The use of patents by a university spin-off
Structure of the case study

- University technology transfer
- The research and the invention
- Filing a patent application
- Marketing intellectual property
- Forming a spin-off company
- Patents as a company asset
Technology transfer offices

• The University of Oxford owns any intellectual property (IP) created in its laboratories

• The academic founders share in any financial returns

• Isis Innovation is the technology transfer company for the University

invention disclosure → marketing & patent management → spin-off company and licence
The research

- In 1990 Professor Malcolm Green published fundamental advances in partial oxidation catalysis in *Nature* (unfortunately before filing a patent!)

- In 1999 Malcolm was joined by Dr Tiancun Xiao

- They worked together to develop a range of new and improved catalysts

- A catalyst is a material that allows a chemical reaction to take place (or take place using less energy)

- Most chemical manufacturing processes use catalysts
What is a catalyst?

- A catalyst is a material that allows a chemical reaction to take place using less energy, but the catalyst itself remains unchanged at the end.
- Some reactions only take place if a catalyst is present.
- Most chemical manufacturing processes use catalysts.

Some catalyst powder
The invention

• In the year 2000, Tiancun manufactured catalysts that:
  – were cheaper than existing catalysts
  – delivered the same high levels of performance

• Malcolm and Tiancun approached the technology transfer company for the University of Oxford

"I thought this new process if it worked would have many benefits, so decided to give it a try"
Tiancun
Helping to reduce CO2 emissions

• The new catalysts can be used to:
  – produce fuels that burn more cleanly
  – produce biofuels from waste
  – improve the efficiency of fuel cells

• Environmental benefits

• Growth markets

Department of Chemistry
Could a patent application be filed?

- Did the invention meet basic patent requirements?
  - new (prior art searches)
  - inventive
  - industrial application
  - permitted

- Did the University have the rights to own the invention?
Did it make sense to file a patent application?

- Was there a need for this technology?
- Did the team think it could make a profit?
- Was now the right time to file a patent?
- What about "freedom to operate"?

The decision was made to file an initial patent in the UK …
Priority patent application filed (28 June 2001)

• Collaboration of
  – inventors
  – technology transfer manager
  – patent agent

• Filed by Isis Innovation Ltd

• After three months: UK search report
Decision to progress to PCT stage

21 June 2002

• 12 months from the initial patent filing

• Initial application filed in the UK was dropped

• International patent application filed (PCT process)
Costs continue to accumulate (2002-2004)

- Patent office and patent agent fees at each stage
- Technical proof-of-concept
- By 2003 four patent applications had been filed
- Original application (PCT) approaching the national phase
  - increasingly expensive!
- The university was still funding all costs
European and national phase patents

December 2003 onwards:

- Continue into the EP/national phase
- At this time none of the patents had been licensed (so no revenues)
- Filed in China and South Africa, Europe and the USA
Some key patent decisions

• Can we file an application for a patent (legal requirements)?

• Do we want to file an application for a patent?
  – Are there other options, like copyright for software?
  – Do we want to consider other routes for technology transfer, like a free, non-exclusive software licence?

• In which countries do we need a patent?
  – Do we continue at the PCT phase?
  – Do we continue at the EP/national phase?

• How do we respond to the search reports?
Marketing intellectual property

• Understand the market
  – Talk to potential partners and customers
  – Draw up confidentiality agreements where appropriate

• Market your technology widely
  – Publications
  – Websites
  – Industry events

• A demonstrator is very useful for explaining new technology
Route to market – licence or spin-off?

- Significant investment was needed

- Different patents relating to
  - petrochemical industry (industry experience needed)
  - emerging fuel cell sector (entrepreneurial)

- Split up patents or keep together?

- Tiancun was keen to keep working on the technology himself

- The decision was taken to "spin off" a new company
Forming a spin-off company (October 2004)

• Management team

• Business plan is continuously refined

• Investors ask many questions about the patents

• The academics are involved in explaining the science to investors and helping to paint a vision for the future
Using patents to help with fund-raising

December 2005

- The patents were licensed into the new company
- In December 2005 Oxford Catalysts raised EUR 640,000
  - Patents essential

April 2006

- Raised EUR 20 million on the London Alternative Investment Stock Market
Oxford Catalysts now

- Publicly listed company with a value of **EUR 90 million** (as of October 2008)

- Raised **EUR 25 million** in funding
Patents have been a key asset for the company

"For a technology company like Oxford Catalysts, intellectual property protected by patents is a key asset for building the business"

Tiancun

• Cost:
  – Patent agents and translators
  – Patent office fees, including renewal fees
  – Legal fees if you need to enforce your patent in court

• Benefit:
  – Essential to attracting investors
    ▪ Create state-of-the-art facilities
    ▪ Recruit top scientists
    ▪ Cover development cost
  – Enables licensing the technology in exchange for royalties
Further information

For further information refer to:
http://www.isis-innovation.com
http://www.oxfordcatalysts.com

or contact Terry Pollard:
terry.pollard@isis.ox.ac.uk