

intrexon Overview

February 2019



About Us



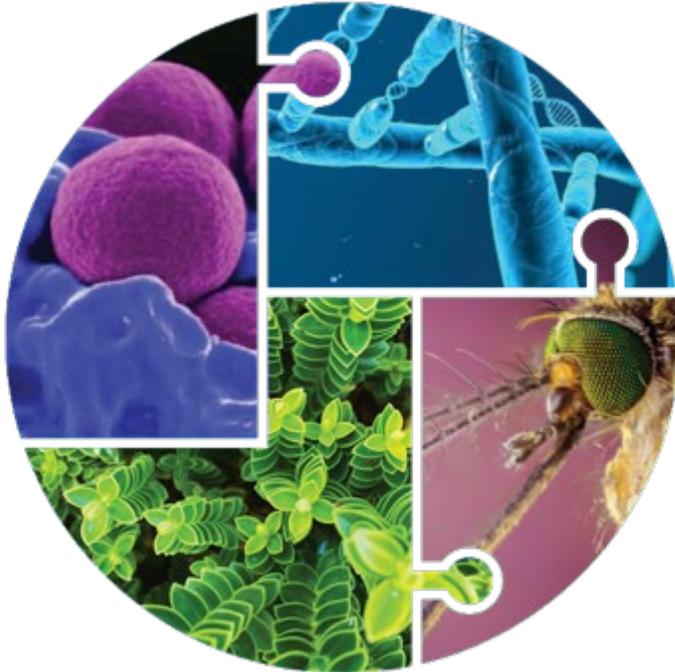
Novel applications of microbes to:

- Make better use of natural resources
- Improve medical treatments
- Reinvent our energy systems through alternative fuel production



Direct changes to plant biology at the genomic level to:

- Address demand for healthy, sustainable foods
- Address resource scarcity
- Develop crops with increased productivity and consumer appeal



New approaches to gene and cell therapy that target:

- Underlying causes of disease
- Multiple genes with a single therapy
- Reduction of patient cost and wait time for cellular therapies



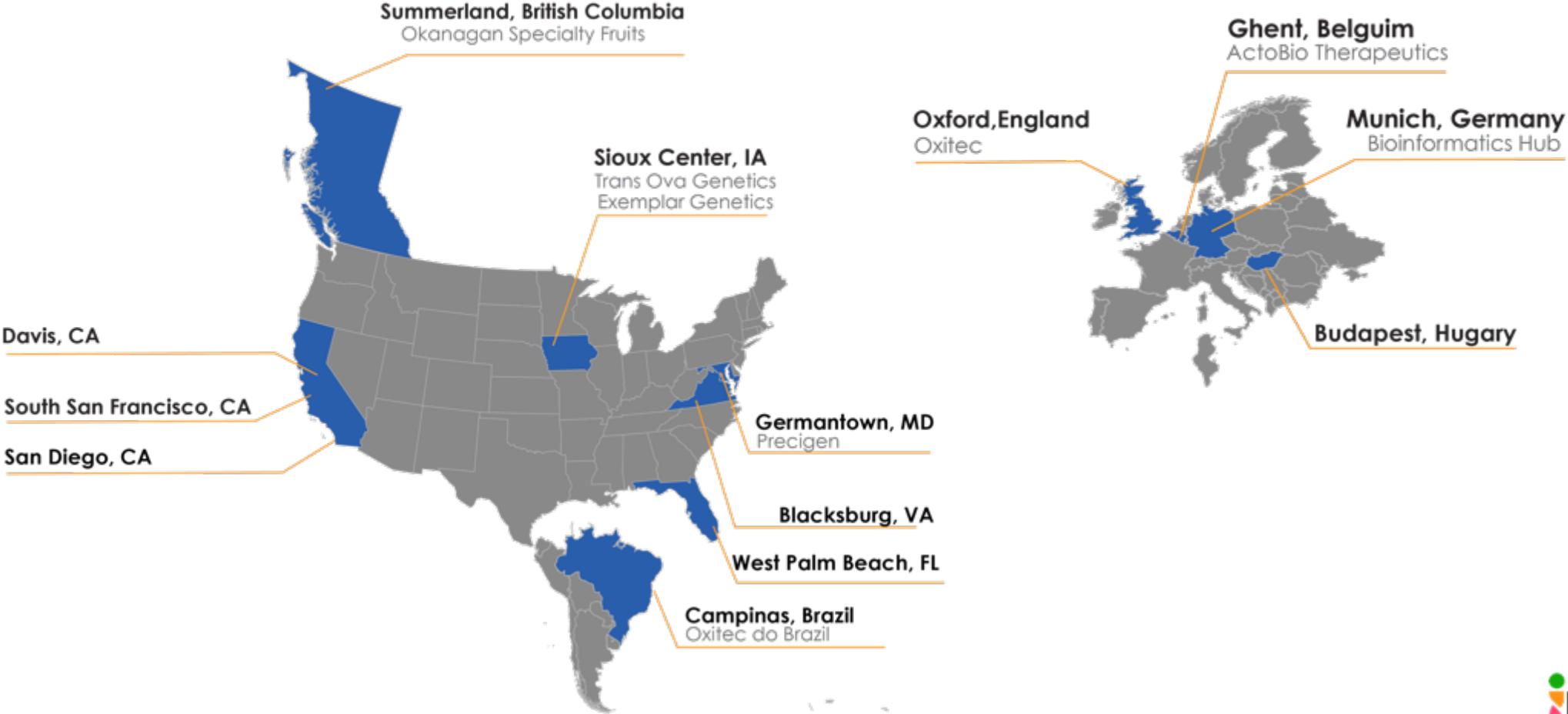
Precision bioengineering to address:

