Evaluation of Medicine and Health (EVALMEDHELSE) 2023-2024

Self-assessment for research groups

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Institution (name and short name): Stavanger University Hospital, SUH
Administrative unit (name and short name): Stavanger University Hospital, SUH
Research group (name and short name): Centre for Age-related Medicine – SESAM
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Content

1. Organisation and strategy

1.1 Research group´s organisation

Describe the establishment and the development of the research group, including its leadership (e.g. centralised or distributed etc.), researcher roles (e.g. technical staff, PhD, post docs, junior positions, senior positions or other researcher positions), the group's role in researcher training, mobility and how research is organised (e.g. core funding organisation versus project based organisation etc.).

SESAM - Centre for Age-related Medicine was established by the Western Norway Regional Health Authority in 2010, to improve coordination, research and professional development, networking, and education. Appropriate treatment and care for older adults includes physical, psychiatric, and social interventions that arise in connection with acute illness, management of a chronic condition, or during rehabilitation, or end-of-life care. SESAM has employed key personnel throughout the Western Norway regional health authority, in each of the four local health trusts, to disseminate new knowledge and research in the area. Research at SESAM is interdisciplinary, with nine different occupational groups currently represented.

SESAM established WiseAge in 2017 to serve as a platform for user involvement and societal engagement, thereby guaranteeing active user participation in research initiatives undertaken by SESAM. It is a meeting place for dialogue between users, social actors and businesses, healthcare personnel and researchers. WiseAge contributes to user participation in all phases of new and established research projects and also in the dissemination of research-based knowledge.

SESAM has successfully grown from 18 staff members in 2012 to 61 staff in 2022, with 45 of these employed in different research projects, including approximately 36 researchers and 14 PhD candidates directly associated with the centre. SESAM's employees have extensive knowledge at professor and postdoc level, assisting with the supervision of master and PhD students, development of professional networks, establishing research infrastructure, and imparting of knowledge. We focus on recruitment and retention of senior researchers, on track for project management of research studies and professor careers. The professor group at SESAM provides mentorship for the senior researchers in this regard.

SESAM mainly employs a centralised leadership model. It is directed by Professor Ingelin Testad, which is the principal investigator (PI) of SESAMs *Care* programme (see 1.2) whereas Professor Dag Aarsland is PI of the *Treat* programme, and Dr. Martha Gjestsen is the PI of the *digitize* programme, together with Professor Clive Ballard as a senior physician. On subprogramme level, a **distributed leadership model** is employed in which SESAM's PhD students and Postdocs are (co-)supervised by SESAMs specialist consultants, research staff and senior advisers.

Table 1. List of number of personnel by categories
Instructions: Please provide number of your personnel by categories.
For institutions in the higher education sector, please use the categories used in DBH, https://dbh.hkdir.no/datainnhold/kodeverk/stillingskoder.

	Position by category	No. of researcher per category	Share of women per category (%)	No. of researchers who are part of multiple (other) research groups at the admin unit	No. of tempo-rary positions
No. of Personnel	Senior physicians	8	25%	3	2
	Physicians	8	20%	0	8

by position	Psychologists	1	0%	1	0
	Researchers and postdocs	8	88%	3	6
	PhD-students	14	43%	7	14
	Research support/ Administrative research staff	12	100%	0	9

1.2 Research group´s strategy

a) Describe the research group's main goals, objectives and strategies to obtain these (e.g. funding, plans for recruitment, internationalization etc.) within the period 2012-2022.

Goal. Since its launch, SESAMs mission is to develop sustainable care and cure strategies, including better diagnosis, risk prediction, and brain health interventions, to preserve well-being, cognition and independent living in aged, cognitively impaired people and people living with dementia.

Key objectives. To reach this overall goal, SESAM's strategy is to develop, advance and test 1. Cost-effective digitized technologies and infrastructures to develop, upscale and deliver interventions (*digitize*); 2. Cognitive and drug-based interventions to improve cognitive function and well-being (*treat*); and 3. care-provision models for improved psychosocial interventions, self-management, and care (*care*).

SESAM strategy and operations are supervised by the SESAM management team that takes care of SESAM activities in collaboration with colleagues and employees, professionals, researchers and clinicians, to implement the research, funding, internationalisation and recruitment strategies and plans, as highlighted below.

Research strategy. SESAMs strategy is to leverage (inter)national collaborations, networking, education, research and communication activities, as they all contribute to SESAMs mission. Interdisciplinarity is at the heart of SESAM, as *digitizing*, *treat* and *care* solutions reinforce each other and may be combined in most cost-effective, personalised interventions. Proven success determinants are the long-term collaborations with regional centres for the development and execution of multi-centre clinical studies and the continuous and extensive involvement of user participation and community engagement in all stages of research projects through the WiseAge platform. To guide this process, SESAM has developed a designated guide for professionals, researchers and user representatives, that includes measures to embed best scientific developments.

Funding strategy. A optimised and standardised grant quality assessment, prioritisation, application and project support has been instaled (See chapter 3 for detail). As part of this process, prior to any major call for proposals, researchers who are planning an application are required to present their project for the WiseAge user panel, a group of 15 WiseAge members dedicated to the role of being user representatives. The user panel provides advice and input, and 1-2 user representatives are appointed to each new project. SESAM's guide for user involvement in research serves as a resource for both users and staff affiliated with SESAM.

Growth and internationalisation strategy. SESAMs growth has been realised by: 1. a proactive research and funding strategy to best capture trends, needs and (funding) opportunities in ageing, digitization and the ever-increasing burden of cognitive impairment and dementia; 2. SESAM PIs leading by example to promote entrepreneurship, networking and collaboration to increase funding and research opportunities, and 3.

SESAMs extensive networking and education efforts to scout, attract, raise and keep (inter)national research talent.

b) Please describe the benchmark of the research group. The benchmark for the research group should be written by the administrative unit in collaboration with the research group. The benchmark can be a reference to an academic level of performance (national or international) or to the group's contributions to other institutional or sectoral purposes.

SESAM is expected to perform high quality research on cognitive impairment and dementia in elderly in Norway and beyond. This is monitored via the institutional benchmark criteria (performance criteria) and administrative unit targets for 2025. Section 1.3 highlights how SESAM has performed according to the administrative units criteria (benchmark results).

Institutional strategies and objectives	
Helse Stavanger shall conduct excellent research and patient treatment	
Users must be involved in all phases of the research	
Increase our international cooperation through networks, researcher mobility, publications, and external funding and perform clinical study programs in medicine established with associated research.	
Research group benchmarks (2025)	
Publications	# annual publications >75
	Maintain >25% publications in level 2 journals
	Maintain 50 per cent international co-authorship
Staff	Number of PhDs 3 per year
	Professor-competent employees from 5 to 7
	# of employees affiliated to other research groups
Funding	Coordinate at least 1 and partner at least 2 active EU projects
	Apply for SFI (Centre for Research and Innovation)
	(Inter)national funding exceeds WNRHA funding
Out-put	Ongoing collaboration with at least 5 private companies

Example: A benchmark for a research group is related to the research groups' aim which again is included in the strategy for the administrative unit. A guidance for the administrative unit to set a benchmark for the research group(s) can e.g. be: What do the administrative unit expect from the research group(s)?

c) Describe the research group`s contribution to **education** (**master´s degree and/or PhD**).

All of the senior researchers have a university affiliation, and the majority are engaged in the collaboration between Helse Stavanger and the University of Bergen regarding the education and training of medical students (Vestlandslegen). SESAM educates master students and PhD students using different education programs, across the research program digitize, care and treat. From 2012 until 2022, SESAM has thereby contributed to the education of 7 master students and 11 PhD students, as displayed in the table below.

