Journal of Oceanography

Dr. Jean Micheal Kornprobst

Editorial Board member

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OMICS International

BIOGRAPHY

Dr. Jean Micheal Kornprobst

- Born on December 3, 1941, Dr. Kornprobst received his PhD in chemistry from the University of Lyon, France in 1969. He held the position of Professor of Organic Chemistry, University of Dakar, Sénégal (1974-1990), Professor of Physical Chemistry, University of Nantes, France (1990-2003), Invited Professor: Universities of Louvain-la-Neuve, Belgium (2006-2007), Campinas, Brazil (2008), Blida, Algeria (2010). He was a Member of the Scientific Advisory Board, Marine Biotechnology Research Centre, Rimouski, Québec, Canada. Coordinator of two research programs in marine biochemistry in Qatar (1993-2003) and Saudi Arabia (1995-2003), Organiser of the 6th International Symposium on Marine Natural Products, Dakar, 1989, Member of the International Organizing Committees: Mediterranean Conference on Natural Products, MNCP'2011, Tipaza, Algeria, 2011; Annual International Congress on Marine Algae, Dalian, China, 2012. He has about 350 scientific works, 260 of which are devoted to marine organisms. He is also the prestigious author of Encyclopedia of Marine Natural Products (2010), Wiley-Blackwell, 3 volumes, 1593 pages.

Research Interests

- Marine Biotechnology
- Organic Chemistry
- Physical Chemistry
- Marine organisms
- Marine Natural Products

Recent Publications

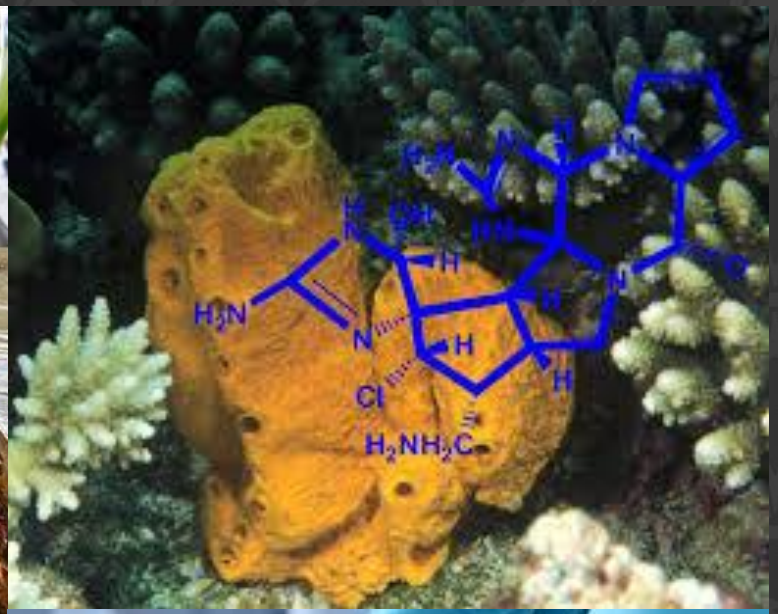
- Cultivable Marine Organisms as a Source of New Products, JM Kornprobst - Industrial Scale Suspension Culture of Living, 2014 - Wiley Online Library

- Outstanding Marine Molecules, S La Barre, JM Kornprobst - 2014 - books.google.com

