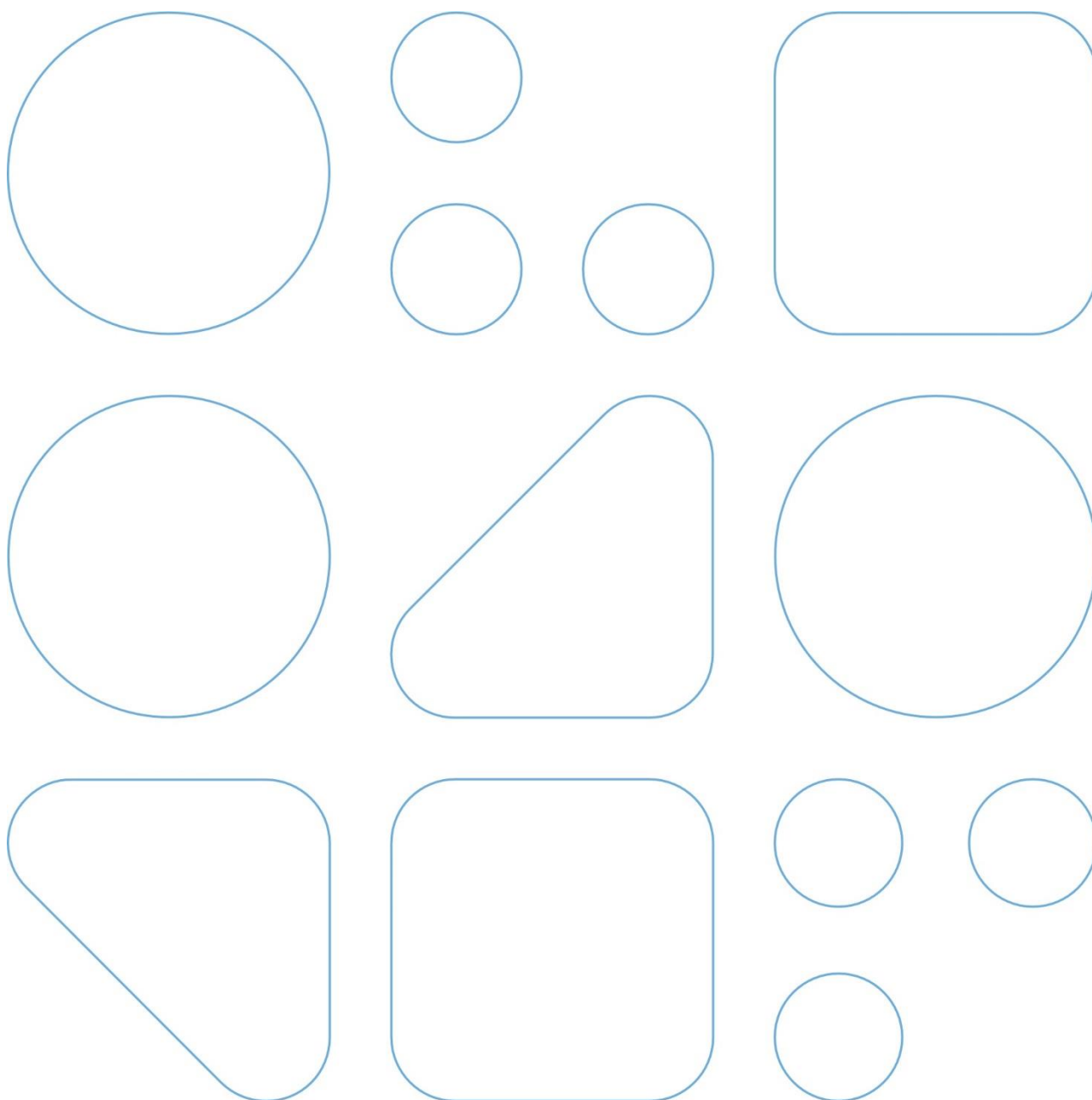


Research at Akershus University Hospital 2021



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1. Summary

A main objective for Akershus University Hospital in 2021 has been to strengthen and highlight the university function. This is a continuation of a long-term investment in research that has resulted in an increasing number of scientific articles and dissertations from the hospital over time.

A total of 427 scientific articles were published by Akershus University Hospital in 2021, compared to 333 the previous year (28% increase). In 2021, 5 employees contested, which was low and a direct consequence of the heavy load on Ahus from the Covid-19 pandemic over 2 years.

We are measured in the number of research points and in previous years we have focused on scientific articles and doctorates. For 2021, in our report we have included EU/NFR funding and clinical treatment studies after this has been included in the national calculation of research points. Ahus has a total of 438.34 points and is ahead of Stavanger University Hospital (410.47 points) for 2021 (see chapter 4, figure 2).

For Ahus, it is important to have close and good cooperation with knowledge institutions and especially the university/high school (UH) sector for the development of Ahus as a university hospital.

The publication list from Akershus University Hospital for 2021 shows that there is close collaboration with researchers from other institutions, and especially with researchers from the University of Oslo and Oslo University Hospital (chapter 7, figure 5). The list also shows that there is increasing cooperation with international institutions.

A total of 200.72 man-years were used for research at Akershus University Hospital in 2021 (SSB figures from 2021). Important sources of funding are South-Eastern Norway Regional Health Authority, the Norwegian Research Council and the Cancer Society (see chapter 9 for which projects have been awarded). NOK 6.5 million was allocated as internal research funds. The award was based on an external peer review of registered applications and followed a process that has recently been evaluated by internal audit Ahus.

In 2021, Ahus has continued measures to strengthen and facilitate more clinical treatment studies. The clinical research outpatient clinic is in the operational phase and we have completed the 3D lab in "Glassgata" at Nordbyhagen. There has also been work on establishing infrastructure for carrying out clinical studies at Gardermoen and Kongsvinger. A record number of new clinical treatment studies have been submitted during 2021 compared to previous years, a total of 67 new ones, respectively. 38 research and 29 industry-initiated studies. For comparison, a total of 39 clinical treatment studies were registered in 2020. During 2021, 191 clinical treatment studies with an active project period were registered in REK. This represents an increase in the number of active clinical trials of approx. 30% compared to 2020. Ahus was also awarded the NorTrials centre within cardiovascular diseases and will then receive some funding to strengthen clinical studies within this and related fields in Norway over the next 5 years. The NorTrials centre for heart diseases is located at the Department of Cardiology, Division of Medicine and also has support with a coordinator from the Division of Research and Innovation (FID).

2. Organisation of research at Akershus University Hospital

The function of director of research and innovation was raised from level 3 to level 2 in the Organisation in September 2016. The reporting line for research following the leadership line in the hospital. Division of Mental Health, Division of Medicine, Division of Surgery, Division of Gynaecology and Obstetrics and Division of Paediatric and Adolescent Medicine have own research departments . The head of research then sits on the division's management team and acts as an adviser to the division director on research matters. Divisions without a research department have research managers who are part-time employees of the division director's staff.

Akershus University Hospital (Ahus) has a formalized collaboration with the University of Oslo (UiO) on research and teaching medical students. The Department of Clinical Medicine at the Faculty of Medicine has a local head who is a scientific employee and reports to the head of department. The person is an observer in the hospital management. The institute has local administration at Campus Ahus. Ahus also works closely with OsloMet within education and research. The collaboration is also formalized here in an overarching collaboration agreement.

The research management in the university line is organized in three clinics; (1) clinic for internal medicine and laboratory subjects (equivalent in the Ahus line Division of Medicine. Division of Diagnostics and Technology and Division of Paediatric and Adolescent Medicine), (2) clinic for surgical subjects (in the Ahus line Division of Surgery , Orthopaedic Clinic and Division of Gynaecology and Obstetrics) and (3) clinic for health services research and psychiatry (in the Ahus line Department for health services research, FID and Division of mental health care and substance abuse).

A significant proportion of the researchers at Ahus have combined positions with UiO, and thus also have a connection to the university line. These report to the clinic manager at the University for their University Tasks and to the immediate manager in the hospital line for tasks related to the employment relationship at Ahus.

Research committees have been established in most divisions and clinics and joint research committees for Ahus and Campus Ahus. The committee consists of representation from the research management, research managers from the clinic/division and clinic managers from the university. The joint research committee, which is a strategic advisory body for the managing director in research matters, is anchored in the collaboration agreement with the university and holds approximately 6 meetings per year. OsloMet and Ahus's user committee are also represented in the committee.

3. Resource use

In 2021, a total of 200.7 man-years were used for research and development work (R&D report to Statistics Norway (formerly NIFU) for 2021). Of this, research man-years accounted for 187.2. In addition, 50.7 man-years are associated with UiO. Ahus also has employees who have side positions/doctoral scholarships at OsloMet and OsloMet has employees with side positions at Ahus.

The research support at the hospital is mainly financed by Ahus and partly by UiO. The research support includes finance, personnel, internal control, medical library, clinical studies, clinical research outpatient clinic, biobank / ebiobank, innovation, research law, digital research infrastructure, statistics and Grants.

Table 1 shows the distribution of research man-years and the number of employees per division/clinic at Ahus. Table 2 shows the distribution of man-years and employees associated with Campus Ahus, UiO.

Table 1: Divisional distribution of man-years and employees at R&D, Akershus University Hospital 2021

Ahus 2021	DDT	PSYK	KIR	Orto	MED	KK	BUK	FID/HØKH	FID/Forskning s- støtte/andre	Analyse/ Datafangst	Medisi n og helsefa	Totalt
Årsverk internt finansiert	12,39	25,14	8,38	3,82	50,78	3,25	5,70	7,55	17,33	0,40	1,19	135,93
Antall ansatte	45,00	67,00	52,00	16,00	125,00	11,00	16,00	14,00	24,00	1,00	4,00	375,00
Årsverk eksternt finansiert	4,01	8,39	2,90	2,08	28,45	2,11	5,44	9,47	1,94	0,00	0,00	64,79
Antall ansatte	9,00	28,00	7,00	6,00	64,00	10,00	16,00	20,00	4,00	0,00	0,00	164,00
Ahus totalt årsverk	16,40	33,53	11,28	5,90	79,23	5,36	11,14	17,02	19,27	0,40	1,19	200,72

Table 2: Divisional distribution of man-years and employees in scientific positions. Campus Ahus, UiO, 2021

UiO - Campus Ahus 2021	DDT	PSYK	KIR	Orto	MED	KK	BUK	HØKH	Forskning- støtte*	Analyse/ Datafangst *	Adm ansatte *	Totalt
Årsverk internt finansiert	1,4	0,4	4,5	1,6	15,0	1,1	3,6	1,7	5,0	1	2,5	37,8
Antall ansatte internt finansiert	7,0	2,0	11,0	4,0	29,0	4,0	5,0	3,0	5,0	1	3	74,0
Årsverk eksternt finansiert	0,2	0,2	0,6	0,0	7,2	0,0	0,2	3,0	1,5	0	0	12,9
Antall ansatte eksternt finansiert	1,0	1,0	3,0	0,0	15,0	0,0	1,0	4,0	4,0	0	0	29,0
Årsverk UiO totalt	1,6	0,6	5,1	1,6	22,2	1,1	3,8	4,7	6,5	1,0	2,5	50,7

* Research support includes the engineers at EpiGen as well as the IT manager.
Analysis/data capture includes the two UiO-employed advisors.
Administrative staff are univ. admin Campus Ahus.

