Danish Diabetes Academy

Annual Report 2021

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Executive Summary

The mission of the DDA is to educate and train the next generation of researchers in the field of diabetes. To achieve this mission, the DDA offers a broad range of activities within education and talent development, networking and collaboration, and recruitment and grants. These activities are supported by communications and outreach on the DDA website and social media. In 2021, we wish to highlight the following:

- The DDA organised 39 PhD and postdoctoral courses, symposia and webinars (69% online or hybrid), which attracted around 1,500 participants from universities, university hospitals and the life science industry in Denmark and abroad, and received high participant satisfaction rates.

- The DDA organised 12 networking and collaboration activities (25% online or hybrid), which attracted around 500 participants from universities, university hospitals and the life science industry in Denmark and abroad, and received high participant satisfaction rates.

- The DDA allocated 9.75 million DKK to national and international applicants for PhD scholarships (5), postdoctoral fellowships (5) and visiting professorships (5) in free and open competition.

- The DDA increased its activities on LinkedIn, Twitter and Instagram, which led to an increased number of followers by more than 33% on LinkedIn, 50% on Twitter and 125% on Instagram compared to 2020.

- The DDA and DDA-funded researchers reported 64 unique publications, 40 new collaborations, 98 dissemination activities and further funding of 14.1 million DKK in total.

The grant budget amounted to 37,167,000 DKK. The DDA experienced a surplus in 2021 of 3.28 million DKK, mainly due to the effect of Covid-19 on the educational and networking activities and due to unallocated industrial PhD scholarship grants.

Finally, in 2021, the DDA focused on preparing and submitting a self-evaluation report (2018-2021), a five-year strategy paper (2023-2027) and an application for a continuation of the DDA (transferred into the Danish Diabetes and Endocrine Academy (DDEA)). During 2021, the DDA bodies and other relevant stakeholders within the diabetes and endocrine research communities provided input on and data for these documents.

Looking into 2022, a continued focus for the educational and networking activities will be to promote translational research across research disciplines, in particular through cross-academy activities with the two new academies: Danish Cardiovascular Academy (DCA) and Danish Data Science Academy (DDSA). Further, the DDA will follow how the outputs and outcomes of the activities and research of DDA-funded researchers are beginning to impact health and society. For its communications activities, the DDA will maintain its focus on social media, while also introducing digital outreach through podcasts and public outreach through public events.

Tore Christiansen
Managing Director

Dansk resumé

DDA's mission er at uddanne og træne den næste generation af diabetesforskere. For at opnå denne mission, udbyder DDA en bred vifte af aktiviteter inden for uddannelse og træning, netværk og samarbejde samt rekruttering og bevillinger. Disse aktiviteter bliver understøttet af kommunikation på DDA's hjemmeside og sociale medier. I 2021 kan vi fremhæve følgende:

- DDA har organiseret 39 ph.d.-og postdoc-kurser, symposier og webinarer (69% online eller hybrid), som har tiltrukket ca. 1.500 deltagere fra universiteter, universitetshospitaler og life-science-industrien i Danmark og udlandet, og som opnåede høj tilfredshed blandt deltagerne.

- DDA har organiseret 12 netværksarrangementer (25% online eller hybrid), som har tiltrukket ca. 500 deltagere fra universiteter, universitetshospitaler og life-science-industrien i Danmark og udlandet, og som opnåede høj tilfredshed blandt deltagerne.

- DDA har uddelt 9,75 millioner kroner til nationale og internationale ansøgere til ph.d.-stipendier (5), postdoc-stipendier (5) og gæsteprofessorater (5) i fri og åben konkurrence.

- DDA har øget sine aktiviteter på LinkedIn, Twitter og Instagram, hvilket resulterede i, at antallet af følgere steg med mere end 33 % på LinkedIn, 50 % på Twitter og 125 % på Instagram sammenlignet med 2020.

- DDA og DDA-finansierede forskere rapporterede 64 unikke publikationer, 40 nye samarbejder, 98 formidlingsaktiviteter og yderligere bevillinger til en værdi af 14,1 million kroner i alt.

DDA's budget for 2021 var på 37.167.000 kroner. DDA havde et mindre forbrug i 2021 på 3,28 millioner kroner, som primært skyldes Covid-19's effekt på DDA's uddannelses- og netværksaktiviteter samt ikke-uddelte bevillinger til industrielle ph.d.-stipendier.

I 2021 var fokus for DDA endvidere at udarbejde og indsende en selvevalueringsrapport (2018-2021), et strategidokument (2023-2027) og en ansøgning om fortsættelse af DDA (ændret til Danish Diabetes and Endocrine Academy (DDEA)). I løbet af 2021 har DDA modtaget input og data til disse dokumenter fra DDA's komitéer og andre relevante samarbejdspartnere fra diabetesforskningsmiljøet og det endokrine forskningsmiljø.

I 2022 vil fokus for DDA's uddannelses- og netværksaktiviteter fortsat være at fremme translationel forskning på tværs af forskningsdiscipliner, især via aktiviteter organiseret i samarbejde med de to nye akademier: Danish Cardiovascular Academy (DCA) og Danish Data Science Academy (DDSA). Derudover vil DDA fortsat følge, hvordan resultaterne af DDA-finansierede forskeres aktiviteter og forskning har indflydelse på sundhed og samfundet generelt. I forhold til kommunikationsaktiviteterne vil DDA fastholde sit fokus på sociale medier, men samtidig introducere digital kommunikation via podcasts og dialog med offentligheden via forskellige typer af arrangementer.

Tore Christiansen
Managing Director

DDA at a glance

The Funding

- Received in 2012-2017: 201 million DKK from the Novo Nordisk Foundation to establish the DDA
- Received in 2018-2022: Additionally, 156 million DKK from the Novo Nordisk Foundation for another five-year funding of the DDA

Main objectives

- To strengthen the research training available to PhD students and postdocs within the field of diabetes at research institutions in Denmark
- To serve as a national hub within diabetes unifying universities, university hospitals and the life science industry in Denmark, and to strengthen educational activities and talent development within the area
- To recruit outstanding national and international PhD students, postdocs and visiting professors with an international, interdisciplinary and cross-sectoral focus within the field of diabetes and metabolism and in open and free competition
- To create measurable visibility around the DDA's work in educating and training early-career researchers as well as highlighting the DDA's network spanning the diabetes field

Organisation

- Three members of the Board of Directors (BoD)
- 15 members of the Committee for Education
- 10 members of the National Advisory Forum
- 93 members of the Committee for Talent Development
- 10 members of the International Advisory Board (IAB)
- Seven employees and one student assistant in the Executive Management Team, which is located at Odense University Hospital (grant holder)

Main collaborators: Nationally and internationally 2021

- The DDA collaborated with national and international research institutions across sectors (academia, university hospitals, the life science industry and non-governmental organisations (NGOs)) on organising online, onsite and hybrid educational and networking activities
- The DDA and DDA-funded researchers established 40 new collaborations across sectors

DDA communications 2021

- Twitter (DDA-Denmark): Number of followers 1,368
- LinkedIn (Danish Diabetes Academy): Number of followers 3,346
- LinkedIn (DDA Alumni Network): Number of followers 97
- Instagram (danish_diabetes_academy): Number of followers: 485
- Youtube (Danish Diabetes Academy): Number of views: 4,478

The DDA uses the following hashtags:

#Danishdiabetesacademy
#DDA_education
#DDA_network
#DDA_grant

Vision

The vision is to enhance the quality of Danish diabetes research education to ensure that it remains at the highest international level

Mission

The mission is to educate and train the next generation of researchers in the field of diabetes

National and international collaborators of the DDA 2021

University of Southern Denmark DK

Copenhagen Institute for Future Studies DK

Danish Cardiovascular Academy DK

University of Southern Denmark DK

Aros Business Academy DK

Steno Diabetes Center Odense DK

Nordic EMBL Partnership for Molecular Medicine

Aalborg University Hospital DK

Steno Diabetes Center Copenhagen DK

University of La Laguna, Tenerife ES

Rigshospitalet DK

Danish Endocrine Society DK

Steno Diabetes Center Odense DK

Aarhus University DK

University of Copenhagen DK

Herlev-Gentofte Hospital DK

Elevate Scientific Academy SE

Gubra DK

Steno Diabetes Center Aarhus DK

University of Helsinki FI

Roskilde University DK

University of Queensland AU

Steno Diabetes Center North DK

Cambridge Metabolic Network UK

DDA recruitment and grant activities 2021

The DDA allocated 9.75 million DKK to the following grants in open and free competition in 2021:

5

5 PhD scholarships (2/3-financed and 1/3-financed), including one industrial PhD scholarship

5

postdoctoral fellowships (two-year), including two industrial postdoctoral fellowships

5

visiting professorships

The DDA presented the two DDA Awards:

25,000

The DDA-Funded Scientist Award (25,000 DKK)

25,000

The Young Investigator Award (25,000 DKK)

DDA educational activities and talent development 2021

19

19 PhD and postdoctoral courses and symposia

20

webinars

Around

1,500

participants in total

Around

35%

of the invited speakers were from abroad

DDA networking and collaboration activities 2021

12

networking and collaboration activities

Around

500

participants in total

Scientific publications, dissemination and further funding 2021

Publications:

64

unique publications

Disseminations activities:

98

dissemination activities

Further funding:

14.1

million DKK in total

Organisation

The primary focus for the DDA organisation in 2021 was to execute the activities within education, networking and grants. Further, the DDA organisation focused on preparing and submitting a self-evaluation report (2018-2021), a five-year strategy paper (2023-2027) and an application for a continuation of the DDA (transferred into DDEA). During 2021, the DDA bodies provided input on and data for these documents. Further information is on page 69.

Other activities of the DDA organisation in 2021 were:

- The Committee for Education worked on the educational and networking programme for 2022 including initiating cross-academy activities with the two newly established Danish academies: DCA and DDSA.

- The Committee for Talent Development reviewed applications for PhD scholarships, postdoctoral fellowships and visiting professorships.

The DDA made no changes to the composition of the bodies in 2021, except for the National Advisory Forum. In mid-year 2021, the chair of the National Advisory Forum, Jette Kolding Kristensen, stepped down, together with two other members, due to other commitments. The BoD nominated a new chair, Professor Christina Brock, Aalborg University Hospital, whereas the BoD decided not to nominate additional new members due to the limited time period of the current DDA grant (2018-2022).

The organogram on page 17 (**Figure 1**) shows the organisation of the DDA.

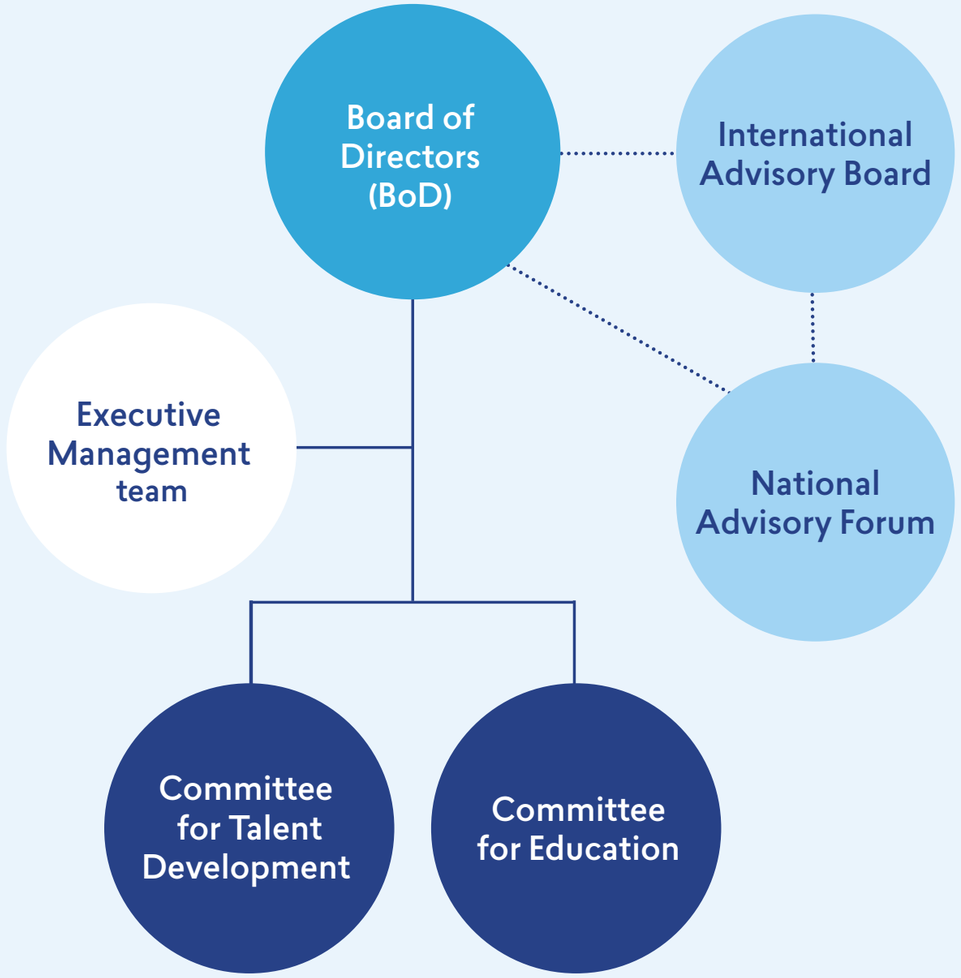
The BoD heads the DDA and is responsible for defining and implementing the overall strategy of the DDA. The Executive Management Team and the four bodies (the International Advisory Board, the Committee for Education, the National Advisory Forum and the Committee for Talent Development) support the BoD.

