Presentation to Atlantic Stakeholder Conference, Porto, Portugal, 20 January 2015.
Workshop: Blue Biotechnology – Recommendations to overcome SME development barriers in the Atlantic marine biotechnology sector .

Models for Marine Biotech Based Innovation: A North American Perspective

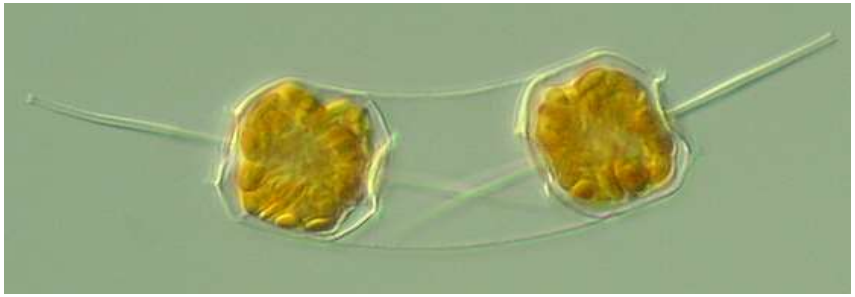
Dr Willie Wilson

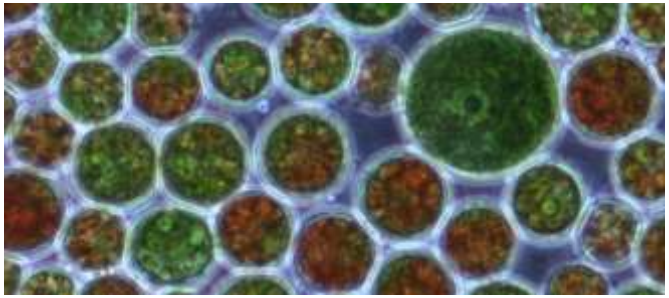
Head of Science

Plymouth Marine Laboratory

Practicing the

ART OF POSSIBILITY





PML | Plymouth Marine Laboratory

got algae? bigelow.org

Case Study 1
Maine USA

Overview of MTI

(Maine Technology Institute)

Focus of this presentation

Maine Technology Institute (MTI)

Fiscal agent

Blackstone Accelerates Growth

Business Innovation Program (BIP)

- SBIR/STTR support
- TechStart Grant
- Seed Grant
- Development Loan
- Business Accelerator Grant (for DLs and SBIR/STTR)
- Equity Capital

Cluster Initiative Program (CIP)

- CIP Planning Award
- CIP Implementation Award

Maine Technology Asset Fund (MTAF)

- Awards for capital investments in R&D leading to commercialization

www.mainetechnology.org

National Center for Marine Algae and Microbiota (NCMA)
Maine, USA

- A Bioresource Center
- 35 years in the algae business
- Started as a seed stock for Aquaculture Industry
- Microbial (Algal) Commodities
- Largest and most diverse living archive of marine microalgae
- Wide range of academic and industry customers/projects.

PROVASOLI-GUILLARD NCMA National Center for Marine Algae and Microbiota Culturing Diversity

