SeaDragon Marine Oils: Forming Collaborative Industry-Science Relationships

By Kathryn Nemec

Introduction

Young innovative firms that spin off research organisations play a key role in linking science to markets. ‘Governments rightly attach priority to encouraging spin-offs from public research to stimulate innovation. Spin-offs fill a gap between research results and innovative products and services’. "Spinning off is the entrepreneurial route to commercialising knowledge developed by public research and as such is attracting a great deal of attention, given the current ‘start up fever’ in many countries. There is special interest in this specific type of industry-science linkage because it may be one of the factors that explain differences in performance in new, fast-growing science based industries, especially biotechnology. Some are tempted to see the spin-off formation rate as a key indicator of the quality of industry-science relations, prompting public research organisations to place greater priority on this aspect of their commercialisation strategy and to publicise their achievements in this area".  

The focus of this case study was SeaDragon Marine Oils, a company that produces marine oil products and nutraceuticals. Its parent company, Merinova Ltd, was formed as BioProducts New Zealand and was spun off from AgResearch in 2004. An innovative added-value project between Merinova and the Bioactivity Investigation Group (BIG) of the University of Otago, provided the opportunity to explore collaborative industry-science relationships.

Background

This case study has been prepared as part of a project on industry-science relationships in the New Zealand Seafood Industry, one of the projects in a wider research programme on innovation and economic growth in the Seafood Industry. In 2003, the Foundation for Research, Science and Technology funded the University of Auckland's Business School to work with the National Institute of Water and Atmospheric Research to undertake this wider programme of research over a 4 year period. Organisation for Economic Co-operation and Development (2002). Benchmarking industry-science relationships. OECD, Paris. pp.10.

Ibid

A nutraceutical is a food or part of a food that may provide medicinal or health benefits, including the prevention and treatment of disease. A nutraceutical may be a naturally nutrient-rich or medicinally active food, such as garlic or soybeans, or it may be a specific component of a food, such as the omega-3 fish oil that can be derived from Hoki and other cold-water fish.
Seadragon Fish Oils (now known as SeaDragon Marine Oils) was established in Nelson in 1996. SeaDragon operates one of only three molecular distillation units in the southern hemisphere (used to concentrate omega-3 in fish oil) in order to manufacture fractions from shark liver oil and fish oil from hoki. The previous owner of SeaDragon, Angus McNeill, who established the company, saw the potential for the company to develop and commercialise specialised fish oil products as by-products of the oil extraction.

In 2003 a sample from the fish oil production was sent to BIG, following a meeting between Angus McNeill and Paul Davis, the director of BIG (based at the University of Otago in the Wellington School of Medicine). A test of the fish oil revealed a range of interesting bioactivities when tested in very low concentrations.

In general, BIG conducts tests on naturally occurring substances in order to identify products or compounds that could be derived from them. Their specialist scientific expertise and methodologies assist industry and researchers to identify, characterise, evaluate and develop natural health and pharmaceutical products. Indeed, ‘BIG is the only unit in Australasia which has the expertise and the wide range of models and assays for testing both in-vitro and in-vivo’. They work with a range of partners, including the Lipid Group at Industrial Research Ltd (IRL) who were also involved in the early analysis of the fish oil from SeaDragon. BIG and IRL had worked together previously on several occasions, and in some cases had referred clients to each other if the others’ particular expertise is required.

SeaDragon, being a small company with limited resources for research and development, couldn’t afford to fund the research, and BIG, realising there was a potential opportunity, did the analysis without a contract. “We did it because we thought it was worth looking at”. BIG, via the University of Otago, subsequently filed a provisional patent on a bioactive compound identified from fish oil in July 2004. And while Angus McNeill realised there was something to be developed, he didn’t have the capital to invest. He was due to retire and so the company was put on the market in 2004.

**Establishing a New Company**

In 2004, when Merinova bought the assets of Seadragon Fish Oils, Seadragon had an excellent reputation and an established customer base in fish oil products. At that stage, Merinova had also bought BioProducts (NZ) Ltd which was engaged in the development and manufacture of bulk deer velvet extracts. BioProducts was a subsidiary of Celentis, the commercial arm of the Crown Research Institute AgResearch Ltd. The Celentis business model was to either license technologies or set up innovative technology based companies, with the aim of spinning them off once established, and using the proceeds to re-invest in research. After 8 years of

---

6 BIG, Wellington School of Medicine and Health Sciences, University of Otago. Promotional material.
operation AgResearch decided it was timely to divest its interests in BioProducts. This prompted the formation of Merinova through a management buy-out of BioProducts and the subsequent purchase of the assets of Seadragon Fish Oils. Merinova Ltd is the holding company for the deer velvet (BioProducts) and fish oil (SeaDragon Marine Oils) businesses. Merinova is owned by 6 shareholders, who were all involved in the management buy out and 5 of whom now work or were directors in the company.