- Risks to global food production resulting from growing resistance to pesticides and traits
- Suppression of disease-carrying mosquitoes
- Over-fishing by providing alternative breeding methods



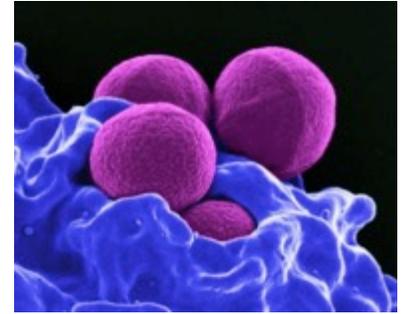
Global Biotechnology Company

Engineering biology to develop biologically based solutions that address global challenges across broad fields to improve the quality of life and health of the planet



Deep Biological Expertise Allows Valuable Reprogramming

- **intrexon** is addressing global challenges with precise control of biological systems across microbes, plants, animals, and human cells
- ***Harness the power of living cells:*** At its core, intrexon is a gene expression and regulation company focused on precise control of a wide collection of cells and organisms
- ***Synthetic biology rests on biology:*** intrexon's deep knowledge of biology combined with our bioinformatics and computational biology tools enables the discovery, generation, and validation of innovative products
- ***Unique toolbox two decades in the making:*** intrexon's precision engineering capabilities allow for controllable, multi-genic payload capacity of our gene programs



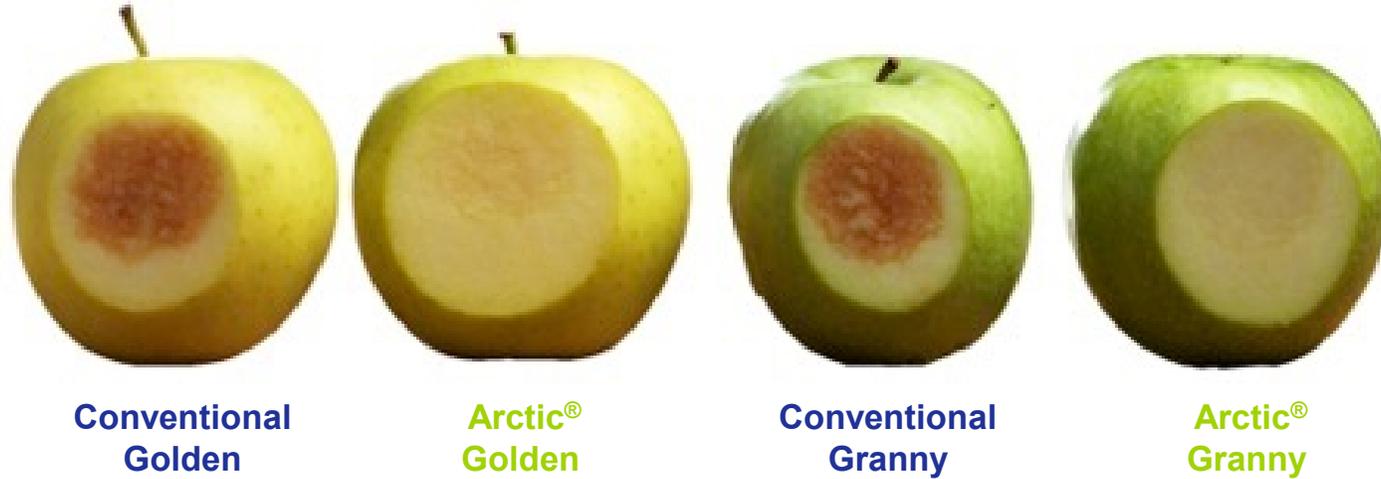
Innovations in Plant Biology to Provide Healthy Foods

