

## Needle free, oral vaccine delivery platform technology

**Background:** Immune Solutions Ltd (ISL) offers a novel oral delivery system to replace injections, aerosols, and patches. This US and internationally patented technology platform uses food-grade fatty acids in a tablet or paste to encapsulate and protect bacterial and viral vaccines and bio-actives. Significant success has been achieved in laboratory and field trials with animals. This work has focused on BCG vaccination against tuberculosis in several animal species. Additional research with viruses and bio-actives show promising results. ISL's technology protects vaccines and medications against aggressive stomach acids and enables effective absorption in the small intestine. Due to its adaptability to include various flavours, including seasonal food preferences flavoured for wildlife, it is ideal for voluntary uptake by wild animals and birds in inaccessible regions. ISL has collaborated over past years overseas in research trials of the oral delivery technology and there is on-going interest from other parties to set up additional technical research and business relationships.

The majority of ISL's science pedigree is in relation to TB vaccination in wildlife. A number of animal species have been successfully vaccinated against TB and long term international relationships have been fostered in an attempt to establish the ISL oral delivery technology as a viable, cost effective vaccination solution against animal and human TB.



**Technology Benefit:** Liporale™ is a lipid based, oral delivery platform. Active ingredients can be formulated uniformly in the lipid matrix and stored in a stable condition at room temperature. Liporale™ protects products from degradation in the stomach, delivering the active ingredient to the mucosal surface in the small intestine for absorption.

Liporale™ technology has a wide range of applications in human and animal disease prevention. In particular where oral delivery of an active ingredient is preferable and thermostability is required. In addition, Liporale™ can be formulated in combination with additives to increase palatability, resulting in its successful application as bait for remote delivery of active ingredients to wildlife. Trials with badger applications in the UK and Ireland and white-tailed deer in the USA show promising results and may form an important part of the Tb vaccination strategies in these countries. Liporale™ has been extensively studied as a platform for vaccine delivery. It has been found to be safe and effective, delivering the vaccine to the intestinal mucosa where it elicits protective immunity at multiple mucosal surfaces. This is particularly relevant for protection against diseases that invade the body through the mucosal surfaces such as the lung, genitourinary tract and intestine.

Recent work undertaken has demonstrated that Liporale™TB induces a stronger and more persistent immune response than subcutaneous vaccination, thereby demonstrating that Liporale™ can provide superior vaccination to injectables in addition to a preferable route of delivery.

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