Medella Therapeutics – monoclonal antibody drugs halt tumour growth

Medella Therapeutics, a spinout company from the University of Sheffield, is developing new cancer treatments using monoclonal antibodies – proteins made by the immune system that bind to a single target, such as a cancer cell – that have fewer side effects than many other therapies. The company initially focused on cancer therapies, although the drugs also have potential application in bone, cardiovascular and central nervous system disease, inflammation, and obesity.

Medella is based on work carried out by Professor Tim Skerry and colleagues in the Department of Human Metabolism at the University of Sheffield. The team have been supported by two BBSRC research grants over a five-year period from 2005. Backing has also come from the university, Fusion IP and other research funding bodies. Skerry’s research into bone biology led to significant findings relating to the use of monoclonal antibodies, which attach to specific receptors on the surface of cells, prompting the cell to die, or not to divide.

“My principal research interest has been in bone biology, including how the skeleton responds to exercise and specifically identification of novel bone signalling systems. In Medella we’ve shifted focus from bone to oncology because we’ve discovered that signalling systems which are important in bone have pervasive implications in diseases in other tissues,” says Skerry. “The change in focus is not just a case of the ‘tide swaying the seaweed’ – pursuing research interests because they attract funding and commercial interest – but because we saw this opportunity to move our work into an area where there was the likelihood of impact on disease and benefits to patients with currently intractable conditions.”

“...Microscopic section of pancreas. Image: defun/iStock/Thinkstock

The monoclonal antibodies identified by Skerry block the action of a hormone called adrenomedullin (ADM), which is involved in cell signalling in many cancer cells. Skerry says early clinical data has demonstrated in the laboratory that they could use a monoclonal antibody to block signalling by ADM, leading to reduced proliferation and increased apoptosis (cell death) in vitro, and shrinkage of tumours in vivo.

“The molecule we’re working on is a novel biological target,” says Dr Gareth Richards, a researcher at the University of Sheffield and senior scientific officer and joint founder of Medella. “Our company is focusing on inhibition of ADM, the ligand (signalling and binding molecule) for receptors containing RAMP2 and RAMP3 – proteins that are found in the majority of tumours. Unfortunately, their expression increases in hypoxic [low oxygen] conditions and this can encourage an aggressive tumour phenotype.”

IMPACT SUMMARY

Medella Therapeutics was founded in 2007 by researchers at the University of Sheffield to develop new cancer treatments using monoclonal antibodies, particularly targeting pancreatic cancer.

Early laboratory studies demonstrated that the researchers could use a monoclonal antibody to block the action of a hormone involved in signalling in many cancer cells, reducing the size of tumours.

In 2013, the global market for monoclonal antibodies to treat cancer was estimated at US$24Bn and could grow to US$34Bn by 2017. The market for pancreatic cancer drugs could reach US$1.2Bn by 2015.
A GROWING MARKET

Medella was launched in 2007 with an investment of £320,000 from Fusion IP (formerly Biofusion Plc)\(^1\), an investment and start-up ‘incubator’ company that works with a number of UK universities to turn intellectual property into sound business propositions, supplemented by research grants, regional R&D funding and further support from the university. In addition, Fusion IP provided assistance to Medella in filing two patent families for its therapeutic agents and antibodies in the EU, UK, USA and other territories. The investment company has a 60% stake in Medella and is also based at the University of Sheffield.

In 2011 the company had 6 employees\(^13\). Currently, Medella is seeking significant major funding for pre-clinical development of its therapeutic agents.

The potential market for its drugs is substantial. In 2013, the market for anti-cancer monoclonal antibodies was estimated at US$24Bn and expected to grow to US$34Bn by 2017\(^14\). Present sales of anticancer antibodies make up almost 30% of the total cancer-drug market and include three existing antibodies (such as Avastin), each of which have annual worldwide sales exceeding £3Bn.

One area that is of particular interest to Medella’s scientists is the potential for its monoclonal antibodies in alleviating pancreatic cancer – the ninth most common cause of cancer deaths – which Skerry thinks could be a ‘blockbuster’ application for its therapeutic drugs. The market for pancreatic cancer drugs could reach US$1.2Bn by 2015 and is currently split between just two approved therapies for the condition\(^15\).

REFERENCES

1. Medella Therapeutics
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9. See, for instance:
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This company is included in BBSRC’s spinout/SME database.