Status	**MSc**	**PhD**	**Postdoc**
Completed	7	11	3
Ongoing	0	14	3
Total	7	25	6

In addition, SESAM researchers are involved in supervision of PhD students that were employed at the premises of international collaborators.

d) Describe the **support the host institution provides to the research group** (i.e., research infrastructure, access to databases, administrative support etc.).

Our research group benefits from a range of support services provided by the administrative unit, which are essential to our ability to conduct high-quality research. The support includes:

1. **Biostatistical Resources**: Assistance in building and maintaining databases of high quality, statistical analysis and guidance, and biostatistical education.
2. **Clinical Research Unit**: Provision of infrastructure for collecting, processing, and storage and biological samples.
3. **Biobanking Services**: Provision of infrastructure and support for biobanking of samples from the group's research project.
4. **Grant Application Support**: Support and guidance in the application process for external funding (both national and international) and subsequent management of projects.
5. **Training in Good clinical practise (GCP)**: Access to mandatory training in GCP to ensure ethical and quality clinical research practices.
6. **Legal Guidance**: Judicial guidance in preparing and negotiating legal agreements for research collaborations and data sharing.
7. **Access to National Network**: Access to the national network for researchers (Norwegian Clinical Research Infrastructure Network; NORCRIN) facilitating collaborations and resource sharing at the national level.

1.3 Relevance to the institutions

Describe the role of the research group within the administrative unit. Consider the research group's contribution towards the institutional strategies and objectives and relate the research group`s benchmark to these.

SESAM currently (2022) already fulfills many of the administrative unit targets set out for 2025, as indicated in the Table below. Based on growth performance during the past decade, and the ambition and expected growth of SESAM in the next decade, it is to be expected that SESAM will increasingly contribute to these targets in the upcoming years.

Institutional strategies and objectives	How SESAM contributes to these (2022)
Helse Stavanger shall conduct excellent research and patient treatment	Fundamental and clinical research by lab researchers and clinical specialists, to perform and directly impact on patient treatment. SESAM published 389 medical publications from 2012-2022 (Pubmed), including 17 clinical trials, 12 observational studies, and 10 meta-analyses to directly analyse and/or impact patient treatment.
Users must be involved in all phases of the research	Since its establishment in 2017, the patient and community platform WiseAge has been successfully involved all clinical research projects and stages of research (see section 1.2).
Increase our international cooperation through networks, researcher mobility, publications, and external	SESAM has a developed and built a broad international network (See figure in 1.6), exemplified by the long-term collaborations with King's College London (PI Dag

funding and perform clinical study programs in medicine established with associated research.		Aarsland) and University of Exeter (PI Clive Ballard), the PROTECT programs in UK, Canada and Norway, the large international PREDICTOM and eDLB network, and the >90% of publications co-authored by international collaborations from 2012-2022
Administrative unit targets (2025)		**How SESAM contributes to these targets (2022)**
Publications	# annual publications from 200 to 300	>50 publications, comprising 25% of total current SUS publications
	Maintain >25% publications in level 2 journals	Over 25% of papers are published in level 2 journals (top 10% of journals in the field). Examples include Nature Genetics (9), Nature Communications (5), Nature Reviews in Neurology (3), Lancet (8), Lancet Neurology (4), Journal of Alzheimers Disease (28) and Alzheimers Dementia (16).
	Maintain 50 per cent international co-authorship	Over 90% of all publications are co-authored by international collaborators.
Staff	Number of PhDs from 15 to 25 per year	SESAM delivered 11 PhDs in the past decade and delivers around 1-2 PhDs per year.
	Professor-competent employees from 30 to more than 50	Currently SESAM has 5 professor-competent employees, this number is expected to increase as the senior researchers aspire to achieve professor-competence within the next 5 years.
	# of employees affiliated to other research groups	SESAM has extensive local, national and international collaborations, consequently, several researchers are affiliated to other core research groups within the field
Funding	Coordinate at least 1 and partner at least 3 active EU projects	SESAM director Professor Ingelin Testad obtained funding for the first EU-coordinated research project at SUH3 partnered and 1 coordinated EU projects
	Increase share of annual regional research funding from Western Norway Regional Health Authority from 20% to 30%	The percentage of grant funding from regional and national sources was 29% of basic funding in 2012 and raised to 43% in 2022.
	(Inter)national funding exceeds WNRHA funding	International funding: 38 837 037NOK; national: 26 317 000 NOK) exceeds WNRHA funding (69 962 500 NOK)
Output	A least 5 patents and commercial agreements per year	Rather than commercialization, SESAM has focused on collaboration with industry partners.

1.4 Research group´s resources

Describe the funding portfolio of the research group for the last five years (2018-2022).

The research group's activities are funded by three main sources:

1. Basic funding by the Norwegian Department of Health. Approximately 30% of this funding is allocated to research-related activities.
2. Basic funding of permanent research positions (including technical/administrative staff) by Stavanger University Hospital.
3. Project-based external funding from the private and public sector.

Between 2018 and 2022, the total funding per year varied between 15 and 48 million NOK, thanks to the acquisition of major EU grants. External funding was obtained from the following sources:

- National, private sector: Norwegian Health Association, Foundation Dam, Civitan, Blidensol fund
- National, public sector: Stavanger University Hospital, University of Stavanger, University of Bergen, Western Norway University of Applied Sciences, KLINBEFORSK, Norwegian Health Services Research Network, Western Norway Health Authority research grants, and The Research Council of Norway
- International, private sector: EVONIK, Daily Colors, Alzheimer's Drug Discovery Foundation
- International, public sector: EU, University of Exeter

Table 2. Describe the sources of R&D funding for the research group in the period 2018-2022.

	2018 (NOK)	**2019 (NOK)**	**2020 (NOK)**	**2021 (NOK)**	**2022 (NOK)**
Basic funding	10 500 000	10 500 000	10 500 000	10 500 000	10 500 000
Funding from industry and other private sector sources	36 000 000	300 000	200 000	6 042 000	1 200 000
Commissioned research for public sector					
Research Council of Norway					
Grant funding from other national sources	3 075 000	33 211 500	6 294 000	42 757 000	4 500 000
International funding e.g. NIH, NSF, EU framework programmes	34 667 037			5 700 000	3 600 000
Other					

1.5 Research group´s infrastructures

a) Research infrastructures are facilities that provide resources and services for the research communities to conduct research and foster innovation in their fields. These include major equipment or sets of instruments, knowledge-related facilities such as collections, archives or scientific data infrastructures, computing systems communication networks. Include both internal and external infrastructures.

Co-management of large international clinical trial consortia. This includes eDLB, the largest international consortium on dementia with Lewis Bodies worldwide, with SESAM managing the Norwegian centres.

Management of national E-health network. National collaboration group for health research in the specialist health care services (Nasjonal samarbeidsgruppe for helseforskning I spesialisthelsetjenesten (NSG)) awarded SESAM an e-health network, which facilitated collaborative relationships enabling skills development, improving coordination and strengthening of research within a limited subject area beyond what can be achieved by the individual research environments alone. This network is constantly being updated and enriched with novel e-health tools and solutions, from amongst others the EU funded projects **SHAPE** "Online Self-management and HeAlth Promotion in early-stage dementia with E-learning for carers – a randomized controlled trial", **RoboCare** "Digital meeting place for people living in nursing homes and their care partners"" and **RADAR AD** "Remote Assessment of Disease and Relapse – Alzheimer's Disease (RADAR-AD)".

Management of a national online clinical research platform. SESAM manages PROTECT Norge – a large-scale research network for online dementia prevention clinical studies, that is built on and hosted by the successful PROTECT UK infrastructure.