In terms of the business case for purchase, SeaDragon Fish Oils was considered a small but strong organisation, with potential for growth. The opportunity for innovation had been identified, and the new owners believed they could take it further – beyond commodity fish oil products to develop a range of higher value health products focussing on nutraceuticals. For example, product ideas being developed included enhancing fish oil by adding other products, deodorised fish oil, powdered oils and marine bioactives.

Their product development process was specified and consisted of the following steps:
- Scan for product opportunities by attending trade shows, reading industry magazines, or identifying new customers.
- Internal screening and weighting of product ideas.
- Decide which ideas to develop based on strategic goals.
- Project plan.
- Identify potential partners based on organisational alignment.
- Conduct risk analysis for trials and patents.

In addition to new products and markets, Merinova was developing a range of services that support their products. They provided training, information and advice to their customers, especially if they were on-selling the fish oil products. Their customer service orientation ensured customers (predominantly bulk suppliers) were fully informed about SeaDragon products and the market opportunities, and had sufficient information to help overcome downstream buyer scepticism or resistance to a new product. Fortunately, the evidence base for health benefits from fish oil has been accumulating over the last several years and this information has been used to inform new customers. Indeed, the medical profession were starting to promote the consumption of fish oil because results of randomised control trials were demonstrating associated health benefits.

Staff background and experience was a key driver for their innovative approach. All their staff had scientific backgrounds, but had been working in the commercial sector for several years as, for example, business development managers, senior managers or food technologists. Their science backgrounds gave them credibility, not only with their customers, but also when engaging or working with science providers. And their commercial background lent itself to a more entrepreneurial approach, with ability to develop and maintain a strong customer base.

In terms of the seafood industry, Merinova was a new player. The company’s strengths were:
- Developing strategies to build innovation into all aspects of their business – operations, products, markets and partner collaborations.
A fresh approach to an existing industry with a strong focus on building collaborative relationships. For example, since starting up they had presented themselves to a range of potential collaborators (seafood companies and research providers) and had described what they wanted to achieve, their strengths and weaknesses, and how they could work together.

A focus on what they could achieve with their partners provided a key platform for building relationships.

Using a sustainable marine by-product with health benefits (i.e. hoki oil). Their use of by-products formed the basis for collaboration with industry partners.

Collaborative use of by-products maximises the value of important resources. (SeaDragon)

A willingness to share information, network and make links in order to grow the nutraceutical/seafood sector as a whole.

A strong research and development culture internally, with support for innovation at a senior level.

Some of the key challenges Merinova had faced included:

- Balancing the development of a customer base while developing new products. This involved generating customer interest, but being explicit about the stage of product development, and managing expectations.
- Balancing the development of new product concepts and projects while ensuring staff were not overloaded with day to day administration.
- Raising funds and finding investors had taken longer than expected. However, they had recently received a grant from New Zealand Trade and Enterprise (NZTE) which would enable them to proceed with market development.

In a growing business finding appropriate investment will always be a challenge to help realise our strategic goals. (SeaDragon)

Changes in the Bioactivity Investigation Group

Since the project began, BIG had appointed a business development manager and incorporated a more commercial focus (i.e. staff required to allocate time to projects). Their aim was to ensure projects were managed in a way that ensured ongoing growth and the long-term economic viability of the group. For example, all work undertaken by the group needed to be conducted on a cost recovery basis.

BIG’s commercial development needed to be considered within the wider context of the University of Otago’s research and enterprise activities. BIG was a small group operating in a commercial environment - they were client focused, recognising that in order to maintain and develop their customer base, they needed to be highly responsive. The University, as with all universities, was a large organisation with a legacy of bureaucracy and systems. As a result, the challenges for a small, dynamic research group interfacing with a large organisation had become apparent. For example, the University managed BIG’s research contracts but lacked the flexibility to be able to respond quickly to clients needs; signing a contract could take a couple of months whereas clients’ expectations were that a contract would be signed in a week. In addition, one option for BIG to increase client responsiveness and income was to operate the laboratory for longer hours and provide the opportunity for staff to
undertake shift work. However, the University’s human resources requirements necessary for BIG to implement shift work was going to take some time to develop.

