Hafion, LLC
2029 Becker Drive
Lawrence, KS 66047
785-764-2296
785-832-8234
Wendy L. Picking, contact
Wendy.picking@hafion.com

Competitive Advantage:
- Defined 3-4 component vaccine
- Antigen cannot mutate into infectious pathogen
- Formulation is simple and fast

Funding:
- SBIR Phase I contract $224,997
- Phase II submission 12/2017
- Seeking 1st Round: $3M

Use of Proceeds:
- Completion of mouse studies
- Completion of formulation
- Pre-IND safety
- Recruitment of CEO

Current Stage:
- Completed POC expected in Q4 FY17

Team:
- TBD, CEO
- Laird Forrest, CSO
- Wendy Picking, President
- Melody Forrest, CFO

Problem
Whooping cough (pertussis), a once presumed conquered disease, is re-emerging because the vaccine is not effective at preventing infection. This acellular vaccine (aP) only stops symptoms and protection is short-lived. A Kaiser Permanente Vaccine Study published in *Pediatrics* (Feb 2106) "found that just three years after vaccination with the aP vaccine and booster, teenagers had lost virtually all of the vaccine's protection, and more than 90% were susceptible to infection." The resurgence of pertussis due to the ineffective aP is resulting in infants and toddlers not only contracting the disease but dying from the side-effects of the severe whooping cough.

Solution
The Hafion pertussis vaccine prevents infection, not just the symptoms. The formulation is a simple, 3-4 component vaccine requiring a single administration.

Market
In 2014, according to the Centers for Disease Control (CDC), 28,660 cases of pertussis were reported in the U.S. The World Health Organization and the CDC recommend all children should be routinely vaccinated for pertussis. According to WHO, in 2015, about 86% of infants received three doses of diphtheria-tetanus-pertussis vaccine worldwide to protect them against infectious diseases.

Competitive Landscape
The acellular vaccine is available only in combination with other vaccines. Diphtheria, tetanus, and pertussis (DTaP) vaccines are given to children younger than seven years old, while tetanus, diphtheria, and pertussis (Tdap) vaccines are given to older children and adults. There are several multi-ingredient vaccines on the market that contain acellular pertussis.

Business Model
Hafion will continue to leverage the partnership with KU and the Kansas Vaccine Institute to develop the vaccine through Phase 2. At this stage of development, the company will partner with existing company to further development the vaccine through approval. Hafion has a contract with NIAID for initial development, making us eligible for Phase 2 ($1.5m) and larger ($10m+) clinical development non-dilutive funding programs of the National Institute of Allergies & Infectious Diseases.

Management Team
The Hafion team has over 40 years of vaccine and formulation experience. Dr. Picking developed the antigen component of the vaccine. Dr. Forrest developed the adjuvant platform. Hafion is located at the Bioscience and Technology Business Center incubator at KU. BTBC provides business assistance to early stage KU spin out companies like Hafion. The company will recruit a CEO in FY18.

Traction to Date
An SBIR Phase I contract was awarded in FY17. The Phase II submission is planned for Q4 2017. The final stages of the mouse proof of concept have been initiated to be completed in FY17. The intellectual property will be licensed from KU after completion of mouse studies leveraging a backend loaded license program for faculty founded companies to be completed by Q1 FY18.