Marine Biotechnology





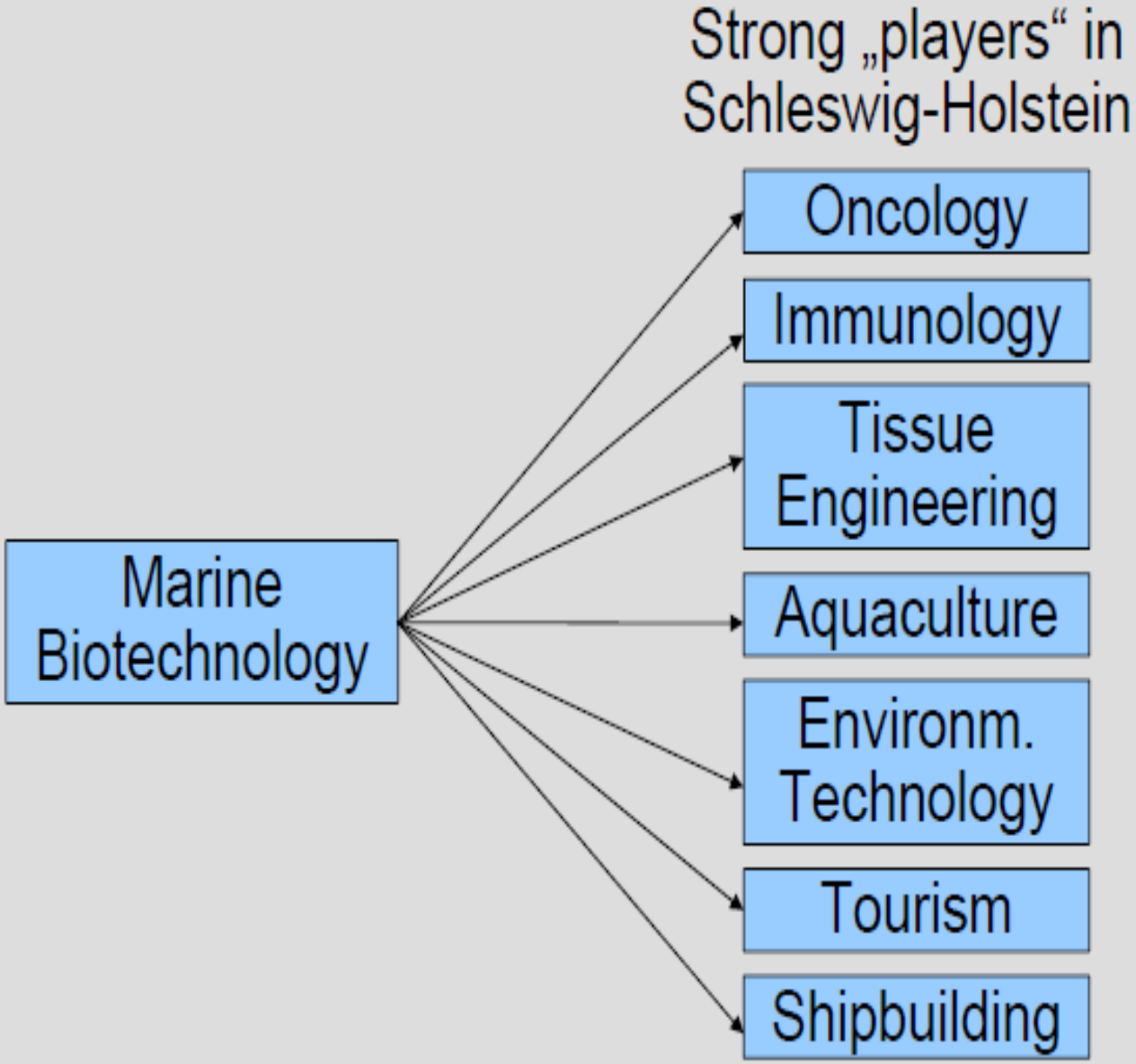




Marine Biotechnology

- Marine Biotechnology is the study of how the various organisms and actions of the ocean can be used to provide services and products to us.
- Marine Biotechnology is the use of living marine resources at (eco)system, concept, organism or molecular level to provide beneficial solutions for the society.



