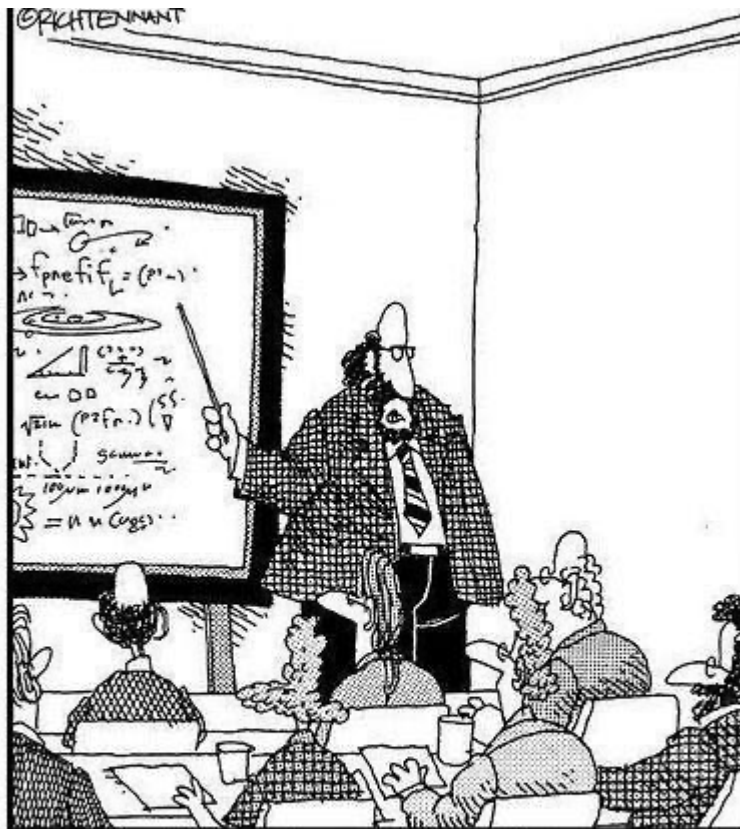


How to engage world-class scientists at leading universities



“Along with ‘Antimatter,’ and ‘Dark Matter,’ we’ve recently discovered the existence of ‘Doesn’t Matter,’ which appears to have no effect on the universe whatsoever.”

With over \$70bn in sales generated from products developed from the work of academic scientists at just 200 US institutions, it's no surprise that companies are increasingly turning to academia to access these leading scientific and engineering minds for their R&D efforts. Partnering with universities can help companies cut costs and accelerate internal R&D, bringing exciting new products to market faster.

When these strategic partnerships go well, they combine the innovation-driven environment of the corporation with the discovery-driven culture of the university. With that being said, there are fundamental differences between academia and corporations which can present challenges when building industry-university partnerships.

In this report, we'll address these differences and show you how to:

- Identify the science and the scientists who would be most relevant to your company and its products.
- Build a long-term relationship that benefits both parties.
- Negotiate with the technology transfer office (TTO).

Academic scientists are clever people with enormous knowledge in their chosen areas of specialization and they frequently come up with exciting new technologies. With this report, we hope to bridge the industry-university gap and provide useful insights for dealing with these institutions.

Arrogant? Uncommercial? Not if you approach things the right way...

Over the years we at [Innovation DB](#) have spent helping people to find academic scientists with potentially commercially interesting research, we have heard the same comments many times...

Academics are anecdotally said to be most interested in their own research, whether it has any practical use or application. It may surprise you, given some

high-profile counter examples, to find out that in fact the figures support this view, with research in the UK, for example, carried out by the principal funding body there, HEFCE, showing that 90% of academics prefer not to engage with business if at all possible. And about half do not even know where to find their

tech transfer office. (It still makes me chuckle to remember that I once had a professor jump out of his chair in one meetings of the faculty board of which I am member at Oxford, simply because I had asked what the business-case was for a potential funding-stream. “You can’t use the word ‘business’!” he exclaimed...)