Okanagan's non-browning apple with benefits from growers to consumers

Botticelli™ technology for micropropagation



Okanagan Specialty Fruits' Arctic[®] Apple – Lead Product in Plant Foods Portfolio



Sliced Apple Market

- Fresh sliced apple market in US estimated at ~\$500 million in sales, but stalled
- Use chemicals or anti-oxidants to stop browning which impacts flavor and cost of sliced apples
- 40% of apples wasted, much from superficial bruising / browning

OSF's Arctic[®] Non-browning Apples

- Via RNAi technology, reduced levels of the enzyme that initiates browning
- Same composition and nutrition as conventional counterparts
- Grows exactly the same as conventional apples in the orchard

Engineering Animal Biology for Food and Agriculture

AquaBounty land-based salmon production

Trans Ova elite bovine genetics

EnviroFlight black soldier fly larvae for animal feed

Oxitec biological crop pest control and self-limiting mosquito vector control

Exemplar MiniSwine research models



AquAdvantage[®] Approach

AquAdvantage[®] approach provides a healthy, more sustainable protein source bringing productivity and environmental benefits to the aquaculture industry:

- Grow salmon in half the time with one-quarter less feed
- Reduces pressure on marine ecosystems



Feed Conversion Ratio of Food Animals



AquAdvantage[®] Salmon 1:1
+20% benefit over conventional farmed salmon

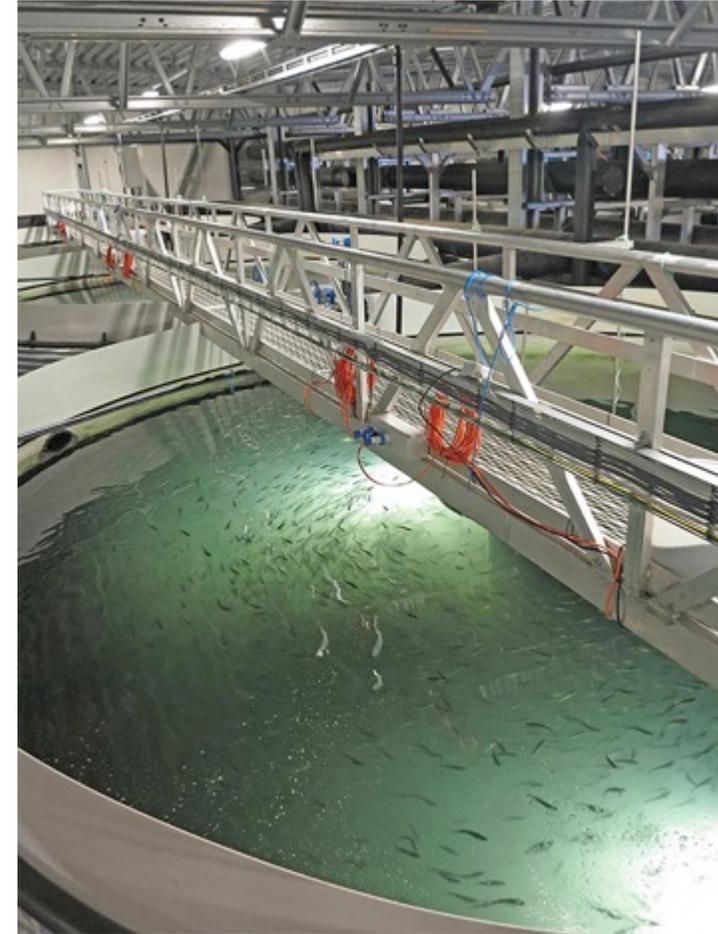
AquaBounty Technologies, Inc. (NASD: AQB) is Intrexon's majority-owned subsidiary that pioneered the AquAdvantage[®] solution