Detailed information about the tasks and responsibilities, meetings and the members of each of the DDA's bodies is available at the DDA website.



Photo: Lizette Skotbo Kabré

Figure 1. Organogram of the DDA



Budget and Accounts

In 2021, the grant budget amounted to 37,167,000 DKK. **Table 1** presents the budget and accounts for 2021. The DDA experienced a surplus in 2021 of 3.28 million DKK, mainly due to the effect of Covid-19 on the educational and networking activities (rescheduling, cancellation or transfer to online activities) and due to unallocated industrial PhD scholarship grants.



Table 1. The 2021 budget compared with the results for 2021, including the difference between the budget and the results. Amounts are in 1,000 DKK.

Financial report			
(Amounts are stated i 1,000 DKK)	Budget	Result	Difference
Educational Activities and Talent Development	4,313	2,925	1,388
Networking and Collaboration Activities	900	369	531
Grants	25,650	24,319	1,331
Executive Management Team (salary)	3,936	3,913	23
Running Costs	1,660	1,652	8
Host institutions' direct costs associated with DDA	708	709	-1
Total	**37,167**	**33,887**	**3,280**

Strategy

The strategy adopted in 2021 for the educational, networking, grant and communication activities builds on the experiences and achievements realised by DDA during the past three years.

For planning the educational and networking activities, the DDA continued the close collaboration with the DDA Committee for Education and the use of a bottom-up process. This involved suggestions from members of the DDA faculty and the DDA bodies, including early-career and senior researchers across academia, university hospitals and the life science industry from Denmark and abroad. In particular, the DDA prioritised to involve early-career researchers, including current and former DDA-funded researchers (PhD students, postdoctoral fellows), organisers, speakers and instructors. Including early-career researchers as active contributors promotes further learning through development of their managerial skills. An example of this is on page 21. The DDA also established relevant partnerships and collaborations across sectors and borders to ensure breadth and variety of topics, and the educational activities included more time for networking and collaboration. The DDA also launched two new strategic initiatives in 2021: 1) obtaining a more balanced profile in relation to the level of seniority and gender of the invited speakers, and 2) providing speakers at the activities with tools to strengthen their presentations through the DDA e-learning course Train-the-Trainer".

For the recruitment and grant activities, the DDA continued previous years' strategy to ensure high quality of the recruitment process with open calls; standardised evaluation forms; in-depth and high-quality international peer-review assessment of all applications and a quality check of the peer-review evaluations by the two chairs of the Committee for Talent Development.

For the DDA's communications activities, the strategic focus was primarily on digital outreach and communications through the DDA's social media channels, website and newsletters to the main target group, early-career researchers. The aim was to highlight the DDA's achievements and the output of DDA-funded researchers to demonstrate the impact of DDA and strengthen the DDA brand, both nationally and internationally. To increase engagement, the DDA commonly invited early-career researchers to take over the DDA Instagram and Twitter profiles.

Organiser of DDA Summer School – not a difficult choice You get so much in return

Vinni Faber Rasmussen MD, PhD student, Steno Diabetes Center Aarhus

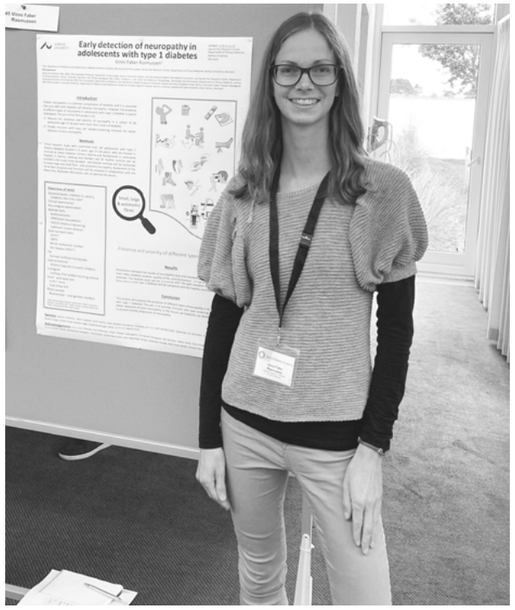
When you have experienced attending a scientific DDA Summer School, where you were enriched with new knowledge and new acquaintances, you feel lucky.

To be a part of a professional community, where research into diabetes binds one together, is unique. Basic and clinical research are brought together, and in addition, the set-up creates possibilities to improve presenter skills, talk to professors, discuss the newest findings and future plans.

Learning, inspiration, and networking are three keywords explaining what you get, when you attend the DDA Summer School. All run by committed people, build from scratch to now a programme with high professional quality. To jump into the organisation team, and try to reach new heights every year, is exciting, satisfying and educational. Once you have had the experience, you would like to give it to others.

The plane picks up great passengers from all parts of the world: academics, clinicians and researchers. Put them together in a beautiful surrounding, and bring them higher to the sky together.

Next year, when there is an anniversary, this will be marked, because something unique has been created. DDA Summer School creates many sparkling moments for young researchers. The fuel for the aircraft must never run dry, and should constantly be refilled with new energy.



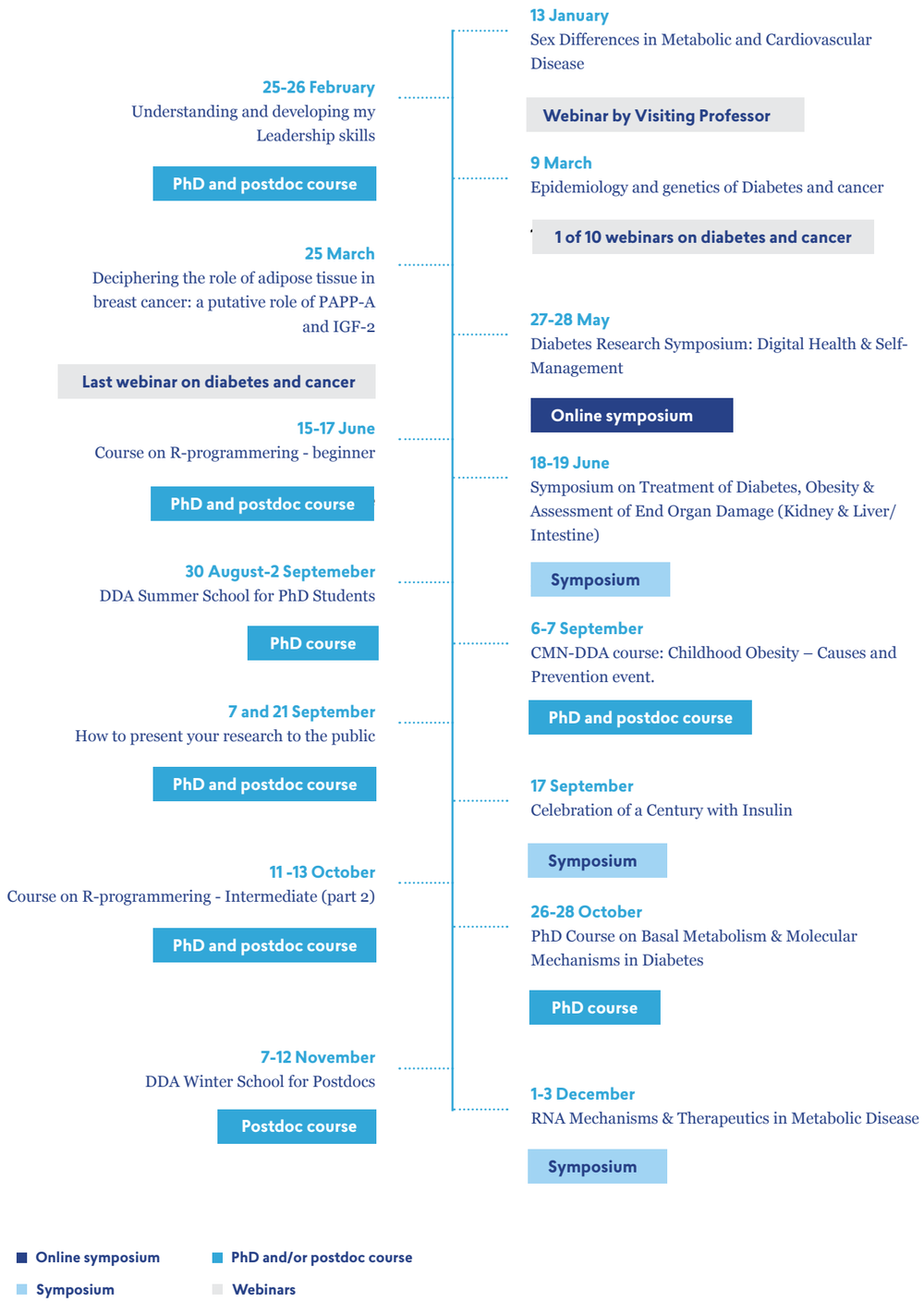
Educational Activities and Talent Development

Activities 2021

In 2021, the DDA organised 39 PhD and postdoctoral courses, symposia and webinars, which attracted around 1,500 participants from universities, university hospitals and the life science industry in Denmark and abroad (**Table 2**). Of the 39 activities, 27 (69%) were online or hybrid activities. In general, the programme received excellent satisfaction scores (higher than 4.0, which was the success criterion) from participants for the scientific programmes, the composition of the programmes, the organisation of the activities and the DDA as a networking hub (**Table 2**).



Timeline for major educational and talent development activities 2021



The 39 activities included two PhD courses, nine courses for both PhD students and postdoctoral fellows, one postdoctoral course, seven symposia and 20 webinars (**Table 2**). One of the highlights of the year was the DDA Winter School for Postdocs (see case story on page 27).

Table 2. The DDA's educational and talent development activities, showing activity type and numbers, number of participants, format and participants' satisfaction rates with the scientific content of the programme, the composition of the programme, the organisation of the activity and DDA as a networking hub (if available). A list of activities with individual data and links to further descriptions and programmes of the activities is included in ***Appendix A.***

Type	Number	Number of participants	Format (online/onsite/ hybrid)	Satisfaction to a very great or a large extent * with the scientific content of the programme (%)	Satisfaction to a very great or a large extent * with the composition of the pro-gramme (%)	Satisfaction to a very great or a large extent * with the organisation of the activity (%)	Satisfaction to a very great or a large extent * with the DDA as a networking hub (%) (if available)
PhD courses	2	104	0/2/0	93.1	91.1	95.9	90.2
PhD and postdoctoral courses	9	178	3/6/0	94.1	88.1	95.9	81.9
Postdoctoral courses	1	43	0/1/0	97.3	100	95.9	97.3
Symposia	7	627	2/3/2	90.5	89.0	96.6	80.3
Webinars**	20	553	20/0/0	N/A	N/A	N/A	N/A
Total	**39**	**1,505**	**25/12/2**	**92.7**	**90.7**	**96.5**	**84.8**

** The participants answered on a scale from 1 to 5 that they were satisfied to a very great (4.0) or a large extent (5.0).*

*** The webinars were recorded and added to the online library of DDA online educational sessions, which is available at the DDA website and on the DDA YouTube channel.*

DDA Winter School challenges postdocs and supports them – in becoming the future scientific leaders

The DDA Winter School for Postdocs is quite a unique event that we are honoured to be part of. We have both participated in several of the previous winter schools (Maria in four, Morten in three) and this has provided us with a unique perspective on how it has evolved over the years, with new and intriguing ideas coming forth every year.

The summit is an event for postdocs made by postdocs. It gives the growing postdoc community a chance to network, learn from each other, and discuss current hot topics, both within science but also related to overall mental wellness, career paths and our role within the scientific community and society at large.

One of the key elements is the DDA challenge, where the postdocs propose solutions for current issues that are important for the scientific community, giving the postdocs a collective voice to find. An intriguing new addition from the last event is a podcast and further participation in the 2022 People's Meeting (Folkemøde) at Bornholm, Denmark, where we will be able to share our solutions with society and various stakeholders. We hope that these initiatives will be heard and factored into decision making because, as we see it, postdocs are the future scientific leaders and are worth listening to!