Coordination of the national end-user infrastructure WiseAge. Knowledge and networking infrastructure for user participation and community engagement.

b) Describe the most important **research infrastructures** used by the research group**.**

SESAM utilises the following research infrastructures:

Equipment/facilities:

- Internal technical infrastructure, including an EEG lab and technical equipment for clinical assessment.
- Local infrastructure at Stavanger University Hospital
  - Clinical Research Unit for collection and handling of biological samples
  - Biobank facilities and infrastructure
- Local collaborative lab facilities at Stavanger University Hospital and the University of Stavanger
- National collaborative lab facilities and competence with Akershus University Hospital and the University of Oslo (NORMENT: Norwegian Centre for Mental Disorders Research).
- International collaborative lab facilities and competence, with recent prominent examples including King's College London (UK; DLB and dementia research), University of Exeter (UK; Dementia research and PROTECT infrastructure), and The University of Gothenburg (Sweden, proteomics).

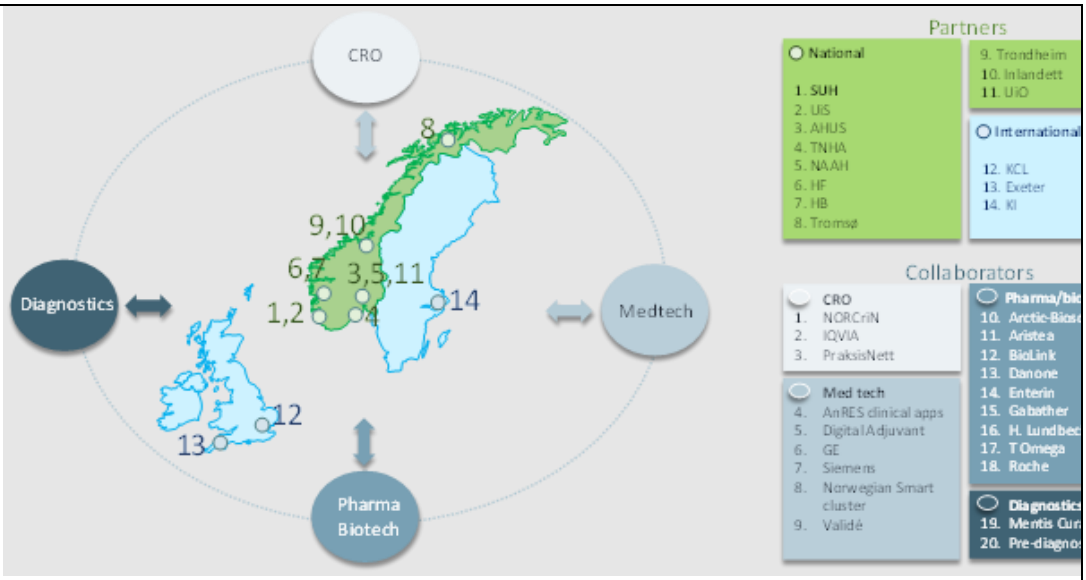
Platforms and networks for data processing:

- NorCRIN, a partnership between all six university hospitals in Norway
- REDCap, a web application for building and managing online surveys and databases

1.6 Research group´s cooperations

Table 3. Reflect on the current interactions of the research group with other disciplines, non-academic stakeholders and the potential importance of these for the research (e.g. informing research questions, access to competence, data and infrastructure, broadening the perspectives, short/long-term relations).

Inter-disciplinary (within and beyond the group)	**Interdisciplinarity within SESAM:** Different disciplines, including genetic, psychiatric, geriatric, nursing, neuroimaging, pharmacology, and end-user involvement expertise, are used across the interdisciplinary programmes *digitize*, *care* and *treat*. **Interdisciplinarity beyond the group.** SESAM is collaborating with centres and experts that bring complementary disciplines, including AI, digital solutions and basic research.
Collaboration with other research sectors e.g. higher education, research institutes, health trusts and industry.	**List of collaborators:** SESAM is collaborating extensively on regional, national and international level with all types of public and private (research) organisations, as is summarised and visualised below. Academic partners are important for (clinical) research collaborations, and patient recruitment, e.g. through the PROTECT network (Exeter) , whereas industrial partners are amongst others important for sponsoring (pharma) or supporting (CRO/Medtech) clinical trials.

	
Transdisciplinary (including non academic stakeholders)	**Patients and society**. WiseAges facilitates the use of older people's expertise and experience in research and knowledge development, by a user panel and user advisory board. The wider community is included by amongst others "Ask Society Knowledge (ASK)! Ask the one who it is about" which is a database comprising the users view on research and social issues and how each individual wants to engage in WiseAge. **Industry**. SESAM works extensively with industry, on regional level (examples regional biocluster), as well as (inter)national level, mainly as part of funded public-private projects (e.g. PD-MIND, RADAR-AD, PREDICTOM). The list of industrial collaborators is summarized in the figure above.

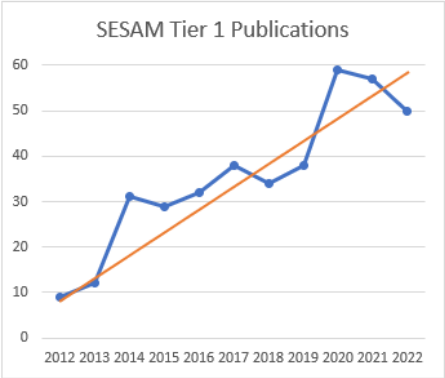
2. Research quality

2.1 Research group's scientific quality

Describe the research profile of the research group and the activities that contribute to the research group´s scientific quality. Consider how the research group's work contributes to the wider research within the research group's field nationally and internationally.

The research quality of SESAM is high. The SESAM infrastructure has facilitated coordination of and partnership in major national and international initiatives that each contribute to maintain brain health and treat neurodegenerative dementias to place Norwegian geriatric clinical science at the forefront of international research. We have also used the infrastructure developed as part of funding within Norway to lead successful bids for major AD clinical trials from the UK and US, in total bringing in more than 100m NOK of international funding for a current and expanding portfolio of 6 cutting edge clinical trials to boost Norway's R&D competitiveness and increase the participation of Norwegians in clinical trials. Concrete clinical outputs include the establishment of new longitudinal outcomes, biomarkers and treatment targets through our longitudinal dementia cohort study (DEMVEST), updated diagnostic criteria for DLB Dementia and best drug repurposing strategies for DLB and AD, through amongst others the DLB consortium coordinated by Dag Aarsland and the Abba-GP and GP/PHD project, new remote memory assessments for use in the clinic, derived from RADAR-AD.

The number of Tier 1 (peer reviewed) publications in Pubmed rose from 9 (2012) to around 60 (2020-2022) in 10 years, with an average increase of 4-5 publications per year.



Most publications are on dementia, including Alzheime''s (149) and/or Dementia with Lewy Bodies (101), while also a significant number of publications deals with cognitive impairment in general (34) and in Parkinson disease (63). Over 25% of papers are published in level 2 journals (top 10% of journals in the field). Examples include Nature Genetics (9), Nature Communications (5), Nature Reviews in Neurology (3), Lancet (8), Lancet Neurology (4), Journal of Alzheimers Disease (28) and Alzheimers Dementia (16).

SESAM research is designed, supported and monitored through a set of concerted measures to maintain and improve the research group´s scientific quality across the different research profiles and research programmes. Most important measures include:

Weekly research meetings of the Management team, to design and coordinate the research programmes, and the Research intervention team, to facilitate and monitor high-quality research applications and derived projects.

SESAM research policy handbook for research staff and new joiners (in En and No) that contains amongst others quality standards, research code of conduct, best practises, and research support facilities and procedures.

