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Hypolipidemic Pharmaceuticals Atorvastatin and Ezetimibe Shake Up Brown Trout Lipid Metabolism

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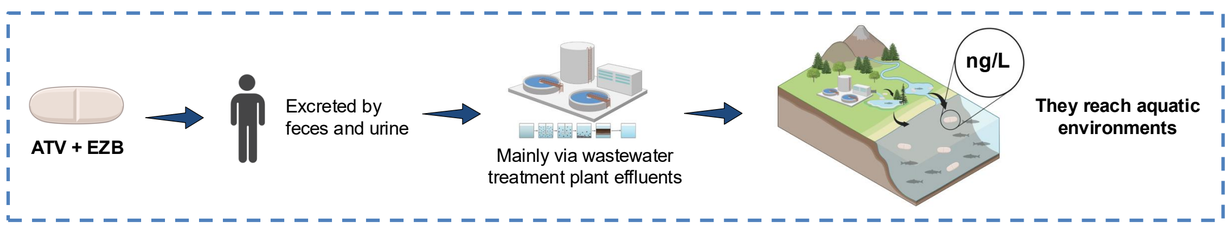
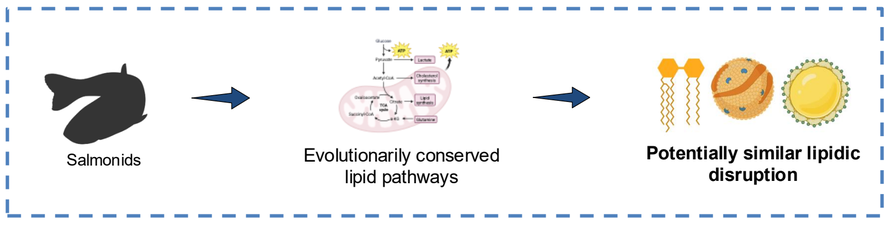
INTRODUCTION & AIM

- The incidence of dyslipidemia is growing worldwide.
- The use of hypolipidemics pharmaceuticals like **Atorvastatin (ATV)** and **Ezetimibe (EZB)** increased.