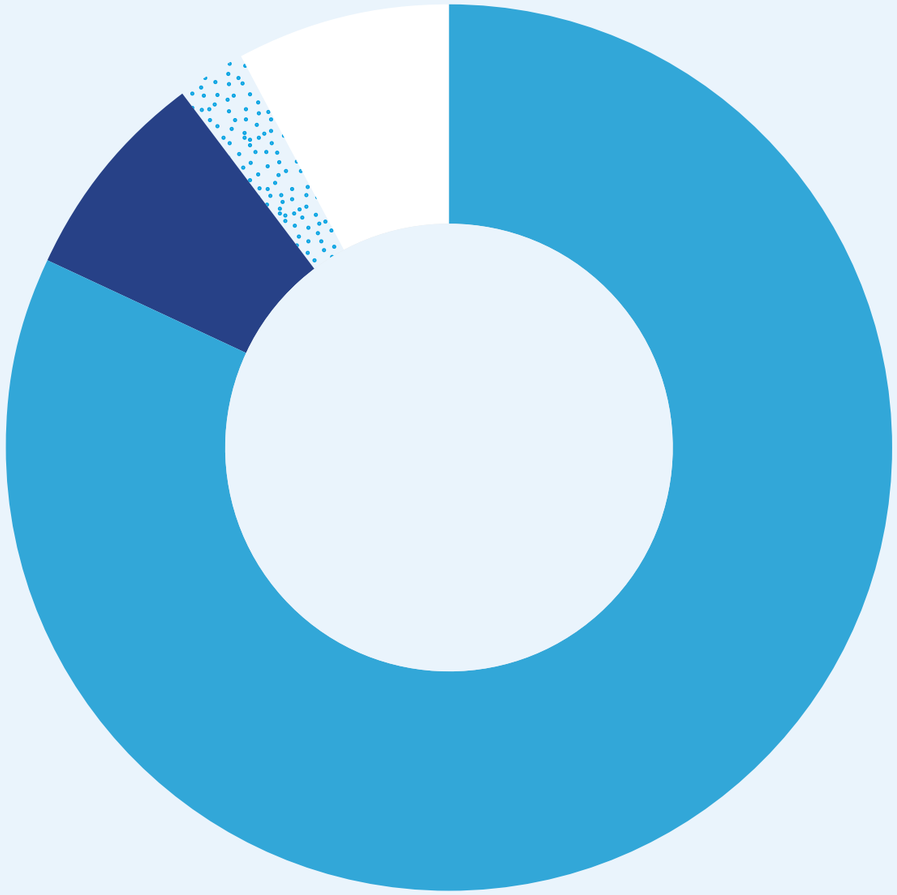
Maria Hauge Pedersen, Postdoctoral Fellow, PhD, NNF Center for Basic Metabolic Research University of Copenhagen



Morten Dall, Postdoctoral Fellow, PhD, NNF Center for Basic Metabolic Research University of Copenhagen

As shown in **Figure 2**, the activities mainly included a wide variety of scientific topics within diabetes and diabetes-related research (82.1%) – ranging from basal metabolism, to heterogeneity in type 1 diabetes and to schizophrenia and metabolism. In addition, the activities included methods courses (7.7%) relevant to diabetes research, transferable skills courses (7.7%) and a course on career development (2.5%). An example of a methods course is on pages 30-31. This course has been a recurrent course throughout 2020 and 2021 and will continue in 2022.

Figure 2. Types of DDA educational and talent development activities in 2021.



- Diabetes research 82.1%
- Methods relevant to diabetes research 7.7%
- Career development 7.7%
- Transferable skills 2.5%

On average, 35% of the speakers were from abroad, 13% were current or former DDA-funded researchers (PhD students, postdoctoral fellows or visiting professors), whereas 18.5% were early-career researchers (PhD students or postdoctoral fellows) (also including DDA-funded PhD students and postdoctoral fellows) (**Table 3**). Further, on average, a comparable percentage of speakers were affiliated with academia (45.5%) and university hospitals (43.9%), whereas averagely 10.4% of the speakers came from the life science industry and private institutions (**Table 3**). Finally, around 38% of the speakers were female.

Table 3. DDA's educational and talent development activities, showing activity type, number of speakers, percentage of speakers from abroad, that are current or former DDA-funded researchers, early-career researchers, from academia, hospitals, life science industry, and according to gender.

Type	Number of speakers from national and international research institutions (% from abroad)	Percentage of speakers that were current or former DDA-funded researchers (PhD students, postdoctoral fellows or visiting professors)	Percentage of speakers that were early-career researchers (PhD students or postdoctoral fellows)	Percentage of speakers from academia	Percentage of speakers from hospitals	Percentage of speakers from life science industry	Gender profile (% male vs. % female)
PhD courses	42/6 (14.3%)	14.3%	9.5%	54.8 %	30.9%	14.3%	64.3% vs. 35.7%
PhD and postdoctoral courses	29/8 (27.6%)	31.0%	41.4%	68.9%	27.6%	3.4%	48.3% vs. 51.7%
Postdoctoral courses	16/8 (50.0%)	0%	0%	31.3%	31.3%	37.5%	68.7% vs. 31.3 %
Symposia	66/29 (47.0%)	0%	16.7%	39.4%	54.5%	6.1%	70% vs. 30%
Webinars	20/8 (40.0%)	40%	25%	25.0%	65.0%	10.0%	50% vs. 50%
Total	**173/61 (35.3%)**	**13.3%**	**18.5%**	**45.7%**	**43.9%**	**10.4%**	**62.4% vs. 37.6**

Reflections

Compared to 2020, the number of educational activities increased by 22% (32 vs. 39) and the number of participants increased by 50% (1,033 vs. 1,505). The lifted assembly restrictions due to the Covid-19 pandemic in the second half of 2021 is a part of the explanation for these increases. Another reason is the continued focus on providing online courses and webinars in addition to onsite activities, documented by the increase in online activities in 2021 of 35% as compared to 2020 (20 vs. 27).

The DDA took a step towards obtaining a more balanced profile in relation to the level of seniority and gender of the invited speakers, with the focus on inviting more early-career researchers and women as speakers.

The majority of the programme consisted of activities relevant to diabetes research. In this context, the partnerships and collaborations with institutions and researchers across sectors and from abroad are of high value for organising the activities and ensuring an interdisciplinary, translational and international programme involving speakers across academia, university hospitals, the life science industry and private institutions, and from abroad.

Course on R-programming led by DDA postdoc

Erin Brown, Postdoctoral Fellow, PhD, NNF Center for Basic Metabolic Research University of Copenhagen

I participated in the DDA PhD & Postdoc Course on reproducible research in R-programming with the aim of learning how to use R for basic analyses and visual representation of my data.

In particular, I had RNA sequencing data that had been analysed by the bioinformaticians at NNF Center for Basic Metabolic Research, but if I wanted to pull out specific genes from this analysis, or make figures and format them how I wanted, I was unable to do so without requesting further help.

I therefore registered for this course, which not only helped me achieve these goals, but I also learned many more skills when working with R, including data management and wrangling, version control, and the importance of reproducibility in data analysis. The code-along sessions were especially helpful, and I now use the notes from these when analysing my own data.

Overall, the organisation and lesson structure of this course was great, with very helpful and knowledgeable instructors, among others a DDA-funded postdoctoral fellow. I would definitely recommend this course to any beginners/intermediates with using R.



Speakers' affiliation at DDA activities (education and talent development *and* networking and collaboration)



Networking and Collaboration Activities

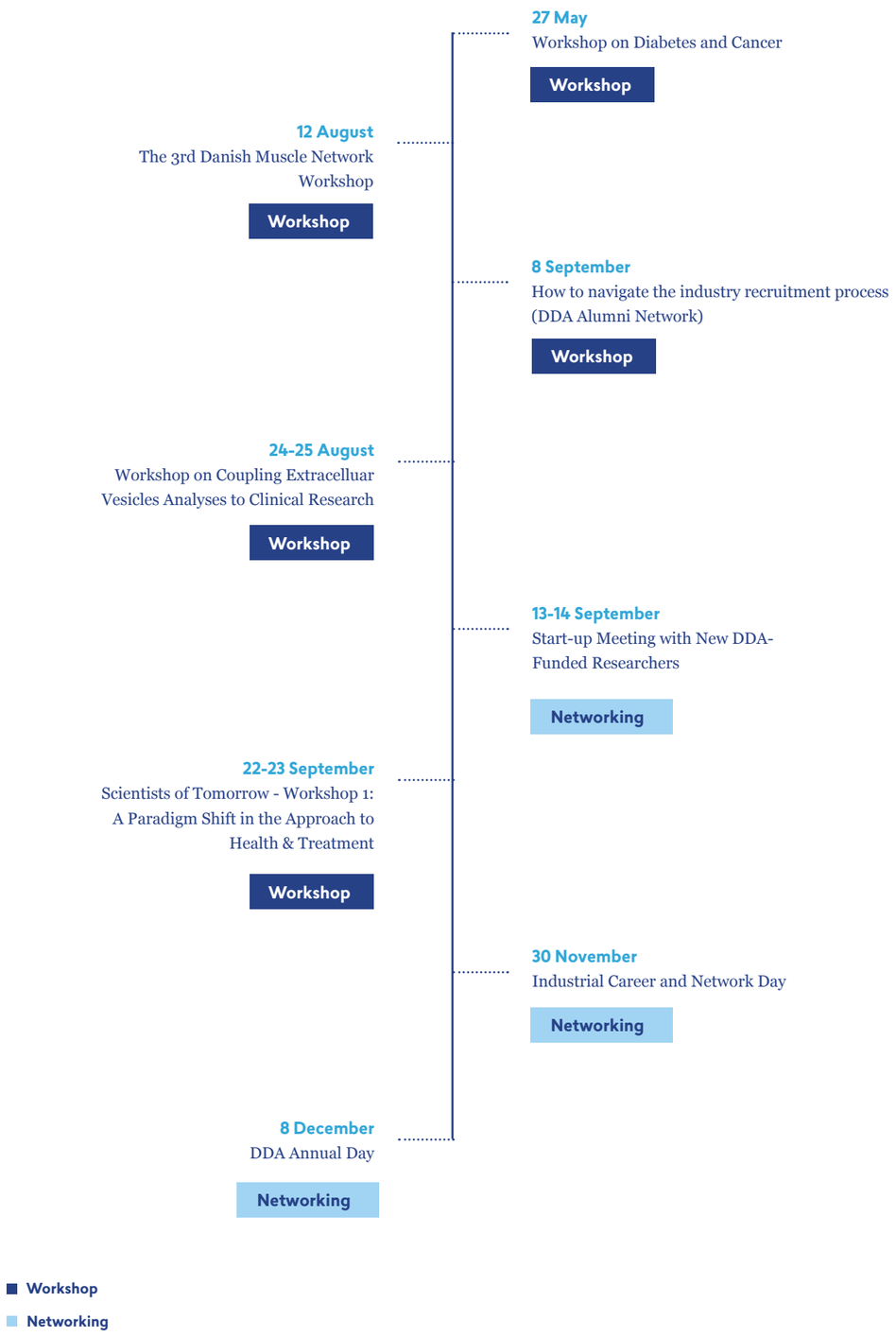
Activities 2021

In 2021, the DDA organised 12 networking and collaboration activities, which attracted around 500 participants from universities, university hospitals and the life science industry in Denmark and abroad (**Table 4**). Of the 12 activities, 3 (25%) were online or hybrid activities. In general, the activities received high satisfaction scores (on average above 4.0, which was the success criterion) from participants for the composition of the programmes, the organisation of the activities and the satisfaction with the networking opportunities (**Table 4**).

Photo: Ida Schmidt



Timeline for major networking and collaboration activities 2021



The 12 activities comprised nine workshops and three networking activities and a variety of topics within diabetes research (25%) including elements of basic, translational, interdisciplinary and clinical research; workshops on career development (50%) including insights into different career paths in life science industry; and general networking events (25%) including DDA alumni networking events and the DDA Annual Day. One of the highlights of the year was the series of webinars and a follow-up workshop on Diabetes and Cancer (see case story on page 38.)

Table 4. The DDA networking and collaboration activities 2021, showing activity type and number, format, number of participants, and participant satisfaction with the composition of the programme, the organisation of the activities and the DDA as a networking hub. A list of activities with individual data and links to further descriptions and programmes of the activities is included in ***Appendix B.***

Type	Number	Online/onsite/ Hybrid	Satisfaction to a very great or a large extent * with the scientific content of the programme	Satisfaction to a very great or a large extent * with the composition of the programme (%)	Satisfaction to a very great or a large extent * with the organisation of the activity (%)	Satisfaction to a very great or a large extent * with the DDA as a networking hub (%)
Workshops	9	2/6/1	78.3	85.4	88.1	73.8
Networking activities	3	0/3/0	72.3	90.7	95.6	67.9
Total	**12**	**2/9/1**	**76.9**	**86.6**	**89.8**	**73.1**

** The participants answered on a scale from 1 to 5 that they were satisfied to a very great (4.0) or a large extent (5.0).*

New collaborations between diabetes and cancer researchers

With the “Diabetes and Cancer” webinars and workshop, we wanted to generate attention towards the emerging connection between diabetes and cancer and to facilitate collaborations between researchers working to understand the interrelations between these diseases.

It is well known that metabolic disturbances such as type 2 diabetes are carcinogenic and, in addition, negatively affects cancer prognosis. This relation seems to be bi-directional, as cancer also seems to mediate metabolic disturbances including diabetes.

Thus, this complex interplay between diabetes and cancer negatively affects the quality of life of patients as well as the overall survival rates. Therefore, a better understanding of the underlying mechanisms behind this complex association is warranted, so preventive interventions could be developed in the future.

