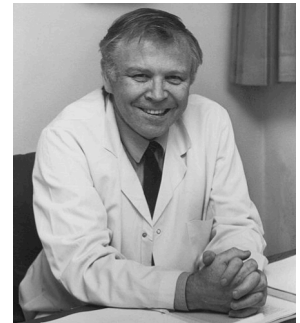


Department of Molecular Biology invites to

The Inaugural Kjell Kleppe Lecture

with **professor Rickard Sandberg**, Karolinska Institute, Stockholm
on **November 10th, 15:15-17:30**, Venue: "Egget, Studentsenteret, Bergen".

Professor **Kjell Kleppe** (1934-1988) was a chemist, biochemist, and molecular biologist, and one of the Norwegian pioneers of genetic engineering. Professor Kleppe is most known for his pre-PCR experiments with DNA amplification while working with the Nobel laureate Gobind Khorana in the late 1960ies. As professor at the Department of Biochemistry, University of Bergen, he led an internationally recognised research group on DNA repair and he spearheaded establishment of genetic engineering and modern molecular biology in Bergen and Norway. Thanks to professor Kleppe, Bergen got its High Technology Centre (HIB). With the Annual Kjell Kleppe Lecture, Department of Molecular Biology wishes to honor the memory and legacy of one of our unsung heroes. We are proud to announce Professor Rickard Sandberg, Karolinska Institute, Stockholm, a pioneer of single-cell sequencing, as the Inaugural Kjell Kleppe Lecturer, a lecture jointly hosted by the Horizons Lecture series.



Professor Kjell Kleppe
(Foto: Universitetet i Bergen)

Links:

Inaugural Kjell Kleppe Lecture / Horizons Lecture

<http://www.uib.no/en/matnat/101783/single-cell-rna-sequencing-modern-microscope-horizons-lecture-rickard-sandberg>

Kjell Kleppe on wikipedia: https://no.wikipedia.org/wiki/Kjell_Kleppe

Programme for the Kjell Kleppe Day on November 10th:

11:00-12:00 "Analyses of allelic gene expression in single cells"

Research talk by **professor Rickard Sandberg**, Karolinska Institute, Stockholm

Venue: Department of Molecular Biology Seminar room:

"The N-terminal", High Technology Centre, Bergen

See abstract below.

15:15-16:00 "**Professor Kjell Kleppe (1934-1988) - Biochemist, genetic engineer and pioneer**"

with presentations by **professors Lars Haarr, Johan R. Lillehaug, and Dag E. Helland**

Venue: "Egget" - the large auditorium at "Studentsenteret", Parkveien 1, Bergen

16:00-16:15 *Light food and drinks*

16:15.17:30 "**Single-cell RNA sequencing: a modern microscope**"

Public lecture, joint with the **Horizons Lecture Series** by

Professor Rickard Sandberg, Karolinska Institute, Stockholm

Venue: "Egget" - the large auditorium at "Studentsenteret",

Parkveien 1, Bergen

See abstract below.



Abstracts:

Horizons Lecture and the Inaugural Kjell Kleppe Lecture:

"Single-cell sequencing: a modern microscope"

by **Professor Rickard Sandberg**, Karolinska Institute, Stockholm

Venue: "Egget" - the large auditorium at "Studentsenteret", Parkveien 1, Bergen,

Thursday Nov 10th at 16:15

Recent advances in molecular analyses of individual cells are transforming modern biology and medicine. In a high-throughput and cost-effective manner, cells of any organ or tissue can nowadays be subjected to detailed molecular characterization that will identify the activity levels of genes within each cell. The molecular profiles of cells enables researchers to group cells into cell types and further characterize their activity states or identify novel sub-types. Single-cell RNA-sequencing is becoming the modern microscope where molecular insights into the unique activities of different cell types will be gained. It has now become realistic to identify all the cell types in various tissues (and even our whole body) and to map out how these cells are affected in pathological tissues. In this seminar I will describe the advances in our abilities to study gene activities in individual cells, and exemplify new insights in biology and medicine gained from such analyses, as well as discuss future developments and applications of this exciting technology.

Research Lecture:

"Analyses of allelic gene expression in single cells"

by **Professor Rickard Sandberg**, Karolinska Institute, Stockholm

Venue: Department of Molecular Biology Seminar room: "The N-terminal",

High Technology Centre, Bergen, Thursday Nov 10th at 11:00

Assessing gene expression in individual cells holds promise to reveal the extent, function and origins of cell-to-cell variability. To this end, my lab has been developing single-cell RNA-sequencing methods (e.g. Smart-seq2), and using the full-length feature of Smart-seq2 together with the detection of heterozygous SNPs we have investigated gene expression at allelic resolution. Analyses across thousands of individual cells revealed fundamental features of allelic expression from autosomes and sex chromosomes. In early embryonic development, female mouse and human embryos achieve dosage compensation of X-chromosome RNA levels using surprisingly different strategies. In mouse, the paternal X chromosome becomes inactivated in 4-cell embryos whereas dosage compensation in human embryos proceeds with a dampening of expression from both X chromosomes. Single-cell analyses of allelic expression of autosomal genes revealed that for a substantial fraction of genes in a cell, the transcribed RNA is derived from only one parental allele. The expression of alleles in a cell was seemingly random, and dynamic over time, even within cells of clonal origins. The allelic resolution was also used to examine other forms of transcriptional and post-transcriptional regulation of protein coding and long non-coding RNAs, demonstrating the power and general utility of allelic resolution single-cell RNA-sequencing to study gene regulation.