One Health Solutions to Prevent Global Disease
Spring, 2016
“Scientists estimate that more than 6 out of every 10 infectious diseases in humans are spread from animals.”

(CDC 2015)
Solution: One Health
US BIOLOGIC focuses on One Health solutions, targeting animal populations to improve human health and food safety.

**Public Health** – US BIOLOGIC is currently implementing an oral wildlife vaccine to reduce wildlife infection of Lyme disease.

**Companion Animal** – The same oral vaccine technology can be reformulated into pet treats to prevent a wide range of diseases in dogs, cats, and horses.

**Poultry and Livestock** – In partnership with the USDA, US BIOLOGIC is developing an orally delivered poultry vaccine to help improve the prevention of poultry disease while avoiding the use of live parasites and antibiotics resistance.
Example: Reservoir Targeted Vaccines

Rabies  Lyme Disease  Ebola

Reservoir Targeted Vaccine (RTV) Prevention Strategies Present a New and Powerful Solution.
Global Lyme Disease Epidemic

World Health Organization – Lyme Zone Countries in Red
With an Estimated 300,000+ New Cases Each Year, Lyme Disease is the Most Commonly Reported Vector-Borne Infectious Disease in the United States. [CDC](https://www.cdc.gov)

Lyme disease-carrying ticks are now in half of all U.S. counties
Cost of Lyme Disease in the U.S.

Annual U.S. Cases of Lyme Disease
Centers for Disease Control and Prevention

Direct Medical Costs, Indirect Medical Costs, Lost Income, Lost Taxes, and Related Lyme Disease Costs Per Case as reported in the CDC’s *Emerging Infectious Diseases* and adjusted for 2014 dollars.

Total Annual Cost Burden

\[ 300,000 \times 10,769 = 3,230,700,000 \]
Emotional and Physical Costs

Clinical Manifestations

• Arthritic Disorders

• Neurologic Disorders

• Lyme Carditis
Integrated Pest Management

- Reservoir
- Targeted Vaccine
- Vector Control
- Education
- Mating Host Control
- Behavioral
- Landscaping
Reservoir Targeted Vaccine (RTV)

Safe
Effective
Eco-Friendly
Cost Efficient
RTV for Lyme Disease

**Before Lyme Vaccine Distribution**

1. Mice and Ticks exchange Lyme *Borrelia* in the wild.

2. Ticks transmit Lyme *Borrelia* to humans and pets.

3. Lyme *Borrelia* causes Lyme Disease.

---

**After Lyme Vaccine Distribution**

1. Mice ingest the Lyme vaccine and pass it to ticks.

2. Ticks are cleared of the Lyme *Borrelia* bacteria.

3. The transmission cycle of Lyme Disease is broken.

A disease prevention platform that can address multiple diseases.
Application Matched to Tick Cycle

Timed vaccine application to accommodate multiple cohorts of mice
Public / Private Application

Private Application
- Residential, farms, ranches, universities, schools, camps, corporate campuses, country clubs, golf courses, etc.

Two-Sided Trails
- Fields, forests, etc.
- Each one-sided mile = 20 protected acres

One-Sided Trails
- Lakes, rivers, etc.
- Each one-sided mile = 10 protected acres

Recreational Areas
- Parks, playgrounds, campgrounds, hiking trails, golf courses, sports fields, etc.
- Application by protected acre
Reduction in Infected Ticks

Recent studies in partnership with the state of **Connecticut** have reported equally compelling reductions in tick infection.

Complete Study Results Published in the *Journal of Infectious Diseases* – 2/12/2014
“EPA recognizes the importance of healthy ecosystems for our health and well-being, and conserving biodiversity is a primary way to sustain healthy ecosystems and the services they provide to us.”

**US BIOLOGIC** is committed to protecting biodiversity and healthy ecosystems.

US BIOLOGIC Technology Recognition

Winner of $1 Million Global Food & Health Innovation Challenge

Top Memphis Innovation

National Media Recognition
1. An integrated “One Heath” approach involving medical doctors, veterinarians, and ecologists is imperative for optimal disease control.

2. Implementing evidence-based solutions to reduce the prevalence of *Borrelia* at its source is critical to sustainable long-term disease control.

3. The disease prevention platform must be expanded to prevent all tick-borne disease.

4. Prevention programs will be leveraged to scientifically support and fund human diagnostic and treatment research.

5. Big Data integration is required to identify, protect, and monitor disease hot zones and human incidence of tick-borne disease.
**US BIOLOGIC Leadership Team**

**Mason Kauffman**  
Chief Executive Officer

**Chris Przybyszewski**  
Executive Vice President

**Steve Zatechka, PhD**  
Chief Operating Officer

**Ed Robb, DVM**  
Chief Science Officer

**Tom Monath, MD**  
Board Member  
Retired Director, CDC  
Retired Chief, USAMRIID  
One Health Leader

**Dave Williams**  
Board Member  
Retired Chairman & CEO of SANOFI

**Gov. Tommy Thompson**  
Board Member  
WI Governor for 14 years  
U.S. Secretary of Health & Human Services

**Mike Shmerling**  
Board Member  
Chairman  
XMi Holdings
For Additional Details
Please Contact:
Mason Kauffman, (901) 755-6868
mason.kauffman@usbiologic.com