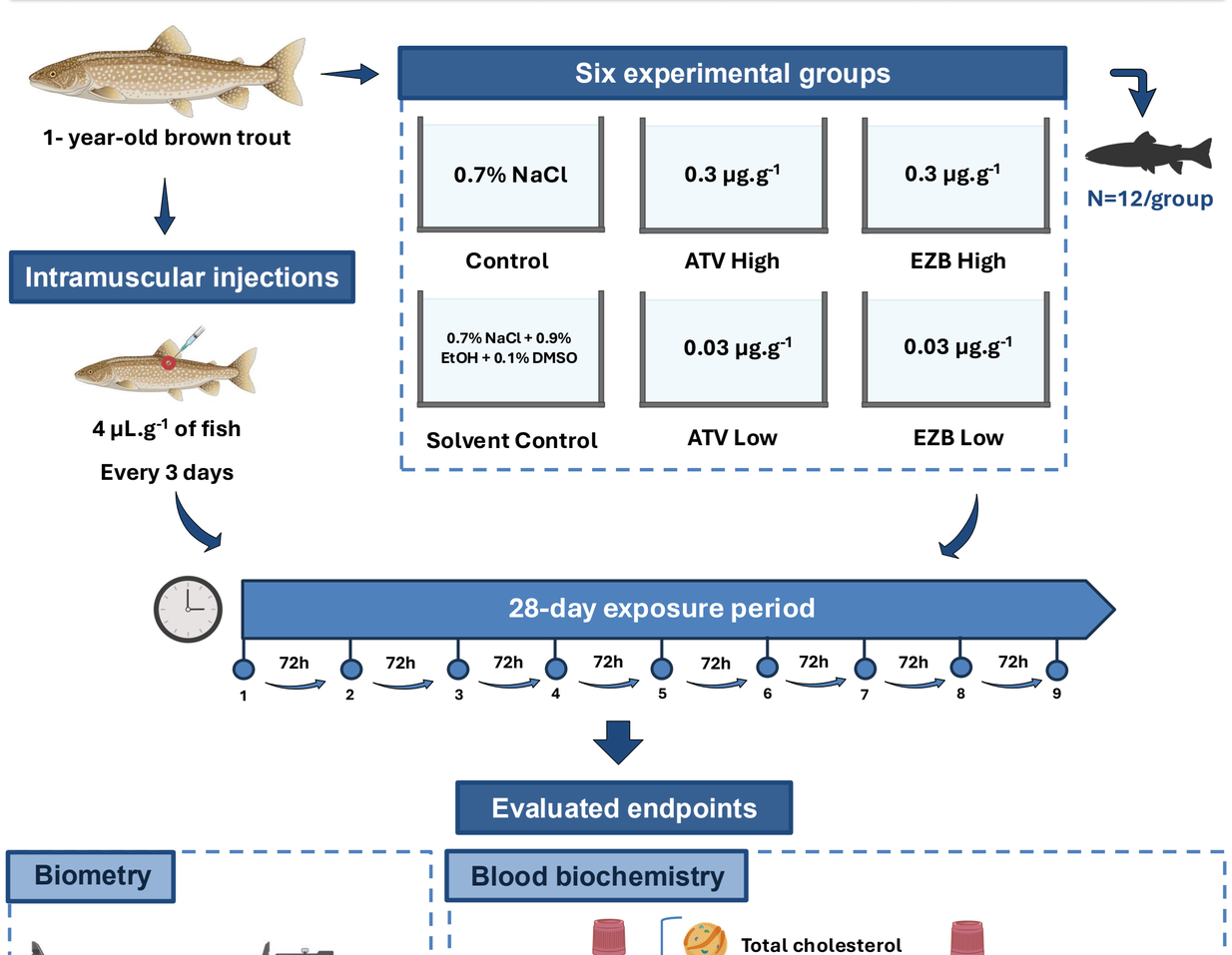


- **ATV** is a statin, a cholesterol biosynthesis competitive inhibitor.
- **EZB** is a cholesterol absorption inhibitor, commonly administered with ATV.
- Hypolipidemics act on highly evolutionarily conserved targets on very low concentrations.
- Salmonids are great models to study lipid disruption.

