

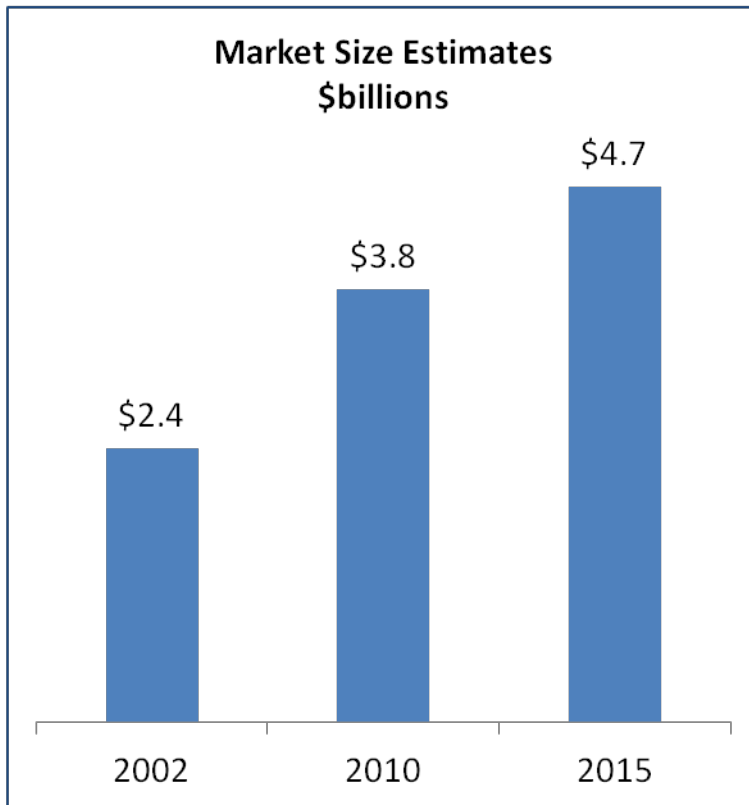


Maritime Summit 11/15/2011

Marine Biotechnology: Any technological application that uses biological systems, living organisms, or derivatives thereof from marine (or waterborne) environments to make or modify products or processes for specific applications

In other words:

A growing marketplace...



With an increasing range of applications...



Note: this excludes research funding

Source: EU; Global Strategy Analytics, press reports: NP analysis

Examples



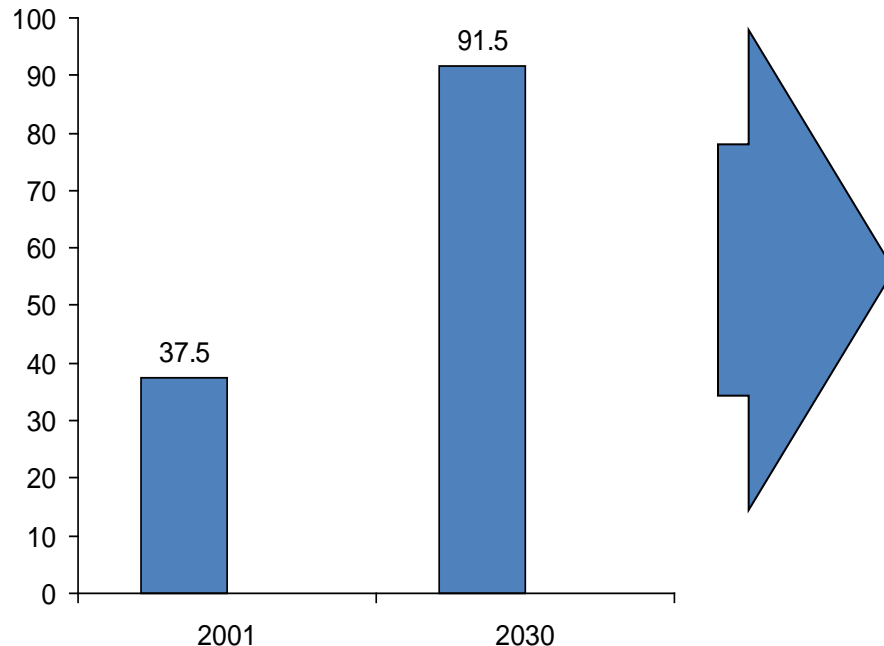
Likely / Emerging issues

- Research support
 - Infrastructure
 - Funding
- Translational research
 - From bench to product
 - From product research to scale production
- Prospecting
- Sustainability
 - Harvesting & Synthetics
 - Cultivation technology & locations
 - Cultivation brings its own set of issues
 - Disease
 - Pollution

