# Academic-industrial partnership leads to potential new cancer therapy

A novel peptide based on the human protein, FKBPL, has recently completed Phase Ia clinical trials in solid tumours, following a long-standing collaboration between Queen's University Belfast[1] and the biopharmaceutical company Almac Discovery Ltd[2]. The work was underpinned by BBSRC-funded research that contributed to understanding the role of FKBPL in blood vessel growth during development.

Research carried out by Professor Tracy Robson[3] and her team whilst at Queen's University Belfast, supported by funding from BBSRC, reinforced our understanding of the ability of the novel peptide, FKBPL, to reduce angiogenesis, and supported the idea that it could be exploited for therapeutic benefit.

"We had some data to suggest that a novel protein, which we call FKBPL, had anti-angiogenic activity. With the funding from BBSRC we wanted to look at the role of that protein in developmental anti-angiogenesis." says Professor Robson.

Angiogenesis is the formation of new blood vessels that originate from other blood vessels. It plays a critical role in normal development and in many conditions, including cancer, as blood supply to tumours is essential to their survival and spread[4]. Research into targeting angiogenesis could potentially lead to the development of therapeutic treatments for a plethora of diseases, including many cancers.

*Angiogenesis, the formation of new blood vessels that originate from other blood vessels, plays a critical role in normal development.*

### From fundamental bioscience

Investment of £457k from BBSRC allowed Professor Robson to develop a mouse model with only one copy of the FKBPL gene. This study showed that mice with only one FKBPL gene have increased angiogenesis during development. On disabling both copies of this gene, Professor Robson and her team found that the mouse embryos did not survive gestation, showing that the gene was more important than originally thought.

"The mice we developed with funding from BBSRC have turned out to be really useful in our research, and what we are trying to do now is tease out some of the other functions of FKBPL with a view to translating that into other disease settings," says Robson.

"What was really nice about the BBSRC grant was that we were able to robustly demonstrate that FKBPL had anti-angiogenic activity in our mouse models and this had real therapeutic potential," explains Robson.

### Hand-in-hand with industry

A parallel collaboration between Professor Robson and Almac Discovery led to Almac identifying, generating and producing therapeutic peptides based on the active anti-angiogenic region of FKBPL.

"There is preclinical evidence that these therapeutic peptides restrict the growth of solid tumour by targeting tumour angiogenesis," Robson explains.

## IMPACT SUMMARY

**Research led by Professor Tracy Robson and her team whilst at Queen's University Belfast, and supported by both BBSRC and a collaboration with bippharmaceutical company Almac Discovery Ltd has led to the creation of a novel therapeutic peptide that is currently undergoing clinical trials in solid tumours.**

**BBSRC investment enabled the researchers to explore the fundamental biology of the peptide, called FKBPL. The research contributed to our understanding of the role of FKBPL in angiogenesis – the growth of new blood vessels from existing blood vessels.**

**In parallel with the BBSRC research, a collaboration with Almac Discovery led to Almac identifying, generating and producing therapeutic peptides based on the active anti-angiogenic region of FKBPL. One of these entered clinical trials in 2015.**

One of these peptides, ALM201, was progressed successfully through pre-clinical development and into the clinic. Phase I clinical trials of ALM201 began in 2015[5], in which the therapeutic peptide was administered to late-stage cancer patients who had failed all other therapies in order to assess its safety, tolerability and the kinetics of this peptide in the human body. This first phase in human trials has just completed and the data indicates that ALM201 is very well tolerated in these patients.

With initial results in the current phase of clinical trials showing promise, work is underway to position ALM201 for patients who could benefit from its therapeutic properties. Since it targets angiogenesis, Professor Robson anticipates this drug would have activity in any solid tumour that has become dependent on blood supply, which is the majority of them. She also hopes ALM201 may have potential in

treating a range of other diseases associated with excessive angiogenesis such as age-related macular degeneration or diabetic retinopathies.

"You always hope your research will have an impact clinically," says Professor Robson, "…but you never anticipate that it's ever really going to get there; the data from the BBSRC grant really reinforced the role of FKBPL in angiogenesis and reassured us we were all on the right track in terms of developing this anti-angiogenic peptide. The two research strands worked hand-in-hand, with one supporting the other, which was great."

1 http://www.qub.ac.uk/research-centres/CentreforCancerResearchCellBiology/

2 https://www.almacgroup.com/discovery/

3 http://www.rcsi.ie/index.jsp?p=256&n=726&a=7934

4 https://www.cancer.gov/about-cancer/treatment/types/immunotherapy/angiogenesis-inhibitors-fact-sheet

5 https://www.almacgroup.com/discovery-news/almac-discovery-initiates-phase-1-study-of-alm201-for-the-treatment-of-patients-with-advanced-ovarian-cancer-and-other-solid-tumours/