New R&D strategy. SESAM recently updated the set-up and implementation of a joint R&D strategy with help of an external expert consultant, to ensure that research funding applications and funded projects best meet SESAMs R&D agenda and are of highest quality. Measures include amongst others: Using clear internal selection criteria and procedures aligned with the SESAM R&D agenda to prioritise new research applications and clinical trials; install a standardised process to develop applications and manage granted projects, incentivized by grant support when adhering to SESAM policies; improve opportunities and talent programmes for high-performers; install flexible career paths across SESAMs core activities (networking, education, and research). See chapter 3 for further detail.

Please add a link to the research group`s website: SESAM - Centre for Age-Related Medicine - Helse Stavanger HF (helse-stavanger.no)

Table 4. List of projects

Instructions: Please select 5-10 projects you consider to be representative/the best of the work in the period 1 January 2012 – 31 December 2022. The list may include projects lead by other institutions nationally or internationally.

Project 1: Self-management and HeAlth Promotion in Early-stage Dementia With E-learning for Carers *2019-present*	**Project owner(s)**	Prof. Ingelin Testad (Centre for Age Related Medicine SESAM, Stavanger University Hospital)
	Total budget and share allocated to research group	**Total:** NOK 34 746 108 **Share allocated to research group:** NOK 16 900 000
	Objectives and outcomes (planned or actual) **and link to website**	**Objective:** The primary objective is to evaluate how we can improve self-efficacy in people with dementia, by evaluating the effectiveness of the intervention compared to treatment as usual. **Planned outcome:** Effect of the SHAPE group intervention on people with mild to moderate dementia in terms of self-efficacy and improvement in key health and mental health outcomes and cost-effectiveness, along with carer stress and knowledge of dementia. **Website:** SHAPE (shapeproject.eu)
Project 2: Improving Well-being and Health for People with Dementia (WHELD) *2010-2016*	**Project owner(s)**	Prof. Clive Ballard (King's College London, UK) Prof Ingelin Testad – Coordinator (Centre for Age Related Medicine SESAM, Stavanger University Hospital)
	Total budget and share allocated to research group	**Total:** GBP 2 106 004 **Share allocated to research group:** In-kind contribution
	Objectives and outcomes (planned or actual) **and link to website**	**Objective:** The objective was to develop and evaluate a complex intervention to improve well-being, reduce antipsychotic use and improve quality of life in people with dementia in care homes through person-centred care, management of agitation and non-drug approaches. **Outcome:** The WHELD programme is effective in improving quality of life and reducing both agitation and overall neuropsychiatric symptoms in people with dementia in care homes. It provides a structured training and support intervention for care staff, with lower overall costs for resident care than treatment as usual. **Website:** The WHELD programme for people with dementia helps care home staff deliver person-centred care (nihr.ac.uk)
Project 3: The Dementia Study in Western Norway (DemVest) *2005-2030*	**Project owner(s)**	Prof. Dag Årsland (Centre for Age Related Medicine SESAM, Stavanger University Hospital)
	Total budget and share allocated to research group	**Total and share allocated to research group:** The project has received multiple fundings from various source over the years, including PhD funding and funding from the Norwegian Health Association. DemVest is a major collaboration project between multiple study centers. Each group possesses independent funding, and researchers contribute based on in-kind contributions.
	Objectives and outcomes	**Objective:** The objective was to follow people with different forms of dementia throughout the course of the disease in order to study the development of functional impairment and impairment of various brain functions. **Outcome:**

	(planned or actual) **and link to website**	Study incidence, clinical profile and course, diagnostic distribution and diagnostic accuracy as well as biological conditions linked to the most prevalent diagnoses of dementia. **Website**: DemVest study - Helse Stavanger HF (helse-stavanger.no)
Project 4: Dementia Disease Initiation (DDI) *2012-2025*	**Project owner(s)**	Prof. Tormod Fladby (Akershus University Hospital)
	Total budget and share allocated to research group	The project received original funding from EU JPND NOK 2 400 000 in 2012 and had received multiple fundings from various source over the years, DDI has become a major collaboration between multiple study centers. Each group possesses independent funding, and researchers contribute based on in-kind contributions.
	Objectives and outcomes (planned or actual) **and link to website**	**Objective:** The purpose of the project is to map risk factors associated with neurological diseases and investigate why memory difficulties and other cognitive problems occur. **Planned outcome:** Additional knowledge is needed, particularly regarding the initial phase of the disease, to develop new biomarkers and potentially disease-modifying treatments. **Website:** DDI study - "When your memory fails" - Helse Stavanger HF (helse-stavanger.no) [norwegian]
Project 5: RADAR-AD *2021-2025*	**Project owner(s)**	Prof. Dag Årsland (King's College London UK)
	Total budget and share allocated to research group	**Total:** EUR 7 659 120 **Share allocated to research group:** EUR 882 041
	Objectives and outcomes (planned or actual) **and link to website**	**Objective:** We aim to investigate how mobile technologies can improve our understanding of Alzheimer's Disease. For example, these techniques might help to detect AD earlier in people with cognitive decline. Mobile technology also allows for a more personalized approach to AD treatment and care, so that people with this disease can live independently for longer. In addition, we also aim to identify "digital biomarkers" (electronic signals that give information about a person's health status) for AD. **Planned outcomes:** Detect AD earlier in people with cognitive decline. Mobile technology also allows for a more personalized approach to AD treatment and care, so that people with this disease can live independently for longer. In addition, we also aim to identify "digital biomarkers" (electronic signals that give information about a person's health status) for AD. **Website:** Welcome to RADAR-AD | Radar-AD (radar-ad.com)
Project 6: The Norwegian Anti-Dementia Drug Trial Platform (NORADD-TP): A nationwide trial platform of symptomatic and disease-	**Project owner(s)**	Prof. Dag Årsland (Centre for Age Related Medicine SESAM, Stavanger University Hospital)
	Total budget and share allocated to research group	**Total:** NOK 20 000 000 **Share allocated to research group:** NOK 20 000 000
	Objectives and outcomes (planned or actual) **and link to website**	**Objective:** 1: Complete an ascending dose, randomized, placebo-controlled trial of phenserine to determine the maximally tolerated and safe phenserine dose to inform a phase 2 trial; 2: Conduct a Phase 2 placebo-controlled RCT of phenserine in people with early AD; 3: Conduct a Phase 2 placebo-controlled RCT of valacyclovir in people with AD 3; 4: Establish the nationwide infrastructure required for recruiting participants with AD and conducting Phase 2 studies with clinical and biomarker outcomes. **Planned outcome:** At the end of the study, we will have in place an