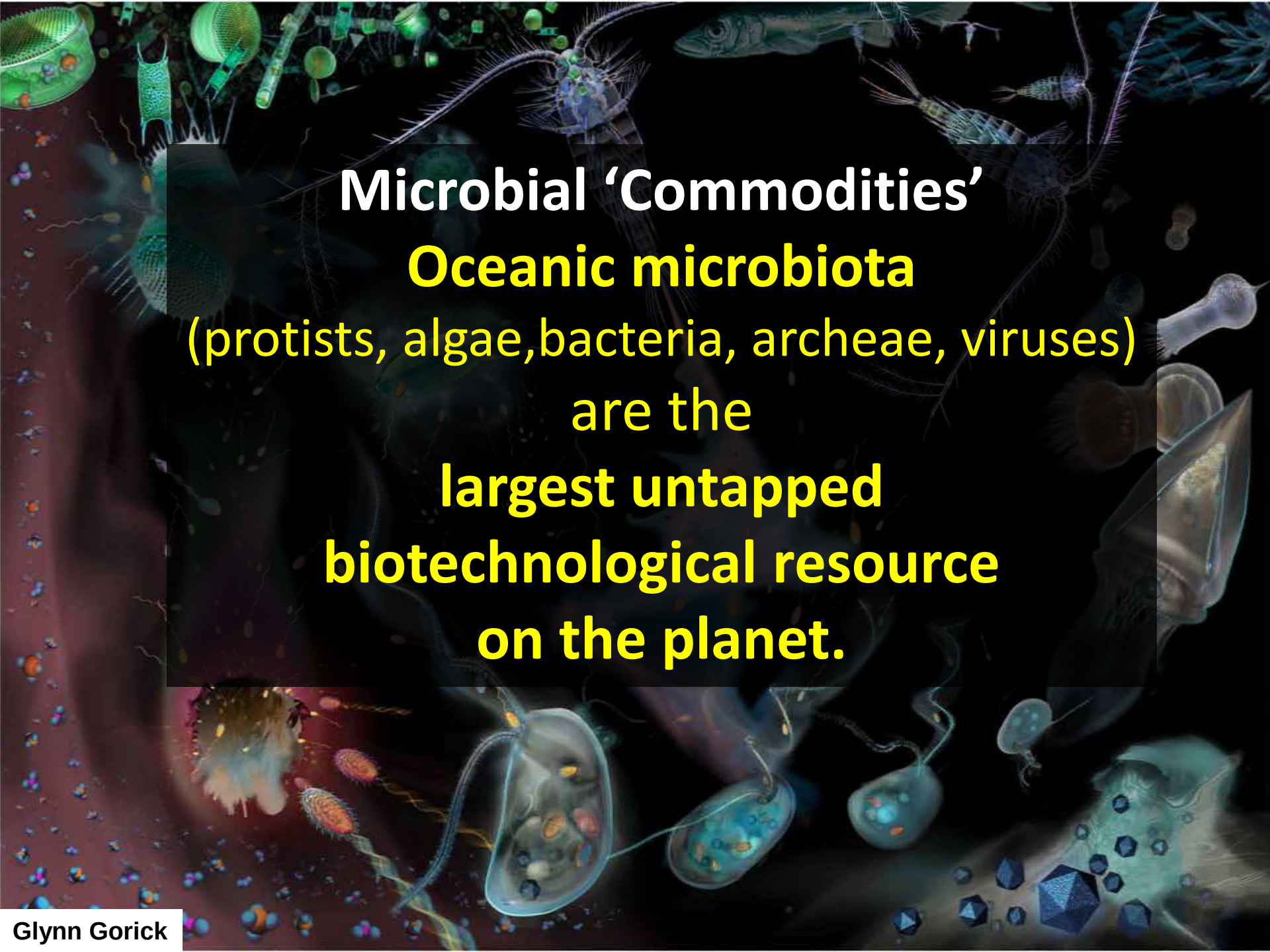
got algae? bigelow.org

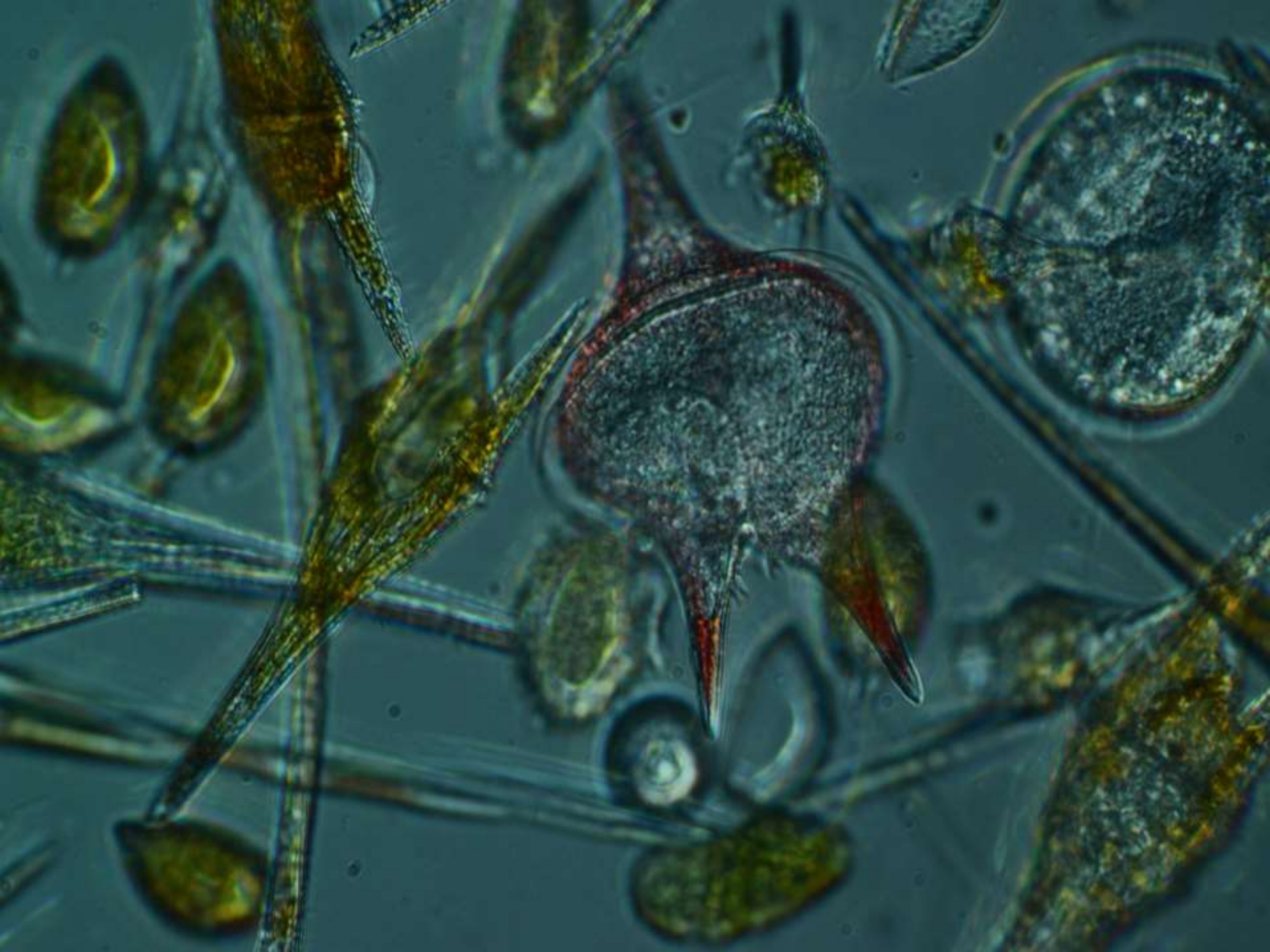
BIGELOW LABORATORY FOR OCEAN SCIENCES

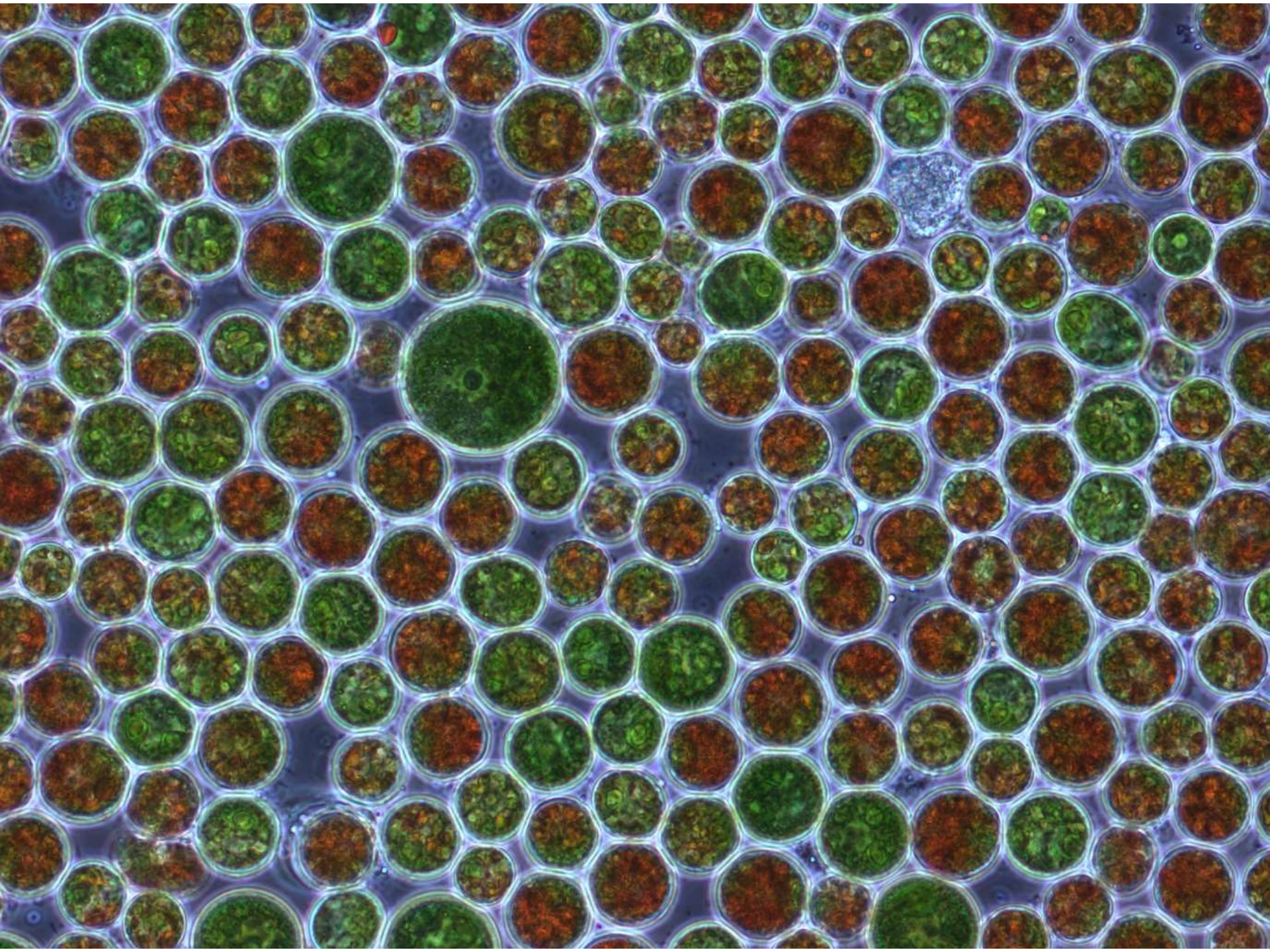
$4.5-million Maine Technology Asset Fund (MTAF) Investment from MTI To build the Norton Center for Blue Biotechnology (NCBB)

Innovation Gets You Recognized

Innovation Video


Microbial 'Commodities'
Oceanic microbiota
(protists, algae,bacteria, archeae, viruses)
are the
largest untapped
biotechnological resource
on the planet.
Glynn Gorick





New Services/Ventures

- Private collections /Patent Repository
- Research projects (to add value to collection)
  - International Cooperative Biodiversity Groups (ICBG) NIH proposal to involve collaboration with India
  - DoE Initiatives/Standard NSF research proposals
  - Characterization of strains (transcriptomes/genomes/metabolites)
- Business Proposals
  - OceanWater Maine™
  - High throughput metabolite screening
  - Exploitation of toxin collection
- Advertising
- Algae characterization services
- Maine Algae Industry Cluster

PROVASOLI-GUILLARD NCMA National Center for Marine Algae and Microbiota Culturing Diversity

got algae? bigelow.org

BIGELOW LABORATORY FOR OCEAN SCIENCES

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Maine Technology Asset Fund (MTAF)

- Awards for capital investments in R&D leading to commercialization

www.mainetechnology.org

Why a Cluster Initiative Program?

- Maine needs more than individually successful technology companies to have a competitive economy.
- Companies benefit from being linked to similar companies, near specialized workforce, and surrounded by industry/research resources that can help them thrive.
- Technology clusters are an important driver of business growth and economic development, leading to the creation and retention of good jobs.

What Exactly is a Cluster?

The term "Technology Cluster" is an organizing principle

Clusters have the following elements:

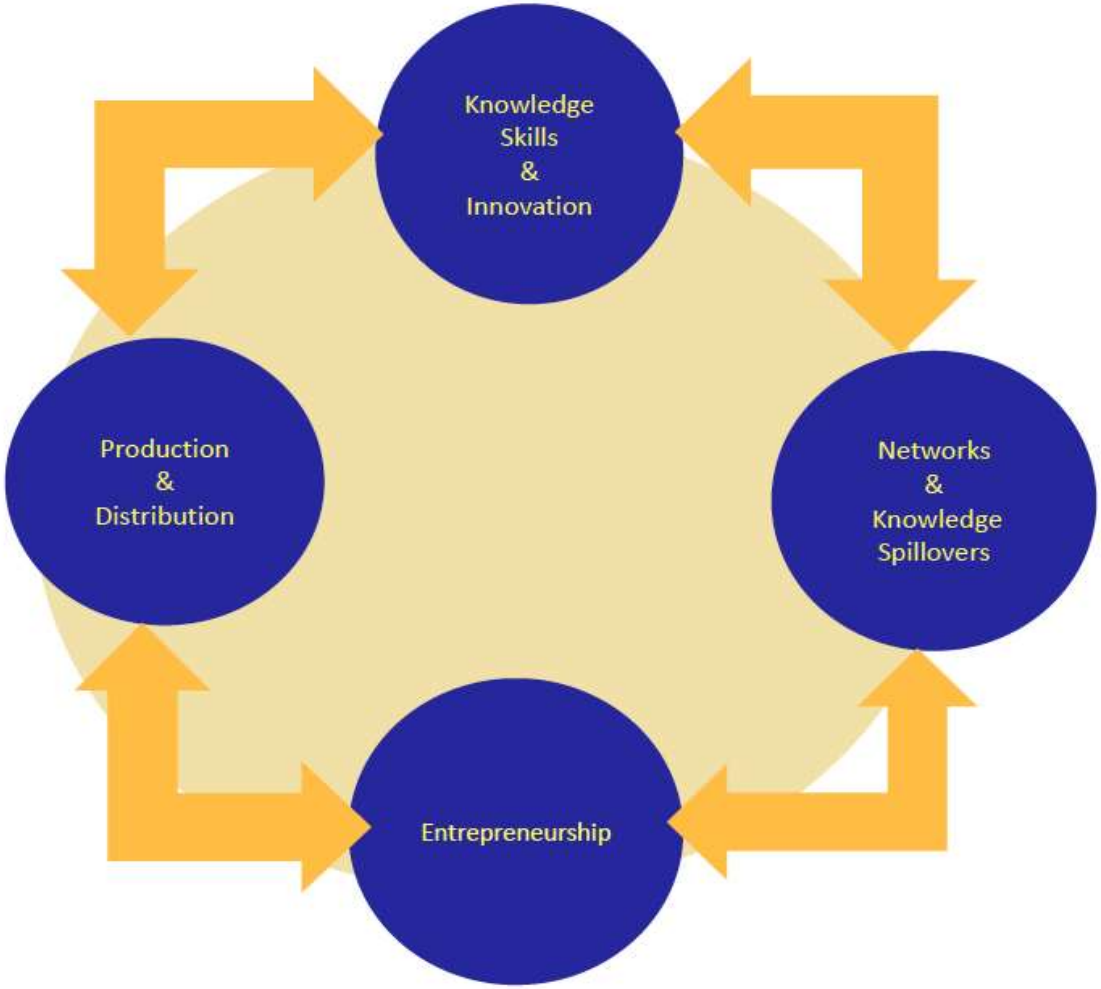
- **concentrations of companies** that typically serve related markets or a targeted need, and draw on similar knowledge and employee/workforce skills to develop innovative products and Services

- **supported by common organizations:** universities, trade associations, legal/financial services and government agencies

- **Relationships and the sharing of knowledge and skills** among such industry group are the key to being a cluster, rather than simply industry concentration

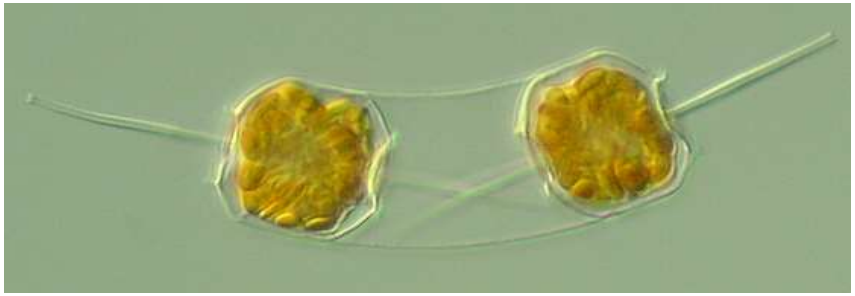
These elements lead to a collective competitive advantage

Four Cluster Elements



From Charlie Colgan's presentation: "Tracking Cluster Evolution in Maine"

Proposal for an Algal Industry Cluster in Maine
(still in discussions)

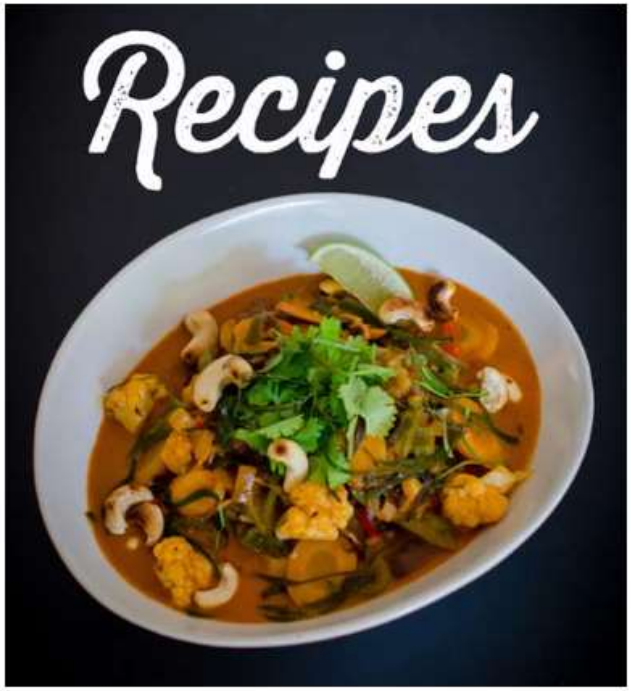


VISION

To create a complete algal supply chain; from seed cultures to biomass infrastructure, processing, testing, and development of market opportunities; that will allow us to lay a foundation to stimulate algal economic development, and make Maine one of the top states in the U.S. to run an algal-based business. It will be a process driven by innovation, education, collaboration, and branding.