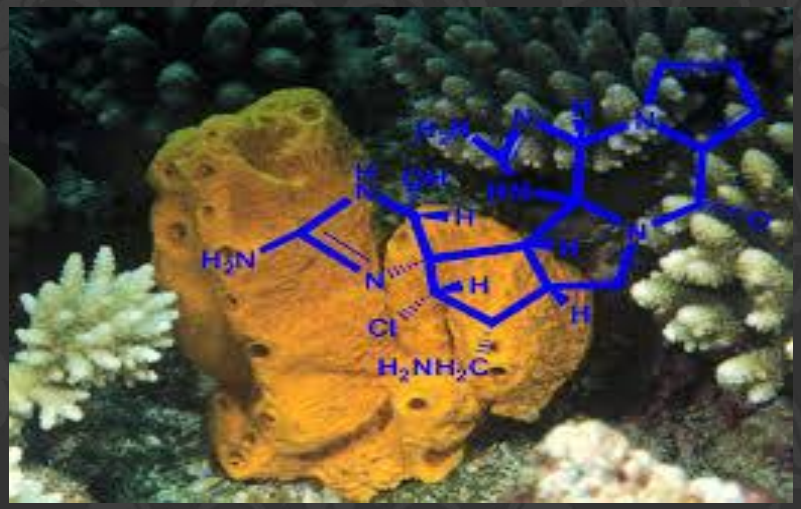

Strong „players“ in Schleswig-Holstein
Marine Biotechnology
Oncology
Immunology
Tissue Engineering
Aquaculture
Environm. Technology
Tourism
Shipbuilding

Related to industry and agriculture

- Marine Biotechnology is providing many new solutions to Industry and Agriculture, including environmentally friendly pesticides and salt-resistant enzymes that are helpful in many industrial applications.

BEGAN FROM……

- Marine Biotechnology is a relatively new field of study, having emerged in the past few years. It began in 1998 when scientists from the Scripps Institution of Oceanography and various departments of the University of California, San Diego, came together and formed the Center for Marine Biotechnology and Biomedicine.



Marine Biotechnology faces the following challenges

There are three main challenges to Marine Biotechnology. These are:

1. **Biosafety (testing Living Modified Organisms may disrupt the natural ecosystem of the ocean.)**

2. **Access to Marine Organisms/Resources (Because Marine Biotechnology takes place in the ocean, the borders between different nations can sometimes erupt in disputes over access to certain resources/creatures.)**

3. **Intellectual Property Rights (The North wants stricter rights to discoveries made in the South, where marine resources are high, while the South feels that because the North is researching in their "property" they should be able to reap some benefits.)**

Future of Marine Biotechnology as it relates to Agriculture and Industry

Scientists in this field of Marine Biotechnology are studying the various enzymes and proteins of marine life in hopes of solving many problems that plague the area of Agriculture and Industry today. These problems include trying to find anti-corrosive coatings and "self-cleaning" surfaces for industrial use.

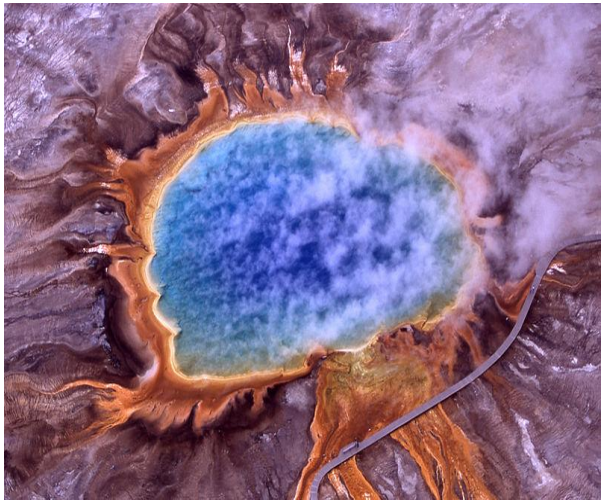
Innovators and Innovations

Agricultural Technique

- Aquaculture is the branch of marine biotechnology most closely related to agriculture. Marine Biotechnology has dramatically improved aquaculture to engineer sea species to yield higher nutrition, and more off spring to help the growing demand for seafood.
- Species include shellfish, striped bass and salmon, and abalone and blue mussels. Research is still being done to improve nutritional values and offspring in various species .
- The National Science Foundation (NSF) and other federal government agencies support research on this "marine agriculture."
- Hopefully, this research should be able to meet the huge demand for seafood expected in the coming years.
- The National Oceanic and Atmospheric Administration (NOAA) is leading the initiative to help the United States become more self-sufficient in the production of seafood.