A key question was what impact the above situation had on developing strong industry-science relationships. An OECD report\(^8\) noted that universities increasing emphasis on research and development and enterprise activities, have had mixed results in terms of successful industry-science relationships. ‘A major reason is that decentralised university systems, in which universities enjoy more freedom in their research policy and relationships with industry, are more responsive than centralised ones to opportunities for industry-science relations. Although the latter may be justified on other grounds, governments should realise that they are increasingly costly in terms of commercialisation potential’.

Despite this, there were considerable advantages for BIG to be located under the University umbrella; in particular it provided financial security and assistance with intellectual property rights.

In terms of the SeaDragon project, while it may have been practice to conduct the occasional analysis without a contract prior to the arrival of the business development manager, it was no longer the case. This had put the SeaDragon project in a unique category for BIG, especially as the new owners had to raise funds and find investors in order to progress the project. Certainly, this situation is one in which many small ‘start up’ companies find themselves – with a potential product or compound that could be commercialised once bioactivity is confirmed, but without the capital to undertake the research and development. For such cases, BIG frequently assisted companies to prepare Foundation for Research Science and Technology (FRST) or NZTE grant applications for research and development. BIG also found themselves in this situation - holding intellectual property that could be developed, but without the funds to do so. Ideally, and once sufficient income was being generated, BIG saw the potential to establish an innovation fund for their own commercial development.

**Forming Collaborative Working Arrangements: What underlies it?**

Even though the previous owner had initiated contact with BIG, Merinova (as the holding company for SeaDragon) was happy to continue the relationship with BIG for a number of reasons:

- BIG were willing to continue the relationship until Merinova secured funding.
- The business development managers of both Merinova and BIG had successfully worked together before. They knew each other from previous jobs and respected the others’ competence.
- The skills and expertise within BIG were highly regarded and credible. They had a reputation for their ability to deliver.
- BIG had previous experience within the seafood industry, and had successfully commercialised a shark extract (in partnership with IRL) and taken it to market in Japan.
- If the product was commercialised successfully, Merinova was confident that BIG’s research would stand up to peer review and scrutiny.

---

BIG had an established customer base in Japan that could assist with future marketing.

Merinova also wanted to continue IRL’s involvement in the project as they had been involved in the early analysis of the fish oil. As a result, Merinova had contracted IRL to undertake research analysis of various fish oil components with a contract-for-service arrangement, rather than as a collaborative partner. SeaDragon had a previous relationship with IRL and knew their experience and skills matched the project, and knew their approach was professional and timely.

There were a range of other factors that cemented the relationship between Merinova and BIG, as described below.

**Memorandum of Understanding:**

Shortly after SeaDragon Marine Oils was formed, Merinova (as the holding company for SeaDragon) and BIG had to sign a Memorandum of Understanding (MoU) as a matter of urgency. While negotiations with BIG had commenced and a provisional patent had been taken out, the project had stalled. The MoU signalled that the organisations were committed to working together, and planned to take the project further. The MoU enabled expectations about the status of the project, how the two parties would work together, and how the project would develop, to be clarified at the beginning of the relationship.

The next step was to develop a collaborative agreement. At the time of this case study, the agreement was due to be signed within the next couple of months. It would define:

- The project plan.
- How the project would be managed, such as frequency of meetings, who would attend, content of meetings, and how progress would be reviewed.
- Obligations of each party to each other and the project.
- A strategy for conflict resolution.
- Responsibility for product commercialisation (Merinova had this responsibility).
- The value of each parties input into the project (for the purpose of assigning intellectual property).
- How the intellectual property would be shared once it is commercialised.
- How the product would be presented to customers and the role of each party at presentations, i.e. BIG would present scientific data.

It was anticipated that the collaborative agreement would identify a range of relationship issues that could potentially arise within the project and include strategies for managing them.

**Intellectual Property (IP):**

BIG filed a provisional patent in July 2004, and a PCT patent in July 2005, and it had been agreed that Merinova would commercialise the product. (It was noted that identifying the commercialising partner at an early stage helps avoid IP problems further down the track). BIG and Merinova were negotiating an IP arrangement with
a view of sharing the IP on a sliding scale; based on the value of their various inputs into further developing the IP over time, i.e. Merinova would take a larger and larger share of the IP as their investment increases. BIG was willing to accommodate the needs of future investors in the resultant arrangement to ensure a win-win outcome.