By gathering competencies within this intersection, between diabetes and cancer, we hoped to promote collaboration, which could stimulate the development of future research projects within this field.

Based on the positive feedback from the participating researchers, we consider the initiative as a great success that led to several new collaborations and networking initiatives.

In 2022, we will host another series of webinars and a symposium with the overall title ‘Metabolism and Cancer’.



Louise Lang Lehrskov, Postdoctoral Fellow, PhD, Center for Physical Activity, Rigshospitalet



Lykke Sylow, Associate Professor, PhD, Department of Biomedical Sciences, University of Copenhagen

The invited speakers and facilitators (in total 59) of the DDA workshops and networking activities included scientists and experts across borders and sectors, i.e. academia (29%), university hospitals (30%) and the life science industry or private consultant companies (41%) (**Figure 3**), and across research disciplines.

Figure 3. Distribution of speakers and facilitators of DDA networking and collaboration activities 2021 by sectors (academia, hospitals, industry or private institutions).



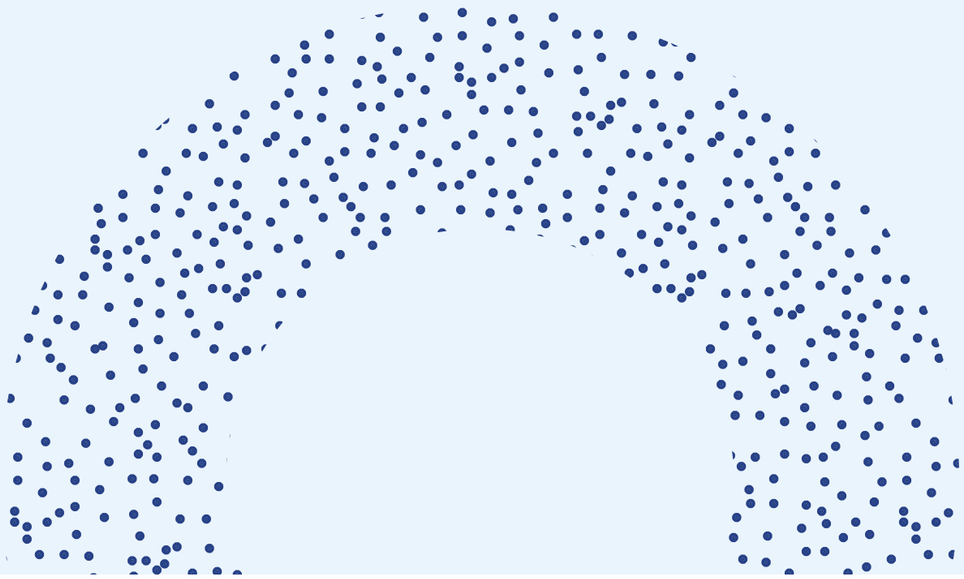
Industry or other private institution	41%
Academia	29%
University Hospitals	30%

Reflections

Similar to 2020, the 12 collaboration and networking activities was a mix of online, onsite and hybrid activities due to the Covid-19 pandemic. The DDA has continuously explored how, and succeeded in, combining digital solutions and face-to-face interaction during the networking activities, while still recognising that the networking activities, in general, are not fit for online formats and that no solution is 100% optimal. This is also reflected in the participant satisfaction score for the DDA as a networking hub, which was below the success criterion of 4.0 (73.1%).

The involvement of organisers, speakers and facilitators affiliated with research institutions across sectors, research disciplines and from abroad secured an interdisciplinary and international approach to the specific themes discussed and presented at the activities and provided opportunities for early-career and senior researchers to discuss specific scientific topics and share knowledge and experiences.

Half of the networking and collaboration activities focused on career development with the view to shine a light on all options for future career paths for DDA alumni and other early-career researchers. These activities included a career day providing insights on a transition to a career beyond academia and on collaborating between sectors, and an event providing practical knowledge on the corporate recruitment process. Further, the DDA also invited early-career researchers for a series of onsite and online workshops (the first three workshops were held in 2021) to discuss the “scientists of tomorrow” in relation to the paradigm shift in the approach to health and science, emerging technologies and the importance of data.





“As an early-career researcher, it is important to be able to combine my own expertise with the new developments in science while building a future career. I think this course will contribute to my career by enhancing my understanding of the future technologies and methods, research trends and improve my ability to implement these developments into my research”. Hande Topel Batarlar, postdoc at the Department of Biochemistry and Molecular Biology at the University of Southern Denmark, in connection with her participation in the series of workshops on ‘Scientists of Tomorrow’.

Photo: Ida Schmidt

Recruitment and Grant Activities

Activities 2021

In 2021, the DDA allocated 9.75 million DKK to national and international applicants for PhD scholarships (5), postdoctoral fellowships (5) and visiting professorships (5) in free and open competition. Further, the DDA awarded the two DDA Awards: the DDA-Funded Scientist Award and the DDA Young Investigator Award.

A System to Make the Correct Administration of Type 2 Diabetes Medication Easier

Nynne Holdt-Caspersen, MSc & PhD student, Aalborg University

Not only do people with type 2 diabetes have to struggle with the condition; they often struggle with taking their medication, too. The result is that many people get the wrong treatment. But Nynne Holdt-Caspersen intends to change this situation. She aims to develop a decision-support system to help patients, providing them with personal guidance and reminders of their medication dosage.

Nynne Holdt-Caspersen has just received a grant of DKK 550,000 from the Danish Diabetes Academy with co-financing from Novo Nordisk A/S for a PhD aimed at developing this decision-support system.

Nynne Holdt-Caspersen is basing her work on new, edible diabetes medications: for example, oral semaglutide, which has had positive results in terms of blood sugar regulation and the reduction of risk factors such as blood pressure and weight. “But we need more. Particularly because dosage instructions can be relatively complex, and because it is difficult to calculate the required dosage,” she says.

The new decision-support system will help by including information about activity during the day, continuously collected using sensors, and the patient’s blood sugar levels.

“This information can be used to generate a profile of the patient, thereby making it possible to automate patient guidance,” says Nynne Holdt-Caspersen.

Measurements, diary and questionnaire data

Currently, no clinical trials have been conducted, in which blood sugar levels are continuously monitored in patients receiving oral semaglutide (GLP-1 antidiabetic). For this reason, the work will start with a three-month pilot study, which will incorporate continuous measurements of blood sugar and activity, and diary and questionnaire data. A total of 20 subjects will be included.

All the data collected will be analysed using artificial intelligence and parameter analysis to identify parameters considered to be relevant to the supporting diabetes treatment.

The results of the data analysis will be used for the development of the decision-support system, which will be evaluated for its ability to guide the patient in administering doses of the oral diabetes medication, and to discover whether it contributes to optimised treatment. The system will then be examined in the context of a control group to determine its efficacy in a clinical trial involving 150 subjects.

Work to take place in Aalborg and at the University of Pavia

Nynne Holdt-Caspersen has received her grant from a fund that supports young researchers, who are simultaneously supported by the life science industry. In this case, Novo Nordisk is covering 2/3 of the costs from its special STAR pool - STAR stands for Science Talent Attraction and Recruitment.

Most of the work for her PhD will take place in Aalborg – at the university, Steno Diabetes Center North and Novo Nordisk’s Aalborg branch with approximately 50 staff, mainly biostatisticians. She will spend the remaining time at the University of Pavia in Italy, in a research group led by Professor Riccardo Bellazzi, head of the university’s Department of Electrical, Computer and Biomedical Engineering.



PhD Scholarships

In 2021, the DDA awarded five PhD scholarships: four 2/3-financed and one 1/3-financed industrial PhD scholarship. The five PhD scholarships were allocated to students across universities in Denmark: Aalborg University, Faculty of Medicine (1), University of Copenhagen, Faculty of Health and Medical Sciences (1) and Faculty of Science (1), Aarhus University, Faculty of Health (1), and University of Southern Denmark, Faculty of Science (1) (**Figure 4**).

Figure 4. The distribution of grants for PhD scholarships allocated by the DDA in 2021 by host institution. The funding rate of applications for 2/3-financed PhD scholarships was 7% in 2021.

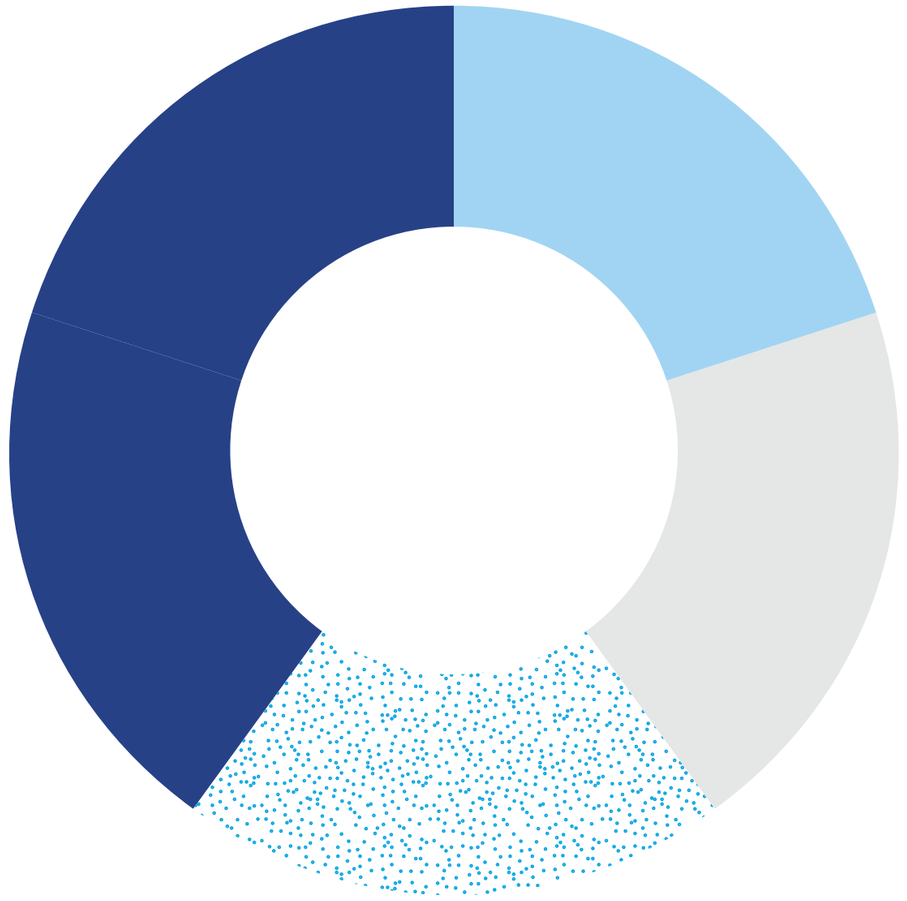


- University of Copenhagen, Faculty of Health and Medical Sciences 20%
- University of Copenhagen, Faculty of Science and Engineering 20%
- University of Southern Denmark, Faculty of Science 20%
- Aalborg University, Faculty of Medicine 20%
- Aarhus University, Faculty of Health 20%

Postdoctoral Fellowships

In 2021, the DDA awarded five postdoctoral fellowships: Three two-year financed and two one-year industrial fellowships. The five postdoctoral fellowships were allocated to postdoctoral fellows employed at the University of Copenhagen (1), Steno Diabetes Center Aarhus (1), University of Southern Denmark (1) and Novo Nordisk (2) (**Figure 5**).

Figure 5. The distribution of grants for postdoctoral fellowships allocated by the DDA in 2021 by host institution. The funding rate of applications for two-year postdoctoral fellowships was 9.4% in 2021



- Novo Nordisk 40%
- Steno Diabetes Center Aarhus 20%
- University of Southern Denmark, Faculty of Science 20%
- University of Copenhagen, Faculty of Health and Medical Sciences 20%



Mexican researcher and his Dutch professor continue their work and will now develop a new family-focused approach to type 2 diabetes prevention and care.

José Omar Silverman Retana, MD, PhD,
Steno Diabetes Center Aarhus

Omar Silverman, a medical doctor from Mexico, is set - under supervision of his Dutch professor Daniel Witte - to continue their work in the field of diabetes and family relations: now, they will develop a new family-focused approach to type 2 diabetes prevention and care.

They work in the international environment of the Steno Diabetes Center Aarhus, and their current research has just been funded by a grant of DKK 1.2 million from the Danish Diabetes Academy

Omar Silverman's postdoctoral research project builds on previous work showing how family relations affect type 2 diabetes risk. The results showed how different combinations of familial diabetes increased the risk of type 2 diabetes, especially if the family member is diagnosed at a younger age. The results also showed that spouses were more similar in their risk behaviours than in the biological mechanisms preceding type 2 diabetes.

His plan now is to investigate how a broader knowledge of family disease history can improve the identification of incident type 2 diabetes for the entire Danish population. He will also conduct a cross-sectional study focusing on measuring spousal synchrony in glucose physiology and behaviours in couples in which one partner is living with type 2 diabetes.