modifying anti-dementia compounds *2022 -present*		infrastructure enabling successful conduct of future anti-dementia clinical trials, allowing patients across the country to participate. We will have determined the maximally tolerated and safe phenserine dose to inform the subsequent phase 2 trial. A three-arm phase 2 trial of phenserine and valaciclovir in early AD will have been completed. The findings from this study will provide information for subsequent phase 3 trials to confirm the clinical effect of these compounds. **Website:** 100 MNOK for Clinical Research: Dementia Study at SUH [Norwegian]
Project 7: Online Assessment of Lifestyle Factors on Cognitive Performance – PROTECT Norge *2020–- present*	**Project owner(s)**	Prof. Ingelin Testad (Centre for Age Related Medicine SESAM, Stavanger University Hospital)
	Total budget and share allocated to research group	**Total and research group share:** The project has an annual running cost of GBP 569 808, funded by the research groups in kind contributions.
	Objectives and outcomes (planned or actual) **and link to website**	**Primary objective**: To determine the role of defined genetic factors on cognition in people over 50. **Outcome measure:** Creation of polygenic risk score for dementia, based on genome-wide association analysis. **Secondary Objectives:** To determine the role of lifestyle and environmental factors on cognition in people over 50. **Outcome measure:** Association of cognitive performance and self-reported lifestyle and environmental factors. **Tertiary Objectives:** To develop a minimum dataset and consent-for-consent cohort to support future research in cognition and healthy ageing in people over 50, including use of the PROTECT infrastructure to deliver online clinical trials. **Outcome measure:** Audit of recruitment figures, integrity of consent process and success in leveraging clinical trial funding. To investigate the short-and long-term sensitivity of a series of cognitive tests when completed by this group. **Additional outcome measure:** Validation analysis of the PROTECT Cognitive Test battery against independent online Cognitive Test series, and through internal validity analysis. To support the ageing research community through data collection and infrastructure for trials and longitudinal data collection. **Website:** PROTECT Norway - Helse Stavanger HF (helse-stavanger.no) [norwegian]
Project 8: Anthocyanins: A new approach to prevention of dementia? (ACID) *2017-2025*	**Project owner(s)**	Prof. Dag Årsland (Centre for Age Related Medicine SESAM, Stavanger University Hospital)
	Total budget and share allocated to research group	**Total:** NOK 9 300 000 **Share allocated to research group:** NOK 9 300 000
	Objectives and outcomes (planned or actual) **and link to website**	**Objectives:** The aim of this project is to perform a 24-week parallel-group placebo-controlled Phase 2 trial, to study the safety and efficacy of anthocyanins in improving key dementia-related mechanisms and cognitive functioning in older people at risk for dementia. **Outcomes:** Anthocyanin supplementation for 24 weeks was safe and well tolerated in people with MCI or cardiometabolic disorders. We found no significant group difference in episodic memory at the end of the study but statistically significant differences in slopes. **Website:** The ACID study - Helse Stavanger HF (helse-stavanger.no)
	Project owner(s)	Prof. Dag Årsland (Centre for Age Related Medicine SESAM, Stavanger University Hospital)

Project 9: DERAIL–- Frequency, risk factors and prognosis of hospital delirium *2022–- present*	**Total budget and share allocated to research group**	Total: NOK 7 479 000 **Share allocated to research group:** NOK 7 479 000
	Objectives and outcomes (planned or actual) **and link to website**	**Objectives:** The purpose of the DERAIL study is to identify risk factors for delirium in patients 65 years and above who are acutely admitted to the hospital, and to investigate the occurrence and course of delirium in these patients. **Planned outcome:** Increased knowledge about the association between delirium and the development of dementia with Lewy bodies. **Website:** DERAIL study - Helse Stavanger HF (helse-stavanger.no) [norwegian]
Project 10: ANeED study: A phase iIa multicentre randomized controlled double blind clinical trial to demonstrate clinical efficacy on cognitive, neuropsychiatric and functional outcomes of Ambroxol in New and Early patients with prodromal and mild Dementia with Lewybodies *2021-2026*	**Project owner(s)**	Prof. Arvid Rongve (Helse Fonna HF)
	Total budget and share allocated to research group	**Total**: NOK 36 000 000 **Share allocated to research group:** NOK 1 600 000
	Objectives and outcomes (planned or actual) **and link to website**	**Objective:** In this study, we aim to investigate whether the medication Ambroxol may have an effect on cognitive impairment or dementia caused by Lewy body disease (DLB). The project also addresses eHealth in DLB, where the objective is to identify digital bio-signatures by applying wearables (a smartwatch and EEG/EOG glasses, EEG headband and a kinetic sensor) in DLB to define diagnosis, prognosis and drug effects and develop a unique DLB-application for devices like smartphones and tablets. An integrated programme on Public and Patient Involvement, coordinated through WiseAge by SESAM, to increase recruitment and containment of participants in the ANeED study. **Planned outcomes:** Primary outcomes will be cognition, global function, disease stage, progression, and neuropsychiatric symptoms. Secondary outcomes will be on sleep disturbances, falls, fluctuations and parkinsonism, and exploratory outcomes will be impact on the potential biomarkers for drug effects defined as qEEG, DaTSCAN, MRI and α-synuclein in CSF. We will build a trial-ready network of Memory Clinics across Norway, and we will design a PPI program in close collaboration with our user and caregiver representatives and our media department to reduce stigma, raise awareness and recruit patients and caregivers. **Website:** ANeED study - Helse Stavanger HF (helse-stavanger.no) [norwegian]

Table 5. Research group's contribution to publications

Instructions: Please select 5-15 publications from the last 5 years (2018-2022) with emphasis on recent publications where group members have a significant role. If the publication is not openly available, it should be submitted as a pdf file attached to the self-assessment. We invite you to refer to the Contributor Roles Taxonomy in your description: https://credit.niso.org/.

Cf. Table 1. List of personell by categories: Research groups up to 15 group members: 5 publications. Research groups up to 30 group members: 10 publications. Research groups above 30 group members: 15 publications.

Publication 1: **Title:** Impact of person-centred care training and person-centred activities on quality of life, agitation, and antipsychotic use in people with dementia living in nursing homes: A cluster-randomised controlled trial Journal: PLOS Medicine Year: 2018 DOI: https://doi.org/10.1371/journal.pmed.1002500 URL: https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002500	**Authors**	**Ballard C**, Corbett A, Orrell M, Williams G, Moniz-Cook E, Romeo R, Woods B, Garrod L, **Testad I,** Woodward-Carlton B, Wenborn J, Knapp M, Fossey J.
	Short description	People with dementia living in care homes often experience agitation and other symptoms that are difficult to treat and distressing for the individual. The study tested the WHELD programme, which combined staff training, social interaction, and guidance on use of antipsychotic medications, in 69 UK care homes in a 9-month clinical trial. Results showed that care homes receiving the WHELD programme saw improvements in quality of life as well as other important symptoms including agitation, behaviour, and pain in people with dementia. The WHELD programme was also shown to be cost-effective.
	Research group's contribution	Professor Testad was part of developing the study, and members from the research group contributed to the data collection in UK. Testad has also contributed to the publication of results in high quality research journals.
Publication 2: **Title:** The psychosis spectrum in Parkinson disease. Journal: Nat Rev Neurol. Year: 2017 DOI: https://doi.org/10.1038/nrneurol.2016.200 URL: https://www.nature.com/articles/nrneurol.2016.200	**Authors**	Ffytche DH, Creese B, Politis M, Chaudhuri KR, Weintraub D, **Ballard** C, **Aarsland** D
	Short description	This review focuses on psychosis in Parkinson disease (PD). Key topics include the prospective risk of dementia in individuals with PD psychosis, and the causal and modifying effects of PD medication. We discuss recent developments, including recognition of an increase in the prevalence of psychosis with disease duration, addition of new visual symptoms to the psychosis continuum, and identification of frontal executive, visual perceptual and memory dysfunction at different disease stages. In addition, we highlight novel risk factors - for example, autonomic dysfunction - that have emerged from prospective studies, structural MRI evidence of frontal, parietal, occipital and hippocampal involvement, and approval of pimavanserin for the treatment of PD psychosis.

