

Cloned Enzymes Identify Bacterial Toxins At Extremely Low Levels

National University of Singapore



Because horseshoe crab blood immediately clots when it comes into contact with bacteria, the blood of this unique animal has been used for decades by pharmaceutical companies for testing the purity of sterilized medical equipment and human injectable products.

Although this quality assurance method is effective, it is costly, time consuming, and suffers batch-to-batch variations in sensitivity, and could possibly kill the horseshoe crab, which is now considered an endangered species in various parts of the world. Now, however, a genetic engineering breakthrough at the National University of Singapore has cloned the enzyme that clots the blood of the horseshoe crab.

A novel generation of cloned horseshoe crab recombinant Factor C for detection and removal of endotoxin was discovered in 1998 by professor Ding Jeak Ling of the department of biological sciences, and associate professor Ho Bow of the department of microbiology.

“ This technology enables Factor C to be produced without having to bleed horseshoe crabs, which will help conserve this dwindling species.

The cloned “Factor C” enzyme reacts to bacteria and endotoxins at extremely low levels, and is more stable and chemically consistent than the naturally occurring form.

The Factor C recombinant technology has been licensed by the National University of Singapore to several companies, including BioDtech and Lonza, a global life sciences company based in Switzerland. Lonza is using the cloned enzyme in both their Pyrogene™ and PyroSense™ systems with Pyrogene being an endotoxin detection kit whilst PyroSense is an online endotoxin monitoring system.

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