

# Harnessing microbiology for innovative product design and development

**Harnessing and even mimicking nature has helped push innovation in product design, especially within the medical sector by utilising biotechnology. GX, a product design engineering company with expertise in this area, has been incorporating life sciences into their products for the past 30 years.**

“Looking back over our 30-year history, we have been fortunate to work on some ground-breaking products that use life science technology, many of which are still in development. Just as technology continues to evolve, so too does the use of life sciences. 30 years ago, I would not have thought to use Plasma to heal wounds or optronics to analyse urine, but today this is commonplace. Who knows where the next 30 years will take us!”

**Gary Ross**

Design Director and one of the founders of GX

## Harnessing the power of Luciferin

GX's first project involving bioluminescence was in 1989, when Amersham enlisted GX's help to develop a portable hygiene monitor. Amersham had discovered a reagent that would emit minute quantities of light when introduced into a sample containing bacteria. The design team were challenged to create a lightweight, hand-held monitor to be used to detect bacteria in food preparation areas.

Having successfully developed this easy-to-use portable monitor, GX's next project using bioluminescence came just a few years later, when the Pall Corporation turned to GX for help. Like Amersham, Pall wanted to market a cost-effective device to food manufacturers that would instantly monitor quality control methods and detect harmful bacteria, using bioluminescent technology.

## Ground breaking solutions

Unlike the Amersham device, Pall's Luminometer measured the bacteria via a filter, making it a simple device to use with little training required. The team at GX decided to experiment using a vacuum and seal system that would have enough suction to seal the machine onto a surface and exclude all light sources. They created a complete vacuum, which allowed them to use photomultiplier technology to take an accurate reading of bacterial luminescence. 17 years on, thanks to the innovative nature of the vacuum technology and the incredible sensitivity it produced, the product is still in use.

## Award winning design

Most recently, in 2012, the design engineering team at GX harnessed the power of technology to detect bioluminescence levels in the development of an online analytical toxicity machine, the Microtox CTM, to measure water pollution. The Microtox CTM is a standalone instrument designed to give a continuous indication of water quality. Using bioluminescent plankton,

GX developed an innovative way of mixing samples of bacteria with water, and then measuring the amount of light emitted by the plankton to indicate if the water is contaminated.

## In house specialists

A product team in GX will include engineers with expertise in mechanical, industrial, electronic, software and system design and engineering, all working in tandem. This collaborative approach ensures that GX retains control of the entire project and can often lead to significant breakthroughs. For example, when developing a urine analysis device for Clinitek Status, GX struck upon a novel arrangement of multiple-wavelength LEDs to ensure accurate visual analysis of patient records. Whilst this product was designed in the late 1990s, it is still being sold in over 100 countries.