The project consists of two work packages (WPs):

- WP1: Development and validation of a population-wide register-based diabetes risk estimation tool that harnesses data on familial connections. WP1 will use routine diagnostic, socio-economic and prescription information on individuals and their relatives to estimate family-level and individual-level diabetes risk predictions, assessing feasibility and performance. The guiding hypothesis (H1) is that by considering broad long-term health trajectories, not only at the individual level but also at the level of couples and nuclear families, an individual and family diabetes risk prediction can be made for the entire Danish population on the basis of existing register data.

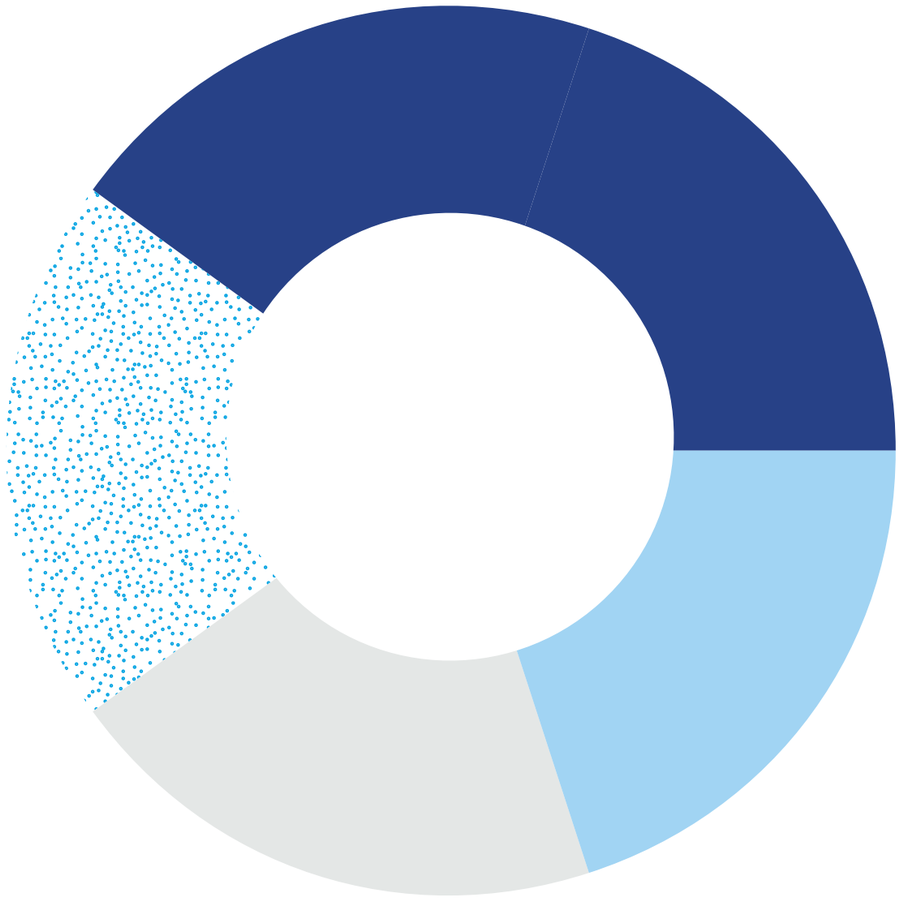
  WP1 includes both the development of a register-based prediction model and its internal and external validation.

- WP2: This study will explore how diabetes care and lifestyle management can be improved if it is targeted with regard to its circadian timing and involves the close social environment. In continuation of previous work, it will focus on the spouse, the closest relation most people have. WP2 will be a cross-sectional study aiming to assess synchrony (co-variation) in glucose variability and behaviours, using wearable devices in couples in which one of the partners is living with type 2 diabetes. The guiding hypothesis (H2) is that a higher degree of spousal behavioural synchrony is related to better glycaemic control in the partner with type 2 diabetes after adjustment for individual-level con-founders (e.g. diabetes duration, BMI) and medication.

Visiting Professorships

The DDA awarded five visiting professorships in 2021. Two of the visiting professorships were allocated to Steno Diabetes Center Copenhagen, one to Steno Diabetes Center Zealand, one to Steno Diabetes Center Odense and one to University of Copenhagen (**Figure 6**).

Figure 6. The distribution of grants for visiting professorships allocated by the DDA in 2021 by host institution. The funding rate of applications for visiting professorships was 71% in 2021.



Steno Diabetes Center Copenhagen	40%
Steno diabetes Center Zealand	20%
Steno Diabetes Center Odense	20%
University of Copenhagen, Faculty of Health and Medical Sciences	20%

DDA Awards

At the DDA Annual Day, the DDA allocated the DDA Awards to two early-career researchers to recognise, excellence, innovation, passion and commitment in Danish diabetes research:

- DDA-Funded Scientist Award: Signe Schmidt MD, team leader at Steno Diabetes Center Copenhagen and previously DDA-funded postdoctoral fellow, who has made important research within artificial pancreas, insulin treatment and clinical research and has shown great potential to be a world-class researcher within her field of expertise.

  Read more.

- Young Investigator Award: Nicolai Albrechtsen, MD and associate professor at the Novo Nordisk Foundation Center for Protein Research, University of Copenhagen, who has shown promising research and made an important contribution within glucagon physiology to the understanding and treatment of diabetes.

  Read more.

Reflections

The grants for PhD scholarships, postdoctoral fellowships and visiting professorships were distributed across educational backgrounds, research institutions in Denmark and various research fields and included a variety of topics as demonstrated in the wordcloud on pages 56-57 .

Similar to previous years, the funding rates for PhD and postdoctoral grants are low (7-9%), which demonstrates the high quality of the recruited researchers. The high quality is also demonstrated by the recruited researchers' publications (increased by 30.6%), but also by their dissemination activities and their abilities to establish collaborations and obtain further funding (pages 62-63).

The Covid-19 pandemic caused delays in DDA-funded researchers' projects, and the DDA thus offered additional funding (an extra month's salary) to partly cover these delays. The majority of PhD and postdoctoral grant recipients from 2018 and 2019 have already applied for the additional funding, and the DDA expects that grant recipients from 2020 will do so as well. Further, it is obvious that the pandemic has also had an effect on the DDA Visiting Professorship programme owing to travel restrictions. Therefore, a number of the visiting professors will need to revise their original project plan and change their plans for visits to Denmark. Yet, almost 1/3 of the visiting professors are well under way to complete their projects and report a successful visiting professorship so far.



Global Influence and Use of Danish Diabetes Data

David Beran, Assistant Professor, MSc, PhD, University of Geneva

Researchers from Odense University Hospital and Swiss visiting professor working to help low- and middle-income countries get better type 1 diabetes treatment.

Denmark's unique records of type 1 diabetes will now be used to help low- and middle-income countries improve treatment for their inhabitants suffering from the condition. In many countries, this will be an uphill climb. They have neither registries nor national insurance numbers, and many people only have information on paper. Consequently, researchers are starting by producing a white paper on the practice in Denmark.

The Danish anchor-men, Professor Kurt Højlund and Professor Anders Green, both from Steno Diabetes Center Odense, are now receiving expert assistance from Assistant Professor David Beran from the Division of Tropical and Humanitarian Medicine at the University of Geneva in Switzerland. His participation in the project has just been facilitated by a grant of DKK 244,500 from the Danish Diabetes Academy.

The team will start by outlining the burden, development, costs and quality of health services for type 1 diabetes in Denmark, accounting for how this type of data is utilised in planning and organising the efforts of the healthcare system. In phase two, they will deploy this Danish approach in the development of a roadmap with a view to planning and prioritising the efforts of the healthcare system in low- and middle-income countries. The ultimate goal is to establish collaboration and expand the network between Steno Diabetes Center in Odense and University of Geneva.

For the benefit of Denmark too

The researchers suggest that the project will also benefit Denmark in three different ways. Firstly, it will increase understanding of the burden of type 1 diabetes and of how data are used by planners and decision-makers in the healthcare system. Secondly, it will profile Denmark's experiences by applying them in other contexts. Thirdly, the collaboration between the applicant and the Danish researchers involved, along with the other partners, will form the foundation for network development in an area of global importance, with Danish expertise as a key component.

"The project has global implications. It will shed light on the need for improved data in relation to the global agenda in the field of diabetes and the empirical basis for assessing quality improvements in healthcare efforts," says Professor Kurt Højlund.

Facts about Health IT:

- Denmark is a global leader in the field of Health IT, including the collection of diabetes data. The sources of these data include the Danish National Patient Registry, the Danish National Prescription Registry, the Danish Register of Causes of Death and the Danish Central Person Registry. Data from these registries can be linked at the individual level via the social security number.

Facts about type 1 diabetes:

- The current assumption is that type 1 diabetes accounts for 5-10% of the total number of diabetes cases.- Type 1 diabetes is a chronic autoimmune disease, in which the beta cells are unable to produce insulin. The disease requires a wide range of health interventions to avoid the development of both acute and chronic complications and to reduce the number of cases of premature mortality.

Examples of research fields of DDA grants 2021

skeletal muscle

signalling networks in human adipocytes

online education programme

diabetes registry

managing glucose around exercise

preventing and managing diabetes in people with severe mental illness

type 2 diabetes prevention and care

molecular mechanisms of sulfide-mediated regulation of AMPK kinase activity

type 1 diabetes globally

genetic risk of type 2 diabetes

type 2 diabetes

single cell sequencing of the gastrointestinal tract

type 1 diabetes

Nephropathy

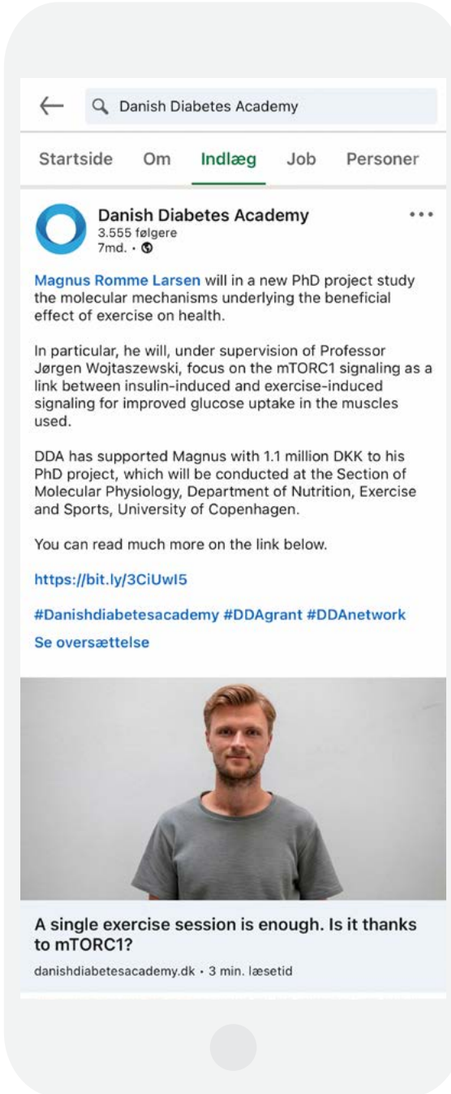
Communications

Activities 2021

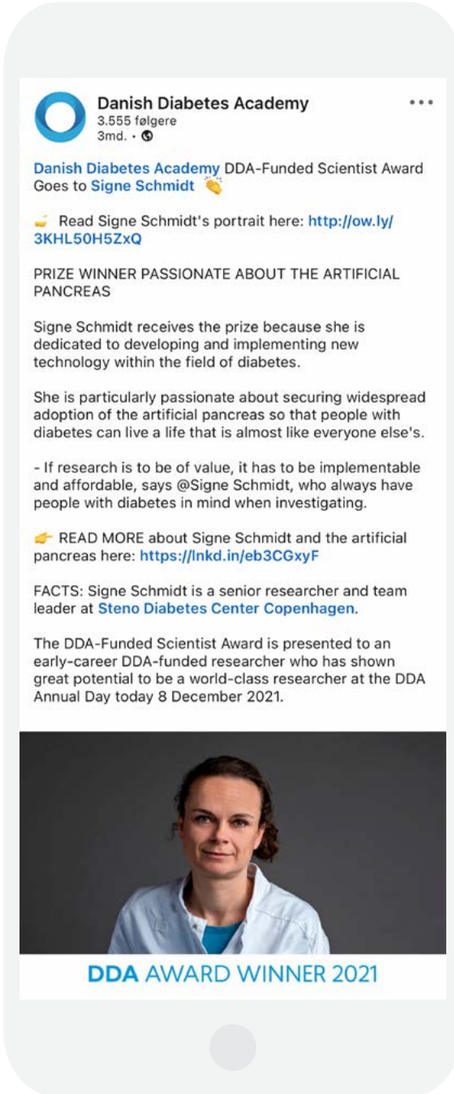
In 2021, the DDA increased its weekly activities on LinkedIn, Twitter and Instagram, which led to an increased number of followers by more than 50% on Twitter, 33% on LinkedIn, and 125% on Instagram compared to 2020.

In 2021, the DDA posted 152 status updates on LinkedIn (2.9 on average per week) generating 4,653 reactions, and 113 status updates on Twitter (2.2 on average per week) generating 1,276 likes. On the Alumni Network LinkedIn profile (97 followers), the DDA posted 51 status updates generating 280 reactions.