Academics are also generally thought to be difficult to deal with, and for two main reasons:

1. First, they may over-estimate the value of their idea in the commercial context, underestimating the value added by all the commercial development and market-orientated work which turns an idea into a successful product.
 - a. This is understandable when you remember that they operate in a world where well-formulated ideas are the entire currency of success, but this realisation may not make it any easier to convince an academic of the true value of an idea, but it provides the starting point.
2. Second, academics may not want to stop their research in other areas of interest to them, in order to focus on the development of an idea that is promising commercially.
 - a. If you are unlucky, you may have to deal with both – someone who over-estimates the value of the idea and is now working on something else, leaving the idea in only a semi-useful form.

However...

- **Academics come up with exciting new technologies**
 - These ideas can be powerful, some incrementally, some transformative, many thought-provoking and valuable for showing a vision of future products that may be developed in various ways

Continued on next page...

- **Academics and their university support staff often underestimate the value of their IP**
 - According to AUTM, the US university network, the value gained from IP by universities is only about 5% of the value achieved with the universities' IP in the market. AUTM reckons that about
 - \$3.5bn is achieved by universities in the US, while the final value in the market is closer to \$70bn.

Making it easier to unlock the potential value

In the section starting on p.6, we will discuss the second step: how to engage the scientists of value to your work and your company.

In this section, we will look at the first step.

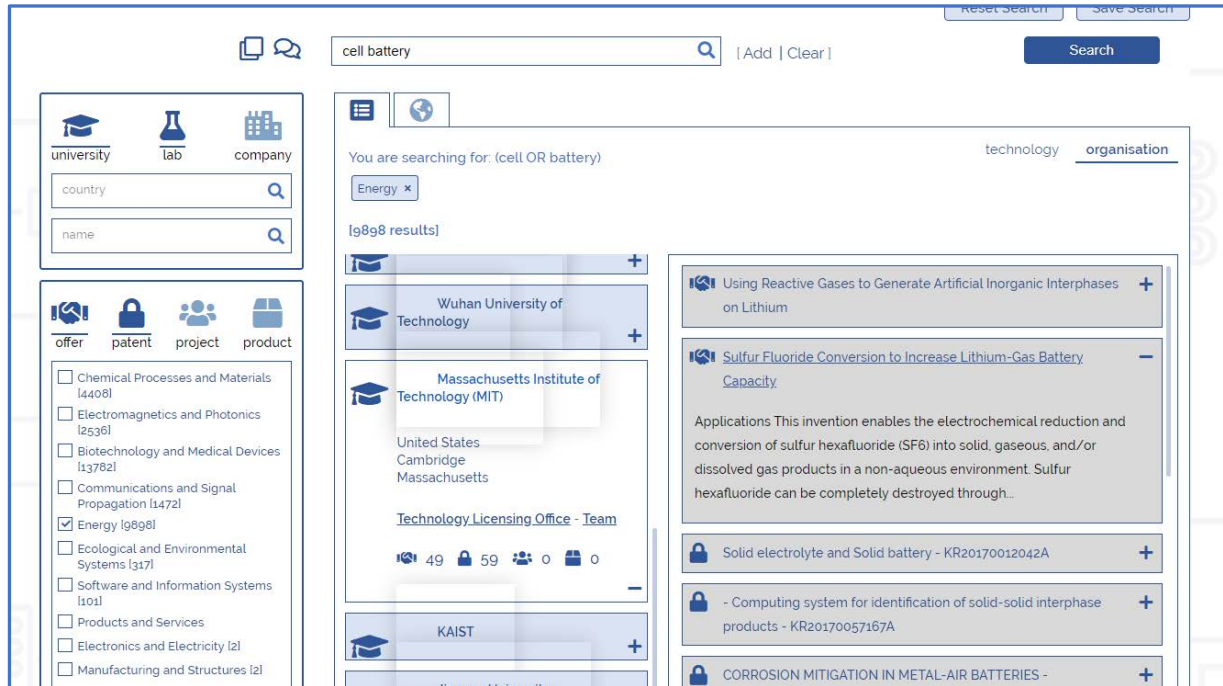
The first step to unlocking the market value of the world-class science that academic scientists produce, is to be able **to quickly identify the science and the scientists** who would be relevant to your company and its products.

