# Pharmaceutical pollution alters behaviour and migration of Atlantic salmon



Researchers have discovered that pharmaceuticals present in waterways are influencing the behaviour of aquatic animals, including fish such as Atlantic salmon. An investigation led by biologist Jack Brand at the Swedish University of Agricultural Sciences explored how drug pollution—stemming from human waste and pharmaceutical factory runoff—affects fish migration patterns.

The study focused on Atlantic salmon in Sweden, where increasing levels of pharmaceutical compounds have been detected in rivers and streams globally, with over 900 different pharmaceutical ingredients identified by scientists. Instead of exposing fish to these drugs through contaminated water, Brand's team implanted pharmaceuticals directly into salmon to monitor the resulting behavioural changes under controlled conditions.

One of the notable findings concerned clobazam, an anti-anxiety medication. The salmon implanted with clobazam exhibited higher migration success towards the Baltic Sea. However, Brand cautioned against interpreting this as a straightforward benefit. “We can't, you know, dump a bunch of pharmaceuticals into the river,” he said, emphasising the experimental nature of the research and the potential unintended effects of drug exposure on aquatic life.

In addition to migration improvements, the drug altered other behaviours: the treated salmon became bolder and less social. These changes could have complex implications for salmon in their broader ecosystem and life cycle, aspects that remain largely unknown. The long-term ecological consequences of pharmaceutical pollution on aquatic animal behaviour are still being studied.

This research highlights the growing concern over drug contamination in natural waterways and its impact on wildlife populations. Further investigations are needed to understand fully how exposure to human medications modifies animal behaviour and what that means for conservation and environmental health.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

1. <https://www.science.org/doi/10.1126/science.adp7174> - This article presents the core research findings that clobazam exposure influences river-to-sea migration success in Atlantic salmon by increasing migration speed and success rates, supporting the claim of pharmaceuticals affecting fish migration behavior.
2. <https://phys.org/news/2025-04-pharmaceutical-pollution-migration-behavior-salmon.html> - This news article elaborates on the study led by the Swedish University of Agricultural Sciences, confirming that pharmaceutical pollution, specifically clobazam, alters migration behavior and social behavior in Atlantic salmon.
3. <https://phys.org/news/2025-04-pharmaceutical-pollution-migration-behavior-salmon.html> - The article also discusses the growing global concern of over 900 pharmaceutical compounds found in waterways worldwide and emphasizes the environmental persistence and ecological impacts of these pollutants, matching the article's overview of pharmaceutical pollution sources and consequences.
4. <https://www.science.org/doi/10.1126/science.adp7174> - This source details the experimental methodology of implanting clobazam into salmon and observing changes in behavior under controlled conditions, supporting the experimental approach described in the article.
5. <https://phys.org/news/2025-04-pharmaceutical-pollution-migration-behavior-salmon.html> - The article quotes researchers cautioning against interpreting increased migration success from clobazam exposure as a benefit, highlighting possible complex ecological consequences and the need for further research, consistent with statements attributed to Jack Brand.
6. <https://phys.org/news/2025-04-pharmaceutical-pollution-migration-behavior-salmon.html> - The discussion on the ecological and evolutionary consequences of drug-induced behavioral changes in fish and the call for advanced wastewater treatment and green chemistry to mitigate pharmaceutical pollution aligns closely with the article's conclusion on environmental health concerns.
7. <https://news.google.com/rss/articles/CBMirAFBVV95cUxQRVhLcEt0aGNZWHFVTlBYelF3LTFCelZRdkdSdEhXSkp6SGFILXcyZHFLX2laWWhaeFNBMUJyNjJpOXFjMTNJVGxKbnM4SjI3Y2tob084cEx1aW91b0duY19LSGk5eU9qWjAtSm5lQUVpUFYxUzJxczVLMVVWQV84V0VETlRZV2xYLU5TVG51UWhLTGNpWjBnUmpoNkwxZEcxR2hoNFVCZGxQS0Mx?oc=5&hl=en-US&gl=US&ceid=US:en> - Please view link - unable to able to access data