

[Home](#) › [News](#) › [2015](#) › [September](#) › [Researchers from UNC Lineberger, Norway launch cancer genetics collaboration](#)

[Log in](#)

- [News](#)
- [News by Topic](#)
- [News by County](#)
- [National Awards](#)
- [Video Library](#)
- [In the News](#)
- [History](#)
- [2015](#)
 - [January](#)
 - [February](#)
 - [March](#)
 - [April](#)
 - [May](#)
 - [June](#)
 - [July](#)
 - [August](#)
 - [September](#)
 - [Eleven UNC Health Care nurses chosen as 'Great 100 Nurses of North Carolina'](#)
 - [A Surprise from Oliver](#)
 - [The Nature of Emergency Medicine](#)
 - [Pancreatic cancer subtypes discovered in largest gene expression analysis of the disease to-date](#)
 - [UNC WakeBrook Awarded \\$1.6 Million Federal Grant to Expand Primary Care Clinic](#)
 - [Diabetes drug boosts bone fat and fracture risk; exercise can partially offset the effect](#)
 - [Oberlander's NEJM commentary: Medicare's new physician payment system is 'a leap of faith'](#)
 - [UNC Urology: Exceptional Care](#)
 - [Siler receives prestigious military medicine award](#)
 - [UNC-Chapel Hill researchers awarded \\$11.3 million for cancer nanotechnology research](#)
 - [Cardiac surgeon Peter J.K. Starek dies; service on Sept. 18](#)
 - [Supported Service](#)
 - [In Her Brother's Footsteps](#)
 - [Rallying for Research](#)
 - [UNC Hospitals honored for 2nd time with Magnet Recognition](#)
 - [Researchers from UNC Lineberger, Norway launch cancer genetics collaboration](#)
 - [UNC Lineberger major grant application earns NCI's highest recognition](#)
 - [White Coat Ceremony: Just the Start](#)
 - [UNC Lineberger to partner in \\$12 million effort to find treatments for genetically-linked cancers](#)
 - [New study questions clinical trial data for kidney cancer drugs](#)

- [Carson receives 2015 Fuller Award](#)
- [UNC Pulmonary Diseases and Critical Care Medicine: A Comprehensive Approach](#)
- [2014](#)
- [2013](#)
- [2012](#)
- [2011](#)
- [Perl-UNC Neuroscience Prize Winners](#)

Researchers from UNC Lineberger, Norway launch cancer genetics collaboration

Researchers from Norway visited the cancer center last week to learn firsthand about UNCseq, a clinical trial launched in 2011 at the N.C. Cancer Hospital. In the trial, researchers use a profile of the genetic and molecular alterations in patients' tumors to try to identify targeted treatments for them.

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UNC Lineberger Comprehensive Cancer Center's innovative use of genetics to make personalized cancer treatment decisions is setting an international example.

Researchers from Norway visited the cancer center last week to learn firsthand about UNCseq, a clinical trial launched in 2011 at the N.C. Cancer Hospital. In the trial, researchers use a profile of the genetic and molecular alterations in patients' tumors to try to identify targeted treatments for them. Researchers from the Oslo University Hospital were looking to learn best practices as they try to build a genetic sequencing program for children in Norway.

"Genetic sequencing is the future of personalized medicine in cancer," said Lars O. Baumbusch, PhD, a molecular biology researcher at the Oslo University Hospital Rikshospitalet in Norway. "We believe sequencing can help us to avoid over and undertreating patients. And from a research perspective, we believe it will help us to better understand cancer – why some children respond to drugs, and why others don't respond at all."

Baumbusch and Fatemeh Kaveh, PhD, a bioinformatics postdoc at the Oslo University Hospital in Ullevaal, met with UNC Lineberger researchers who are involved in analyzing sequencing data and in translating it



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Fatemeh Kaveh, PhD, a bioinformatics postdoc at the Oslo University Hospital, Lars O. Baumbusch, PhD, MSc, a molecular biology researcher at the Oslo University Hospital, and UNC Lineberger Director Norman E. Sharpless, MD.

into clinical practice. Kaveh said it's helpful to see how others have solved bioinformatics problems ranging from computer storage issues to problems of how to match a patient's tumor genomic profile to a reference.

"We want to build up our own knowledge competence in this field," Baumbusch said. "It's one thing to send our samples abroad for analysis, but we want to build our own expertise, as well as to learn what's possible and what are the limitations."

In Norway, the researchers launched a research project that will enroll 10 children with high-risk pediatric cancers. For this first group, they sequenced the tumors in Norway, but consulted with UNC Lineberger researchers for data analysis and clinical interpretation. They have also started a retrospective study of molecular changes in neuroblastoma in children using banked cancer tissue samples. Both projects are part of effort launched in 2012 called the Norwegian Pediatric Cancer Sequencing Consortium.

The collaboration with UNC Lineberger grew out of a connection with Monica Cheng Munthe-Kaas, MD, PhD, a pediatric oncologist at the University of Oslo. She was doing research in North Carolina at the Research Triangle Park-based National Institute of Environmental Health Sciences, which is one of the institutes of the National Institutes of Health.

While she was involved in a separate project at NIEHS, she said that UNCseq is exactly what she's interested in -- studying how to best integrate the latest knowledge and understanding of cancer genetics into clinical use.

"Further genetic understanding and classification is likely to have a large impact on individualized treatment in the future, with hope for improving the prognosis and care for those children with aggressive and difficult to treat cancers," she said. "Also, childhood cancer is a rare disease, and international collaborations are very important both in terms of securing enough cases to actually be able to do research as well as sharing knowledge."

D. Neil Hayes, MD, a UNC Lineberger member and an associate professor of clinical research in hematology and oncology at the UNC School of Medicine, said UNC has developed expertise in interpreting genetic data and for meeting regulatory requirements to make UNCseq possible. He said a difficult part of the trial is in interpreting the sequencing data. To help solve that problem, UNC launched the Molecular Tumor Board, which is a group of oncologists molecular pathologists, and bioinformatics experts who meet to discuss clinically actionable genes.

"The actual sequencing of samples is the easy part," Hayes said. "But the interpretation of the results -- only a handful of people on the planet can do it."

Now the 2,000th patient has been enrolled in UNCseq, Hayes said.

"I think we think cancer is a genetic disease, so the ability to characterize tumors in terms of their genetics is fundamental," he said.

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