Table 3 shows the development in the number of man-years over the past nine years.

Table 3: Development of divisional distribution of man-years for R&D at Ahus and Campus Ahus for the period 2013 – 2021

	DDT	PSYK	KIR	Orto*	MED	KK	BUK	FID	Forsknings- støtte**	Analyse/ Datafangst	Adm ansatte**	Medisin og helsefag- divisjonen	TOTAL Forskning og utvikling
Ahus årsverk													
2013	12,8	22,2	8,5		46	7	3,3	23	8,5				131,3
2014	13	30,6	4,4	4,9	55,6	6,9	9	19,7	9,6				153,7
2015	11	29,5	5,3	7,4	64,8	6,1	12,8	21,9	10,5				169,3
2016	17,9	47,7	6,4	6,2	71,2	5,4	11,4	19,9	5,8	3,2			195,1
2017	19,3	44	6,1	6,7	69,3	6,3	10	23,4	5,8	3		0,2	194
2018	19,3	44	6,1	6,7	69,3	6,3	10	23,4	5,8	3		0,2	194
2019	15,6	29,8	10,1	5,9	73,9	6,9	7,8	18,1	13,8	0,3		1,4	183,6
2020	15,6	29,8	10,1	5,9	73,9	6,9	7,8	18,1	13,8	0,3		1,4	183,6***
2021	16,4	33,53	11,28	5,9	79,23	5,36	11,14	17,02	19,27	0,4		1,19	200,72
UiO årsverk													
2013	2,4	0,9	8,5		13	1,4	2,1	1,6	7				36,9
2014	1,4	0,4	6,2	3,2	16,7	1,9	1,4	2,8	9,8				43,8
2015	1,4	0,4	7,7	2,9	20	1,4	1,4	1,6	10,5				47,3
2016	1,4	0,4	7	2,7	19,3	1,6	2,4	2,8	6,4	2	2,7		48,7
2017	1,6	0,6	16	5	22,3	3	4	5	6	2	2,5		50,6
2018	1,6	0,6	16	5	22,3	3	4	5	6	2	2,5		50,6
2019	2	0,6	5,2	1,7	16,4	1,6	3,6	2,9	6	2	2,5		44,5
2020	2	0,6	5,2	1,7	16,4	1,6	3,6	2,9	6	2	2,5		44,5
2021	1,6	0,6	5,1	1,6	22,2	1,1	3,8	4,7	6,5	1	2,5		50,7

* In 2013 Orto was organised under the Division of Surgery.

** This includes the research engineers at EpiGen, statisticians and IT support. Data capture includes the two UiO employee advisors.

*** Same figures as in 2019, there was no reporting of figures to NIFU in 2020.

DDT:	Division of Diagnostics and Technology
PSYK:	Division of Mental Health
KIR:	Division of Surgery
ORTO:	Orthopaedic Clinic
MED:	Division of Medicine
KK	Division of Gynaecology and Obstetrics
BUK:	Division of Paediatric and Adolescent Medicine
FID:	Division of Research and Innovation

4. Scientific production

In 2021, 427 articles with the address Akershus University Hospital were registered in CRISTin (Current Research Information System in Norway)¹, compared to 333 the year before (an increase of 28 per cent). Of these articles, 23 per cent were published in a level 2 journal, which is defined as a leading journal in its field, and the rest were published in a level 1 journal. Table 4 shows the number of scientific publications by level 1 and 2 for the years 2014-2021. Table 5 shows the distribution of scientific publications and publication points per division/clinic in 2021.

Figure 1 shows the divisional development of publications for the period 2011 – 2021.

Table 4: Number of scientific publications by level 1 and 2 from 2014 - 2021

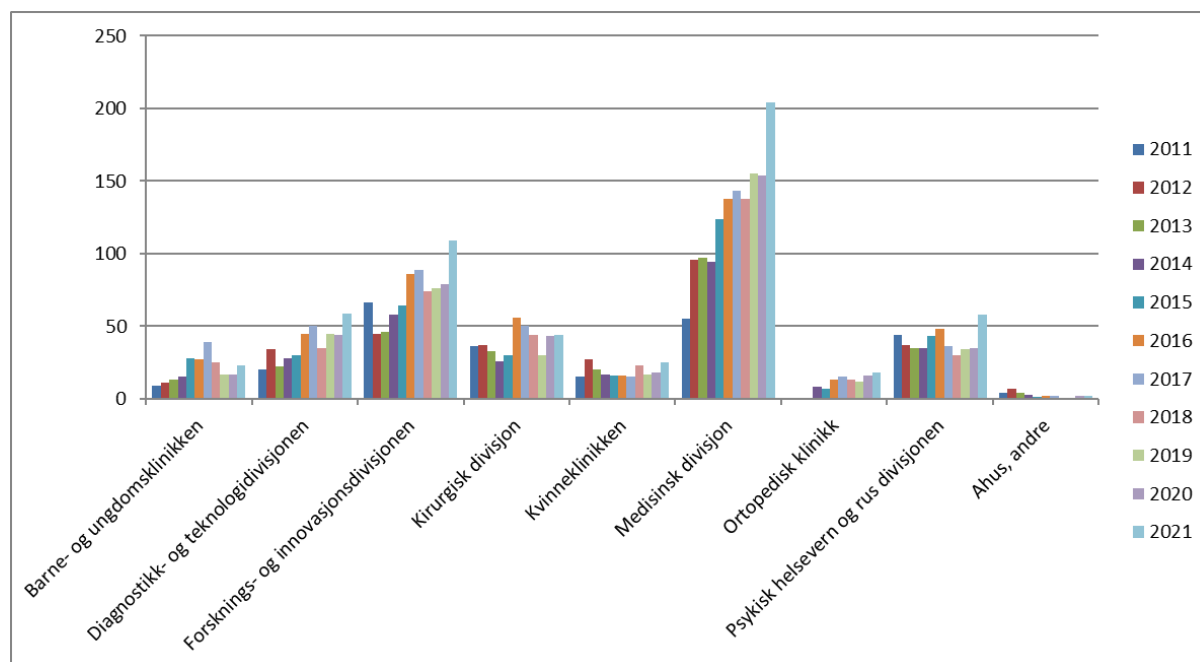
Year	Number of level 1	Number of level 2	Total number of articles
2014	191	47	238
2015	234	51	285
2016	289	74	363
2017	297	61	358
2018	253	70	323
2019	245	77	322
2020	249	84	333
2021	331	96	427

Table 5: Scientific publications and publication points per division 2021

	Total	Level 1	Publ. point	Level 2	Publ. point
Division of Paediatric and Adolescent Medicine	23	19	7.12	4	4.56
Division of Diagnostics and Technology	59	48	17.10	11	6.84
Division of Research and Innovation	109	82	27.52	27	25.35
Division of Surgery	44	38	17.14	6	5.85
Division of Gynaecology and Obstetrics	25	19	9.81	6	8.98
Division of Medicine	204	146	53.28	58	50.40
Orthopaedic Clinic	18	15	6.92	3	3.13
Division of Mental Health	58	46	22.57	12	16.63

¹ www.cristin.no

Figure 1: Development by division in publications 2011 - 2021



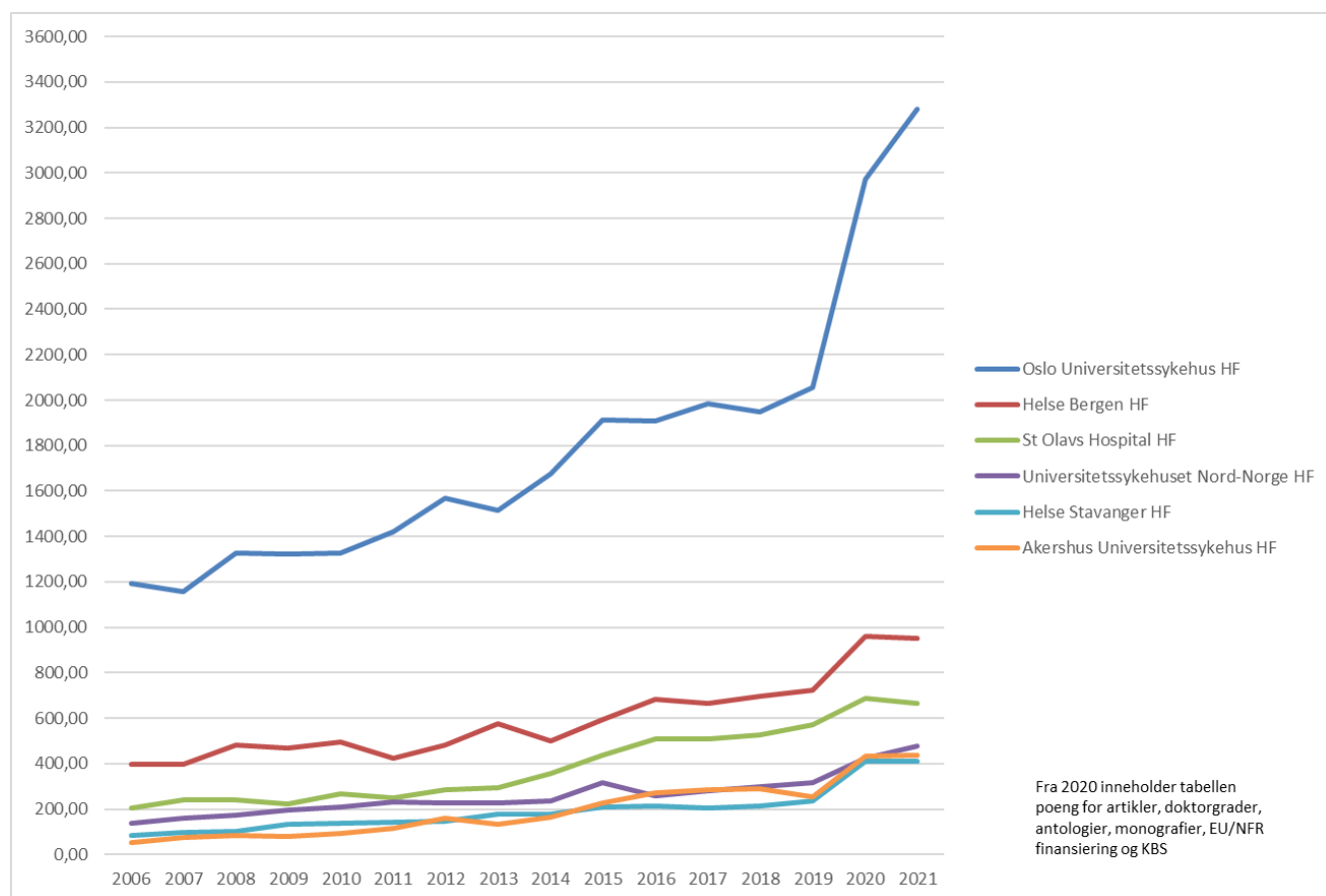
In 2021, 5 employees did their dissertation. Table 6 shows the distribution of the number of awarded doctoral degrees per division. In chapter 12 there is an overview of who argued the thesis with a short summary of the various theses.