Ocean APPROVED

Fresh, Frozen Kelp from the Coast of Maine



Ocean APPROVED

MTI
Seed Grant
$10,000
Product Development

MTI
Seed Grant
$12,500
Proof of Concept
Farming

MTI Phase 0
$5,000
SBIR Application Prep

Private
Investment

NOAA SBIR
$95,000
Initial Farm Technology

GMRI
UConn
Bigelow
KRB

MTI Pre
Phase II
$10,000
Prep SBIR II

CEI Loan

NOAA SBIR
Phase II
$300,000
Final Farm Technology

Private
Investment

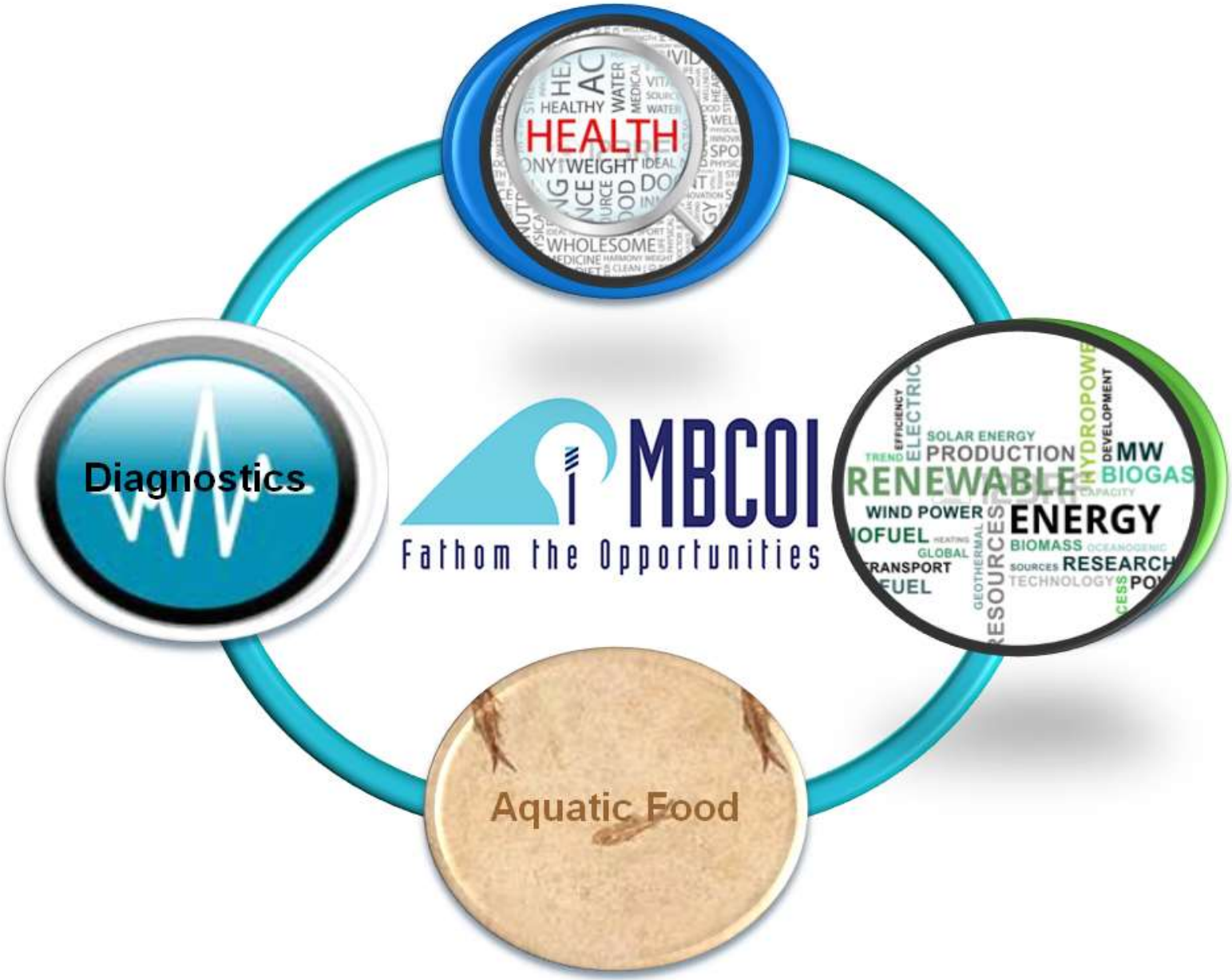
MTI
Business
Accelerator
$30,000
Commercialization

CEI Loan

2006 2008 2009 2010 2011 2012 2013

Case Study 2
North Carolina USA

Marine Bio-Technologies Center of Innovation (MBCOI)



Marine Bio-Technologies Center of Innovation (MBCOI)

MISSION

MBCOI's mission is to accelerate the commercialization of innovative technologies by uniting stakeholders in marine research both domestically and internationally.

