- UI Program and Researchers:
 - Dr. Ron Hardy: ARI Director Emeritus, Fish Nutrition
 - Dr. Brian Small: Director HFCES, Fish Physiology
 - Dr. Matt Powell: Associate Director HFCES, Fish Genetics

- USDA, ARS Trout Grains Project:
 - Dr. Ken Overturf: Lead Scientist – Genetics and Selective Breeding
 - Dr. Tom Welker: Fish Physiology

- Columbia River Intertribal Fish Comm.:
 - Dr. Shawn Narum: Lead Geneticist

University of Idaho



HAGERMAN FISH CULTURE
EXPERIMENT STATION

Aquaculture Research Institute

USDA Agriculture Research Service 

Columbia River Inter-Tribal Fish Commission 



ARI SUBUNITS

Moscow Campus - Aquatic Animal Research Facilities

- UI-ARI Program and Researchers:
 - Dr. Ken Cain: ARI Associate Director, Fish Health/Immunology
 - Dr. Vikas Kumar: Research Assistant Professor, Fish Nutrition
- UI-Fisheries and Aquatic Science Faculty
 - Dr. Jim Nagler: Department Head Biology, Fish Reproduction
 - Dr. Chris Caudill: Associate Professor (FWS), Fish Migration and Ecology
 - Drs. Quist/Scarnecchia/Kennedy/Wilhelm (FWS), Fish Ecology/Behavior/Management and Limnology



University of Idaho
Aquaculture Research Institute



UI-CAMPUS - AQUATIC ANIMAL RESEARCH FACILITIES

- *New Aquatic Animal Research Laboratory (AARF)*
 - 4,000 ft² wet lab (RAS and flow through), conference room, labs, and faculty/staff/student offices
 - Egg, larval/adult fish rearing and live feeds production:
 - *Freshwater and Marine species*





AQUACULTURE RESEARCH INSTITUTE

AQUATIC ANIMAL RESEARCH FACILITY

Completed 2019

| ITEM | ARI Aquaculture Research Institute Project | DOLLARS |
|----------------|---|---------------------|
| | | |
| BP # 01 | ARI BP # 01 Main Building Package | \$ 2,628,500 |
| BP # 02 | ARI BP # 02 FFE Equipment Hookup Package | \$ 320,000 |
| TOTAL | ARI Total CP Capital Project Cost | \$ 2,948,500 |
| | | |
| | ARI Central Admin and Facilities Funding | \$ 2,548,500 |
| | ARI Research Office VLF Funding | \$ 400,000 |
| TOTAL | ARI Total CP Capital Project Funding | \$ 2,948,500 |
| | | |



UI-CAMPUS - AQUATIC ANIMAL RESEARCH FACILITIES

- *New Aquatic Animal Research Laboratory (AARF)*



UI-CAMPUS - AQUATIC ANIMAL RESEARCH FACILITIES

- *ARI – Cold water Research Laboratory*
 - 8000 ft² wet lab (RAS and some flow thru): eggs to broodstock: *Salmon, trout, sturgeon, tilapia, etc.*
 - *Experimental trials, fish supply for research/teaching*



UI-CAMPUS - AQUATIC ANIMAL RESEARCH FACILITIES



- Aquatic Animal Laboratory in the College of Natural Resources (CNR-AAL)
 - Flow through: SPF de-chlorinated municipal water
 - Isolation rooms (egg incubation and rearing, pathogen challenges, feed trials, and photoperiod/temp control)



UI-RESEARCH – CAIN LAB

Fish Health Research & Aquaculture Development

Fish Health/Immunology

- Focus on prevention
 - Vaccine development
 - Immune responses
- Emerging pathogens
- Fish Health/Nutrition

Aquaculture Development

- Burbot conservation aquaculture
- Commercial aquaculture feasibility



VACCINE DEVELOPMENT

Live attenuated Coldwater Disease (CWD) vaccine

- **Developed and patented at UI**
- Effective immersion vaccine
- Completing commercialization trials with industry partner
- USDA regulatory approval and full licensing for US
 - *Expected product release in 2021*