The process of negotiating the value of each partner’s contribution to the project was a key element of the IP arrangement. Financial contribution was considered the easiest to value, but other types of in-kind contributions, such as finding investment money, providing a physical space, or finding a marketing partner, also had to be valued. BIG’s contribution was valued through the negotiation process – *it won’t just be a fee for their service, their IP input will also be valued* (SeaDragon). IRL didn’t hold a share of the IP, but they could potentially develop IP from the analytical methods that they had developed for the project.

The process of acknowledging the value of each other’s input was vitally important. If one party felt their value was not being acknowledged, they would feel resentful. Both research providers in the case study expressed this sentiment, especially if a company wanted to own 100% of the IP. It was considered more helpful and productive when there’s collaboration between a research provider and a company – when the IP is shared and reviewed at subsequent project milestones.

*If they want to own 100% IP, well, we’ll do it but it’s not ideal. Needs to be more than ‘just a job’, better when it’s something we have a real vested interest in.* (BIG)

It was noted that a company needs to be realistic about the benefits that it brings to an IP agreement - it cannot achieve its goals without the intellectual contribution of research providers. The same could be said for a research provider; their intellectual contribution is not the most important aspect. A project cannot be realised without a company’s investment, commercial drive or other resources.

*Everyone has a role and it needs to be valued. Nobody’s one role is most important – companies and science providers both need each other.* (SeaDragon)

*All IP needs to be negotiated on a case-by-case basis – every input has a different value and it needs to be explored.* (SeaDragon)

**Organisational Alignment:**

Organisational alignment had made a significant contribution towards the relationships formed between Merinova and BIG. Areas of alignment included:

- Fostering a learning culture. Both organisations had established internal mechanisms to facilitate the development of an evaluation and learning culture. BIG held staff forums to discuss and share ideas about projects – what was working, what wasn’t, and what were the links between projects. This arose from an appreciation that innovation arises from unexpected and serendipitous events. Within Merinova, regular stop/go project review meetings were held.
We review what we did well and what we could do better – the process helps reduce tension and subjectivity. (SeaDragon)

- Strong leadership for innovation within the organisation and at a senior management level. Both organisations had a research and development culture.
- Similar visions for business development and future directions, for example they both had ambitions for their own and their sectors growth.
- Committed to the success of their partners.
- Face similar challenges in terms of balancing growth while not outstripping resources.
- Share a common understanding of project risks and potential benefits.

**Relationship Attributes:**

A key feature of the relationship was trust. The project wouldn’t have progressed if a strong basis of trust was not present within the relationship.

_A lot of it is based on trust, goodwill and understanding. We’re a young start up company but having difficulty raising funds. They’re helping us keep the project alive._ (SeaDragon)

_We’re not legally bound to this project yet we’re choosing to work on it – which is in keeping with the spirit of the MoU. We know there are more benefits if we work together._ (BIG)

Regular communication was considered critical to ensuring the relationship was maintained, especially when SeaDragon was looking for investors, and the project was essentially on hold for BIG.

_There’s lots of communication – we know what’s happening._ (BIG)

Another element of trustworthiness related to the size of New Zealand and professional reputations.

_New Zealand is so small that trust is a big deal. We’ll hear about reputations through the grapevine. People in this industry have been known for a long time – a lot depends on their reputation._ (BIG)

**Future Directions**

A sense of frustration was apparent for both parties. Merinova had taken longer than anticipated to raise funds and find investors, and BIG had been carrying the risk of holding a patent while the project was on hold.

_We have to take it to the next stage – BIG don’t have the money for this._ (SeaDragon)
However, and as mentioned previously, this situation is not uncommon for start up companies. They can be in a catch-22 situation – until the project gets started there’s nothing to offer investors, and it’s not until a project has progressed to a certain point that it begins to look attractive to investors. Merinova has had to be honest with BIG about their situation and not raise false expectations.

Merinova was certainly aware that they had a lot at stake with this project. They knew that as a new company, they had to get ‘rungs on the ladder’.

*We need to demonstrate that we can achieve what we set out to do and build a history of our ability.* (SeaDragon)

In addition, the nature of an innovative project implies risk;

*In this area you can get very excited about what you see in the test tube and can think it’s going to translate to animals and subsequently to humans – it doesn’t always work out that way in research.* (SeaDragon)

In vivo trials were very expensive. For Merinova they constantly had to balance how much is spent, with potential commercial benefits and market opportunities.

Aside from these delays, no significant relationship issues were identified. This was ascribed to the high level of communication, detailed and up front planning, complementary skills and respect for each other. And at the time of the case study, the situation appeared close to resolution. There is no doubt that the good collaborative relationships would see the project through to the next stage.