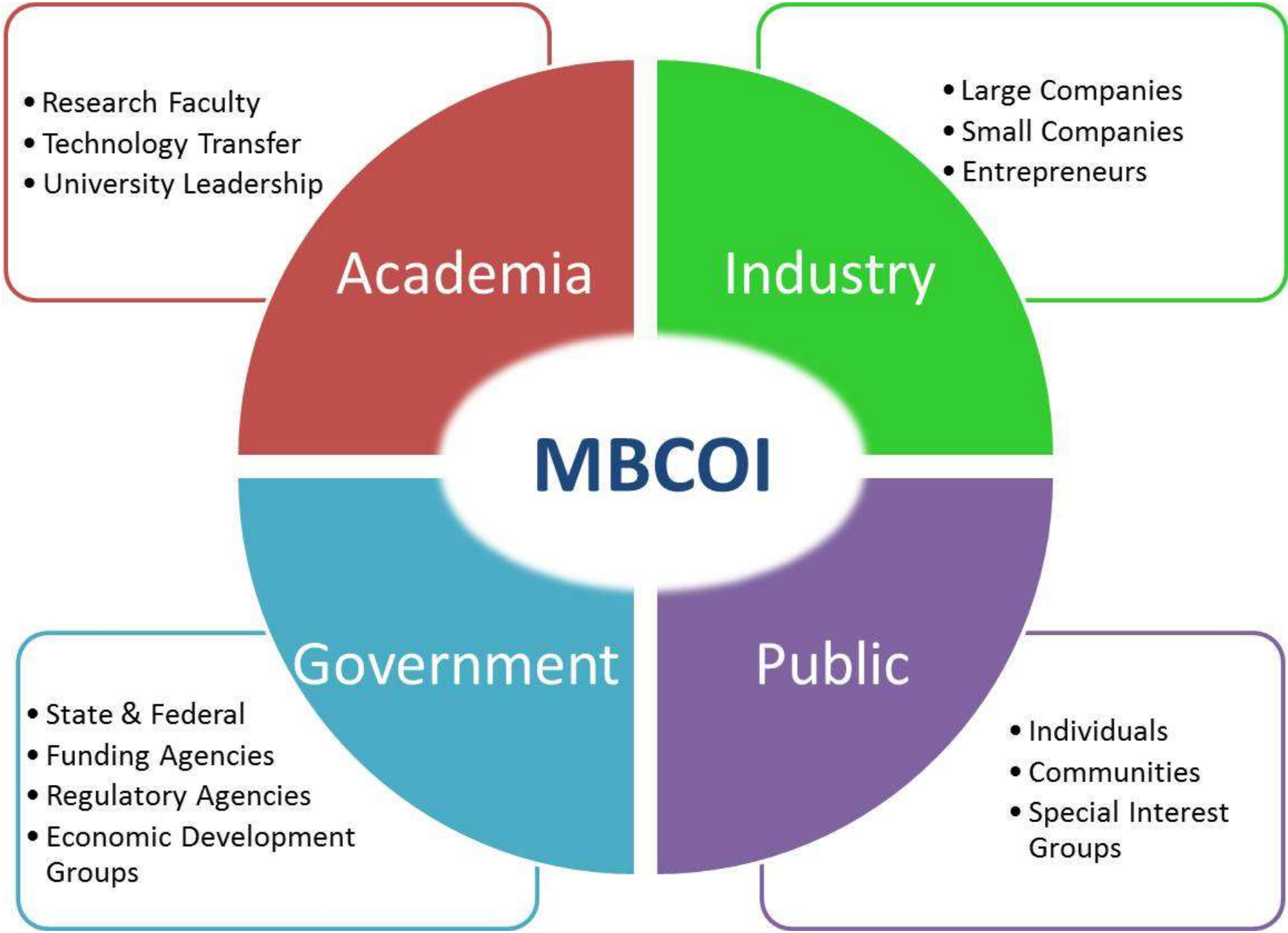
VISION

To stimulate North Carolina's economy by establishing MBCOI as the "go-to" center for information, collaboration, and commercialization of marine biotechnologies.

GOALS

MBCOI intends to become the nexus for marine biotechnology in North Carolina by:

- Fostering unity among North Carolina stakeholders in marine biotechnology;
- Serving as a liaison for researchers throughout academia and industry;
- Providing a mechanism for scientific exchange through focused workshops and meetings;
- Identifying opportunities for collaborative, multidisciplinary research;
- Stimulating economic development by assisting with the expansion of current organizations and creation of new enterprises; and,
- Promoting an international identity for North Carolina's efforts in marine science.


• Research Faculty
• Technology Transfer
• University Leadership
Academia
• Large Companies
• Small Companies
• Entrepreneurs
Industry
MBCOI
Government
• State & Federal
• Funding Agencies
• Regulatory Agencies
• Economic Development Groups
Public
• Individuals
• Communities
• Special Interest Groups