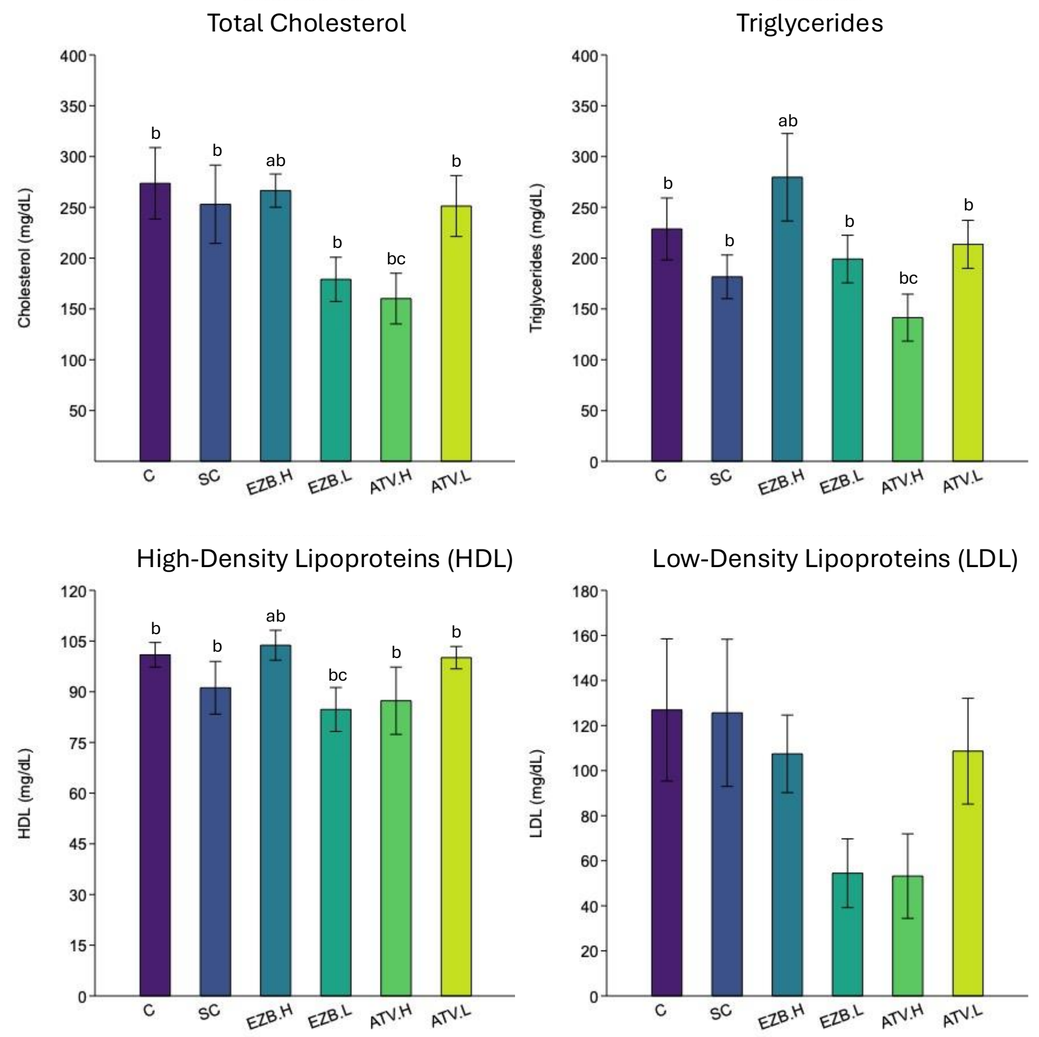


Aim: Test the disruptive effects of ATV and EZB on lipidic parameters using juvenile brown trout (*Salmo trutta*).

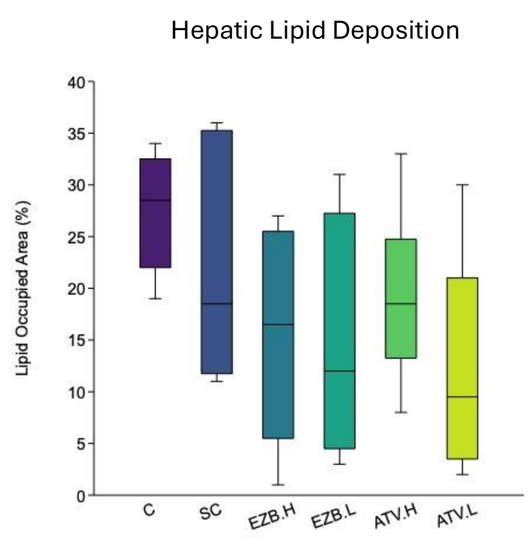
METHODS



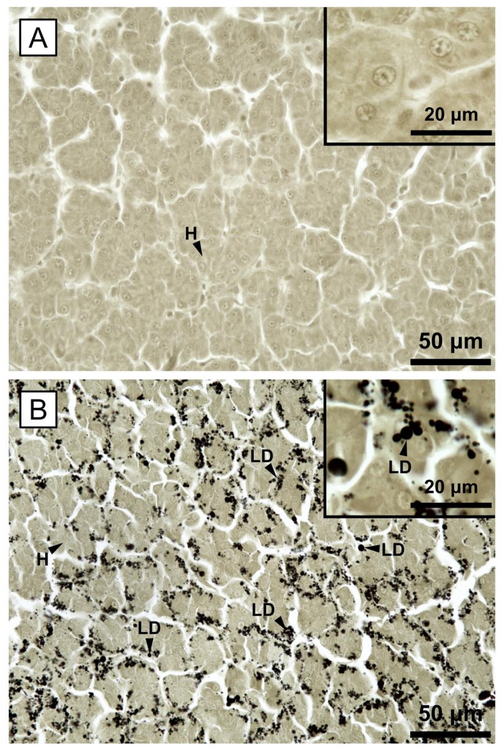
RESULTS & DISCUSSION



- **Total cholesterol**, **HDL** and **LDL** were all showed a tendency to decrease under **ATV.H** and **EZB.L**, in accordance with the mechanism of action of both pharmaceuticals.
- The reduction of circulating circulating lipids by **ATV** was markedly dose-dependent.
- At a higher dose, **EZB** failed to produce significant hypolipidemic effects on circulating lipids.



- No significant differences were found regarding the deposition of lipids in the liver.
- All animals exposed to EZB and ATV showed a tendency for lower deposition of hepatic lipids.
- A heterogeneous distribution of lipid droplets in the liver was observed in all treatments, with areas of high density contrasting with areas where droplets were reduced or absent.



Representative histological sections of osmicated liver from a lipid droplet-free area (A) and a droplet-rich area (B). H – Hepatocyte; LD – Lipid droplets.

CONCLUSION AND FUTURE WORK

Main conclusions

- **Atorvastatin and Ezetimibe:** Hypolipidemic effects, unclear in some cases.
- **Model applications:** Biomedicine and ecotoxicology.

Future work

1. Test mixture exposures with hyperlipidemics (17α-ethinylestradiol and levonorgestrel).
2. Assess the efficacy of alternative routes of administration.
3. Expand experimental endpoints by including molecular analysis and lipidomics.

REFERENCES