Fifty Years of Molecular Biology at Aarhus University – a brief Department history
by Finn Skou Pedersen

The Department of Molecular Biology at Aarhus University was founded during a period of major expansion of Danish universities with excellent public support for new buildings, research, and education. In the mid 1960s the biological disciplines at Aarhus University were represented solely by departments of botany and zoology. To prepare for the development of a full teaching program in biology, new professorships and departments were planned and established. As part of this expansion, Niels Ole Kjeldgaard was recruited from the University of Copenhagen and appointed professor of molecular biology at Aarhus University in 1967, and the Department of Molecular Biology was officially founded on 5 June 1968. It was the first university department in Denmark bearing this name.

A year later, Kjeld Marcker, a Danish researcher in Cambridge, UK, was appointed professor of biochemistry and decided to join the Department of Molecular Biology in the new Biology I building on the university campus that was finished in 1970.

Niels Ole Kjeldgaard
(1926-2006)

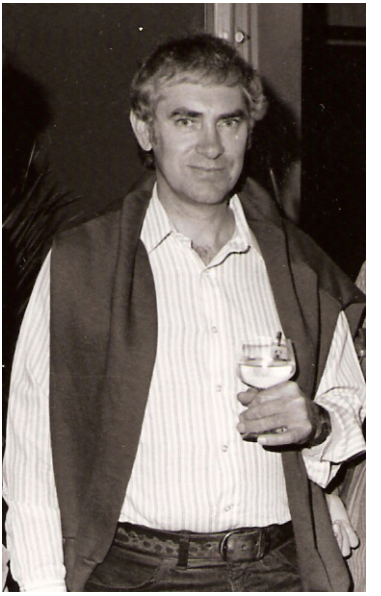
Kjeld A. Marcker
(1932-2018)

With the recruitment of Staffan Magnusson, a Swedish national also from Cambridge, UK, as Head of the Division of Protein Chemistry in 1970, the three early research leaders of the department were in place. Kjeldgaard focused on the regulation of RNA synthesis in bacteria, Marcker on control of eukaryotic protein synthesis, and Magnusson on the amino acid sequence of prothrombin.

The three research founders created an open international environment during those first optimistic years, which offered excellent conditions for the establishment of strong research projects, new well-equipped facilities, good support from the university, and no teaching obligations. Even though research at the department has changed and diversified over five decades since then, several current members of scientific staff at the Department can in fact trace their roots back to those three as their scientific parents, grandparents or even great grandparents.

In 1976, the Department merged with the Department of Plant Physiology to become the Department of Molecular Biology and Plant Physiology, a step that turned out to create a good basis for later research strongholds in plant molecular biology.

Staffan Magnusson (1933-1990)



Brian F.C. Clark
(1936-2014)

First row: Lars Sottrup-Jensen, Lone Christensen, Kirsten Andersen, Mette Frandsen, Torben Lund, Patricia Martinez, Johan Chr. Leer, Kirsten Gausing & Aase Sørensen. Second row: Niels Ole Kjeldgaard, Just Justesen, Inger Bjørndal, Emmy Pedersen, Grazyna Dudek-Wojciechowska, Hans Andersen, Ole Fr. Nielsen, John Kristensen, Yrsa Gregersen, Frank Nielsen, Jan Obel, Kjeld Marcker, Ole Westergaard, Jens Vuust & Lasse Lindahl. Third row: Elmer Gocke, Kitty Nielsen, Valborg Sørensen, Karin Morre, Dorte Abildsteen, Benedikte Traasdahl, Mogens Bentzen & Ebbe Truelsen.

A full study program in biology became available at Aarhus University from 1975, and the Department of Molecular Biology began offering introductory and advanced courses in biochemistry, molecular biology, and plant physiology. This gradual implementation of a full teaching program led to a steady increase in experimental projects carried out by graduates and undergraduates, resulting in an increased need for research laboratories. Moreover, recombinant DNA technology that was invented in the early 1970s was changing molecular biology from a purely academic discipline without major interaction with the society around us into an area with huge practical implications and an associated need for trained scientists.

Beginning in 1987, an ambitious governmental "Biotechnological Research and Education Program" provided strong funding for this new area. At Aarhus University this funding was implemented as the "Bioregulatory Research Centre" with five divisions headed by professors Kjeldgaard, Marcker, Lars Bolund from the Department of Human Genetics, and Brian Clark and Julio Celis from the Biostructural Chemistry Division at the Department of Chemistry. Besides exposing and fertilizing interdepartmental collaborations, the grant for the new Centre allowed a much needed update of infrastructure and had a major impact on the overall level of activities in the Department.

