# Formaldehyde-free toxoids

## Background

**Scientists at the Defence Science and Technology Laboratory (Dstl) in the UK have developed a method to treat a toxin to produce a toxoid for use in vaccines that does not involve the use of formaldehyde. These toxoids are more stable, quicker to produce and avoid the toxicity associated with formaldehyde.**

## Technology

Formaldehyde is currently used in a number of human and animal vaccines. However, there are several disadvantages to the use and presence of formaldehyde. These include damage to DNA, and possible irritation, pain and discomfort following vaccination. Toxoid production with formaldehyde can also take many weeks at high temperature, and the subsequent toxoid may still have residual toxic activity, may revert to toxicity or may not retain its immunogenicity.

Dstl have developed an alternative method to toxoid production which uses a less toxic material, and produces toxoids more quickly and easily.

A ricin toxoid was prepared using the Dstl method, and compared with a formaldehyde ricin toxoid. The Dstl toxoid was more stable, could be produced in 3 days at room temperature and pressure, and could induce a protective immune response.

## Applications

- Human toxin-based vaccines
- Veterinary toxin-based vaccines

## Benefits

- More stable toxoid
- Quicker and easier to prepare (3 days at RTP)
- Immunogenicity is retained
- Toxoid production has been demonstrated with a number of toxins including cholera toxin, *C. difficile* A toxin and diphtheria toxin.
- Low cost of goods
- Materials are less toxic than formaldehyde

## Intellectual property

Patents not yet published. Further details are available under confidentiality.

Licensees available for single or multiple vaccines.

Partnerships sought with companies that have candidate toxins, to evaluate usage with the Dstl toxoiding technique.

### Licensing & Partnering Opportunity

For further information on this technology, please contact:

Ceri J. Mathews, PhD MBA

T: +44 (0)1794 301217 M: 07798 631852

E: cerimathews@ploughshareinnovations.com