

BioMedical Design

– Enhance your opportunities

spot needs
create value



spot urgency
create a new world

Ideas anchored in the needs of today



New methods for treating diseases, greater involvement of patients, better use of resources...

The healthcare area meets new challenges every day. More than ever specialists in innovation are sought to identify needs, qualify ideas and create commercial solutions in the interaction between healthcare, universities and industry.

BioMedical Design Novo Nordisk Foundation Fellowship Programme is aimed at professionals who can think and act in a solution-oriented manner in order to face these healthcare challenges through structured and evidence-based efforts. The goal is to allow physicians, business practitioners, engineers and other disciplinary professionals to become future leaders of healthcare innovation.

The programme trains participants in the biodesign innovation process – a repeatable, proven process for identifying, inventing, and implementing new health technologies.

A total of 16 fellows are admitted to the programme each year over a 4-year period – eight fellows at Health, Aarhus University and eight at SUND, University of Copenhagen. The 10-month course contains both theory and practical fieldwork.

The fellowship programme addresses a wide range of talented professionals who work with innovation, research or have the curiosity and the desire to meet the challenge.

The course is funded by the **Novo Nordisk Foundation** and anchored at **INNO-X Healthcare**, Health Aarhus University and **SUND** Copenhagen University.

Content and structure of the BioMedical Design programme

The 10-month, full-time programme consists of a boot camp and a three-step process encompassing clinical immersion, creative skills and commercial skills development.

The programme is completed when fellows submit the fellowship report at the end of the course.

During the different phases, the fellows will receive feedback from experts, people in key knowledge positions and various stakeholders.



1. Bootcamp - Foundational knowledge

During the boot camp the fellows are taught and trained in health ethnography tools in order to be able to conduct observations in a critical and objective manner. During the boot camp fellows will form interdisciplinary teams.

Healthcare staff from the clinical departments in which the fellows will be immersed will introduce various medical aspects including state-of-the-art technologies, patient care and examination procedures relevant to the clinical field of focus.

→ Lasts for 4 weeks)