	Research group's contribution	This is one publication in a cluster of pimavanserin trials that led to licensing of pimavanserin in US for Parkinson's disease and then evaluated for treatment of AD. This review also included first publication of the PD dementia data from the 2014 study and included Dag Aarsland. The Stavanger team were instrumental in setting up the care home research network that enabled the trial to be delivered – and which is now mirrored in Stavanger – giving us excellent opportunity to run this type of trial in Stavanger re psychosis and agitation – and currently in advanced discussions with several pharmaceutical companies re a substantial contract.
Publication 3: **Title:** Characteristics and predictors for hospitalizations of home-dwelling older persons receiving community care: a cohort study from Norway Journal: BMC Geriatrics Year: 2018 DOI: https://doi.org/10.1186/s12877-018-0887-z URL: https://bmcgeriatr.biomedcentral.com/articles/10.1186/s12877-018-0887-z	**Authors**	**Gjestsen, MT**, Brønnick K, **Testad I.**
	Short description	Older persons are substantial consumers of both hospital- and community care, and there are discussions regarding the potential for preventing hospitalizations through high quality community care. The study identified some clinically relevant factors that are vital in understanding what health care personnel in community care need to be especially aware of in order to prevent hospitalizations for this population.
	Research group's contribution	The publication was part of the PhD thesis by Martha Therese Gjestsen at SESAM. Ingelin Testad was the candidate's main supervisor.
Publication 4: **Title:** Drug repositioning and repurposing for Alzheimer disease**.** Journal: Nat Rev Neurol. Year: 2020 DOI: https://doi.org/10.1038/s41582-020-0397-4 URL: https://www.nature.com/articles/s41582-020-0397-4	**Authors**	**Ballard** C, **Aarsland** D, Cummings J, O'Brien J, Mills R, Molinuevo JL, Fladby T, Williams G, Doherty P, Corbett A, Sultana J.
	Short description	Drug repositioning and repurposing can enhance traditional drug development efforts and could accelerate the identification of new treatments for individuals with Alzheimer disease (AD) dementia and mild cognitive impairment. Promising compounds are highlighted, to prioritize for clinical trials in individuals with AD. We also describe emerging work, focusing on the potential value of transcript signatures as a cost-effective approach for the identification of novel candidates for repositioning.
	Research group's contribution	Two SESAM affiliated professors as lead authors. This work has underpinned the successful grant applications for trials of phenserine, fasudil and anti-virals that are and will be running in Stavanger.

Publication 5: **Title:** Self-management and HeAlth Promotion in Early-stage Dementia With E-learning for Carers (SHAPE): study protocol for a multi-centre randomised controlled trial *Journal: BMC Public Health* *Year: 2020* *DOI:* *https://doi.org/10.1186/s12889-020-09590-9* *URL:* *https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-020-09590-9*	**Authors**	**Testad I,** Clare L, Anstey K, Selbæk G, Bjørklof GH, Henderson C, Dalen I, **Gjestsen MT,** Rhodes S, Røsvik J, Bollen J, Amos J, **Kajander MM**, Quinn L, Knapp M.
	Short description	The SHAPE intervention is designed to meet the needs of people with dementia to maintain independence and dignity, improve health behaviours, and live well with the disease in their own home for as long as possible. The primary objective is to evaluate how we can improve self-efficacy in people with dementia, by evaluating the effectiveness of the intervention compared to treatment as usual.
	Research group's contribution	The research group conceptualised the study and obtained the funding, and further developed the study design and methods. The group further contributed in setting up the trial locally at each site and developed the intervention material. The group, along with co-authors, drafted the manuscript, and all other authors reviewed and provided feedback on the drafts.
Publication 6: **Title:** Improving mental health and reducing antipsychotic use in people with dementia in care homes: the WHELD research programme including two RCTs *Journal: Programme Grants for Applied Research* *Year: 2020* *DOI:https://doi.org/10.3310/pgfar08060* *URL:* https://www.journalslibrary.nihr.ac.uk/pgfar/pgfar08060#/abstract	**Authors**	**Ballard C**, Orrell M, Moniz-Cook E, Woods R, Whitaker R, Corbett A, **Aarsland D,** Murray J, Lawrence V, **Testad I**, Knapp M, Romeo R, Zala D, Stafford J, Hoare Z, Garrod L, Sun Y, McLaughlin E, Woodward-Carlton B, Williams G, Fossey J.
	Short description	The objective of the study described in the publication was to develop and evaluate a complex intervention to improve well-being, reduce antipsychotic use and improve quality of life in people with dementia in care homes through person-centred care, management of agitation and non-drug approaches. The WHELD programme is effective in improving quality of life and reducing both agitation and overall neuropsychiatric symptoms in people with dementia in care homes. It provides a structured training and support intervention for care staff, with lower overall costs for resident care than treatment as usual.
	Research group's contribution	Stavanger team was leading in study development and data collection – links in with future aims to run WHELD in Norway.
Publication 7: **Title:** Loneliness, physical activity and mental health during Covid-19: a longitudinal analysis of	**Authors**	Creese B, Khan Z, Henly W, O'Dwyer S, Corbett A, Vasconselos Da Silva M, Mills K, Wright N**, Testad I, Aarsland D, Ballard, C.**
	Short description	Loneliness and physical activity are important targets for research into the impact of COVID-19 because they have established links with mental health, could be exacerbated by social distancing policies, and are potentially modifiable. After accounting for pre-COVID-19 trends, we show that experiencing

depression and anxiety between 2015 and 2020 *Journal: International Psychogeriatrics* *Year: 2021* *DOI:* https://doi.org/10.1017/S1041610220004135 *URL:* https://www.cambridge.org/core/journals/international-psychogeriatrics/article/loneliness-physical-activity-and-mental-health-during-covid19-a-longitudinal-analysis-of-depression-and-anxiety-in-adults-over-the-age-of-50-between-2015-and-2020/3ABF68EC662FA64D8B638362B24A740A		loneliness and decreased physical activity are risk factors for worsening mental health during the pandemic. Our findings highlight the need to examine policies which target these potentially modifiable risk factors.
	Research group's contribution	The research group contributed to study design, funding, manuscript drafting, and review.
Publication 8: Title: An update on blood-based biomarkers for non-Alzheimer neurodegenerative disorders *Journal: Nature Reviews Neurology* *Year: 2020* *DOI:* 10.1038/s41582-020-0348-0 URL: https://www.nature.com/articles/s41582-020-0348-0	**Authors**	**Ashton**, N. J., Hye, A., Rajkumar, A. P., Leuzy, A., Snowden, S., Suárez-Calvet, M., ... & **Aarsland, D.**
	Short description	This review outlines the neuropathological, clinical, molecular imaging and cerebrospinal fluid features of the most common neurodegenerative disorders outside the Alzheimer Disease continuum and gives an overview of the current status of blood-based biomarkers for these disorders.
	Research group's contribution	The group contributed to the initial idea and outline of content for the manuscript, as well as critical review and editing the manuscript.
Publication 9: Title: Parkinson disease-associated cognitive impairment	**Authors**	**Aarsland, D**., Batzu, L., Halliday, G. M., Geurtsen, G. J., **Ballard, C.,** Ray Chaudhuri, K., & Weintraub, D.