Examples of two status updates are below.

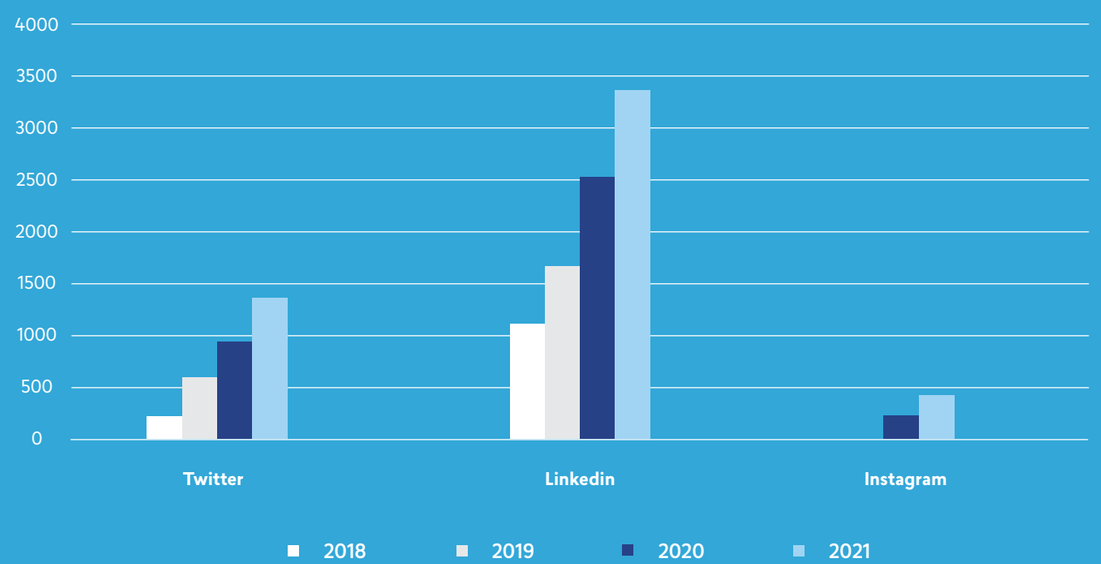


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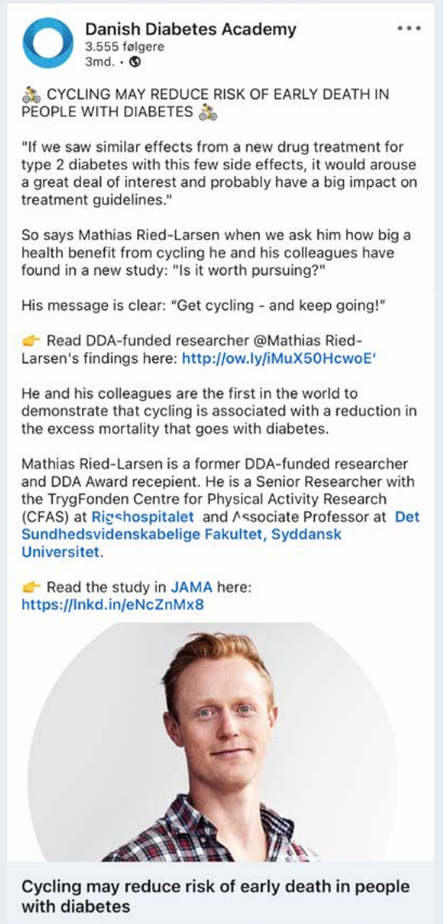
Figure 7. Number of followers of the DDA social media channels (Twitter, LinkedIn and Instagram) as per 31 December 2018, 2019, 2020 and 2021, respectively (the DDA Instragram profile was created in 2019, but statistics are only available from 2020 and onwards for this channel).



By the end of 2021, the number of followers on twitter was 1,368, on LinkedIn 3,346 and on Instagram 485 (**Figure** 7).

The DDA communications activities 2021 also included release of the DDA newsletters and DDA Alumni Network newsletters, which were received by around 2,778 and 149 subscribers, respectively.

Finally, the DDA posted stories on the DDA website and social media based on interviews with current and former (alumni) DDA-funded PhD students, postdoctoral fellows and visiting professors. These stories included career portraits and case stories highlighting DDA-funded researchers' careers and research, and they achieved media coverage 16 times in 2021, including newspapers, electronic periodicals and Danish university and university hospital websites. An example of a research story is to the right.



Reflections

In 2021, the focus of the DDA's communications activities was mainly to strengthen the presence on social media for dissemination of activities. The increase of followers on LinkedIn, Twitter and Instagram, and the reduced media coverage reflect this. During recent years, social media have changed the way early-career researchers communicate. The use of digital platforms such as LindkedIn, Twitter and Instagram have enabled easy and rapid dissemination of news and announcement of activities to reach early-career researchers and share research stories to a much wider audience across borders and sectors and to the public.

Link to article

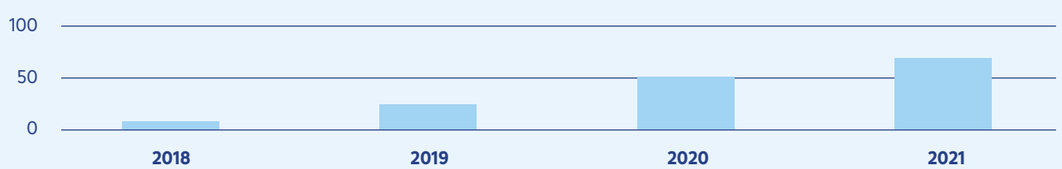
Scientific Publications, Collaborations, Dissemination and Further Funding

In 2021, the DDA and DDA-funded researchers reported 64 unique publications, 40 new collaborations, 98 dissemination activities and further funding of 14.1 million DKK in total.

Scientific publications

DDA-funded researchers reported 64 unique publications attributed to their DDA grant (pre-dominantly in peer-reviewed journals).This in an increase of 30.6% as compared to 2020 (**Figure 8**). An example of an article published in 2021 is on pages 64-65.

Figure 8. The number of unique publications reported by DDA-funded researchers in 2018, 2019, 2020 and 2021.

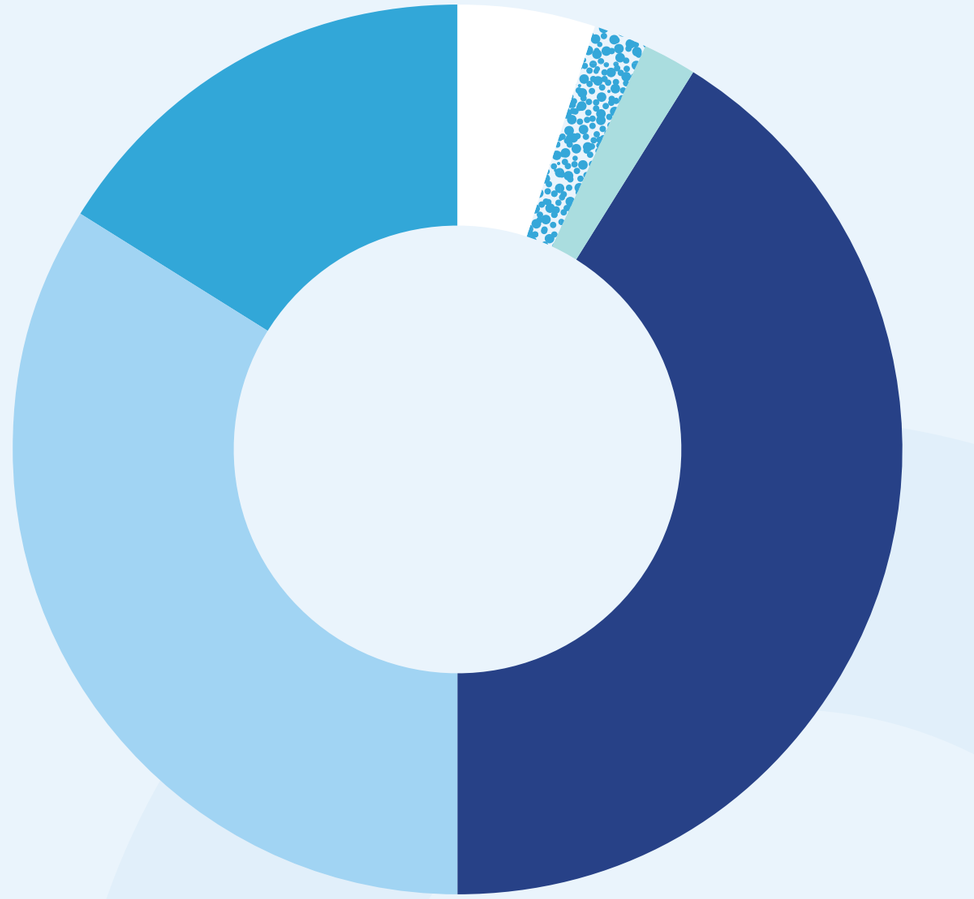


Collaborations

The number of new unique collaborations established by the DDA and DDA-funded researchers in 2021 was 40.

In total, DDA and DDA-funded researchers have, since 2018, established 172 collaborations across sectors with the majority within academia (universities) (41%) (**Figure 9**). The data also reveals a high percentage of collaborations with hospitals (34%) and the private sector (16%), as shown in **Figure 9**.

Figure 9. The number of unique collaborations reported by the DDA or DDA-funded researchers according to sectors.



Academic/University	41%
Hospitals	34%
Private	16%
Public	5%
Unkown	2%
Charity/Non Profit	2%

Trauma seems to pass from mother to child

Line Hjort, Postdoctoral Fellow, PhD, Department of Obstetrics, Juliane Marie Centre, Rigshospitalet and Environmental Epigenetics Lab, Novo Nordisk Foundation Center for Basic Metabolic Research, University of Copenhagen

It seems that trauma can be passed on: children born to women affected by post-traumatic stress during pregnancy also seem to be affected. At least, researchers from Denmark, Kosovo and Australia have measured increased levels of the stress hormone cortisol in the blood of such children.

At the same time, they found that genes involved in the development of anxiety and depression, for example, are affected when mothers have been subjected to sexual violence, torture or other traumatic events during pregnancy.

Doctors and practitioners treating torture victims have been seeing this for a long time, but they are pleased that it can now also be demonstrated by biological facts.

> "The long-term hope is to find a method of ensuring that the children of mothers who have been subjected to traumatic experiences, or who have PTSD, get the proper help right from birth."

One of the researchers behind the study is Line Hjort, PhD, a human biologist from Rigshospitalet and Center for Basic Metabolic Research at Copenhagen University.

The study, the first of its kind in the world, looked at 120 children between the ages of 6 and 17 born to 117 mothers in Kosovo. 72% of the mothers were assessed by questionnaire as having had PTSD while pregnant, while all the women had developed PTSD later. Along with thousands of others, the 117 women had been subjected to sexual violence and torture in the civil war of the 1990s in the former Yugoslavia

Line Hjort explains that the children were in a constant state of alert, and that this too may increase their risk of developing mental disorders.

Specifically, the study showed that almost 30% of the children had an abnormal (either excessive or insufficient) level of the stress hormone cortisol, something that worries the researchers. 'Cortisol is a useful hormone because it enables us to react quickly when necessary. But too high a level over an extended period can mean, for example, that we risk ending up in a state of stress or anxiety because we are unnecessarily vigilant and in a constant state of alert', she says.

> "Line Hjort emphasises that the study is about women who have been subjected to a very high degree of stress, and that it does not say anything about effects on the unborn child in the womb generally."

She hopes that the study can pave the way for larger-scale investigations of the impact on the child of trauma during pregnancy. The new study is already set to be followed up with another designed to show whether therapy can help these children achieve a lower stress level. The scientists want to find out whether family therapy can be a way of avoiding an elevated cortisol level.

This will be done through a study of the same 120 Kosovan children, who will be examined before and after a course of therapy lasting from 3 to 6 months.

Professor Romain Barrès of the Novo Nordisk Center for Basic Metabolic Research at the University of Copenhagen is one of the leading researchers in the field of epigenetics. In the newspaper ***Kristeligt Dagblad***, he points out that one cannot rule out a connection between the children's stress and them having been brought up by traumatised mothers. 'It is possible that the mother's trauma is affecting the child biologically, but the study includes only a relatively small number of women, so it is important not to come away with overly firm conclusions until we know more. Nor do we know whether it might in some cases be an advantage for children to have a higher blood cortisol content. For example, in some cases it might encourage more careful behaviour', says Romain Barrès, who – like Line Hjort – calls for further studies.

The study was carried out for: the Kosovo Rehabilitation Centre for Torture Victims (KRCT); Rigshospitalet; the Danish Institute Against Torture; Monash University in Melbourne. The results are published in an article in the scientific journal ***Epigenomics.*** First draft submitted: 22 January 2021; accepted for publication: 28 April 2021; published online: 17 May 2021.