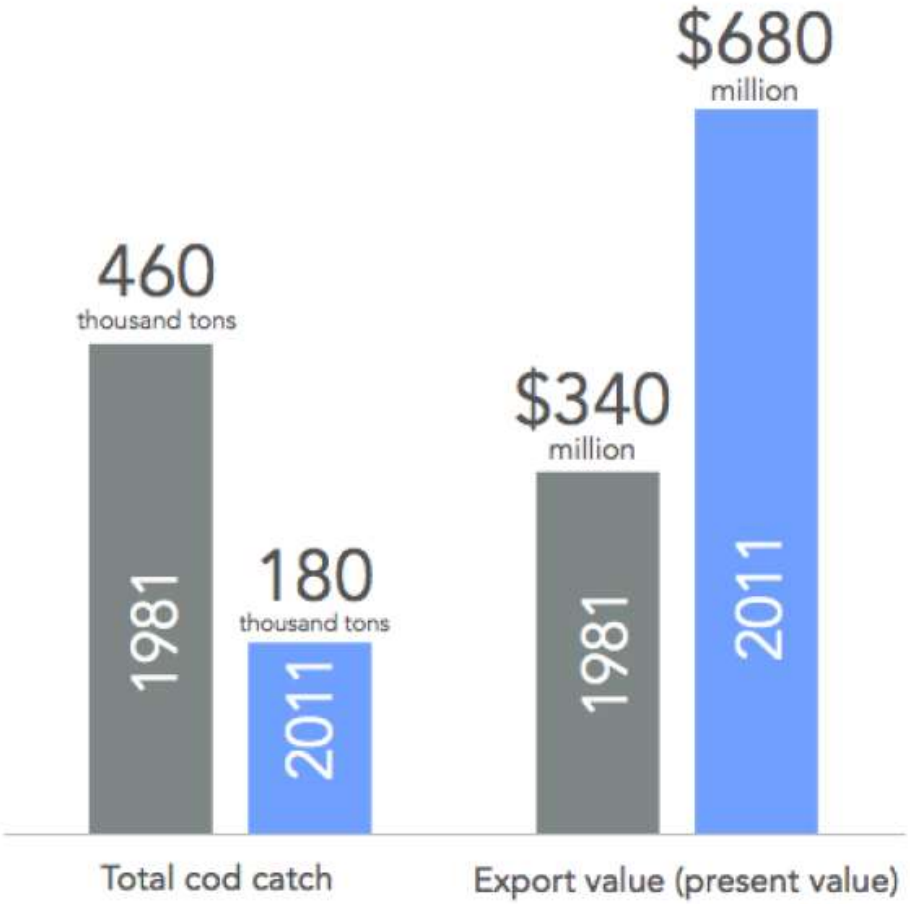
Case Study 3
Iceland

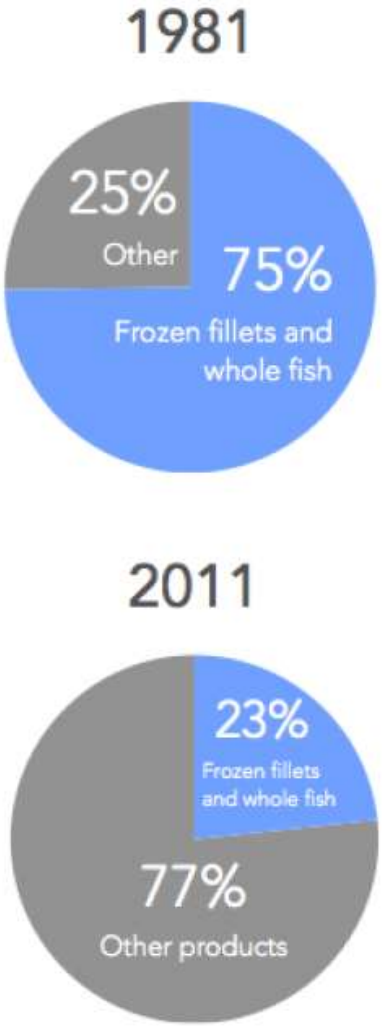
ICELAND OCEAN CLUSTER

Dr. Thor Sigfusson
Founder & CEO

ICELAND
OCEAN
CLUSTER

Total catch (cod) and export value 1981 vs 2011

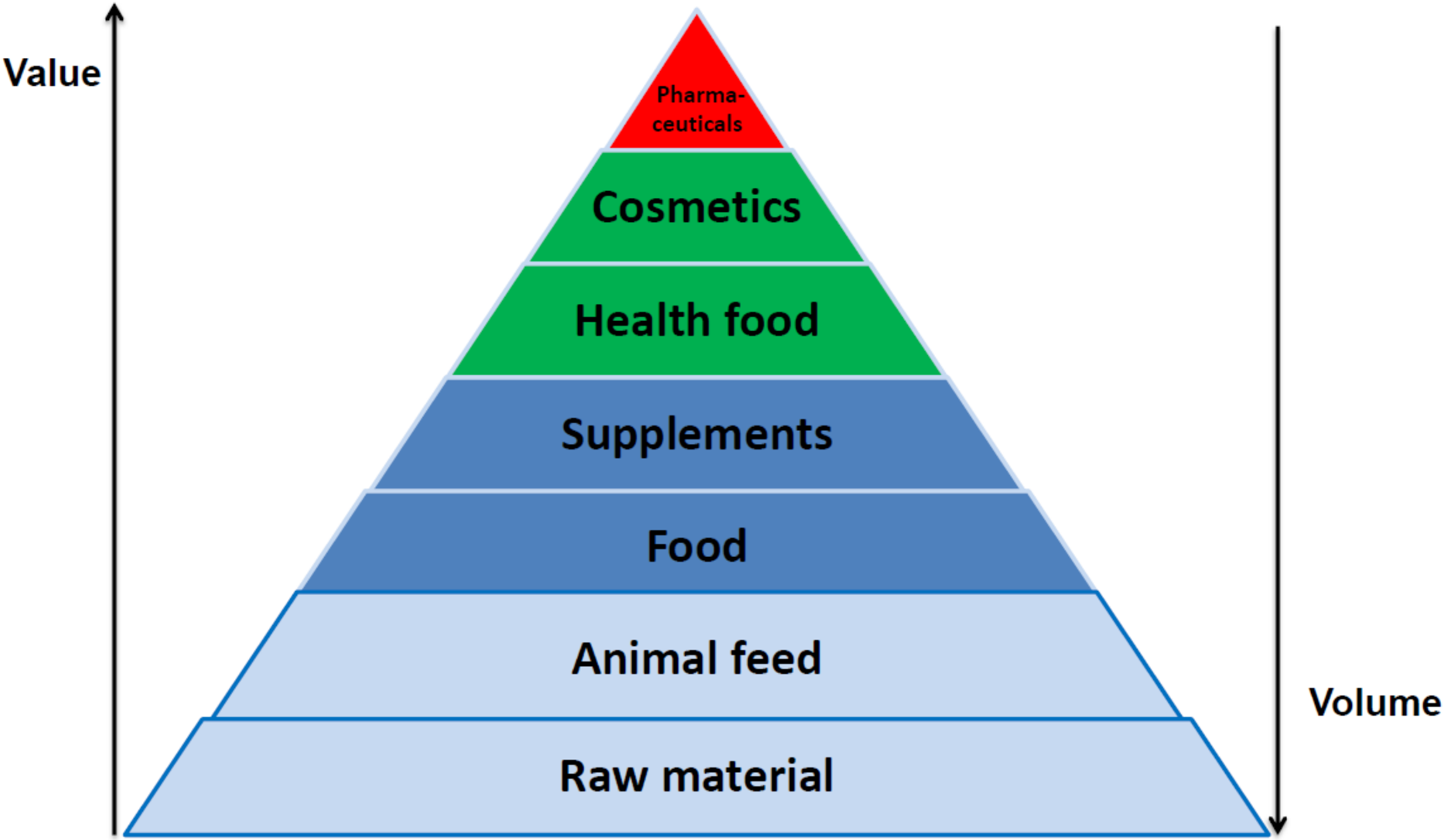




ICELAND
OCEAN
CLUSTER
Turning Waste
into Value
Meeting series around the North Atlantic
Winter 2012-2013

Fisheries and fish processing
Ocean technology
Transportation and harbors
Marketing and distribution
Ocean Surveillance and administration
Finance and service
Seabed
Ocean tourism
R&D, education and training
Biotechnology
Aquaculture
ICELAND OCEAN CLUSTER