However, towards the end of the 1980s space problems in the Biology I building and its extension, the Biology II building from 1974, were of such a nature that a solution had to be found. A building plan from the golden years 15 – 20 years earlier had never been implemented, and there was no immediate hope of getting a building that could accommodate the rapidly growing Department of Molecular Biology. Beginning with a move in 1991, the outcome was that individual research groups moved into rented laboratory facilities in the newly built Science Park, located at about 500 meters from the Biology building complex on campus. While this distance was short enough to maintain shared seminars and integrated teaching, it also required duplications of infrastructure and had a negative impact on the overall research potential and the spirit of unity among staff and students.

Biology building

The Science Park

During the same years, the possibility of merging the Division of Biostructural Chemistry of the Department of Chemistry with the Department of Molecular Biology was discussed. Biostructural chemistry had been built up around professor Clark, who was recruited from Cambridge, UK, in 1974, with a focus on macromolecular structure and mechanisms of protein synthesis. This merging was in place in 1996 and new facilities at the Science Park allowed the Biostructural Chemistry groups to integrate directly with a larger number of groups of the Department of Molecular Biology, resulting in a department with research activities at two sites of approximately equal size, where research groups at the original campus site focused on molecular biology and the groups in the Science park on proteins and plants. Besides having a major impact on the overall research potential and profile of the department, the merging into a new Department of Molecular and Structural Biology also allowed alignment and strengthening of educational programs as well as integrated use of teachers who had earlier taught at two separate departments.


iNANO building

The establishment of the Interdisciplinary Nanoscience Centre at Aarhus University in 2002, and its later consolidation within a new building housing research groups from different departments, has spurred new technology-driven research activities at the Department of Molecular Biology. The staff of the Department of Molecular Biology also contributes to teaching at the educational programs in nanoscience, and many students with a training in nanoscience have contributed to research projects at our department.

In agreement with the growing need for scientists with advanced training in molecular biology and biochemistry in diverse areas, new educational programs were established and coordinated by the Department of Molecular Biology. Among these are programs in molecular biology in 2003, biotechnology in 2006, and in 2007 molecular medicine in close collaboration with the Faculty of Health Sciences. Those programs have attracted large numbers of students each year. Our Department has also contributed to an education in Molecular Nutrition and Food Technology for a number of years.

In 2011, the current Department of Molecular Biology and Genetics was created by the merging of the Department of Molecular Biology and three strong research groups that had grown out of agricultural science and later had become affiliated with Aarhus University as part of the former Department of Genetics and Biotechnology. The group of Molecular Genetics and Systems Biology is currently in the process of moving from Foulum at a distance of about 50 km from Aarhus to the biology complex on the Aarhus University campus, whereas the Center for Quantitative Genetics and Genomics still remains at Foulum. The group of Crop Genetics and Biotechnology is located at Flakkebjerg more than 200 km from Aarhus.

Those major steps of reorganization were implemented as part of a radical restructuring of research and administrative units of Aarhus University. While it is clear that the diverse areas of expertise and research topics now represented within one department will have a huge potential for research, teaching, outreach, and governmental services, the process of integration over the past seven years has been impeded by physical distance as well as different organization structures and cultures.


Foulum


Flakkebjerg

This recent period of mergings and reorganisations has been further complicated by economic turbulence at the Faculty of Science during the same years, which has also hit hard at our department with two rounds of unvoluntary reduction of staff affecting scientific as well as technical and administrative staff.

As this history shows, the Department of Molecular Biology at Aarhus University was founded during a period of very favourable conditions at Danish universities, and has since then been under constant change with optimistic as well as less optimistic periods. However, we are fortunate that today's celebration of our 50 years' anniversary coincides with a period of renewed optimism.

Let us finish by quoting two passages from Niels Ole Kjeldgaard's words on the occasion of the 25 years' anniversary of the Department of Molecular Biology on 5 June1993.

The first passage reads:
"The Department of Molecular Biology has at all times been in the forefront of research here in Denmark. The Department's scientific production and the large number of graduates, post-graduates and PhDs that have passed through have to a high degree influenced the development of molecular biology in Denmark, and have without doubt reached the goal that was set 25 years ago."