That is why, with active support from our clients, such as PepsiCo, Lilly, Philips, Magna, GSK, Beiersdorf and others, we built a database of commercially interesting technology from around 5,000 academic institutions across 200 countries, all over the world, to make it dramatically easier to identify technologies of interest.

Innovation DB gives you all the top universities across the globe, not just MIT or CalTech, but Cambridge, Oxford, Tsinghua and Singapore, Zurich and Paris, and thousands of others

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First search for something of interest:



The screenshot shows the Innovation DB search interface. At the top, there is a search bar with the text "cell battery" and a search button. Below the search bar, there are filters for "university", "lab", and "company". On the left side, there are filters for "offer", "patent", "project", and "product". The main search results area shows "19898 results" and lists several organizations, including Wuhan University of Technology, Massachusetts Institute of Technology (MIT), and KAIST. On the right side, there are detailed search results for specific technologies, such as "Using Reactive Gases to Generate Artificial Inorganic Interphases on Lithium" and "Sulfur Fluoride Conversion to Increase Lithium-Gas Battery Capacity".

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Then drill into technologies of interest, to see more details and who came up with the tech:

SULFUR FLUORIDE CONVERSION TO INCREASE LITHIUM-GAS BATTERY CAPACITY

Categories for this Invention

Energy

- Energy Harvesting
- Energy Storage

Batteries

- Lithium Batteries

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[VIEW ALL CATEGORIES](#)

Intellectual Property

Electrochemical reaction and system for conversion of sulfur hexafluoride
US Patent Pending

Questions about this

Applications

This invention enables the electrochemical reduction and conversion of sulfur hexafluoride (SF₆) into solid, gaseous, and/or dissolved gas products in a non-aqueous environment. Sulfur hexafluoride can be completely destroyed through interaction with an alkali metal, such as lithium, to yield high discharge capacities. As a result, this technology is suitable for greenhouse gas mitigation and electrochemical power applications.

Problem Addressed

Maturation of commercialized primary lithium-based batteries like lithium-thionyl chloride and lithium-carbon monofluoride has ultimately led to the tapering off of energy density gains in recent years. This invention utilizes the reaction and destruction of sulfur hexafluoride, a non-reactive greenhouse gas which has been difficult to activate with current chemistry methods, to increase the discharge capacities of lithium batteries. As a result, it addresses two challenges, (1) the capture and destruction of a greenhouse gas, and (2) the increase of lithium battery energy-density.

Technology

This invention establishes candidate electrolytes in which sulfur hexafluoride may be dissolved to permit electrochemical reactivity and battery development.

TECHNOLOGY #18986

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Then check out the details of the university's representatives who can help you:


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Engaging the scientists

So, now you can find them, but how do you work with these interesting, but occasional tricky characters? Are there any basic building-blocks that can be used to build a solid working structure with academic scientists?

It's the science, stupid!

Everything starts with a shared excitement about the science. The academics are excited about the science because they have chosen a life where science is the core of what they do, choosing at an early point in their career to forgo likely greater financial gains for a life where their curiosity can be indulged. You should be excited in the science because it has the potential to enable brilliant new products. In fact, if you don't find the science exciting, you really should let someone else speak to the academics.

Since this is the starting point, a science-based relationship is the best route forward, which means supporting research into areas that show real promise for your organisation. Depending on the situation, help in kind works even better than straightforward funding of research, as this ensures that the academic really is interested in what you are interested in, and is not just using your funding because the grants have run out.

A nice example of this is the J&J Labs in Trinity College Dublin, where 3-D printing facilities have been set up so that researchers can construct frames for growing living tissue and related bioassays, see https://www.tcd.ie/news_events/articles/amber-unveils-global-3d-bioprinting-lab-at-trinity/

Johnson and Johnson's new 3d printing lab in Ireland



A tango takes two

In a relationship there are two parties (or more) and, of course, academics have their gripes about business too. There are some, often exaggerated but still valid, examples of companies apparently stealing ideas from academics and never properly compensating them, at least as it looks from the academic's point of view, or of a change in strategy in a company meaning that lines of research are shut down at short notice, leaving academics and their Ph.D students or Post-Docs in the lurch.