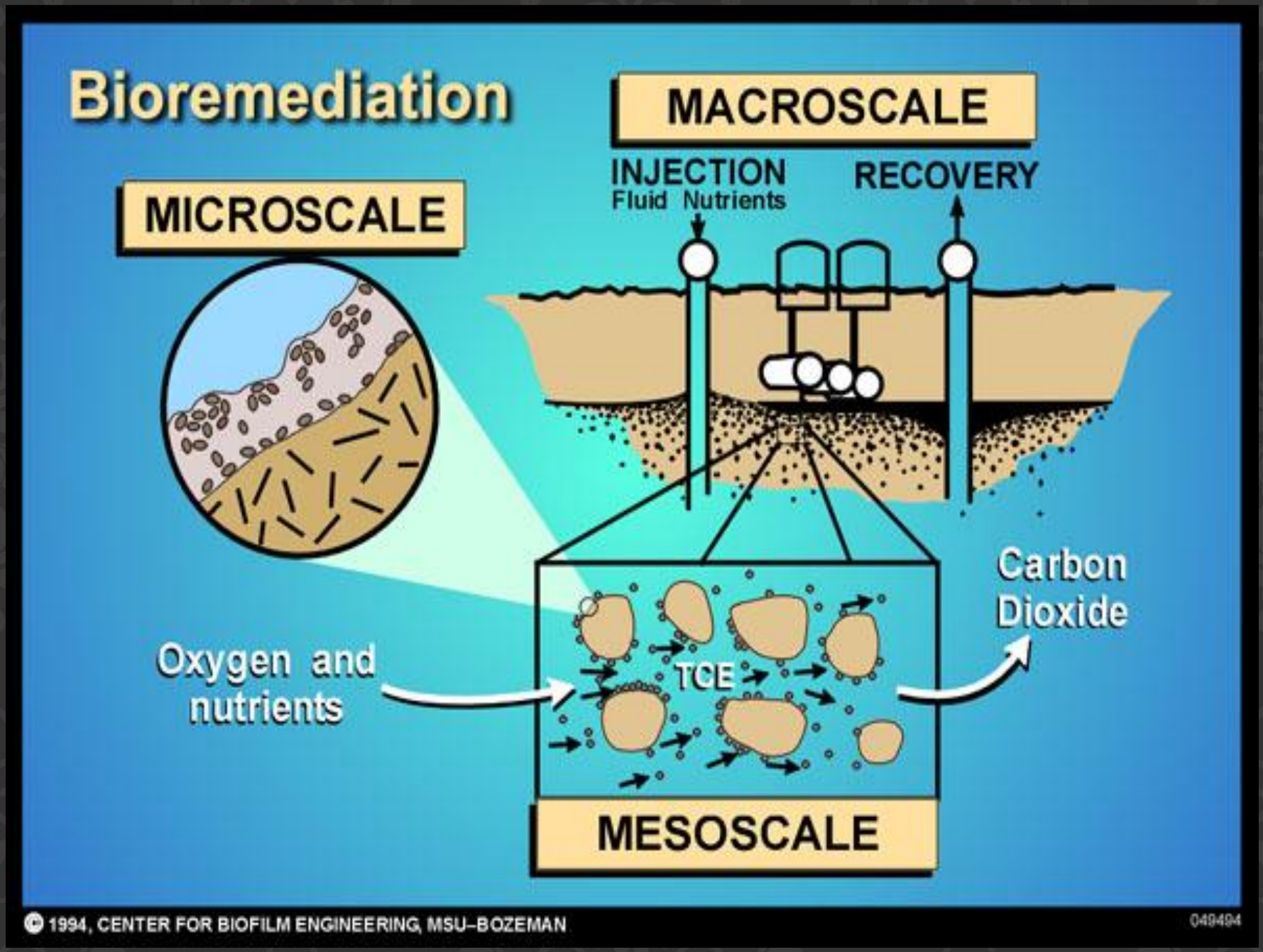
Industrial Products

- One of the latest amazing aquatic discoveries is directly related to marine biotechnology-that of thermophiles and psychrophiles. These are organisms that are capable of living in extreme environments.
- Thermophiles flourish in extremely hot places like Yellowstone National Park's thermal pools; while psychrophiles are the opposite, preferring freezing cold areas to live, like the waters in and beneath the polar regions. Thermophiles were discovered in 1966 by Thomas Brock.
- Enzymes produced by thermophiles have great importance in the industry of biotechnology. Those enzymes are the basis of the process known as polymerase chain reaction, or PCR. PCR is widely used with the development in the field of biotechnology, including DNA fingerprinting.



Bioremediation

Bioremediation speeds the natural degradation process. it is being used to clean up sewage, sludge, seafood wastes, and toxins in marine areas. By using genetically modified marine organisms, scientists are able to clean up or contain oil spills. For example, this approach achieved great success after the oil spill from the Exxon Valdez in Alaska.


Bioremediation
MACROSCALE
INJECTION
Fluid Nutrients
RECOVERY
MICROSCALE
Carbon Dioxide
Oxygen and nutrients
TCE
MESOSCALE
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Impact on Society

Economic Impact