Table 6: The number of dissertations per division 2013-2021

	2013	2014	2015	2016	2017	2018	2019	2020	2021
Division of Paediatric and Adolescent Medicine		1	2	1	2	2	4	1	
Division of Diagnostics and Technology				2	1	1	1	1	2
Division of Research and Innovation	2	4	3	1	2	2		3	1
Division of Surgery	3			1	1	3		3	
Division of Gynaecology and Obstetrics		4	1	2		1	1	1	
Division of Medicine	4	5	8	2	6	6	3	8	1
Orthopaedic Clinic			2		1	1	3	0	1
Division of Mental Health	1	1	1		3	6	1	3	

The number of research points including clinical treatment studies has increased slightly from 435 in 2020 to 438 in 2021. For the period 2006 – 2019, the graph only shows points for scientific articles and doctorates, but from 2020 we have expanded the overview to apply to the total number of research points (scientific articles, doctorates, anthologies, monographs and EU/NFR funding) and KBS points (Clinical treatment studies). Figure 2 shows a comparison between the Norwegian university hospitals for the period 2006 to 2021.

Figure 2: Research credits (scientific articles, doctorates, anthologies, monographs, EU/NFR funding) and clinical treatment studies (KBS) - comparison between the Norwegian university hospitals. For the period 2006-2019, the graph only shows points for scientific articles and doctoral degrees



DOFIs (report on invention) have been submitted to our TTO (Technology Transfer Office, Inven2), 12 patents and a license agreement.

Table 7: Innovation activity 2021 - reported from Inven2

	Number
DOFI	17

Patent applications	12
License Agreement	1

5. Development in the number of publications and doctorates

Table 8 and figures 3 and 4 show the development in the number of scientific publications and the number of doctoral degrees awarded in the period from 2010 to 2021. The number of published articles has shown a positive increase from 2010 and from 2020 to 2021 there has been a significant increase in the number of scientific articles. In 2021, 5 employees contested, which was historically low and a direct consequence of the heavy burden on Ahus from the Covid-19 pandemic over 2 years.

Table 8: Publications and doctorates 2010-2021

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Publications	130	210	238	228	238	285	363	358	323	322	333	427
Doctoral degrees	10.5	8	20	10	15	17	9	16	22	13	20	5

Figure 3: Development in the number of publications

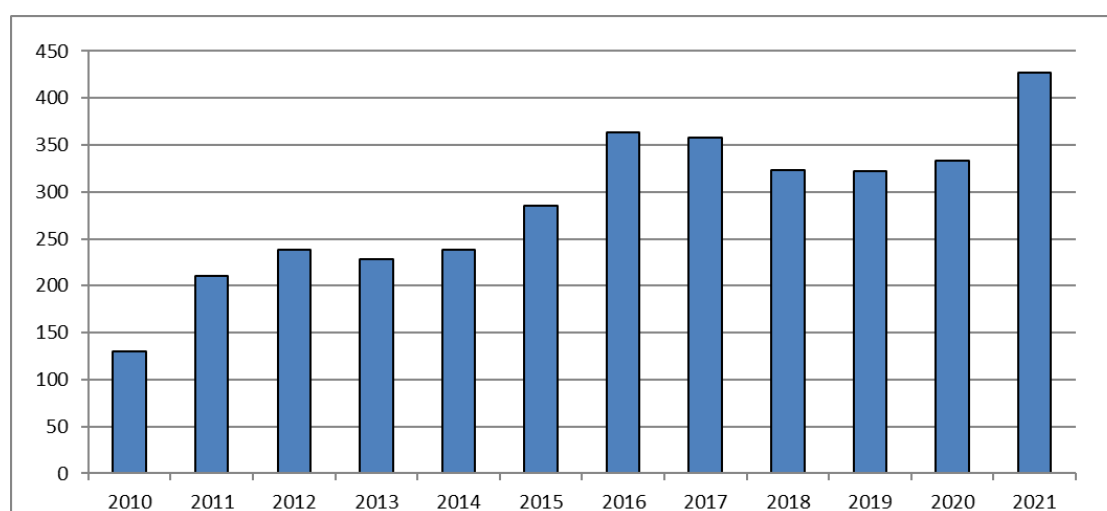
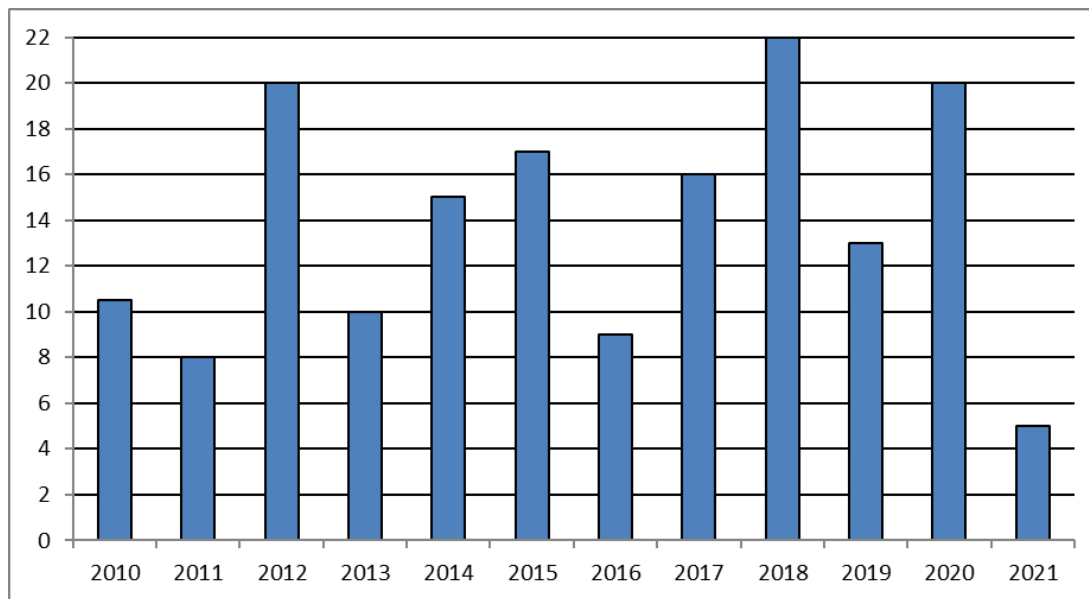


Figure 4: Development in the number of doctoral degrees



6. Publishing researchers

The tables below show the number of researchers who published at least one scientific article with the address Akershus University Hospital in 2021. Table 9 shows publishing researchers broken down by gender and age, and table 10 shows the corresponding overview per division. Data are taken from CRISStin.

Table 9: Publishing researchers divided by gender and age

Men		Women		Total	
Number	Avg. age	Number	Avg. age	Number	Avg. age
182	48.3	194	45.8	376	47

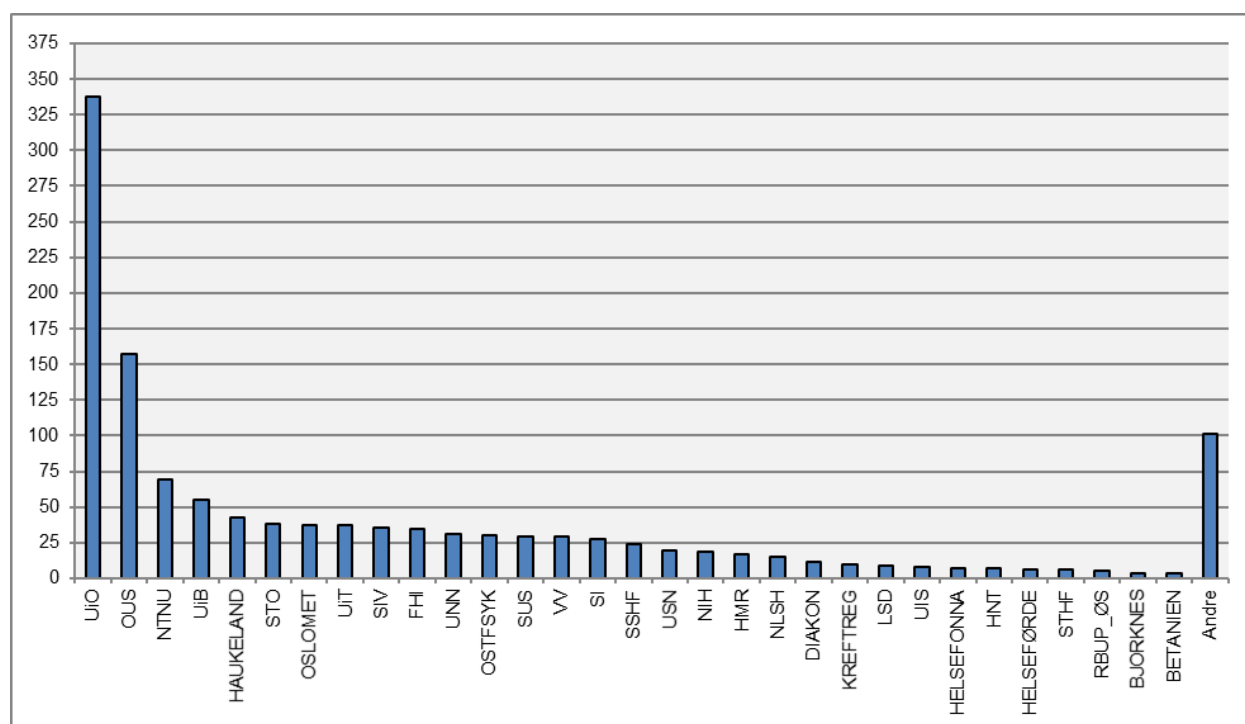
Table 10: Publishing researchers divided by gender and age per division