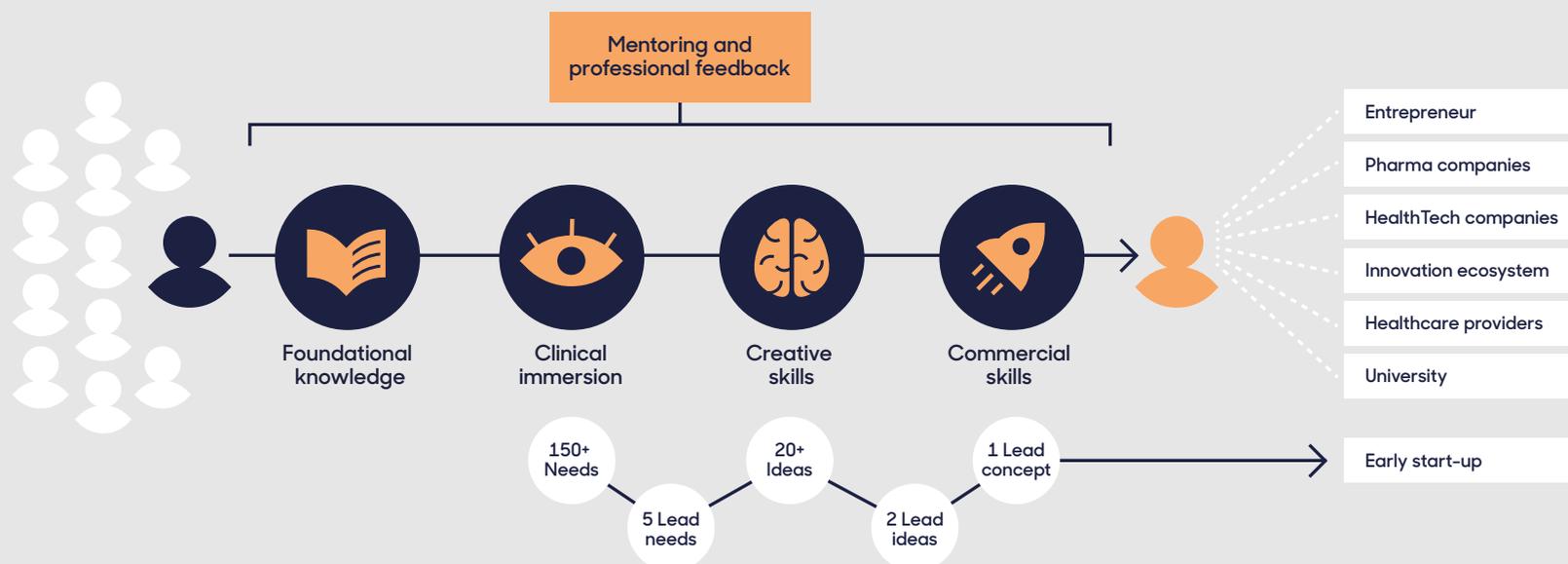


2. Clinical Immersion

During an 8-week immersion period on a clinical ward, the teams carefully observe the different functions and activities of the daily routine in order to identify any problems encountered by the personnel or patients. During the immersion period, each fellow makes individual arrangements with the clinical staff to shadow the work on the ward by either following one of the staff members, a patient or a specific procedure, examination, operation or consultation.

The fellows identify and log hundreds of clinical needs and dive deeper into five key needs with the highest potential-value for the next phase.

→ Lasts for 12 weeks)





3. Creative skills

During this phase the focus is on creating and validating different solution concepts to the five key needs. Through repetitive ideation sessions, fellows generate at least 20 ideas to solve the five key needs. Ideation, prototyping, user involvement and the search for available technologies will force the fellows to find a compatible match between needs and technological feasibility. During this phase the seeds for future collaborations between the entrepreneurs and the clinic are sown.

→ Lasts for 10 weeks



4. Commercial skills

The fellow teams will select one lead concept and then the initial prototyping begins. Each fellow team develops a business model based on listing, testing and validating preliminary assumptions on key business aspects. The assumptions are supplemented with research on patenting, drafting the design of clinical tests, drafting of regulatory approval documents and, not least, the gathering of data and insights to formulate a clinical implementation strategy.

Each fellow team will end up generating a single validated solution concept to solve a documented clinical need. The teams will provide an early prototype with a complementary validated business model and an execution plan.

→ Lasts for 14 weeks

End product

The end-product for each team will be a single validated solution concept to solve a documented clinical need.

The teams submit a written report on the final need and product resolution, business plan description, patent landscape analysis and patent strategy, a draft research study design and a draft regulatory approval strategy.

A physical prototype or product concept artefact should also be produced.

Graduation will take place with an open-access presentation and questions from an invited assessment committee.



Learning outcomes

The fellowship programme will provide you with a wealth of new knowledge, skills and competences. Some of the primary learning goals are listed here.

Knowledge and understanding:

- Healthtech-specific innovation and commercialisation theory and practices
- Healthcare systems understanding
- Design thinking and creativity theory
- Healthcare implementation framework

Skills:

- Ability to act professionally across business and institutional units
- Ability to collect and combine quantitative and qualitative data to characterise healthcare needs and identify market opportunities
- Ability to analyse and match needs with technology
- Interdisciplinary collaborative skills

Competences:

- Enhanced creative self-efficacy
- Entrepreneurial mindset
- Good communication; internal to team and external to stakeholders
- Teaming; self-management of own role in teams relative to dynamics and competences to produce the right innovation team

The path to new positions

BioMedical Design opens the door to new prospects, whether the fellow is a researcher who wants to target his or her research, an employee who wishes to become a specialist in innovation or an entrepreneur who has a dream of opening up his own business.

The 64 fellows will, after completing the course, appear as highly competent and dedicated professionals who can become health entrepreneurs, enter innovation teams in companies, lead innovative developments at hospitals or take positions in the various health clusters in Denmark. Truly everyone will have formed bonds and significantly increased their network across different fields and sectors, nationally and internationally.