With new advances in aquaculture, marine biotechnology is significantly improving economic efficiency in the yield of various seafoods. Already, in Santa Barbara, environmentally friendly and economically efficient industries have been created that are producing sea urchins, abalones, algae, etc. to help meet the growing demand for seafood. In addition, many enzymes found in sea creatures are being used as the basis for many biotechnology applications, a multi-billion dollar industry.

Research done on the Eastern Oyster has also produced the discovery of Polyaspartic Acid, which helps plants take in more nutrients from the soil without using as much fertilizer. This is helping to stimulate agriculture even further.

Social Impact

New drugs are being discovered through the use of marine biotechnology that has helped the Drug Industry begin producing drugs to combat things such as cancer and AIDS. One such example is the discovery of a bacteria found in the small marine animal called Bugula Neritina. This bacteria is being developed to fight a great variety of cancers, which greatly impacts many in the public.

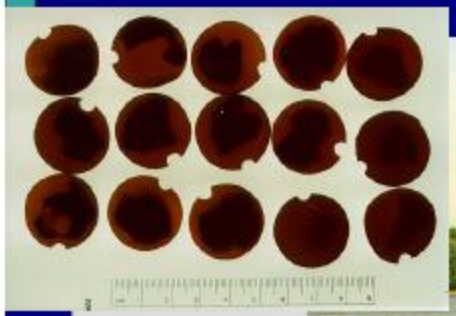
Political Impact

Marine Biotechnology has sparked many disputes over territory. Because virtually all species and resources for Marine Biotechnology are found in the ocean, disagreements between various countries have come up due to the uncertainty of where one country ends and the other begins.