Sustainable AquAdvantage® Salmon Update

Domestically-produced alternative to imported ocean cage reared salmon

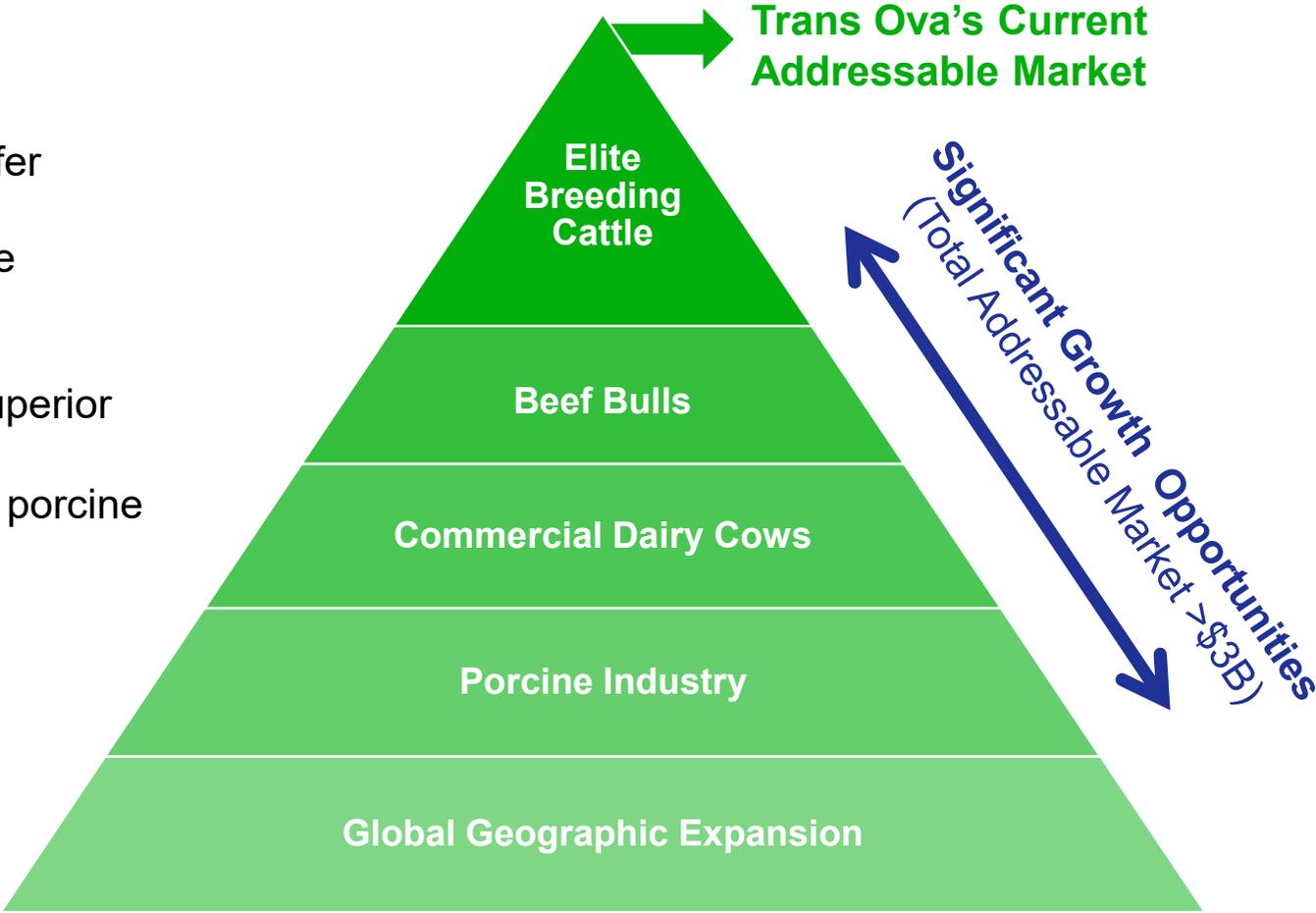
- Currently distributed throughout Canada
- November 19, 2015 – FDA approval for production, sale, and consumption in the U.S.
- April 27, 2018 – FDA approval to raise AquAdvantage® Salmon at land-based Indiana facility; conventional salmon is currently being raised at the facility
- AquaBounty granted a CA\$2.0M loan from the Department of Economic Development of the Province of Prince Edward Island to complete the construction of a 250mt facility
- U.S. Department of Agriculture released disclosure standards for the labeling of products containing bioengineered components
- Production and sales of AquAdvantage® Salmon in U.S. await official labeling guidelines by the FDA