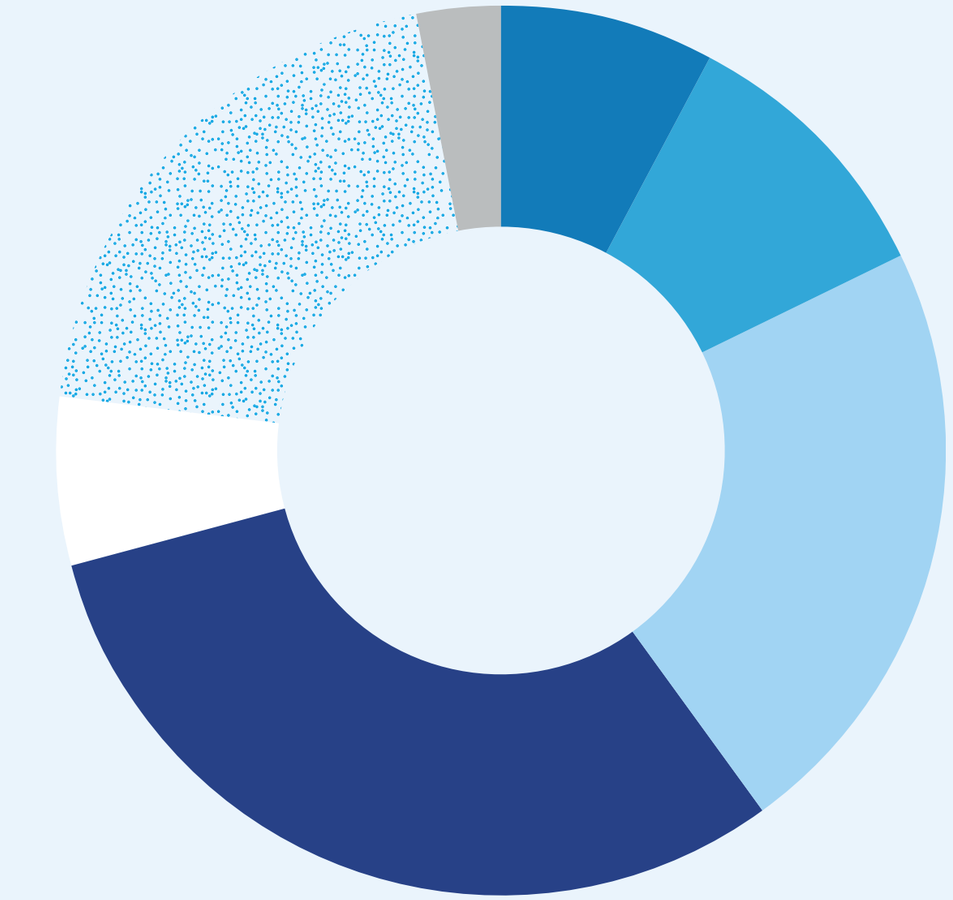
The article:
Intergenerational effects of maternal post-traumatic stress disorder on offspring epigenetic patterns and cortisol levels | Line Hjort*,‡,1,2, Feride Rushiti‡,3, Shr-Jie Wang‡,4, Peter Fransquet5, Sebahate P Krasniqi3, Selvi I Çarkaxhiu3, Dafina Arifaj3, Vjosa Devaja Xhemaili3, Mimoza Salihu3, Nazmie A Leku3 & Joanne Ryan**,5 The article was published online 17 May 2021.



Dissemination activities

The number of dissemination activities reported by the DDA or DDA-funded researchers in 2021 was 98, of which 45% had international reach (**Figure 10**). The majority of the disseminations were talks at national and international workshops and conferences and press releases.

Figure 10. Distribution of DDA and DDA-funded researchers' dissemination activities in 2021 by type of dissemination.

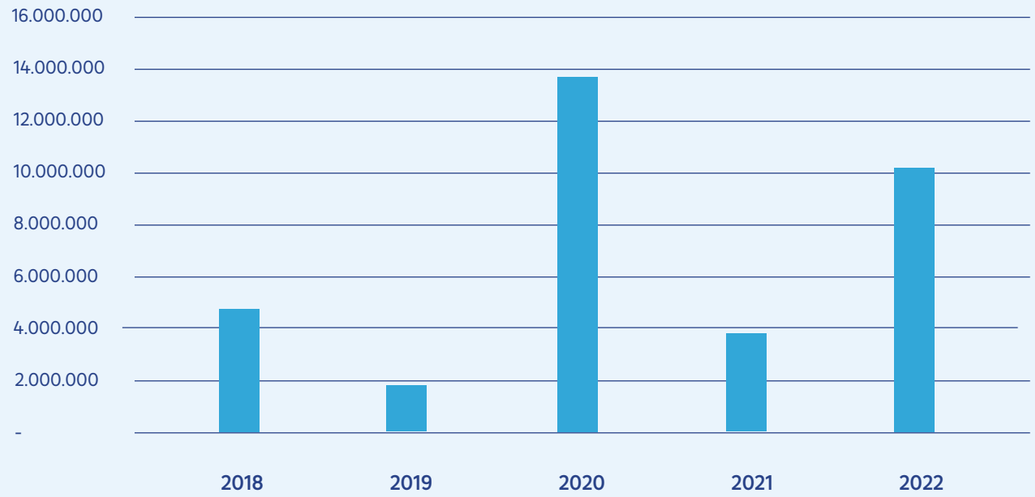


A broadcast e.g. TV/radio/film/podcast (other than news/press)	3%
A formal working group, expert panel or dialogue	8%
A magazine, newsletter or online publication	10%
A press release, press conference or response to a media enquiry/interview	22%
A talk or presentation	31%
Engagement focused website, blog or social media channel	6%
Participation in an activity, workshop or similar	20%

Further funding

Since 2018, the DDA and DDA-funded researchers have reported any additional funding received for their project (e.g. additional funding for their PhD scholarship, postdoctoral fellowship or travel grants) corresponding to a value of 34.5 million DKK in total (**Figure 11**). In 2021, DDA-funded researchers reported additional funding of 14.1 million DKK in total, of which the majority (10.4 million DKK) has a funding start date in 2022.

Figure 11. The amount of further funding reported by the DDA or DDA-funded researchers in 2019, 2020 and 2021.



Future Focus

A continued focus in 2022 for the educational and networking activities will be to promote translational research across research disciplines, in particular through cross-academy activities. As an example, the DDA and DDSA will organise a Data Science Spring School & Challenge where early-career researchers and professionals will work in interdisciplinary groups to tackle real-world challenges in health research. The event will focus on collaboration and networking opportunities, facilitating knowledge dissemination on different topics in data science and diabetes research. Another translational event will be the DDA & DCA PhD Course on Basal Metabolism & Molecular Mechanisms in Diabetes – From Basic Research to the Clinic where early-career researchers will participate in an introductory, interactive and interdisciplinary course on basal metabolism, the pathophysiology of diabetes and its complications at the molecular level.

To support knowledge sharing, collaboration and coordination of activities, a cross-academy networking group including the managing directors of DCA and DDSA will be established in 2022. The aim of the collaborations between the three academies is to expand the national network of early-career researchers and bridge researchers from the three academies.

The DDA has no more funding for PhD scholarships, postdoctoral fellowship and visiting professorships, but the DDA will follow how the outputs and outcomes of the activities and research of DDA-funded researchers are beginning to impact health and society.

For its communications activities, the DDA will continue to focus on high presence on social media, while also introducing two new focus areas: 1) digital outreach through a series of podcasts with the view to disseminate early-career researchers' research and their ideas on how to build bridges between science and society, and 2) public outreach through an event at the People's Meeting at Bornholm with the view to facilitate dialogue between early-career researchers and the public.

Self-evaluation 2018-2021 and the future of DDA

In accordance with the grant agreement, the Novo Nordisk Foundation conducted an external, independent and international evaluation of the performance of DDA from 2018-2021. The purpose of the evaluation was to assess whether the DDA has been successful in relation to its overall objectives and to reflect of the progress of the DDA.

Thus, in June 2021, the DDA submitted a self-evaluation report, which was prepared in collaboration with the BoD and members of the DDA bodies. Further, current and former DDA-funded researchers and representatives from the DDA faculty, including representatives from university hospitals, universities and the life science industry in Denmark, contributed to the report.

In addition to the self-evaluation report, the DDA also submitted a strategy paper that outlined the DDA's strategy for the years 2023-2027 with a focus on extending the scope of the current DDA to encompass all fields of diabetes and endocrinology. Based on the self-evaluation and the strategy paper, the Novo Nordisk Foundation invited the DDA to apply for a potential continuation and development of the DDA into DDEA for the years 2023-2027.

For developing the application, the DDA involved key stakeholders from basal, clinical and translational research, and all fields of diabetes and endocrinology, including members of the DDA bodies; current and former DDA-funded researchers; representatives of university hospitals; universities; the life science industry; professional societies, NGOs and the two new academies, DCA and DDSA.

The application describes how a future DDEA will build on the DDA's former achievements to promote world-class research excellence within the entire field of Danish endocrinology to improve the prevention and treatment of diabetes and endocrine diseases. Through a concerted capacity-building effort, the DDEA aims to foster research talent – by educating and developing the skills and careers of early-career researchers and by uniting representatives from academia, hospitals, life science industry, relevant professional societies, and NGOs. The DDA submitted the application in December 2021, and the Novo Nordisk Foundation expects to make a final decision before July 2022.

Closing remarks

The DDA has successfully delivered on its major work streams in 2021 and has continued to meet its mission and strategic objectives. The strategy adopted in 2021 for the main activity areas (education and talent development, networking and collaboration, grant and recruitment) built on the experiences and achievements realised by the DDA during the past years with a continued focus on internationalisation, interdisciplinarity and collaboration across sectors.

This approach, alongside a number of improvements and new strategies, made it possible for the DDA to provide high-class educational and networking activities for national and international early-career researchers across sectors, which may contribute to set-up early-career researchers for a successful future in the Danish diabetes research field.

Further, the impact of DDA-funded researchers on health and society is starting to show. In 2021, DDA-funded researchers published in high-impact journals, initiated new collaborations with other researchers from academia, university hospitals and the life science industry, engaged in dissemination activities and obtained further funding for their research. In 2022, the DDA will continue to follow the outputs and outcomes of the activities and research of DDA-funded researchers, and display these through the DDA communication channels.

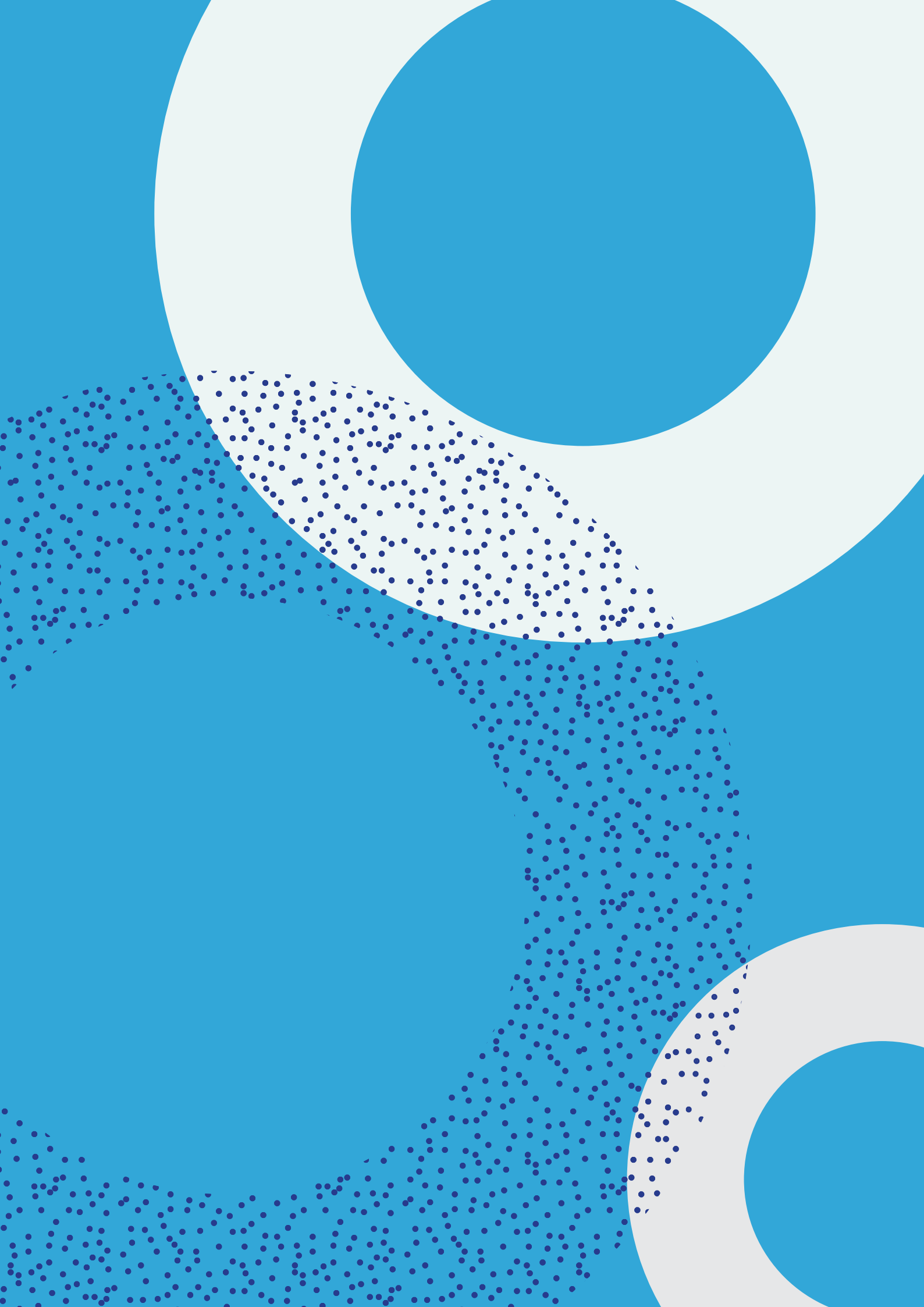
Finally, an important focus point in 2022 will be the outcome of the application for a continuation of the DDA (transferred into the DDEA). A successful application will help secure and capitalise on the outputs and impact generated by the DDA throughout the past nine years as a unifying hub for early-career researchers in Denmark.