Journal: Nature Reviews Disease Primers *Year: 2021* DOI: 10.1038/s41572-021-00280-3 URL: https://pubmed.ncbi.nlm.nih.gov/34210995/	**Short description**	The mechanisms underlying cognitive decline in Parkinson disease (PD) remain largely unclear. Here, we describe the epidemiology of PD-associated cognitive impairment and what is known about its mechanisms and pathophysiological changes. In addition, the diagnostic criteria, procedures and biomarkers to identify patients with PD at increased risk for early and rapid cognitive decline, are reviewed. Finally, we present an overview of the status of pharmacological and non-pharmacological therapeutic strategies and an outline of the most promising breakthroughs that are likely to drive future research pathways.
	Research group's contribution	Lead author invited to write a primer; brought in the authors and led the writing process.
Publication 10: Title: Synaptic markers of cognitive decline in neurodegenerative diseases: a proteomic approach *Journal: Brain* *Year: 2018* *DOI:*https://doi.org/10.1093/brain/awx352 URL: https://academic.oup.com/brain/article/141/2/582/4791883	**Authors**	Bereczki, E., Branca, R. M., Francis, P. T., Pereira, J. B., Baek, J. H., **Hortobágyi**, T., Winblad, B., **Ballard, C.**, Lehtiö, J., **Aarsland, D.**
	Short description	Cognitive changes occurring throughout the pathogenesis of neurodegenerative diseases are directly linked to synaptic loss. We used in-depth proteomics to compare 32 post-mortem human brains in the prefrontal cortex of prospectively followed patients with Alzheimer's disease, Parkinson's disease with dementia, dementia with Lewy bodies and older adults without dementia. We present results that suggest that particular synaptic proteins have an important predictive and discriminative molecular fingerprint in neurodegenerative diseases and could be a potential target for early disease intervention.
	Research group's contribution	DAG Conceptualization and project administration, data collection and curation and validation.
Publication 11: Title: Association of Plasma p-tau181 and p-tau231 Concentrations With Cognitive Decline in Patients With DLB *Journal: JAMA Neurologyl* *Year: 2022* *DOI:* *10.1001/jamaneurol.2021.4222* URL: https://jamanetwork.com/journals/jamaneurology/article-abstract/2786605	**Authors**	Gonzalez MC, **Ashton** NJ, Gomes BF, **Tovar-Rios DA**, Blanc F, Karikari TK, Mollenhauer B, Pilotto A, Lemstra A, Paquet C, Abdelnour C, Kramberger MG, Bonanni L, Vandenberghe R, Hye A, Blennow K, Zetterberg H, **Aarsland D; European–Dementia With Lewy Bodies (E-DLB) Consortium.**
	Short description	Plasma phosphorylated tau (p-tau) has proven to be an accurate biomarker for Alzheimer disease (AD) pathologic characteristics, offering a less expensive and less invasive alternative to cerebrospinal fluid (CSF) and positron emission tomography biomarkers for amyloid-β and tau. This study suggests that plasma p-tau181 and p-tau231 levels may be used as cost-effective and accessible biomarkers to assess cognitive decline in individuals with DLB.
	Research group's contribution	Conceptualization and project administration, data collection and curation and validation

Publication 12: Title: Remote monitoring technologies in Alzheimer's disease: design of the RADAR-AD study Journal Alzheimer's Research & Therapy Year: 2021 DOI: *https://doi.org/10.1186/s13195-021-00825-4* URL: https://link.springer.com/article/10.1186/s13195-021-00825-4	**Authors**	Muurling, M., de Boer, C., Kozak, R., Religa, D., Koychev, I., Verheij, H., Nies, V. J. M., Duyndam, A., Sood, M., Fröhlich, H., Hannesdottir, K., Erdemli, G., Lucivero, F., Lancaster, C., Hinds, C., Stravopoulos, T. G., Nikolopoulos, S., Kompatsiaris, I., Manyakov, N. V., Owens, A. P., Narayan, V. A., **Aarsland, D.,** & Visser, P. J.
	Short description	Remote monitoring technologies (RMTs), such as smartphone applications, wearables, and home-based sensors, can change these periodic subjective assessments to more frequent, or even continuous, objective monitoring. The aim of the RADAR-AD study is to assess the accuracy and validity of RMTs in measuring functional decline in a real-world environment across preclinical-to-moderate stages of AD compared to standard clinical rating scales.
	Research group's contribution	Stavanger team had the PI of the project, designed and planned the study and contributed to data collection as a clinical site.
Publication 13: Title: The combined effect of amyloid-β and tau biomarkers on brain atrophy in dementia with Lewy bodies Journal: NeuroImage: Clinical Year: 2020 DOI: 10.1016/j.nicl.2020.102333 URL: https://www.sciencedirect.com/science/article/pii/S2213158220301704	**Authors**	Abdelnour, C., Ferreira, D., **Oppedal**, K., Cavallin, L., Bousiges, O., Wahlund, L. O., Hort, J., Nedelska, Z., Padovani, A., Pilotto, A., Bonanni, L., Kramberger, M. G., Boada, M., Westman, E., Pagonabarraga, J., Kulisevsky, J., Blanc, F., & **Aarsland**, D.
	Short description	Alzheimer's disease (AD)-related pathology is frequently found in patients with dementia with Lewy bodies (DLB). However, it is unknown how amyloid-β and tau-related pathologies influence neurodegeneration in DLB. This paper highlights that CSF Amyloid- β is related to medial temporal and posterior brain atrophy in Lewy body dementia; that CSF p-Tau is associated with posterior brain atrophy in Lewy body dementia, and that CSF AD-related biomarkers are not related to atrophy in the frontal lobes.
	Research group's contribution	The research group was responsible for conceptualization and project administration, data curation and validation.
Publication 14: Title: Hospitalization in people with dementia with Lewy bodies: Frequency, duration, and cost implications	**Authors**	Mueller, C., Perera, G., Rajkumar, A. P., Bhattarai, M., Price, A., O'Brien, J. T., **Ballard**, C., Stewart, R., & **Aarsland, D.**
	Short description	Increased hospitalization is a major component of dementia impact on individuals and cost, but has rarely been studied in dementia with Lewy bodies (DLB). Our aim was to describe the risk and duration of hospital admissions in patients with DLB, and compare these to those in Alzheimer's disease (AD) and the general population. Patients with DLB are more frequently admitted to general hospitals and utilize inpatient care to a substantially higher degree than patients with AD or the general elderly population.

Journal: Alzheimer's & Dementia: Diagnosis, Assessment & Disease Monitoring Year: 2018 DOI: 10.1016/j.dadm.2017.12.001 URL: https://www.sciencedirect.com/science/article/pii/S2352872917300696		These data highlight an opportunity to reduce hospital days by identifying DLB earlier and providing more targeted care focused on the specific triggers for hospitalization and associations of prolonged stay.
	Research group's contribution	Conceptualization and project administration, data collection and curation and validation
Publication 15: Title: A Randomised Placebo-Controlled Study of Purified Anthocyanins on Cognition in Individuals at Increased Risk for Dementia *Journal: The American Journal of Geriatric PsychiatryJournal* *Year: 2023* *DOI: 10.1016/j.jagp.2022.10.002* URL: https://www.sciencedirect.com/science/article/pii/S1064748122005425	**Authors**	**Aarsland D, Khalifa K, Bergland AK, Soennesyn H, Oppedal** K, **Holteng LBA, Oesterhus R, Nakling** A, Jarholm JA, **de Lucia C**, Fladby T, Brooker H, Dalen I, **Ballard C.**
	Short description	The aim of the study was to study the safety and effect of anthocyanins in maintaining cognitive functioning in people at increased risk for dementia. Participants (206 individuals, aged 60–80 years) diagnosed with either mild cognitive impairment (MCI) or two or more cardiometabolic disorders (i.e., diabetes, hypertension, obesity) were enrolled at three different centres in Norway. Participants were randomly assigned to four capsules with a total of 320 mg/d of naturally purified anthocyanins or placebo 1:1 for 24 weeks. The primary outcome was the Quality of Episodic Memory composite measure (0–100) from an online cognitive test battery CogTrack, which was administered at baseline and monthly for the next 24 weeks. Secondary outcomes included other cognitive scores from the CogTrack battery. We applied mixed effects models with a baseline test score, group, time and their interaction as fixed effects, as well as other predefined baseline covariates. The primary comparison was the group difference at week 24 based on a modified intention-to-treat principle.
	Research group's contribution	The publication stems from the project Anthocyanins: A new approach to prevention of dementia? (ACID) listes as project 8 in table 4. The research group, with PI Prof. Årsland was the owner of the project, hence responsible for all research activities and lead of this publication.

Table 6. Please add a list with the research group´s monographs/scientific books.