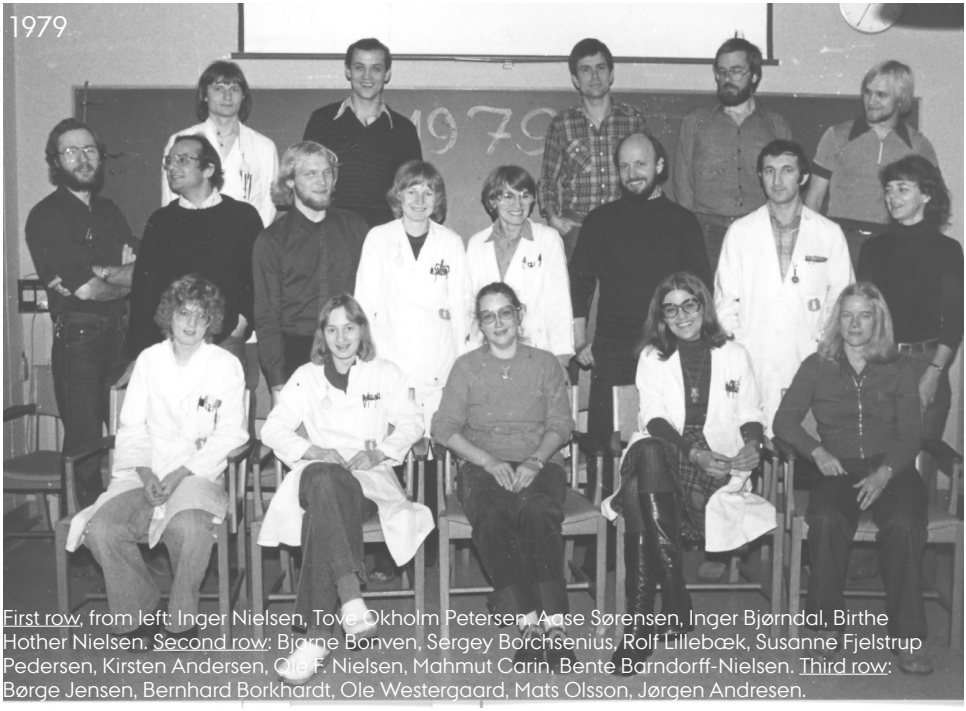
What goals were in fact set in 1993 for the next 25 years? Maybe a steady focus on quality, diversification and continued development in alignment with international standards and societal needs. Aided by mergings, the department has certainly grown and now includes a wide variety of areas of research and teaching as reflected by the increase in professorships from two at the Department of Molecular Biology in 1993 to 15 at the Department of Molecular Biology and Genetics in 2018. The Department has maintained very strong basic research and at the same time been part of the development of molecular biology and genetics into areas with more direct applications. Researchers and graduates of the department have made inventions and established start-up companies. Our former students play important roles in the private and public sector in Denmark as well as internationally.

The second passage reads:
"Therefore, on the occasion of the 25th anniversary of the founding of the Department it must be a big wish that the old plans for the construction of a new research and teaching building will soon be fulfilled."

Will this dream come true? Indeed, it has been a long journey, but now we are close to our new home. Detailed planning is currently ongoing to make a 23,000 m^2 space in a former hospital building ("Kommunehospitalet") ready for takeover by the Department of Molecular Biology and Genetics in 2021.

In 2021, our department will take over these hospital buildings at "Kommunehospitalet"

First row, from left: Hanne Ranch Johansen, Esper Boel, Karna Skorstensgaard, Henrik Husted, Poul Jørgensen. Second row: Poul Fabech, Inge Lauridsen, Margit S. Jensen, Karen Vibe-Pedersen, Anne Marcker, Erik Østergaard Jensen, Yrsa Gregersen, Jens Jørgen Hyldig-Nielsen, Jens Vuust, Kjeld Marcker, Lars Sottrup-Jensen. Third row: Lene Kristensen, Susan Alsen, Rita Rosendahl Hansen, Ole Nymann, Marianne Nielsen, Kirsten Paludan, Torben Lund, Johan Chr. Leer



First row, from left: Inger Nielsen, Tove Okholm Petersen, Aase Sørensen, Inger Bjørndal, Birthe Hother Nielsen. Second row: Bjarne Bonven, Sergey Borchsenius, Rolf Lillebæk, Susanne Fjelstrup Pedersen, Kirsten Andersen, Ole F. Nielsen, Mahmut Carin, Bente Barndorff-Nielsen. Third row: Børge Jensen, Bernhard Borkhardt, Ole Westergaard, Mats Olsson, Jørgen Andresen.

First row, from left: Bodil Moss Hansen, Preben Sahl, Gitte Bak Poulsen, Palle Vistesen, Anette Rommelhoff, Else Christensen. Second row: Peter Guldager, Bent Sørensen, Inger Ottesen, Bjarne Munk Hansen, Rita Wyndaele, Ole Rasmussen, Leif Skøt, Niels Poulsen

1983

1989

1989