	Men		Women	
	Number	Avg. age	Number	Avg. age
Division of Paediatric and Adolescent Medicine	7	44.4	12	44.9
Division of Diagnostics and Technology	29	51	31	49.0
Division of Research and Innovation	16	43.6	15	49.1
Division of Surgery	33	48.5	17	48.6
Division of Gynaecology and Obstetrics	2	59	14	47.6
Division of Medicine	65	47.1	74	43.6
Orthopaedic Clinic	14	47.5	2	33.5
Division of Mental Health	15	54.1	28	44.9

7. National cooperation

Figure 5 shows an overview of Norwegian institutions that researchers at Akershus University Hospital have published together with in 2021. Co-publishing with the University of Oslo and Oslo University Hospital is most common.

Figure 5: Joint publication with Norwegian institutions



Description of the abbreviations in the figure above:

- | | |
|--|---|
| <ul style="list-style-type: none"> • UiO - University of Oslo • OUS – Oslo University Hospital HF • NTNU – The Norwegian University of Science and Technology • UiB – University of Bergen • HAUKELAND – Haukeland University Hospital • STO – St Olav Hospital Hospital Trust • OSLOMET – Oslo Metropolitan University • UiT – The Arctic University of Norway • SIV – Hospital in Vestfold • FHI – Institute of Public Health • UNN - University Hospital in Northern Norway • OSTFSYK – Hospital in Østfold • SUS – Stavanger University Hospital • VV – Vestre Viken Hospital Trust • SI – Innlandet Hospital Trust | <ul style="list-style-type: none"> • SSHF - Sørlandet Hospital HF • USN – The University of Southeast Norway • NIH – Norwegian Institute of Sports • HMR – Health Møre and Romsdal • NLSH – Nordland Hospital Trust • DEAKON - Deacon Home Hospital • KREFTREG – The Cancer Registry • LSD – Lovisenberg Diakonale hospital • UIS – University of Stavanger • HELSEFONNA – Helse Fonna Hospital Trust • HNT – Health Nord-Trøndelag Hospital Trust • HELSEFØRDE – Helse Førde Hospital Trust • STHF –Telemark Hospital Trust • RBUP-ØS - RBUP East and South • BJORKNES – Oslo New College • BETHANY – Bethany Hospital |
|--|---|

8. International cooperation

In 2021, 216 articles or 51 per cent of the published articles were joint publications with foreign partners. As Figure 6 shows, the number of articles that include international collaboration has been stable in recent years. Figure 7 shows countries with which we have international co-publications. The USA and Great Britain are the countries with which we have the most joint publications.

Figure 6: Number of publications from Ahus with international collaboration

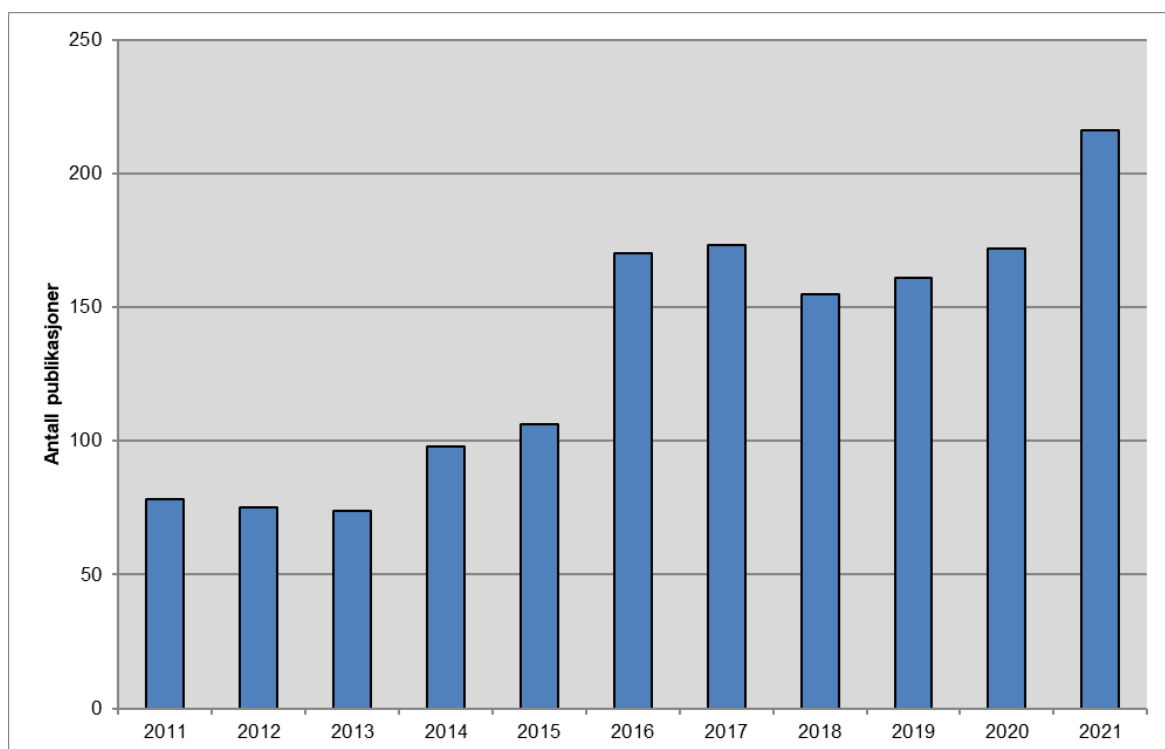
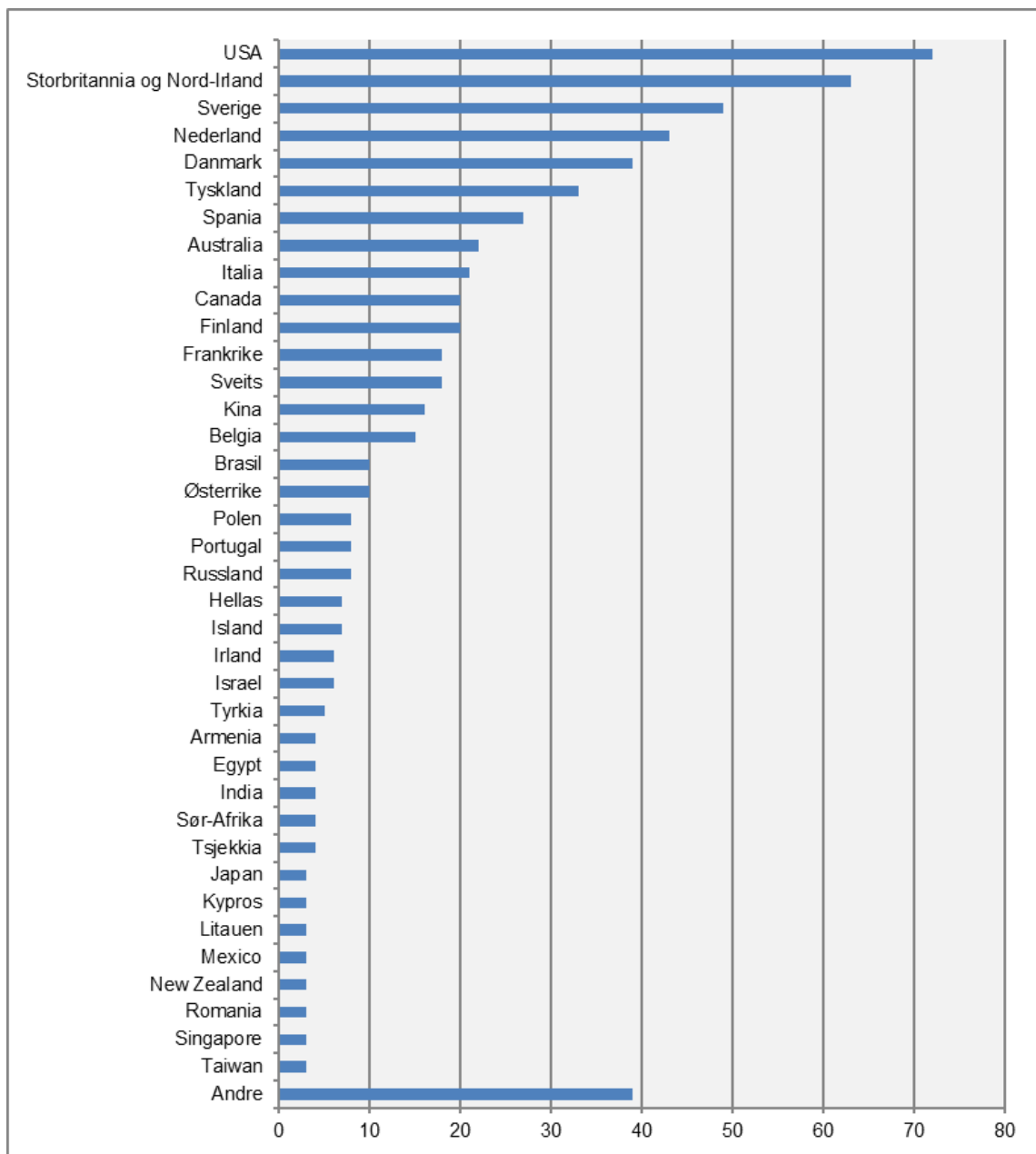


Figure 7: Co-publishing internationally



9. Grant of external research funds

In 2021, Akershus University Hospital was awarded a total of NOK 84 million in external research funds; among others from Health South-East RHF, the Research Council of Norway, and the National Association for Public Health and the Cancer Society. Figure 8 shows external funding broken down by funding source from 2011 to 2021. Tables 11 and 12 show the allocation per project.

