Capital Raises ~$135 Million

**NOL’s ~$200M**
AVANT develops and sells vaccines and immunotherapeutics for high-value, large markets:

- cholesterol management
- cardiac surgery
- infectious disease
- biodefense
- food safety
A New Generation of Vaccines

Viral  Bacterial  Cholesterol
### AVANT Product Pipeline

<table>
<thead>
<tr>
<th>Category</th>
<th>Preclinical</th>
<th>Phase I</th>
<th>Phase II</th>
<th>Phase III</th>
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<td>Rotarix®</td>
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<td>Megan® Vac</td>
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<td>MARKETED</td>
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</tbody>
</table>
Our role in a global industry

Providing Vaccines to all who need them, including those in the developing world
Push Me Pull You

Business Models for Developing World Vaccines
Push

Overwhelming Need

• Research initiatives
  – Don’t always lead to products
Pull

Vaccine Purchase Fund

Tiered Pricing
Viral Vaccines: Rotarix®

GSK and AVANT are developing Rotarix® for global use

- GSK to commercialize
- Tiered Pricing
- GAVI
<table>
<thead>
<tr>
<th>Category</th>
<th>Image</th>
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**AVANT’s Model: Bacterial Vaccines**

*“IP Excess”*
Bacterial Vaccines: Technology Platform

VibrioVec® & SalmoVec™ Delivery Systems

Anthrax antigen
Plague antigens

Protection from Anthrax and Plague (Y. pestis)

ETEC E.coli
Shigella

Protection from Travelers’ diarrhea
Bacterial Vaccines: Technology Platform

1. Strain selection
   *V cholerae, S typhimurium, S typhi*

2. Attenuation
   - ΔphoPQ, ΔcyADcrp
   - Δctx

3. Plasmid stabilization
   Balanced lethal genes:
   - Δasd, ΔpurB, ΔglnA of cDNA complemented on pDNA

4. Regulated expression of heterologous Antigen (hAg)
   - pag, nirB, htp

5. Vectored antigen localization
   - a) Cytoplasm: no signal
   - b) Periplasm: pelB
   - c) Surface: INP, OMP fusions
   - d) Secreted: HlyA
Bacterial Vaccines: Technology Platform

VitriLife® Process

- Reduces manufacturing time
- Enables bulk processing
- Lowers cost of goods
- Facilitates combination vaccines
- Avoids cold chain
- Allows room temperature storage
Vaccines for the 21st Century

A New Generation of Vaccines

- Safe
- Effective
- Oral
- Single dose
- Rapid protection
- No refrigeration
BioDefense – 3 Different Government Programs

$rPA$  Oral Anthrax  Combination Oral Anthrax/Plague

>$10M received

DynPort Vaccine Company LLC  UNITED STATES OF AMERICA
Bacterial Vaccines

GLOBAL HEALTH
CholeraGarde®
Typhoid Fever

TRAVELERS’
ETEC *E.coli*, Campylobacter Combination

FOOD SAFETY
Megan®Vac, Megan®Egg
Other Livestock Vaccines
Finding a Margin

• Lower Cost of Goods
  – VitriLife® shortens time in plant

• Lower Cost of Distribution
  – VitriLife® avoids cold chain

• Lower R&D Costs
  – Offset by DoD

• Lower Clinical Development Costs
  – e.g., IVI/Gates