Trans Ova – Largest Supplier/Producer of Bovine Embryos in US

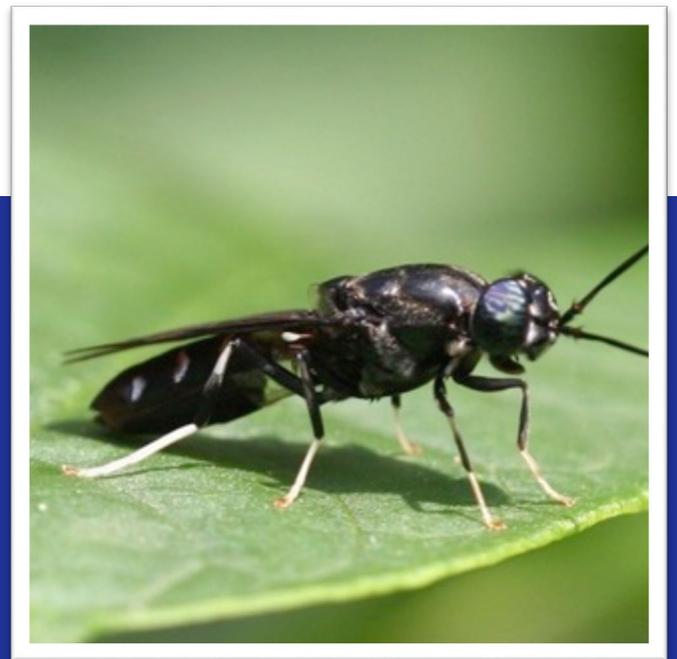
Trans Ova Genetics is the leader of bovine genetics in North America:

- Preeminent market share in **IVF** and **Embryo** Transfer
- At forefront of expanding **genetic gains** through elite heifers, cows, and bulls
- **Expanding product line** to include embryos with superior female genetics opening door to **productivity advancements** for efficient, high-quality bovine and porcine production on a global basis



EnviroFlight Black Soldier Fly Larvae

- Highly efficient production with insects that thrive on a variety of feedstock inputs
 - Do not carry zoonotic diseases, do not bite or sting
 - Sustainable and eco-friendly
 - Can be used as a high quality nutrient source for virtually all species of animals
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- * **Recent approval by Association of American Feed Control Officials (AAFCO) to include use in poultry diets**
 - * **Opened largest black soldier fly larvae facility in the US in Q4 2018 with the ability to produce 900mt of product a year and is designed to scale up to 3,200mt**



Oxitec – Pursuing a Sustainable Approach to Insect Control



Fall Armyworm – Pest of >80 plant species, \$13+ billion in crop losses since 2016



Diamondback Moth – Global pest shows resistance to almost every insecticide, c.\$4-5 billion cost per year in US alone



Spotted-Wing Drosophila – Damages soft and stone fruits in Asia, North America and Europe



Medfly – Destructive pest on >250 fruits, nuts and vegetables

Self-limiting, targeted species-specific platform prevents offspring from developing into reproductive adults, resulting in population suppression to protect yield and quality of crops