Figure 8: External funding broken down by funding source 2011 - 2021

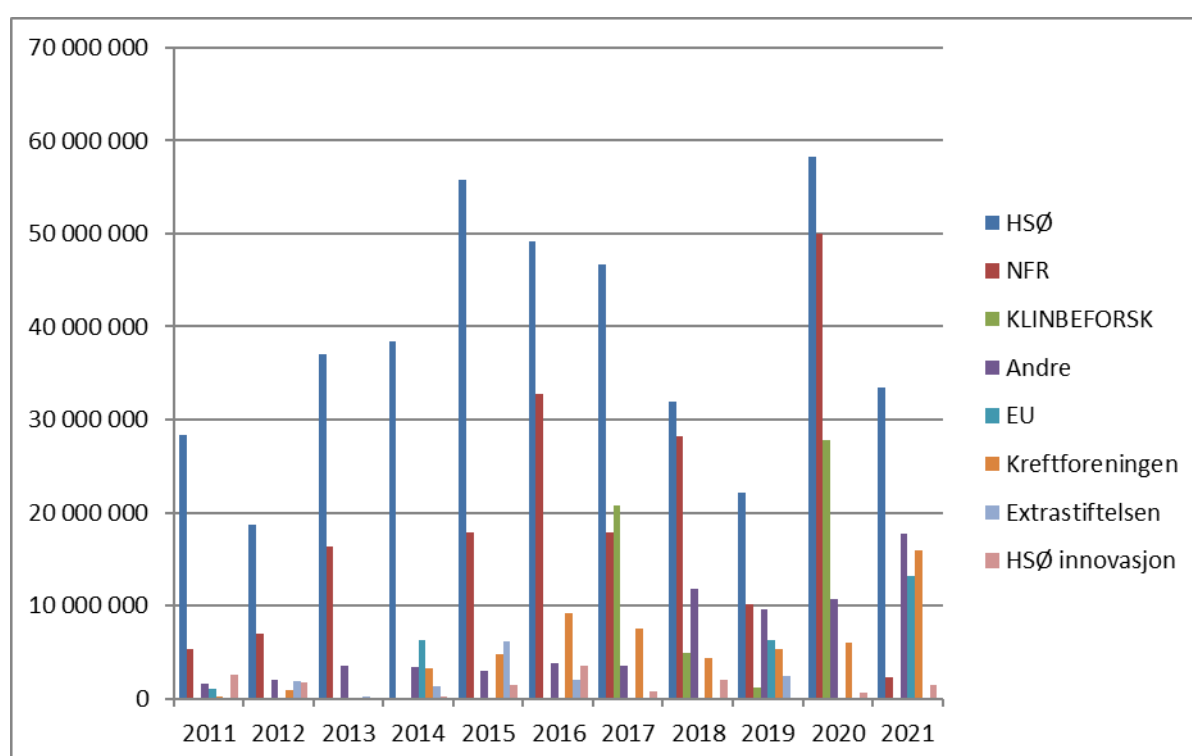


Table 11: Projects that have been granted external research funding for PhD fellows, post doc fellows and major operating grants

Project title	Project Manager	Division/Clinic	Funded by:	Allocation 2021
Digital patient history for children and young people with type 1 diabetes	Lisa Johanne Fosshaug	Division of Paediatric and Adolescent Medicine	Health South-East	1,400,000
DeepMRSI platform for whole-Brain metabolic maps	Morteza Esmaeili	Division of Diagnostics and Technology	Health South-East	210,000
A pilot study for lung cancer screening with low dose CT in Norway	Haseem Ashraf	Division of Diagnostics and Technology	The Cancer Society	7,999,000

Project title	Project Manager	Division/Clinic	Funded by:	Allocation 2021
Development of Volumetric MR Spectroscopy for Spatial Metabolic Imaging of the Brain	Morteza Esmaeili	Division of Diagnostics and Technology	Health South-East	3,468,000
Gravitate - Health	Petter Hurlen	Division of Diagnostics and Technology	EU project collaboration with UiO	2,275,000
Resident uncertainty: Roots, reasoning, and remedy	Pål Gulbrandsen	Division of Research and Innovation	Health South-East	3,468,000
Secretoneurin : biomarker and therapeutic strategy in cardiovascular disease	Helge Røsjø	Division of Research and Innovation	Health South-East	3,468,000
Validating secretoneurin as a marker of ventricular arrhythmias	Helge Røsjø	Division of Research and Innovation	National Association for Public Health	2,250,000
Many Providers, confused INFORMATION ? Coordinated and tailored communication with older patients in hospital-home TRANSitions (MAPINFOTRANS)	Pål Gulbrandsen	Division of Research and Innovation	The Research Council via cooperation agreement with UiO	2,002,000
Severity and EQ-5D (SEVQ)	Mathias Barra (Kim Rand)	Division of Research and Innovation	The Executive Committee of The EuroQol Group Association	789 532
Pain and palliation research group	Olav Magnus Fredheim	Division of Surgery	Health South-East	9,004,000
Hypno: game-changing EEG device for sleep improvement (ProHypno)	Harald Hrubos-Strøm	Division of Surgery	Research Council/EU cooperation agreement with Drawzee)	3,000,000
Revolution of sleep diagnostics and personalized health care based on digital diagnostics and therapeutics with health data integration — SLEEPREVOLUTION	Harald Hrubos-Strøm	Division of Surgery	EU project via cooperation agreement with the University of Reykjavik	2,433,521
BEhavioral and Adherence Model for improving quality, health outcomes and cost-Effectiveness of healthcare (BEAMER)	Harald Hrubos-Strøm	Division of Surgery	Universidade do Porto (Innovative Medicines Initiative)	5,168,750
Bloody seriousness - treatment of endometriosis	Merete Kolberg Tennfjord	Division of Gynaecology and Obstetrics	Physiofond	3,336,000
Creating Immunity to Eradicate Metastasis in Colorectal Cancer	Anne Hansen Ree	Division of Medicine	The Cancer Society	8,000,000
Molecular linkages of the impaired NAD+- mitophagy axis and tau pathology in Alzheimer's disease	Evandro Fei Fang	Division of Medicine	Health South-East	3,468,000
To B or not to B: Defining pathogenic B cells in multiple sclerosis	Peter Andreas Vold Lossius	Division of Medicine	Health South-East	3,468,000
Impact of Covid-19 on pre-existing, acute and long-term cardiac injury	Peder Langeland Myhre	Division of Medicine	Health South-East	3,468,000
Crosstalk between defective mitophagy and Tau pathology in the initiation of Alzheimer's disease	Evandro Fei Fang	Division of Medicine	Civitan Norway's Research Fund for Alzheimer's disease	1,500,000

Project title	Project Manager	Division/Clinic	Funded by:	Allocation 2021
Nutraceuticals for healthy ageing	Hilde Loge Nilsen	Division of Medicine	Aker BioMarine Antarctic.	988 430
Research on ALS	Trygve Holmøy / Ola Nakken	Division of Medicine	ALS Norway Foundation	700,000
Improving public cancer care by implementing precision medicine in Norway (IMPRESS)	Anne Hansen Ree	Division of Medicine	Novartis via collaboration agreement with OUS	1,250,000
Ocrelizumab Versus Rituximab off-Label at the Onset of Relapsing MS Disease (OVERLORD-MS)	Rune A Hoglund	Division of Medicine	Cooperation agreement with Helse Bergen	2,840,000
My life, my responsibility (MILA)	Anne Edvardsen	Division of Medicine	The Directorate of Health via Ullensaker municipality	774 583
Save the meniscus - The Bøttehank study	Asbjørn Årøen (Axel Szava Petterson)	Orthopaedic Clinic	Sophie's Memory	764 660
Nutritional factors and microbial and HPA axis functioning associated with prenatal depression: A longitudinal population-based study	Soili Marianne Lehto	Division of Mental Health	Health South-East	3,468,000

Table 12: Projects granted smaller grants from external funding sources

Project title	Project Manager	Division/Clinic	Funded by:	Allocation 2021
The extracellular glycoproteins ADAMTSL2 and ADAMTSL3 regulate fibrosis in the heart and affect the development of dilated cardiomyopathy.	Ida Lunde	Division of Diagnostics and Technology	The Blix family fund	40,000
Operating funds for opt -SN	Anett H Ottesen	Division of Research and Innovation	The Blix family fund	50,000
Operating funds from Fam Blix Fond 2021	Joana Reis	Division of Diagnostics and Technology	The Blix family fund	40,000
Tenderness of the cruciate ligament attachment in children. How is it actually going?	Maren Gundersen	Division of Diagnostics and Technology	Sophie's Memory	200,000
TIC CKD	Ivar Eide	Division of Medicine	The National Association for Kidney Patients and Transplants (LNT)	125,000
PSA tests	Jan Oldenburg	Division of Medicine	Prostate cancer association	94 137
Heart failure AI - clinical decision support tool	Henrik Schirmer	Division of Medicine	The Research Council	150,000
Patient-reported outcomes and lung function after hospitalization for COVID-19 (PROLUN)	Gunnar Einvik	Division of Medicine	Norwegian Association for Pulmonary Medicine (NFL)	50,000