	Title - Authors (Please highlight group members)- link to webpage (if possible)
1	«Aldring – Nye forutsetninger i en ny tid» **Ingelin Testad**, Geir Sverre Braut, Arnfinn Fiskå, editor and author of chapter 13; "Velferdsteknologi i et omsorgspartnerskap"
2	"Neuropsychiatric and cognitive changes in Parkinson's Disease and related movement disorders. Diagnosis and management" **Dag Aarsland**, Daniel Weinstaub, Jeffrey Cummings, Ray Chaudhuri
3	"Rights, Risk and Restraint-Free Care of Older People: Person-Centred Approaches in Health and Social Care", edited by Rhidian Hughes, **Ingelin Testad** author of the chapter "Reducing Restraint: The benefits of Education and Training"
4	"Første, annen, halvannen – hva med sikkerheten?", Karina Aase, **Ingelin Testad**. Author of the chapter "Pasientsikkerhet – Teori og praksis i helsevesenet"
5	"Det går an! Muligheter i miljøterapi". Editor Ragnhild Kruger, **Ingelin Testad**, **Dag Aarsland,** Anne Margrethe Aasland, authors of the chapter "Betydningen av følelser i møtet med mennesker med demens. Hverdag og vitenskap"
6	"TMA kurshefte – terapeutisk mestring av pasienter med aggresjonsproblematikk" - **Ingelin Testad**
7	"Atypical Parkinsonian Disorders. Clinical and research aspects" Irene Litvan. **Dag Aarsland**, Uwe Ehrt, Clive Ballard author of the chapter "Role of neuropsychiatric assessment in diagnosis and research
8	"Oxford textbook of old age psychiatry" Tom Dening, Alan Thomas. Arvid Rongve, **Dag Aarsland**, author of the chapter "Dementia with Lewy bodies and Parkinson's disease dementia"

2.2 Research group´s societal contribution

Describe the societal impact of the research group's research. Consider contribution to education, economic, societal and cultural development in Norway and internationally.

Education. SESAM contributed to formal education activities (summarised in 1.2c), but on top of that also contributed to education of researchers and the general public through additional measures. SESAM has increased awareness on ageing, cognition impairment and dementia amongst the elderly population as demonstrated by WiseAge, the frequent SESAM public conferences, Interviews, SESAM Website visits, Publications in newspapers and magazines and Educational programmes and campaigns.

Economical and societal. SESAM indirectly contributes to strengthen Norway's economy, as ageing and cognitive impairment/dementia impose an enormous and ever increasing clinical and economic burden on society. By developing care solutions, SESAM is contributing to self-management and well-being of elderly. In addition, the e-health platform, including PROTECT Norge, is designed to increase cost-effectiveness of development and delivery of treat and care solutions, to positively impact on Norway's economy. The major clinical trial infra-structure enabled us to deliver a substantial commercially funded trial of a nutraceutical product for AD, as well as lead an international JPND programme for a psychosocial intervention to promote peer support for people with dementia.

Table 7. The research group's societal contribution, including user-oriented publications, products (including patents, software or process innovations

Instructions: Please select 5–10 of your most important user-oriented publications or other products from the last 5–10 years with emphasis on recent publications/products. For each item, please use the following formatting.

No.	Name of publication/product	Date of publication/ product	Link to the document
1	Booklet created to guide PPI representatives and researchers in how to		sesam_veileder_for_brukermedvirkning_original.pdf (helse-stavanger.no) [Norwegian]

	engage PPIs in research: "SESAMs veileder for brukermedvirkning i forskning"		
2	WiseAge by SESAM: A presentation about our PPI programme.		WiseAge - Helse Stavanger HF (helse-stavanger.no)
3	A small booklet developed based on the findings from a health promotion clinical trial, comprising an educative intervention (Dementia school). Here is presented 10 good advises – from persons with dementia to persons with dementia.	08.12.2022	10-gode-rad-for-a-leve-godt-med-demens.pdf (helse-stavanger.no) [Norwegian]
4	"Athena-hjørnet" - quarterly publication in NSF lokalen, newsletter for nurses in Rogaland	Q4 (Dec) 2020 Q2 (April) 2022	nsf-lokalen-3-2020-hele-utgaven.pdf [Norwegian] nsf-lokalen-1-2022.pdf [Norwegian]
5	Blog posts: - This is a golden opportunity to participate in something that we know works. - Have a Heart for the Brain!	03.05.2023 02.06.2023	Dette er en gylden mulighet til å bli med på noe som vi vet virker - Nasjonalt senter for aldring og helse (aldringoghelse.no) [Norwegian] Ha hjerte for hjernen! - Helse Stavanger HF (helse-stavanger.no) [Norwegian]
6	The Norwegian National Centre for Ageing and Health (Ageing and Health) has created an guidance in dementia, operationalizing the national guidelines for dementia. Here is included a presentation of the dementia school, developed by SESAM in the section about support and information (Veiviser demens; Støtte og informasjon).		Støtte og informasjon - Veiviser demens (aldringoghelse.no) [Norwegian]
7	"Dementia school" - course for persons with dementia.		Brukerskole for personer med demens - Nasjonalt senter for aldring og helse (aldringoghelse.no) [Norwegian]
8	Report from the Directorate of health on the consequenses for the Norwegian Primary health care services, section 3.2 focusses on persons with dementia. Describes SESAM PROTECT Norge project.	10.08.2022	Konsekvenser for personer med demens – Helsedirektoratet (hdir.no) [Norwegian]

3. Challenges and opportunities

Information about the strengths and weaknesses of the research group is obtained through the questions above. In this chapter, please reflect on what might be the challenges and opportunities for developing and strengthening the research and the position of the research group.

With help of an external expert consultant, SESAM recently conducted an extensive analysis based on individual and group interviews across the (senior) research staff, to identify challenges and opportunities in SESAMs research group. This has led to the renewed R&D agenda and concrete measures to implement it, to proactively pursue the opportunities and thereby overcome the challenges.

Main opportunities are to leverage the ICT proficient elderly population in Norway, the strong international colaborations and the recently set-up PROTECT Norway digital clinical trial platform, to strengthen SESAM and thereby Norway's position as a clinical trial hub for digitised care and cure trials to improve cognition and well-being in elderly. Given the large, multidicisplinary group, research funding and research project quality is further improved by a standardised grant application developmental process. This is summarised in more detail below.

	Challenges	**Opportunities**
organisation	• Gap between PIs and co-PIs/senior researchers • Lack of clear procedures to develop, team-up, and manage	1. Provide talent management programmes and flexible career opportunities aligned with SESAM's research, education or networking pillars. Use these flexible function profiles to qualify, support and motivate research staff 2. Leverage the strong (inter)national network to recruit and retain new talent. 3. Implement the newly designed R&D agenda and policy measures to prioritise, optimise and standardise procedures for grant development and the execution of research projects and clinical trials.
Scientific	• Wide scope of knowledge centre, research centre, Research hub, and clinical centre may lead to fragmentation and/or loss of focus • Little mechanisms to steer/prioritise amongst topics, trials, grants etc	4. Leverage societal trends with an ever increasing burden and hence need to improve cognitive impairment in elderly due to aging, dementia and Parkinson 5. Leverage the recently developed PROTECT digital clinical trial network, which perfectly fits the relative high ICT proficient (elderly) population in Norway and can be used to quickly upscale the number and size of clinical trials in a cost-effective manner. 6. On top of bullet 3, Implement the updated R&D agenda to effectuate the above trends, and further integrate and expand the digitize, care and treat programmes.
Resources	Limited capacities due to: • Fragmentation (multiple positions at several institutions • Limited financial incentives for MDs to get their PhD.	7. Strengthen the SESAM identity and attractiveness, by communication protocols and measures to more effectively communicate SESAM requirements and benefits.
Funding	• Increasing standardization, harmonization and quality of grant applications along the three pillars digital, care, and cure • Clear business model for clinical trial programme lacking	8. On top of bullet 3 and 6, incentivize the standardised grant development programme, by in kind/in cash support for developing prioritsed grant applications, when adhering to SESAM R&D agenda and internal policies 9. Develop a financial model to plan and conduct clinical studies, and balance investigator versus industry sponsored clinical trials, to optimise the balance between funding, research output and patient participation in clinical trials.