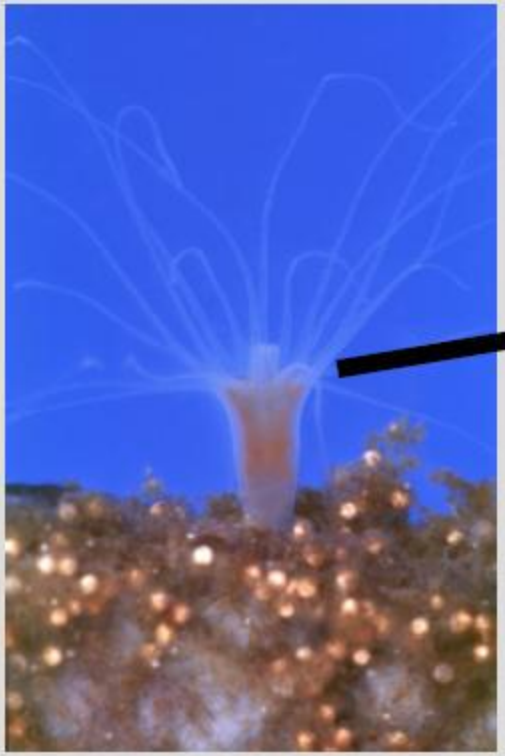
Ethical and Legal Issues

- Marine Biotechnology currently faces a variety of ethical and legal issues.
- One example is the studying and use of organisms and resources found in other countries' terrirtory.
- Just because one country may have much richer resources and a better selection of marine life, it doesn't mean that just any country can come nad infringe on that terrirtory for their own research.
- Scientists are still struggling with this today as they try to come to terms with scientists of other countries.
- One such example are the disputes between U.S. scientists and the countries south of the equator, where marine resources are rich.
- Another ethical issue is to make sure that ecosystems and species remain stable. When scientists modify living organisms, it poses the possible threat of damaging the surrounding wildlife and habitat. So marine biotechnologists must remain conscious of what they are doing and make sure to keep the environment healthy and stable.

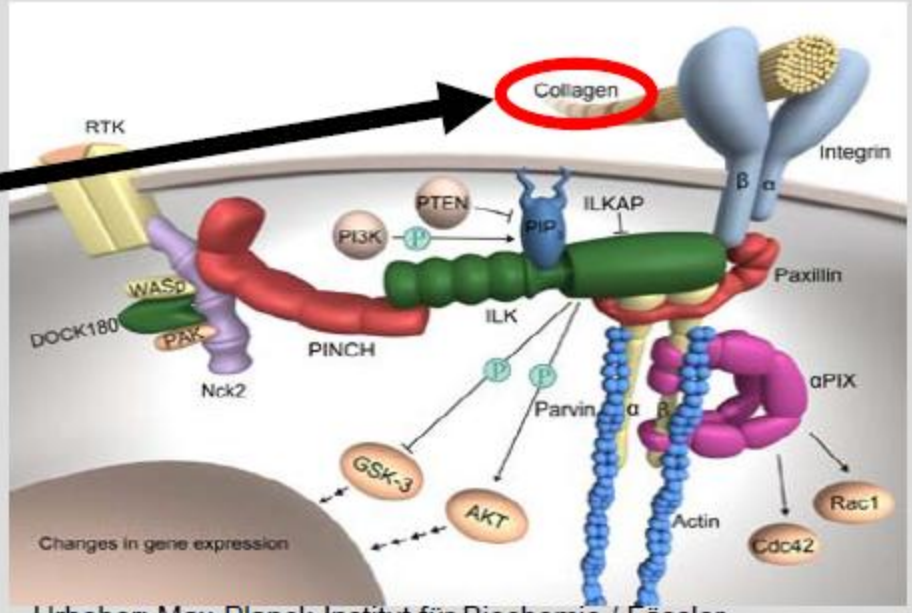
Sustainable aquaculture --> High quality seaweed for the cosmetic and food industry



Research on the use of collagen from marine invertebrates in wound healing and product development



Marine collagen is improving wound healing



Urheber: Max-Planck-Institut für Biochemie / Fässler

According to J.M.Kornprobst's Research,

- Sulfur is the fourth element in sea-water, by importance after chlorine, sodium, and magnesium, and the sulfate ion is the most stable combination of sulfur in sea-water and the second anion by importanc e after chloride.
- Consequently, it is not surprising to find many sulfated compounds in marine organisms.
- It is surprising to find considerable variations in the presence of sulfate groups within the different phyla of marine organisms.
- More than 500 sulfated compounds have been isolated from marine organisms so far but most of them originate from two phyla only, Spongia and Echinodermata.
- The sulfated compounds are presented according to the phyla they have been identified from and to their chemical structures.

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