Project title	Project Manager	Division/Clinic	Funded by:	Allocation 2021
Patterns of Prostate-Specific Antigen (PSA) use and follow-up for Prostate Cancer in Norway	Jan Oldenburg	Division of Medicine	EAU-Research Foundation (EAU-RF)	250,000
Development of Norway's first basic course in inflammatory bowel disease	Petr Rícanek	Division of Medicine , Digestion	Ferring Pharmaceuticals	93,800
TITRATE (induction for acuTe ulcerative colitis)	Kristin Kaasen Jørgensen	Division of Medicine , Digestion	Academic Medical Centre (AMC), Amsterdam	240,000
Preventive health - better use of health data	Jesper Ravn	Division of Medicine , Heart	The Research Council	100,000
Multi- centre , adaptive, randomized trial of the Safety and efficacy of treatments of covid-19 in hospitalized adults	Olav Dalgard	Division of Medicine , Infection medicine	The French National Institute for Health and Medical Research	0
European DisCoVeRy for Solidarity: An Adaptive Pandemic and Emerging Infection Platform Trial (EU- SolidAct)	Olav Dalgard	Division of Medicine , Infection medicine	Cooperation agreement with OUS (EU project)	250,000
Blood test that predicts the spread of bowel cancer	Anne Hansen Ree	Division of Medicine	University of Oslo	400,000
Epidemiology and outcomes of sarcoidosis in Norway: a national register-based cohort study	Knut Stavem	Division of Medicine	Norwegian Sarcoidosis Association via the Lung Association	100,000
Development of online basic course in inflammatory bowel disease (IBD)	Petr Rícanek	Division of Medicine	Janssen- Cilag AS	100,000
Research grant from AstraZeneca/NCS	Peder Langeland Myhre	Division of Medicine	From Astra- Zeneca via the Norwegian Cardiological Society	50,000
Patient-reported outcome after Achilles tendon rupture with a minimum of 5 years of follow-up: Long-term follow-up of patients randomized to conservative treatment, open and mini-open surgical treatment	Rune Bruhn Jakobsen	Orthopaedic Clinic	Aase Bye and Trygve JP Hoff's fund for scientific medical research (Unifor)	50,000
Plate fixation versus nailing of 3 and 4 part shoulder fractures	Annett Wikerøy	Orthopaedic Clinic	Sophie's Memory	266,900
Reduction of amputations in the lower extremity when introducing a pack course for diabetic foot ulcers	Monica Sailor	Orthopaedic Clinic	Sophie's Memory	315 631
Psychosocial stress as a cause of disease development	Johannes Gjerstad	Division of Mental Health	Odd Fellow	90,000

10. Internal research funds

Once a year, internal strategic research funds are advertised for which employees can apply. The applications are assessed for quality by external peers.

In 2021, a total of NOK 20 million was applied for, distributed among 54 applications. The total sum allocated was 7.4 million distributed over 21 projects (see table 13). Applicants are encouraged to use the feedback from their colleagues to improve their applications when applying for research funding from South-Eastern Norway Regional Health Authority and other external sources.

Table 13: Projects granted internal research funding 2021

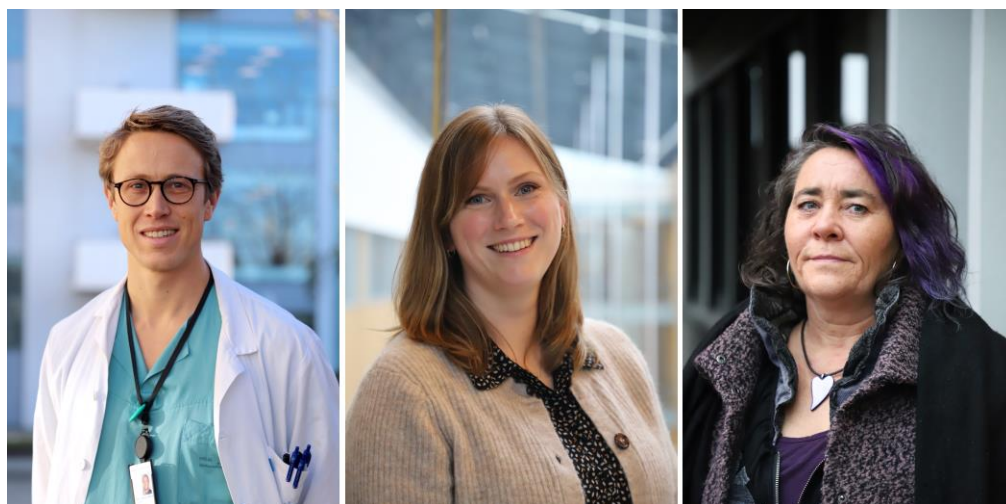
Project title	Project Manager	Division/Clinic	Allocated amount
Antibiotic stewardship - hospital implementation strategies, monitoring and safety	Christopher Inchley	Division of Paediatric and Adolescent Medicine	250,000
The gonorrhoea epidemic in Norway – the importance of the throat niche in transmission and antimicrobial resistance development	Truls M. Leegaard	Division of Diagnostics and Technology	500,000
Tailoring chemotherapy and surgical treatment for colon cancer to the patient and not vice versa	Johannes Kurt Schultz	Division of Surgery	125,000
Validation of the electronic administration of the Norwegian PFDI-20 and PFIQ-7 condition-specific quality of life questionnaires which will be used in an electronic medical quality register for patients with pelvic organ prolapse	Catherine Joyce Teig	Division of Surgery	50,000
New utility for DNA methylation in breast cancer: cell free circulating DNA as a potential biomarker for early detection	Jovana Klajic	Division of Medicine	500,000
Defective mitophagy links vascular aging to dementia	Evandro Fei fang	Division of Medicine	500,000
Identifying risk factors for amyotrophic lateral sclerosis, multiple sclerosis and myasthenia gravis	Trygve Holmøy	Division of Medicine	500,000
Next generation sequencing in the studies of hormonal resistance in breast cancer	Jürgen Geisler	Division of Medicine	500,000
Precision microbiota profiling, for diagnosis, prognosis and treatment individualization in paediatric inflammatory bowel disease	Jørgen Jahnsen	Division of Medicine	250,000
Premature aging and progressive fibrosis in renal transplantation. A biopsy study of cellular senescence in the renal allograft	Ivar Anders Eide	Division of Medicine	250,000
Exploring Novel Mechanisms in Heart Failure	Anett Hellebø Ottesen	Division of Medicine	500,000
Increased antimicrobial resistance caused by non-antibiotic therapy in inflammatory bowel disease patients (REDIRECT)	Aina Elisabeth Fossum Moen	Division of Medicine	250,000
Dynamic alterations in m6A RNA methylation in weight regulation	Yvonne Böttcher	Division of Medicine	500,000

Project title	Project Manager	Division/Clinic	Allocated amount
mRNA modifications in obesity – bioinformatic discovery of disease specific targets	Torunn Rønningen	Division of Medicine	250,000
The Norwegian Cerebral Venous Thrombosis study (NoCVT)	Espen Saxhaug Kristoffersen	Division of Medicine	250,000
Fractures of the proximal humerus. Two Prospective Randomized Controlled trials on the treatment	Rune Bruhn Jakobsen	Orthopaedic Clinic	250,000
Equivalence class formation and cortical synaptic plasticity in autism spectrum disorders.	Eva Malt	Division of Mental Health	500,000
"Open Dialogue in network meetings" - a collaborative implementation of a therapeutic approach in Akershus University Hospital and two community mental health services	Tiril Østefjells	Division of Mental Health	500,000
Plan D - a randomized controlled trial of Vitamin D supplementation in psychotic disorders	Mary Nerhus	Division of Mental Health	250,000
A pairwise randomized study on implementation of guidelines and evidence based treatments of psychoses: Personal recovery and satisfaction among patients with psychosis	Kristin S. Heiervang	Division of Mental Health	500,000
Long acting naltrexone for opioid addiction: the importance of mental, physical and societal factors for sustained abstinence and recovery (NaltRec study)	Lars Tanum	Division of Mental Health	250,000

11. Outstanding Research Award

Each year, awards for outstanding research are awarded to three articles with the first author from Ahus. An important purpose of this is to stimulate good research and highlight the qualitatively good research that is produced and published by the hospital's staff. The three managers of the UiO clinics at Ahus nominate a ranked list of three articles each on the basis of set down criteria. The final decision is made in a coordination meeting between Ahus and Campus Ahus. The prize winners receive flowers, a diploma and NOK 10,000 which can be used for operational travel/conference attendance or the like.

The award winners in 2021 it was Peder Langeland Myhre (Division of Medicine), Johanna Dypvik (Division of Gynaecology and Obstetrics) and Kristin Klemmetsby Solli (Division of Mental Health).



From left: Peder Langeland Myhre, Johanna Dypvik and Kristin Klemmetsby Solli.

Announcement of the winners

Clinic for Health Service Research and Psychiatry:

Kristin Klemmetsby Solli, Arild Opheim, Zill -E- Huma Latif, Peter Krajci, Jūratė Šaltytė Benth, Nikolaj Kunøe, Lars Håkon Reiestad Tanum.

Adapting treatment length to opioid-dependent individuals' needs and preferences: A 2-year follow-up to a 1-year study of extended-release naltrexone. Addiction 2020 pp. 1-10.

DOI: <https://doi.org/10.1111/add.15378>

Long-acting naltrexone (XR-NTX) is a treatment alternative for opioid addicts, which blocks the addictive effect, reduces the craving for opioids, and protects against overdose.

Akershus University Hospital (Ahus) has over several years participated in a research project to investigate whether treatment with naltrexone can provide good help to those addicted to opioids.

After an initial study period of one year of treatment with naltrexone, the participants were offered to continue in a follow-up study of up to two years. Here, the participants themselves could choose how long they wanted to have naltrexone treatment, based on their own wishes and needs.

On average, the participants chose to continue the treatment for a further year.

Most participants, 70 percent, reported no relapse to opioid use during the follow-up study.

Treatment satisfaction was measured on a scale from 0-10. The participants were very satisfied, with an average score of over 9. When asked to what extent they would recommend the treatment offer to other opioid addicts, the participants scored an average of over 9.5.

The study shows that long-acting naltrexone is a safe and secure long-term treatment alternative for opioid addicts. The treatment must be adapted to the individual, both with regard to the length of the treatment and the content of the treatment.

Clinic for surgical subjects:

Johanne Dypvik, Sandra Larsen, Camilla Haavaldsen, Ola Didrik Saugstad, Anne Eskild.

Placental Weight and Risk of Neonatal Death. JAMA pediatrics 2020; 174 (2) pp. 197-199.

DOI: <http://jamanetwork.com/article.aspx?doi=10.1001/jamapediatrics.2019.4556>

Since 1999, placental weight has been reported to the Medical Birth Register, along with a range of other information about the mother, the pregnancy, the birth and the child. Access to this data has made it possible for researchers at Akershus University Hospital (Ahus) to study whether there is a connection between the weight of the placenta and the risk of the child dying during the first 28 days after birth. The results were published in a research paper in 2020.

It has previously been shown that children who are small in relation to the duration of the pregnancy, or who are born before term, have an increased risk of dying during the first year after birth.

This may indicate that there are unfavourable conditions in the uterus that have an impact on the risk of dying. The risk of the child dying is highest in the first period after birth, which strengthens the assumption that conditions in the womb can play a significant role.