FISH HEALTH RESEARCH (product development)



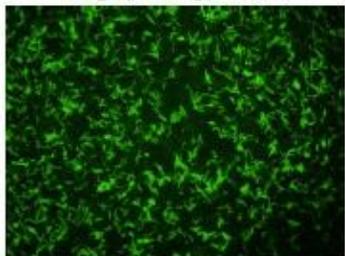
Diagnostic tools:

- **Monoclonal antibody development**
 - Anti-*Flavobacterium psychrophilum* antibody
 - Licensed technology: Immunoprecise, Inc.
 - Widely used for rapid diagnosis of Coldwater disease

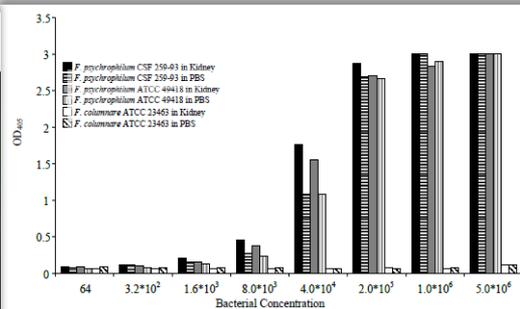
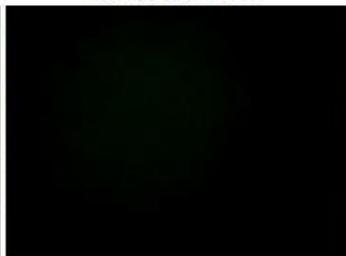
Probiotic discovery:

- ***Enterobacter sp. (C6-6)* in feed: reduces impact of Coldwater disease**
 - Discovered and patented at UI (2013)
 - Seeking Industry partners

F. psychrophilum



F. columnare



UI-RESEARCH – KUMAR LAB

Fish Nutrition: Ongoing studies

- 1. Dietary requirements for organic and inorganic zinc in diploid and triploid rainbow trout**
 - Determine Zn requirements in a commercial strain of rainbow trout
- 2. Alternative approach to enhance the utilization of alternative oil sources in trout**
 - Dietary supplementation of bile salt
- 3. Effects of dietary bentonite on iron toxicity in rainbow trout**
- 4. Effects on seed quality of white leg shrimp using microencapsulated and enhanced particle diets**

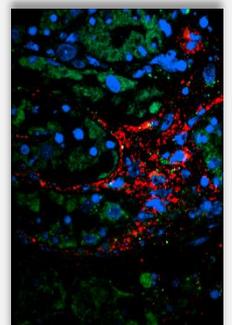
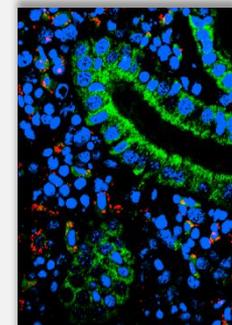


UI-RESEARCH OPPORTUNITIES AND AVAILABLE SERVICES



Research/Services:

- 1. In depth research projects**
 - Sponsored research agreements (industry/agency)
- 2. Short term studies or product evaluation**
 - Diet testing/evaluation
 - Disease susceptibility testing
 - Diet ingredients (functional feeds, additives, immunostimulants)
 - Vaccine efficacy evaluation
- 3. Disease Diagnostics**
 - Routine testing bacteriology/virology (not FH inspections)
- 4. Other services upon request**



UI-RESEARCH OPPORTUNITIES AND AVAILABLE SERVICES

Student training:

1. Graduate students

- Research experience and training for upper level or specialized positions

2. Undergraduate training (Fisheries/Aquaculture)

- Fish culture and laboratory experience
 - Direct hire on research projects
 - Work study program
 - Internships (always looking for sponsorship)





2019 AQUACULTURE RESEARCH INSTITUTE – MOSCOW TEAM



QUESTIONS?