The fellows have at least five potential professional pathways following the programme:

1. Becoming a health tech entrepreneur.
2. Working with innovation management positions in health tech companies.
3. Becoming a health tech entrepreneur in a clinical environment and promote needs-driven innovation in healthcare together with colleagues.
4. Seeking new challenges within health-related areas such as pharma, health tech or biotech.
5. Becoming a researcher, manager, facilitator or consultant at universities, university spin-outs and in the health innovation ecosystem, influencing the activities here with an applied commercial and innovative ability.



It is expected that a third of the fellows at the BioMedical Design Fellowship Programme will start companies and commercialise the solutions created during the fellowship.

The assumption is based on experiences from the various Biodesign programmes from around the world.



Applicant's background:

The question is not who you are, but where you want to go.

Fellows will be selected based on their experience, passion, and drive, as well as their potential to become leading innovators in the health tech field.

Applicants with academic backgrounds in medicine, biosciences, engineering or business are the obvious choices as candidates. However, many applicants also have relevant experience in the healthcare industry or in research positions. Above all, the BioMedical Design Programme is created for candidates who have the ambition to become leaders in health technology innovation. Applicants with seemingly unconventional backgrounds such as anthropology, design or digital innovation are also more than welcome to apply.

Applicants with a non-academic background such as nurses, physiotherapists or occupational therapists can also apply on certain conditions such as length of work experience and involvement in projects.

Fellows will obtain an entrepreneurial mindset, which can either make them become entrepreneurs creating their own business or entrepreneurs in their employee setting.

Fellows receive a monthly stipend of 40.000 dkr. and travel funds during their fellowship period.

Qualification criteria

looking for applicants with diverse backgrounds:

Fellows should have an academic and professional background in medicine or healthcare, business, technology, product design or the like. However, we accept applications from any individuals who have demonstrated exceptional creativity and/or innovation in their professional or academic careers.

Aside from the formal qualification criteria fellows will be selected based on their abilities to express their intentions for applying for the fellowship, demonstration of collaborative skills, and ability to challenge own perceptions.

The academic level should be at Masters or above and a minimum of 5 years of professional work. Physicians should have finished KBU (basic clinical education year) and one year of introductory position.

Nurses and similar occupations are qualified if they have at least 6 years of work experience in combination with a demonstration of development work or other additional experience from innovation or research.

Four seats per year will be reserved for non-Danish-speaking fellows. Applicants from any country are welcome.

The fellowship programme is a full-time study course and fellows are expected to be on leave from their ordinary job while attending the course.

Learning methods designed for identifying clinical needs

In search for clinical needs

The main mission of the fellowship programme lies in detecting clinical needs and finding solutions in the healthcare system, principally in Danish hospitals but also in the primary health sector and the interaction between the two sectors.

A clinical need occurs when current technology, tools and procedures are inadequate to help the healthcare staff to perform their tasks precisely and effectively. The concept also includes unmet needs among patients to deal with their illnesses in the most beneficial way.

The format will provide the fellows with knowledge on real-world problems and tasks and give a personal and tactile learning experience. It will train their ability to gather tacit knowledge and challenge their default thinking. The fellow teams will turn data-analyses into action-enabling decisions.

Fellows will be trained, mentored and taught by a core staff team supplemented by a number of external teachers such as experts from industry, academia and the healthcare sector.

Dynamic learning and teaching methods

The BioMedical Design Programme is by nature very dynamic with a large mixture of active and lecture-based learning, but with emphasis on active, team-based learning to enhance interdisciplinary and collaborative skills.

We are focused on giving our fellows practical experiences, which demonstrates how they can apply taught theory in real world problem solving.

The projects, which the interdisciplinary fellow teams embark on, are not playground projects but will be rooted in reality.



spot passion
create talent

Typical structure of the teaching:

- a. Preparation by reading a text, listening to a video and/or performing a practical task together with fellow team members.
- b. Lecturing and instruction in class combined with exercises
- c. Out-of-class teamwork on projects based on specific instructions from the previous in-class lecture. The out-of-class tasks are what we call "get-out-of-the-building" exercises. Fellow teams have to perform field work, research, interviews and networking.
- d. Written assignments are limited and generally short except for the final report.