Dypvik and colleagues looked at the relationship between placental weight and the risk of the child dying within the first 28 days after birth, for almost one million children born in Norway in the years 1999-2015. They studied this connection in children both with and without congenital malformations.

The study shows that among children born early, both high and low placental weight gave an increased risk of the child dying during the first month after birth.

Among children born at term, it was only in children with congenital malformations that low placental weight gave an increased risk of death.

These findings can probably be used to identify children with an increased risk of dying in the first period after birth.

Clinic for internal medicine and laboratory subjects:

Peder Langeland Myhre, Christian Prebensen, Heidi Strand, Ragnhild Røysland, Christine M Jonassen, Anbjørn Rangberg, Vibecke Sørensen, Signe Sjøvik, Helge Røsjø, My Hanna Sofia Svensson, Jan Erik Berdal, Torbjørn Omland.

Growth Differentiation Factor-15 Provides Prognostic Information Superior to Established Cardiovascular and Inflammatory Biomarkers in Unselected Patients Hospitalized with COVID-19. Circulation.

DOI: <https://doi.org/10.1161/CIRCULATIONAHA.120.050360>

Researchers at Akershus University Hospital were among the first in the world to systematically collect blood samples from all patients admitted with COVID-19.

We took blood samples from all hospitalized covid-19 patients on the day of admission, day 3 and day 9, from 9 March to 18 May, says doctor and postdoctoral fellow Peder Langeland Myhre at the cardiology department at Ahus

The substance GDF-15 is secreted in the body in severe infections, acute illness and heart disease. The patients with high GDF-15 values had low oxygen levels, more inflammation in the body, signs of damage to the heart and also more coronavirus in the blood. GDF-15 was markedly higher in covid-19 patients who ended up on ventilators or died. In the patients with a poor prognosis, GDF-15 continued to rise until day 3 and day 9 of the hospital stay.

In summary, it appears that GDF-15 plays a central role in covid-19 and that the use of this blood test can help with the early identification of patients at high risk of a severe course.

The advantage of having such a biomarker is that one can early identify high-risk patients who are likely to have a serious course and need to be admitted to hospital/intensive care unit, and low-risk patients who can therefore, for example, be observed at home. This could lead to better treatment and less resource use.

12. This year's theses

In 2021, five employees at Akershus University Hospital defended their PhD. Table 6 shows the distribution of doctoral degrees per division. Below is an overview of the doctoral students' work:



MSc Kristin Häikio at the Division of Research and Innovation defended the thesis on 9 February: ***"Family carers' perspectives on care for older people living with dementia: interactions and involvement with health services, and the role of health literacy"***

The trial lecture was held on the stated topic *"Responsibilities of carers as carers of elderly people with dementia at the intersection between moral responsibility and health and care provision"*

Supervisor: Professor II Jorun Rugkåsa



MSc Heidi Annett Eilertsen by the Division of Diagnostics and Technology argued on 6 May over the thesis: ***"The ability of Hematology Analyzers to Detect Pathological Cells in Blood –with Special Focus on Blasts and Immature Granulocytes"***

The trial lecture was held on the stated topic *"Laboratory tests used to diagnose and classify acute lymphoblastic leukemia"*

Supervisor: Professor Tor Arne Hagve



Cand. With. Hanna Josefine Abrahamsson at the Division of Medicine defended her thesis on 27 May: ***"Vitamin D Status and Immune Responsiveness in High-Risk and Advanced Colorectal Cancer"***

The trial lecture was held on the stated topic *"Epidemiology and oncological therapy of pancreatic cancer"*

Supervisor: Professor II Anne Hansen Ree



Cand. Med. Tommy Frøseth Aah at the Orthopaedic Clinic defended the thesis on 24 September: ***"Surgical aspects and microRNA in knee cartilage pathology"***

The trial lecture was held on the stated topic *"Treatment of meniscal injuries in the knee. History, present, and future"*

Supervisor: Professor II Asbjørn Årøen



M.Sc. John Christopher Noone at the Division of Diagnostics and Technology, defended the thesis on 29 October: ***"Improved characterization and identification of causative microbial agents in orthopedic implant-associated infections using next-generation sequencing"***

The trial lecture was held on the stated topic *"Virulence factors as targets for development of new vaccines and therapeutics"*

Supervisor: Senior researcher Hege Vangstein Aamot

13. Research support at Akershus University Hospital

Department for Research Support

Research administration:

The administration handles personnel administration and financial follow-up in the research projects. The department takes care of, among other things, also reporting and general operations for all research activity at the hospital. The department is i.e. administratively responsible for meetings in joint research committees, collaboration meetings for research, hearings, announcements and allocation of internal strategic research funds.

Internal control - Deviations in research

In line with the requirements for internal control according to Regulations on the Organisation of medical and healthcare research § 4, Ahus has a deviation routine for quality and research projects. Since December 2018, approx. 50 research deviations, and these vary in scope and severity. There is also variation in the number of reported non-conformities divided by division/clinic level.

For 2021, 16 research deviations were registered, of which 10 were privacy-related, and 6 deviations were related to patient incidents. For about half of the cases led to the consequences of a temporary stay in the course of study, among other things pending relevant post-approvals. Ahus has two cases from previous years that have been dealt with by the Norwegian Data Protection Authority, and where subsequently, among other things, measures have been initiated such as better training in privacy in research and quality projects, as well as a focus on further developing internal control routines.

Section for Biobank, Privacy and digital research infrastructure

Biobank

Ahus has ongoing work related to an overall system for an overview of collected biomaterial for research. This work has revealed some missing and fragmented infrastructure for biobanking. Increased utilization of biological material should be seen in connection with access to clinical data from the established Data Warehouse at Ahus. The potential is increased quality in research projects, an increase in clinical studies and particularly in pragmatic studies within large patient populations. This can greatly promote Ahus both as a research institution and as an attractive collaboration partner. In 2021, routines for biobanking have been revised and completed, which are actively used in guidance for project managers. Making older active research projects/ biobanks available in an electronic notification to the data protection officer (eSkjema) is in the final phase, this provides an overview and better internal control in real time, as all changes are

updated continuously. A process has been initiated with project managers to review existing biobanks in order to get an overview of active biobanks at Ahus.

Digitization of research courses and new websites

The research course "Package process for research" was held digitally in both spring and autumn 2021. The course was divided into six different thematic modules, where the focus is on practical information useful in everyday research. Each module had a duration of approx. one hour. Information about the courses and registration was published in newsletters and on Ahus's website. A process has begun to establish new external internet sites for research, in order to strengthen the visibility of research at Ahus and make relevant information available to the research communities. The procurement process is planned to start in January 2022, where offers will be received from several suppliers in accordance with procurement routines.

Pragmatic studies

Increased focus on and demand for more patients to be offered participation in clinical trials requires the hospital to facilitate innovative study designs such as pragmatic clinical trials and register-randomized clinical trials. Ahus leads work package 13 "Pragmatic studies" in the research administrative network NorCRIN. This work is important to identify and address challenges, but not least to see opportunities and draw on experiences already gained. Initiatives from divisions/clinics are handled continuously and a module in pragmatic studies is offered as part of the "Package process for research".

Privacy

Ahus has prioritized investing in privacy expertise in research over several years. This has been an important factor in ensuring that Ahus fulfils its responsibility as an institution responsible for research and data, and is an available legal resource for the research environment. In 2021, 249 new research and quality projects were registered in eSkjema, compared with 212 projects in 2020. The notifications include personal impact assessments (DPIA), as well as associated agreements for quality control. In connection with the corona pandemic, there has been a significant increase in the number of inquiries regarding privacy. The Schrems II judgment on the disclosure of personal data to third countries and increased use of cloud-based electronic solutions has created challenges. Legal expertise in combination with other professional areas, as well as assistance and guidance from an early stage, has contributed to increased quality control of the processing of personal data. Privacy advisers collaborate with lawyers at other healthcare organisations, and continuously discuss various issues with, among others, the Norwegian Data Protection Authority, the Directorate of Health and REK.

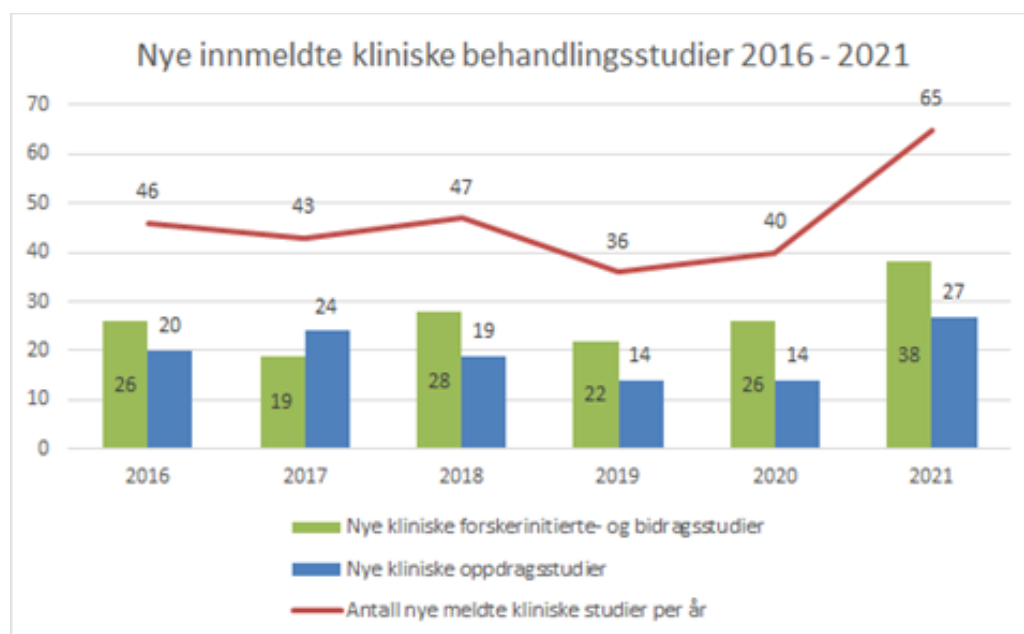
Section for clinical studies

In recent years, Ahus has had a strategic and targeted investment in strengthening the infrastructure for clinical treatment studies. Investments for 2021 have been to continue measures to facilitate more clinical treatment studies, as well as introducing new measures such as establishing areas and equipment for carrying out clinical studies at Ahus Gardermoen. The

national action plan for clinical studies and the National Audit Office's investigation into clinical treatment studies in the healthcare institutions have provided key guidelines for the work in 2021 and have been implemented in local action plans.

