

On a quest to cure cancer

The premature death from cancer of a close friend and colleague, made Agnete Engelsen even more determined to find a way to cure this devastating disease. **TEXT** JENS HELLELAND ÅDNANES



In your PhD thesis, you wrote about the most aggressive form of brain tumour. Why did you pick this subject?

"I have been pretty lucky with the choices I have made in life, and I am grateful for the many lucky coincidences along the way. As early as middle school, I knew that the natural sciences were for me. However, during my studies, I often caught myself thinking, 'Will I ever have a use for this knowledge later in life?' When you are studying, it can sometimes be hard to predict what use there is in the world outside of academia for what you learn."

So what convinced you to carry on studying, all the way to a PhD?

"For my Master's thesis, I got the opportunity to work with a very dedicated group of researchers on experimental treatment strategies for aggressive breast and brain cancers. When I finally got to do research in the laboratory, I increasingly started to see the value of my educational choices. This research brought me into contact with people from many academic disciplines, such as cancer doctors, surgeons, nurses, radiographers, and statisticians. The mul-

tidisciplinary effort needed to make progress in research, made it clear to me what practical use there was for my expertise."

What type of research did all these contacts lead to?

"I became part of a research group for a relatively rare cancer type, *glioblastoma*, which, at the same time, is the most common and aggressive type of brain cancer. Patients are treated with surgery, radiation- and chemotherapy to fight the tumours. Sadly, already before the patient is diagnosed, aggressive cancer cells are on the attack and invade the healthy brain tissue. In addition, the cancer cells hardly respond to treatment with radiation and chemotherapy. Half of the patients diagnosed with *glioblastoma* die within a year, and there are few long-term survivors. The brain defines who we are, and brain cancer is probably one of the most feared of all types of cancer."

What motivated you to choose such a dark topic for your PhD?

"The poor prognosis of *glioblastoma* was the motivation for my PhD work. As I mentioned, this is a relatively rare form of cancer; affecting only one in 100,000 people a year.



Agnete Svendsen Tenfjord Engelsen (36)

- **Title of dissertation:** "Intratumoural Heterogeneity of Glioblastoma. Implications of Immature Phenotypes on Tumour Growth and Resistance to Treatment."
- **May 2013:** PhD graduate at the Department of Biomedicine, Faculty of Medicine and Dentistry, University of Bergen (UiB).
- **Current employment:** Postdoctoral fellow, Cellular Networks Group (CELLNET), which is part of the Centre for Cancer Biomarkers (CCBIO), Department of Biomedicine, UiB.

While finalising my PhD thesis, one of my dearest friends and colleagues was diagnosed with this particular type of cancer. Suddenly it became very personal. Every day, while writing my thesis, I thought of her. And every day, my motivation grew. I wanted to find out why these cancer cells are so resistant to treatment."

“ The brain defines who we are, and brain cancer is probably one of the most feared of all types of cancer. ”

What did you find whilst writing your thesis?

"We found a molecule, called NG2, which rests on the surface of particularly aggressive cancer cells in *glioblastoma*. We established that patients with higher NG2 expression on the cell surface have a poorer survival prognosis, and do not respond to chemotherapy or radiation treatment. Furthermore, we found that NG2 is a promising point of attack,

and a biomarker that could be implemented in the clinical management of brain tumours."

What is a biomarker?

"A biomarker is a measurable characteristic of cells. It is like the cells wave a flag, telling us how to approach the problem. More knowledge about cancer biomarkers may be the key to improving treatment, and to tailoring treatment strategies to the individual patient and tumour characteristics, as opposed to 'one size fits all' treatment strategies."

What was it like to finish your PhD?

"Defending the PhD was one of the best days of my life, well, at least of my academic life. The workload was intense! In addition, I had two small children home, but luckily, my husband is an Iron Man. Still, it was a bit like living in a bubble. When I attended the PhD ceremony in Håkonshallen three months after my doctoral defence, I met several people from my earlier days of study, who had all chosen different directions for their studies. This was great fun!"

So, what are you doing now?

"After finishing my PhD, I was really excited to be offered a postdoc-

toral fellowship at UiB's new Centre of Excellence, the Centre for Cancer Biomarkers. There is definitely a red thread from my previous cancer research via my doctoral thesis to what I do now. My current research is focussed on lung and breast cancer."

What have you found so far?

"We have found that aggressive cancer cells behave similarly to stem cells; mimicking their survival strategies and ability to adapt to external challenges. What is unique about our approach is that we develop our understanding in the context of the normal stem cell biology that is often overlooked by cancer researchers."

What do you see yourself doing in ten years' time?

"I am very motivated to continue my work in cancer research! However, as our contracts are short, mine is for three years, the future is slightly uncertain. But I am sure that we are on the brink of a major breakthrough in cancer research, and I also believe that cancer treatment will be completely different ten years from now. This will provide opportunities in research and development." ●