None of the DDA's achievements would be possible without the large commitment and involvement demonstrated by the members of the DDA bodies, the DDA-funded researchers and other collaborators in Denmark and abroad. Their support helps the DDA in providing high-quality educational and networking activities that unify universities, hospitals and the life science industry.

Appendices

Appendix A.
Overview educational and talent development activities 2021

Appendix B.
Overview of networking and collaboration activities 2021



Danish Diabetes Academy Annual Report 2021

Appendices

Danish Diabetes Academy Annual Report 2021

Appendices

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Appendix A. Overview of educational and talent development activities 2021

Appendix A. Overview of educational and talent development activities 2021

Appendix A provides a list of all educational and talent development activities offered by the DDA in 2021, divided into onsite and hybrid activities (**Table 1**) and online activities of shorter duration (e.g. webinars) (**Table 2**). The list also provides links to further descriptions and programmes of the activities (if available – some activities were closed activities for invited participants and were not announced on the DDA website).

Table 1. *Educational and talent development activities 2021 with information on activity, date, format, number of participants, participants that were current or former DDA-funded researchers (DDA alumni), participant satisfaction with the scientific content of the programme, the composition of the programme, the organisation of the activity and the DDA as a networking hub (if relevant).*

Activity	**Date**	**Format**	**Participants (n)**	**Participants: current or former DDA-funded researchers (n)**	**Satisfaction** to a very great or a large extent * **with the scientific content of the programme (%)**	**Satisfaction** to a very great or a large extent * **with composition of the programme (%)**	**Satisfaction** to a very great or a large extent * **with the organisation of the course (%)**	**Satisfaction** to a very great or a large extent * **with the DDA as a networking hub (%)** (if relevant)
Understanding and developing my leadership skills (DDA Alumni Network)	24-25 February & 7 April	Online	16	5	100	91	100	N/A
PhD & Postdoc course on online presentations technique	14 May	Online	10	2	N/A	N/A	N/A	N/A
Symposium on Digital Health & Self-Management	27-28 May	Online	33	0	94	82	100	N/A
PhD & Postdoc Course on the social media landscape	4 June	Onsite	13	N/A	N/A	N/A	N/A	N/A
Symposium: Insight from three award winning diabetes researchers	11 June	Online	89	N/A	N/A	N/A	N/A	N/A
PhD & Postdoc Course on reproducible research in R-programming (Introductory)	15-17 June	Onsite	25	10	93.3	N/A	100.0	N/A
PhD & Postdoc Course on Presentations with impact	16 June & 23-24 June	Onsite	11	N/A	N/A	N/A	N/A	N/A
Hybrid Symposium on Treatment of diabetes,	18-19 June	Hybrid (onsite/online)	96	10	76.2	76.2	88.1	76.2

Activity	Date	Format	Participants (n)	Participants: current or former DDA-funded researchers (n)	Satisfaction to a very great or a large extent * with the scientific content of the programme (%)	Satisfaction to a very great or a large extent * with composition of the programme (%)	Satisfaction to a very great or a large extent * with the organisation of the course (%)	Satisfaction to a very great or a large extent * with the DDA as a networking hub (%) (if relevant)
obesity and assessment of end organ damage (kidney and liver/intestine)								
PhD & Postdoc Course on reproducible research in R-programming (Intermediate)	28-30 June	Onsite	24	4	91.7	94.5	94.4	66.7
The DDA PhD Summer School on Diabetes & Metabolism	30 August - 2 September	Onsite	52	11	91.5	97.9	97.9	91.5
Cambridge Metabolic Network (CMN)-DDA online course: Childhood Obesity – Causes and Prevention	6-7 September	Online	54	5	85.7	66.7	88.0	N/A
PhD and Postdoc Course on How to present your research to the public	7+21 September	Onsite	6	1	N/A	N/A	N/A	N/A
Symposium on Celebration of a Century with Insulin	17 September	Onsite/Hybrid	215	22	94.4	98.2	98.1	83.3
PhD & Postdoc Course on reproducible research in R-programming (Intermediate)	11-13 October	Onsite	19	4	100.0	100.0	97.0	97.0
PhD Course on Basal Metabolism & Molecular Mechanisms in Diabetes	26-28 October	Onsite	52	12	93.9	92.7	98.8	89.0
Symposium on Heterogeneity in Type 1 Diabetes	29 October	Onsite	42	5	96.4	92.9	100.0	85.7
DDA Winter School 2021 for postdocs	7-12 November	Onsite	43	8	97.3	100.0	95.9	97.3
Symposium on Clinical Metabolic Physiology	26 November	Onsite	42	1	N/A	N/A	N/A	N/A

Activity	Date	Format	Participants (n)	Participants: current or former DDA-funded researchers (n)	Satisfaction to a very great or a large extent * with the scientific content of the programme (%)	Satisfaction to a very great or a large extent * with composition of the programme (%)	Satisfaction to a very great or a large extent * with the organisation of the course (%)	Satisfaction to a very great or a large extent * with the DDA as a networking hub (%) (if relevant)
Symposium on RNA Mechanisms & Therapeutics in Metabolic Disease	1-3 December	Onsite	110	4	91.3	95.7	N/A	76.1

** The participants answered on a scale from 1-5 that they were satisfied to a very great or a large extent (4 and 5)*

Table 2. *Online educational and talent development activities of shorter duration (e.g. webinars) 2021 with information on activity, date, number of participants and presenter.*

Activity	Date	Participants (n)	Presenter
Webinar on Sex Differences in Metabolic and Cardiovascular Disease	13 January	32	DDA Visiting Professor John Stafford, Vanderbilt University Medical Center (US)
Webinar on Cell-to-cell communication via Extracellular vesicles - challenges and opportunities in diabetes research	15 January	43	DDA Visiting Professor Carlos Salomon, The University of Queensland (Australia)
Webinar on Preclinical drug discovery in NASH - Narrowing the translational gap	17 February	20	Senior scientist Henrik Björk Hansen, GUBRA (DK)
Webinar on Does diabetes effect voluntary movement? A study of the effect of diabetes on the pathway for voluntary movement	23 February	5	PhD Jesper Guldsmed Madsen, Institute of Clinical Medicine, Comparative Medicine Lab, Aarhus University (DK)
Webinar on Improved time-in-range is associated with albuminuria reduction in persons with type 1 diabetes	24 February	7	DDA postdoc Ajenthen Ranjan, Steno Diabetes Center Copenhagen (DK)
Webinar on Epidemiology and genetics of Diabetes and cancer	09 March	37	Professor Andrew Renehan, University of Manchester (UK)
Webinar on The COPLab study	11 March	19	Professor Christoffer Johansen, Copenhagen University Hospital (DK)
Webinar on The anti-inflammatory effects of exercise: focus on diabetes and cancer	11 March	45	Professor Bente Klarlund Pedersen, Copenhagen University Hospital (DK)
Webinar on The link between breast cancer and diabetes	15 March	35	Professor Signe Borgquist, Aarhus University (DK)

Activity	Date	Participants (n)	Presenter
Webinar on Schizophrenia and Metabolism: A Collision of Brain and Body?	15 March	46	DDA Visiting Professor Margaret Hahn, Centre for Addiction and Mental Health (CA)
Webinar on Cancer treatment and diabetes	16 March	21	Assistant Professor Emily J. Gallagher, Mont Sinai Hospital (US)
Webinar on Childhood obesity and adult cancer	16 March	28	Associate Professor Jennifer Baker, Frederiksberg Hospital (DK)
Webinar on Metabolic health, insulin, and breast cancer: Why oncologists should care about insulin	18 March	22	Professor Nicholas J G Webster, UC San Diego School of Medicine (US)
Webinar on Muscling in on insulin resistance in cancer	23 March	38	Associate Professor Lykke Sylow, Copenhagen University (DK)
Webinar on Metabolic and epigenetic changes after adjuvant chemotherapy in patiens with early breast cancer	24 March	24	DDA Postdoc Linn Gilberg, Copenhagen University (DK)
Webinar on Deciphering the role of adipose tissue in breast cancer: A putative role of PAPP-A and IGF-2	25 March	24	Professor Jan Frystyk, University of Southern Denmark (DK)
Webinar on A natural whey protein hydrolysate, PEP2DIA, regulates blood sugar levels after meals	8 April	22	Bioactives Clinical Trials Specialist Joanna Moro, Ingredia SA (F)
Webinar on The impact of diabetes on colorectal cancer	13 April	25	DDA Postdoc Tinne Laurberg, Steno Diabetes Center Aarhus (DK)
Webinar on The effect of colectomy and chemotherapy on glucose homeostasis in patients with non-metastatic colon cancer	13 April	15	DDA Postdoc Louise Lang Lehrskov, Copenhagen University Hospital (DK)
Webinar on Using evolutionary life history theory to understand variability in human growth, metabolism and behaviour	25 May	45	DDA Visiting Professor Jonathan Wells, UCL Great Ormond Street Institute of Child Health (UK)

Appendix B. Overview of networking and collaboration activities 2021

Appendix B. Overview of networking and collaboration activities 2021

Appendix B provides a list of all networking and collaboration activities offered by the DDA in 2021 (**Table 1**). The list also provides links to further descriptions and programmes of the activities (if available – some activities were closed activities for invited participants and were not announced on the DDA website).

Table 1. *Networking and collaboration activities 2021 with information on activity, date, format, number of participants, participants that were current or former DDA-funded researchers (DDA alumni), participant satisfaction with the scientific content of the programme, the composition of the programme, the organisation of the activity and the DDA as a networking hub (if relevant).*

Activity	**Date**	**Format**	**Participants (n)**	**Current or former DDA-funded researchers**	**Satisfaction** to a very great or a large extent * **with the scientific content of the programme (%)**	**Satisfaction** to a very great or a large extent * **with composition of the programme (%)**	**Satisfaction** to a very great or a large extent * **with the organisation of the course (%)**	**Satisfaction** to a very great or a large extent * **with the DDA as a networking hub (%)** (if relevant)
Workshop on Diabetes and Cancer	27 May	Hybrid (online/onsite)	35	8	100.0	100.0	80.0	80.0
The 3rd Danish Muscle Metabolism Network Workshop	12 August	Onsite	45	6	88.0	100.0	96.0	80.0
Workshop on coupling Extracellular vesicles Analyses to Clinical Research Circulating Liquid Biopsies for Biomarker Discovery & Real-time Monitoring of Metabolic Changes in Obesity & Diabetes	24-25 August	Onsite/Hybrid	21	6	93.3	93.3	100.0	93.3
Workshop on How to navigate the industry recruitment process (Alumni Network)	8 September	Onsite/Hybrid	32	10	81.0	85.7	92.9	38.5
Start-up Meeting with New DDA-Funded Researchers	13-14 September	Onsite/Hybrid	34	34	64.2	91.7	93.7	N/A
Workshop on Scientists of Tomorrow – part 1	22-23 September	Onsite	28	16	41.7	50.0	62.5	75.0

Activity	**Date**	**Format**	**Participants (n)**	**Current or former DDA-funded researchers**	**Satisfaction** to a very great or a large extent * **with the scientific content of the programme (%)**	**Satisfaction** to a very great or a large extent * **with composition of the programme (%)**	**Satisfaction** to a very great or a large extent * **with the organisation of the course (%)**	**Satisfaction** to a very great or a large extent * **with the DDA as a networking hub (%)** (if relevant)
Brainstorming workshop in relation to the challenges at the Winter School 2021 for postdocs	27 October	Online	32	8	N/A	N/A	N/A	N/A
Workshop on Scientists of Tomorrow - part 1.5	28 October	Online	28	16	N/A	N/A	N/A	N/A
Workshop on Scientists of Tomorrow - part 2	24-25 November	Onsite	30	20	61.1	83.3	91.7	83.3
Industrial Career and Network Day	30 November	Onsite	82	5	82.7	85.5	93.6	66.4
Networking Dinner Event for DDA-Funded Researchers	December 7	Onsite	32	28	N/A	N/A	N/A	N/A
DDA Annual Day	8 December	Onsite	102	44	80.3	89.7	97.4	68.0

** The participants answered on a scale from 1-5 that they were satisfied to a very great or a large extent (4 and 5)*