Team-based learning:

The 16 fellows accepted annually will be divided into four interdisciplinary teams of four with broad professional and academic backgrounds as well as balanced personality profiles. The teams are formed one month into the programme and will last until the end of the course.

Needs led healthcare innovation:

An intensive field study (6–8 weeks), which takes place in selected clinical wards at Danish hospitals, is a cornerstone of the BioMedical Design programme. During the study the fellows will identify real clinical problems or needs. They will continuously work with these needs during the course to gain an in-depth understanding and to prioritise a need where a solution would create impact and be commercially sustainable.

The right combination

The BioMedical Design Programme combines theory and practical experience with an extraordinary focus on interdisciplinary team formation and team dynamics. The structure of the programme ensures that the fellows are equipped with the tools and methodologies needed to lead a structured innovation process from exploration and qualification of valuable needs to implementation of a resolution or introduction of a new product to the market.



Why should a company or institution allow a talented employee a 10-month leave?

Here are the arguments:

- Every company benefits from supporting relevant candidates to tap into the BioMedical Design programme due to the possibilities for uncovering new markets together with relevant clinical network expansion, from which both fellows and companies can benefit.
- Researchers returning to post-doctoral positions at universities will be well equipped to engage professionally in translational research and industry-financed development projects.
- Fellows obtain better communication and collaboration skills in relation to future cross-functional development projects.
- Fellows obtain increased qualifications in running innovation projects along with enhanced abilities to determine where to apply technology and how to create value for users and customers.
- Fellows return to the company/research institution with a real-time view on the needs and opportunities in the healthcare system and new skills to generate creative solutions to the needs.
- No expenses. Stipend and other expenses are paid by the fellowship programme.



How to apply:

1. Provide the required material consisting of CV, motivated application, confirmation of possibility to obtain permission of leave from employer, copy of diploma, and a two-minute video of the applicant expressing what he or she wishes to do with the BioMedical Design competence after the programme has ended.
2. Apply online at www.biomedical-design.dk before the deadline of 30 March.
3. Shortlisted candidates will be invited to an interview session in April.
4. Selected candidates for fellowships are notified early May.
5. The programme begins in early September.

Who is behind?

The health faculties of Aarhus University and University of Copenhagen will execute the BioMedical Design Fellowship Programme over the next 4 years (2019-2023). The programme has received a €10.5m grant from the Novo Nordisk Foundation based on previous work and experiences with needs-driven innovation by INNO-X Healthcare at Aarhus University.

The BioMedical Design programme is part of an international family of similar fellowship programmes such as BioInnovate, Galway, BioDesign, Oxford, Clinical Innovation Fellowship KTH, Stockholm, and BioDesign at Stanford University.

Knowledge and practices are exchanged in this community for the mutual benefit and continuous evolution of the programmes.

Two locations: Aarhus and Copenhagen

BioMedical Design Novo Nordisk Foundation Fellowship Programme operates from two offices, one at Aarhus University and one at the University of Copenhagen.

Fellows will be divided in two groups of eight fellows at each site. Desks and a workspace will be available for each team.

Teaching will take place at these sites and also at residential stays. Sometimes fellows at University of Copenhagen will travel to Aarhus to

participate in classes, and vice versa. In addition, residential stays for both groups will occasionally be available.

Clinical immersion will take place at different hospitals in Denmark. Two main clinical departments will annually be chosen as hosts for the first 4 weeks of immersion. Validation of found needs hereafter takes place at clinics at different hospitals in Denmark.

Further information:

Administration:

BioMedical Design
Novo Nordisk Foundation
Fellowship Programme

INNO-X Healthcare
Managing director, Sys Zoffmann Glud
Telephone: (+45) 2459 2667
Email: sys@innox.au.dk
Web: biomedicaldesign.dk

Partners:



AARHUS UNIVERSITET

Aarhus University, Department
of Clinical Medicine