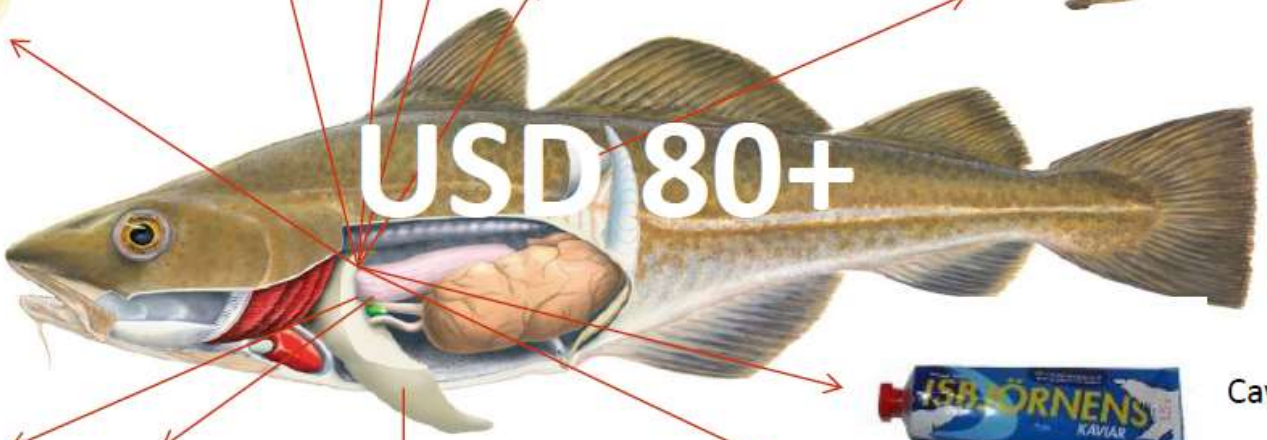
Value chain for utilization



Canned products made from cod liver: Smoked liver and liver paté

Fish skin transformed to leather and medical device

Natural fish stock for food processing

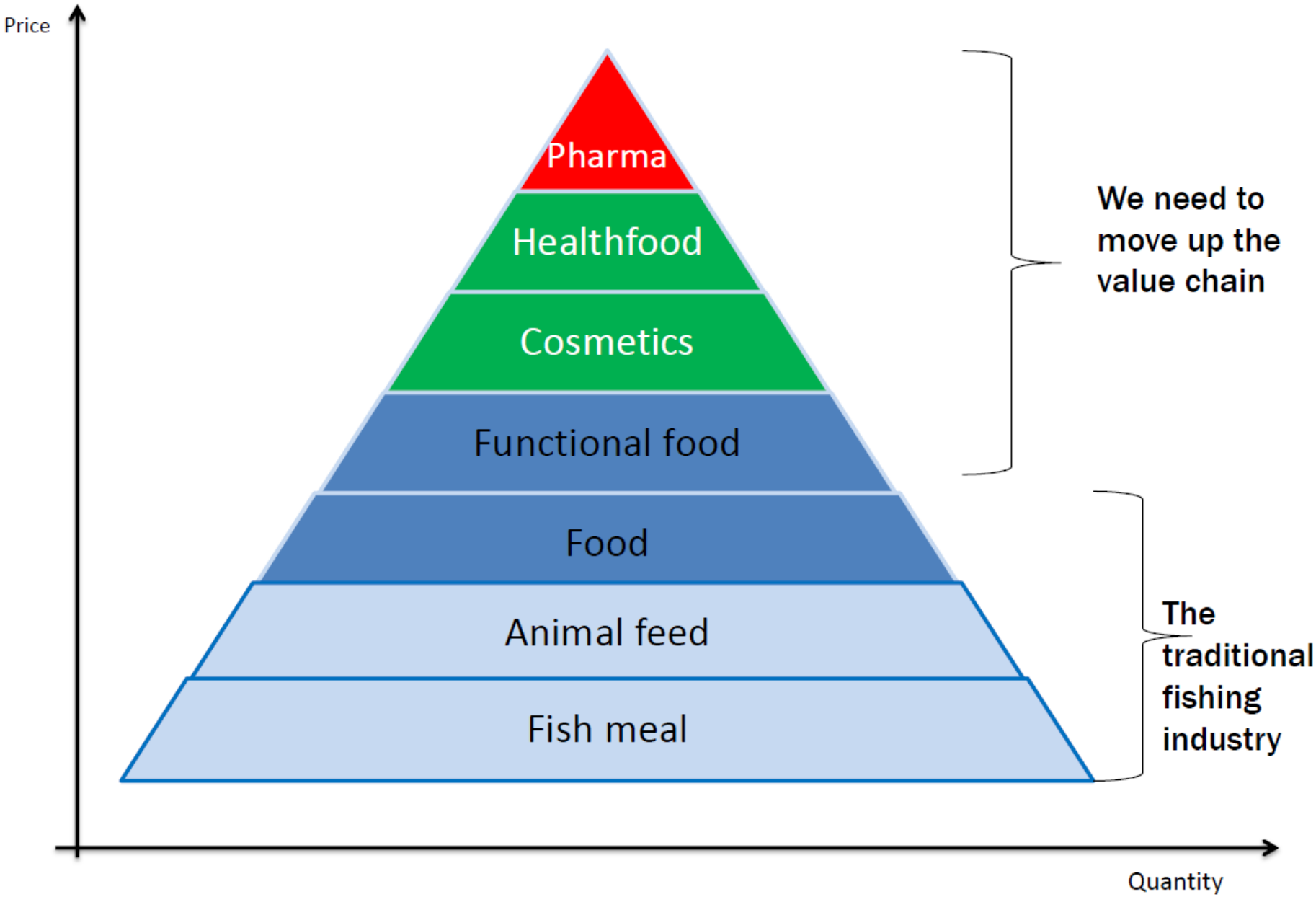


Caviar from roe

Cosmetics made from enzymes from inner organs.

Liver oil and intestine fish oil.

Hand- & foot creams with omega 3


Price
Pharma
Healthfood
Cosmetics
Functional food
Food
Animal feed
Fish meal
We need to move up the value chain
The traditional fishing industry
Quantity

ICELAND
Iceland Ocean Cluster
CANADA
OceansAdvance
FAROE ISLANDS
House of Industry
NAOCA
The North Atlantic Ocean Cluster Alliance
NORWAY
Ålesund Kunnskapspark
Innovation Norway
Sintef
DENMARK
Maritime Development Center of Europe
GREENLAND
Hunters and Fishermens Association

Recommendations

- Cluster initiatives are the way forward to encourage innovation and entrepreneurial spirit.
- Mechanisms to facilitate productive relationships Business to Business, and Academia to Business.
- Central resources that provide funding mechanisms coupled with business advice.
- We need to find mechanisms to encourage and promote transatlantic relationships.