Cultivation example - Aquaculture

- e.g., Growth in aquaculture stimulates growth in aquaculture health technologies

**Aquaculture Production Forecast
(millions of tons)**



Fish Health Business Implications

- Economic losses from disease are estimated to be approximately \$9 billion
- With the forecasted increase in production without major changes in vaccine and fish health technologies losses could reach \$22 billion by 2030
- Fish vaccine business is estimated to be approximately \$30-50 million globally
 - In contrast non-companion mammalian and poultry animal health industry is a \$7.2 billion industry globally
 - The fish disease industry could become a \$3.6 billion global business*

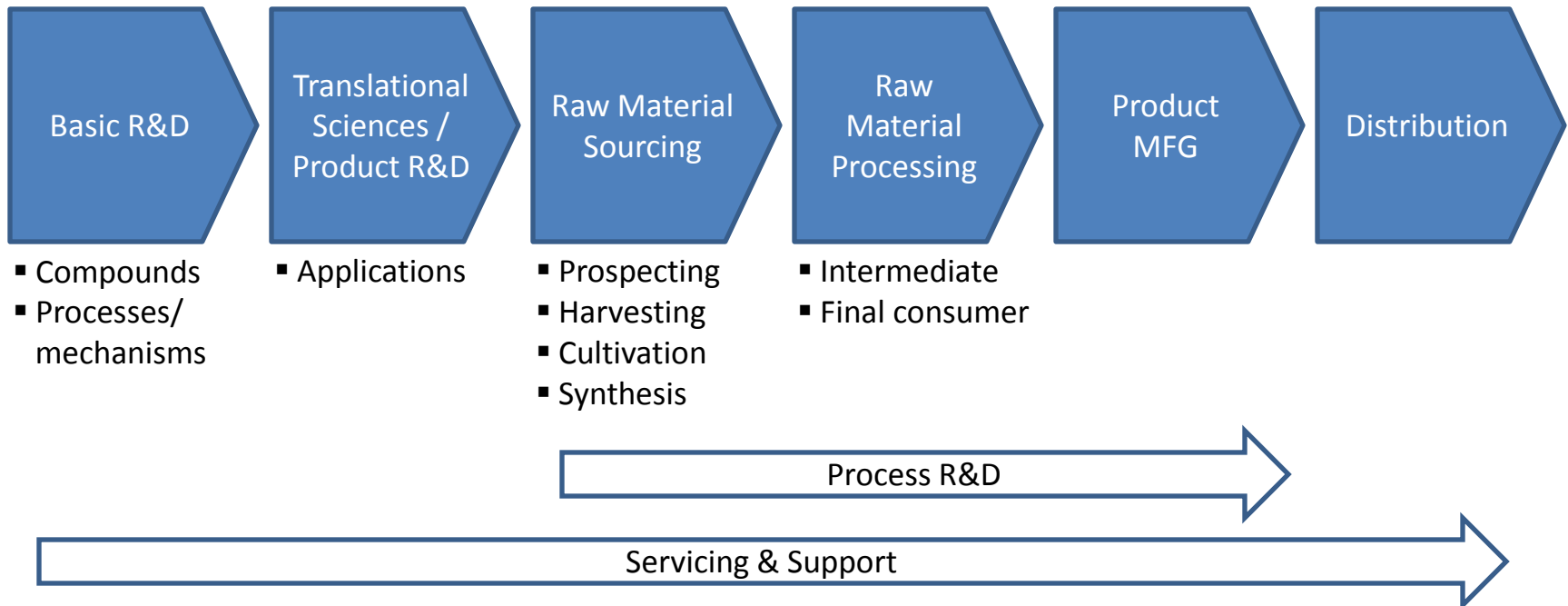
*Note: Derived from livestock animal health expenditures per ton of meat production of approximately \$39 compared to \$1.20 per ton now
Material is outdated and for illustration purposes only

Gloucester & Marine Biosciences

Looking at the industry through the perspective of the value chain is a good starting point for evaluating Gloucester's potential position in the industry

- Value chain is a complementary approach to “cluster”

Marine Biotechnology Value Chain



Opportunities exist when capabilities match the value chain (or a decision is made to create capabilities)

Illustrative