During the year, a record number of new clinical treatment studies were registered compared to previous years, a total of 65 new studies, divided between 38 research and 27 industry-initiated studies. For comparison, a total of 40 clinical treatment studies were registered in 2020. In 2021, Ahus had 193 clinical treatment studies with an active project period in REK. Figure 9 shows the development in the number of new clinical treatment studies/agreements for the period 2016 – 2021.

Figure 9: Development in the number of new registered clinical treatment studies from 2016 – 2021



An increase in the number of new clinical treatment studies has been continued as one of the hospital's 10 main goals in 2021, and implies that clinical treatment studies that include patients must be increased by 15% compared to the previous year. In 2021, Ahus had 139 studies that included patients (figures from National reporting for clinical treatment studies). Of these, project managers at Ahus were responsible for reporting on a total of 68 clinical treatment studies with the number of included patients in 2021 for all participating centres. The results from the national reporting are included in the calculation of the indicator for clinical treatment studies in the national system for results-based funding in healthcare institutions.

The clinical research polyclinic at Nordbyhagen is in the operational phase and a total of 19 studies were underway in the areas at the end of 2021. In addition, in 2021, the establishment of infrastructure for carrying out clinical studies at Gardermoen was initiated. The dedicated areas can be used by all divisions and clinics at Ahus, and contribute to an organized and efficient implementation of the clinical studies.

Figure 10: Clinical research outpatient clinic offers areas and basic equipment for carrying out clinical studies, and where all divisions, clinics and departments can register studies they wish to carry out in the outpatient clinic



Establishment of the 3D lab at Ahus was completed in autumn 2021 in Glassgata at Nordbyhagen. This is a collaboration between the Division of Research and Innovation, Division of Surgery, Orthopaedic Clinic and Campus Ahus under the University in Oslo. The establishment of the 3D lab opens up opportunities for research projects in various fields such as surgery, orthopaedics, oncology and radiology. The establishment of such a facility represents an important innovation for patient care, research and innovation at Ahus. In 2021, six new projects started in the 3D lab.



Figure 11: 3D printing of bone at the 3D lab in Glassgata in Ahus.

Medical Library

The medical library organizes and facilitates access to quality-assured sources of knowledge (databases, books and journals) for the hospital's employees. The knowledge sources are offered in electronic or printed form, and all employees at Ahus have direct access to the electronic resources in Ahus' network as well as the possibility of access from home via the library's login service. The library also offers courses and guidance in literature searches and EndNote (reference management), and carries out searches in connection with research projects, publishing, procedural work, patient care, academic updates, etc.

In 2021, the library carried out 75 tutorials, 58 commissioned literature searches and held 24 courses/presentations. A total of 661.5 hours have been used for courses, guidance and search assignments. As an infection prevention measure, the library premises were in periods completely closed or unmanned, with 24-hour access with an ID card and code. During these periods, library services were offered and carried out digitally.

Research clinics

Privacy and ethics

Personal protection has fixed guidance hours every Tuesday from 1.30pm to 3.00pm. Advice on privacy issues, research ethics, handling of deviations and biobanking is carried out on the 5th floor in Nye Nord and is open to all employees at Akershus University Hospital and UiO Campus Ahus.

Statistics and quantitative methods

The statistical research clinic is open to all employees at Ahus and UiO, Campus Ahus. The research clinic operates according to the drop-in principle every Tuesday from 1.30 to 3.00 p.m., but it is also possible to make contact at other times. Statistical research clinic offers advice on data processing and analysis, and the use of statistical methods. We provide the following statistical support:

- Discussion of variables, including help defining them and what they can be used for
- Choice of statistical methods, including help to understand these, and practical advice on how to proceed

The statisticians also give advice on where employees can attend courses to acquire the necessary knowledge.

After further assessment, the person providing statistical support can contribute more than what is described above. In such cases, conditions for further collaboration are discussed, including decisions on co-authorship.

Health research clinic

The health-related research clinic is a low-threshold offer of advice on health-related research issues for employees at Ahus. The health research clinic can offer:

- Help to identify and specify possible problems in an early idea phase
- Help to clarify the applicability of different research methods, with regard to current issues and projects
- Advice on methods for preparing a research project
- Advice on applying for research funding

Health economics research clinic

The health economics research clinic is a low-threshold offer for employees at Ahus and UiO, Campus Ahus who are interested in health economics issues in a clinical setting. The health economics research clinic can offer:

- Discussion of how health economic issues can fit into clinical projects
- Cost-effect analyses and cost-benefit analyses
- Selection of effect measures: health-related quality of life (HRQoL) measured by e.g. EQ-5D, 15D or SF-6D
- Advice on relevant cost components
- Advice on the collection of data
- Advice on the use of methods and analyses
- Other health economic issues (financing, cost analyses, choice models, etc.)
- Advice on methods for preparing a research project
- Advice on application writing

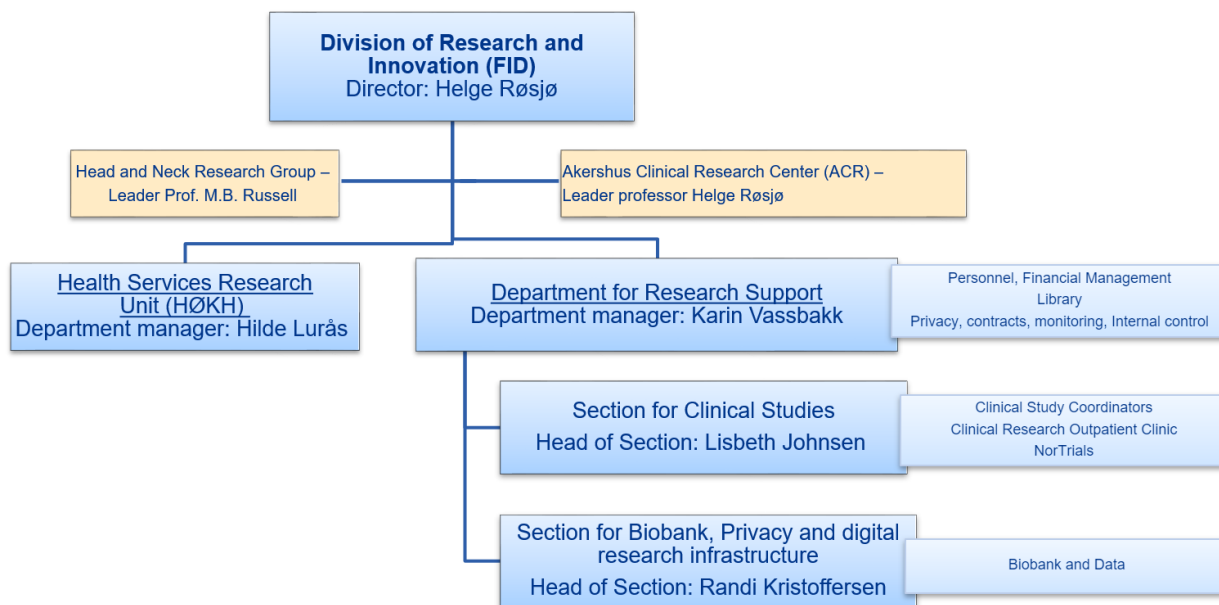
Analysis department (Data capture)

The analysis department is a service body for researchers at Ahus and Campus Ahus, UiO. The group helps with data collection, data extraction and secure storage of research data. If you want help, the project must have [the necessary applications and approvals in order](#).

More information about research outpatient clinics at Ahus - [see Research support and facilities - Akershus University Hospital \(ahus.no\)](#)

14. Organisational map Division of Research and Innovation

Figure 12: Organisation map for the Division of Research and Innovation as of November 2021



15. Appendix 1: Research groups as of October 2021

Division of Medicine. Research leader Per Selnes

- Cardiovascular Research Group (Torbjørn Omland)
- Pulmonary Medicine research group (Knut Stavem)
- Functional Genetics of Obesity Research Group (Yvonne Bøttcher)
- Cancer – Translational research group, AHUS (Jürgen Geisler)
- Clinical neuroscience research group (Tormod Fladby)
- Gastroenterology Research Group (Jørgen Jahnsen)
- Center for haematological research at Ahus (Anders Dahm)
- Renal medicine research group (My Svensson)
- Endocrinology research group (Ingrid Nerموen)
- Molecular and Clinical Oncology Group (Vessela Kristensen, Anne Hansen Ree, Hilde Nilsen)

Division of Surgery. Research leader Juha Tapio Silvola

- Anaesthesia (Signe Sjøvik)
- Gastrosurgery (Johannes Schultz)
- Vascular/Thoracic Research Group (Jarlis Wesche)
- Palliative medicine (Olav Magnus Fredheim)
- Ear-nose-throat (Harald Hrubos-Strøm)
- Urology (Stig Müller)
- Quality and patient safety (Anne Karin Lindahl)

Orthopaedic Clinic / research group. Research leader Asbjørn Årøen.

- Orthopaedic research group (Asbjørn Aarøen)

Division of Gynaecology and Obstetrics. Research leader Anne Eskild.

- Women's diseases and obstetric care (Anne Eskild)

Division of Mental Health/Department R&D (Research and development). Research leader Ketil Hanssen-Bauer

- Children & adolescents mental health (Marianne Aalberg)
- Mental health, treatment and implementation (Kristin S. Heiervang)
- Substance Use and Addiction (Lars Tanum)
- Neuropsychobiology (Soili Marianne Lehto)

Division of Research and Innovation. Research leader Helge Røsjø

- HØKH (Health service research) (Hilde Lurås)
- Head and neck research group (Michael Russel)

Division of Paediatric and Adolescent Medicine. Research leader Vegard Bruun Wyller

- PAEDIA (Vegard Bruun Wyller)

Division of Diagnostics and Technology. Research leader Ida Gjervold Lunde

- Infectious medicine and microbiology (Hege Vangstein Aamot)
- Medical Biochemistry. Interdisciplinary laboratory medicine and technology (Sigmund Sperstad)
- Pathology research group (Ulla Randen)
- Clinical radiology (Jon Terje Geitung)

Akershus universitetssykehus HF

Besøksadresse: Sykehusveien 25, Lørenskog
Postadresse: Postboks 1000, 1478 Lørenskog
Telefon: 67 96 00 00
Epost: postmottak@ahus.no