As a result, and as in life generally, building trust is the central element of a productive relationship that leads to long-term gains for both parties. This means putting in some time early on, visiting and chatting. It is helped by some simple good will gestures, such as sharing useful resources or relevant research results. It will most likely involve simply enjoying your time exploring the science and letting this show, so that any 'business bogeyman' images are dispelled.

In short, it means acting like a partner, not a buyer.

Why do other people always get involved?

This process of building trust and establishing a solid working relationship will involve managing the TTO as well as the professor and this is a different challenge.

The TT officer is there to make money for the university and may have multiple projects to handle and be only moderately interested in yours, even if the academic is completely on-side. This can create delays. The TTO may have processes, agreed with academic administrators, that are unhelpful (or sometimes even not properly fit for purpose). You may have been assigned a TTO who does not really understand what you are trying to achieve with your academic. You may have someone who is new to tech transfer and makes a hash of the IP negotiations. Some will be great, some will not.

TTOs vary dramatically in style and focus across the world and many, of course, are excellent, but it is important to understand that since a university cannot assume that its academics possess competence in structuring commercial agreements, the TTO is essential to the process from the university's point of view. Chaperons are not pleasing company early in a relationship, but once the chaperon is on your side, the relationship can flower more easily.

So, you have to make time to engage this office too and this should be understood before you speak to your academic, even if you explore the potential of the science a little before engaging the TTO fully.

Unfortunately, TTOs still have a reputation for being very aggressive in their valuation of university IP and this remains the main complaint that is regularly made by technology scouts in the companies we deal with. However, as with all negotiations and disputes, showing the rationale for your valuation of their IP, and requiring the TTO to justify its valuation, is still the best way to move toward a sensible price.

Unexpected benefits



Once trust is established and the procedural aspects are under control, a truly valuable relationship can be established.

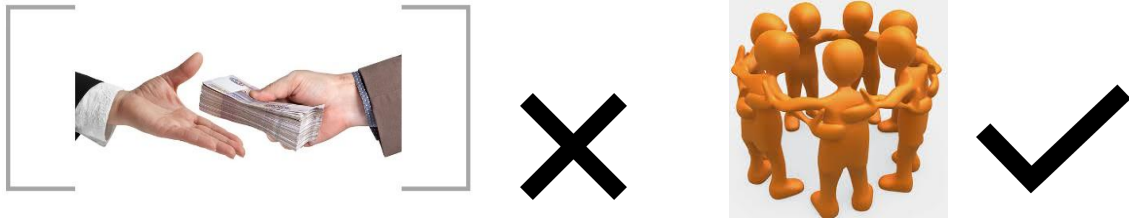
It is not uncommon for academics to start to hire post-docs and recruit Ph.D. students specifically to work on your projects, which can be very powerful. In effect you are getting a purpose-built university research team, with a leading academic to manage it.

Getting the members of this team to see your own company's operations can be very helpful, building understanding and strengthening interactions.

Inviting junior researchers to work for periods in your labs builds effectiveness into their research by helping them understand more fully how their research will be applied and provides excellent recruitment opportunities. At a session at French pharma conference, Biofit, that I chaired recently, speakers from Sanofi, Merck and Abbvie all said that they had hired researchers directly from university teams with which they had been working.

Longer-term engagement also leads to knowledge-sharing in both directions, which can build competence in the core science in your own staff, while expanding the professors' knowledge of non-academic research. Sharing in this way builds still more trust and effectiveness.

Essential take away points



1. The best route to finding a good academic partner is to focus on the science
2. Simply offering to fund research or buy ideas from academics will not produce the best results, but partnering with academics can be enormously productive
3. To partner well will involve taking the time to build trust
4. TTOs will need to be involved and can be over-optimistic about the value of IP, but can underestimate the market value of IP too, providing exciting opportunities
5. Building a solid partnership can lead to the creation of a dedicated academic research team to support your work

Written by Dr Gerald Law, CEO of Innovation DB

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***Innovation DB** provides a global database of academic technologies with commercial potential, currently listing over 600,000 technologies, from about 5,000 institutions and universities, in more than 200 countries.*

We are the trusted partner of blue-chip multinationals from many sectors, but also Venture Capitalists, mid-size and small R&D intensive companies and technology consulting firms.