

## Focusing on oyster food safety

Researchers are investigating how norovirus interacts with oysters to further improve food safety. Oysters potentially lacking a receptor necessary to bind norovirus are being examined to see if a 'norovirus resistant oyster' may exist, resulting in significant economic and human benefits.

Norovirus is the leading cause of gastroenteritis in humans and outbreaks due to the consumption of contaminated oysters have been widely documented overseas. Oysters can become infected with norovirus while filter feeding in marine waters contaminated with human sewage or by direct contact with infected food handlers.

In Australia, outbreaks related to oysters are rare due to the excellent water quality in growing areas; however outbreaks that occur in overseas countries impact consumer confidence worldwide. China is the largest producer of oysters internationally, while Australia has a vibrant oyster industry, with opportunities to expand production due to the expansive stretches of pristine coastline. Researchers from SARDI Food Safety and Yellow Sea Fisheries Research Institute (YSFRI), based in Qingdao, China have therefore joined forces to work on an innovative project that aims to improve oyster food safety.



SARDI and Queen Elizabeth Hospital scientists, Dr Cath McLeod (right) and Susan Lester in Qingdao, China.

Recent research has shown that not all humans are susceptible to norovirus. Norovirus infects humans by binding

to cellular receptors called 'histo blood group antigens', similar to a 'lock' and 'key' mechanism. Once inside the cell the virus replicates, leading to gastroenteritis. Some lucky humans who lack these receptors are not susceptible to norovirus.

In oysters, norovirus binds to these same cellular receptors in the intestine. This raises the possibility that oysters which lack norovirus receptors may not specifically bind the virus. Therefore, this collaborative research aims to understand how norovirus bio-accumulates and is retained in Sydney Rock and Pacific oysters, investigating the potential that some oysters may be norovirus 'resistant' and not specifically retain the virus.

The specific binding of norovirus to the receptors in the oyster intestine may explain why norovirus has been found to persist for long periods in live oysters (e.g. for up to 10 weeks). This persistence leads to lengthy closures of otherwise productive oyster growing regions, resulting in significant economic losses for the oyster industry.

The potential development of a 'norovirus resistant oyster' will not remove the need to grow oysters in clean seawater devoid of human pathogens. However, it does raise the possibility of minimising losses in productivity through reducing closure times of oyster growing areas following sewage contamination events.

This research may also contribute to reducing the human health impacts of oyster borne norovirus outbreaks, increasing consumer confidence and potentially provide Australia with a competitive market advantage.

The project is a 2 year initiative and substantial results are envisaged within the next few months. Funding is provided by the Department of Innovation, Industry, Science and Research and the Australian Seafood Cooperative Research Centre.

## Key Points

Researchers are investigating how norovirus bio-accumulates and is retained in Sydney Rock and Pacific Oysters.

Information may be used to support the commercial production of a 'norovirus resistant oyster' resulting in significant economic and human health benefits.

Collaborations with China's Yellow Seas Fisheries Research Institute is providing a beneficial exchange of scientific information creating new opportunities for research to further support the oyster industry.

## Key Contacts

Dr Cath McLeod  
Subprogram Leader  
Seafood Safety and Market Access  
South Australian Research and Development Institute  
Ph: 08 8303 9623  
E-mail:  
[cath.mcleod@sa.gov.au](mailto:cath.mcleod@sa.gov.au)

## Acknowledgements

Department of Innovation, Industry, Science and Research

South Australian Research and Development Institute

The Australian Seafood Cooperative Research Centre

Yellow Seas Fisheries Research Institute

[www.misa.net.au](http://www.misa.net.au)