Danish Diabetes Academy

Scientists of tomorrow

Programme overview

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Content

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What is it about?

The course focus is on trends and developments in health. The course is divided into four workshops, each with a specific theme describing the changes and trends we observe in science, technology, and medicine today. Through analysing needs, changes, challenges and opportunities, you will develop a new mindset through megatrends and learn about a paradigm shift in our approach to health and science, emerging technologies and the importance of data. These are all elements undergoing rapid changes, and they will shape the research landscape in the coming decade.

The course is developed and delivered by the Copenhagen Institute for Futures Studies (CIFS). CIFS is a world leader in applying futures studies and foresight methodologies tailored to client-specific challenges and a global thought leader in the future of health.

The course will take place over four x 1.5-day workshops. In between physical workshops, CIFS will facilitate online networking and collaboration activities.

What will I learn?

This course will provide you with a broader perspective on the society you work in and under which circumstances your research will be applied in the future. It will inspire you to work with a more holistic mindset and identify new opportunities offered by convergence of disciplines outside your area of expertise.

This course provides you with:

- A toolbox for futures thinking and leadership.
- Solid insight into the megatrends and health trends that shape the future and how they may affect health and medical research.
- Insight into technological innovation, new entrants in the health domain, new business models, disruptions etc.
- Foresight and the ability to see past the next publication.
- A greater understanding of and appreciation for collaboration, data sharing and convergence of disciplines.
- Inspiration for the development of innovative products, collaborative partnerships and approach to science.

Dates and details

Physical workshops

Workshop 1: A paradigm shift in the approach to health and treatment
Workshop 2: The holistic approach to health and research
Workshop 3: Data, data sharing, interoperability and standards
Workshop 4: Technology, artificial intelligence, and readiness

Online networking and collaboration activities

To connect the workshops and form a stronger network between participants, the course also includes four 2-hour online workshops and a series of real-time Delfie surveys covering themes of the coming workshop and bridging the themes of the workshops together. During the activities with Delfie surveys and online workshops, you will be tasked to write a position paper together with other participants.

Dates

Physical workshops (1.5 days)	**Online workshops (2 h)**	**Delfie surveys (20 min)**
		September 2021 week 36
22-23 September 2021		
		October 2021 week 40
	28 October 2021 at 10:00-12:00 hrs.	
		November 2021 week 44
24-25 November 2021		
		December 2021 week 49
	January 2022 week 1	
		January 2022 week 3
26-27 January 2022		
		February 2022 week 6
	March 2022 week 9	
		March 2022 week 12
	April 2022 week 14	
4-5 May 2022		

Preparation time: You should expect one hour preparation time before physical workshops and 15 minutes preparation for online workshops.

Workshop 1, 22-23 September 2021: A paradigm shift in the approach to health and treatment

The overall focus in this workshop is on the changes that are already happening. The emerging health paradigm is moving away from the current treatment-centric approach to healthcare towards an approach that emphasises maintenance of health and prevention of disease. We will also talk about how different "omics" are advancing a comprehensive understanding of general biology, pathology and personalised medicine.

- **From one size fits all to personalised health care**

Today, we are facing a paradigm shift within our approach to understanding biology, health, healthcare and treatment. We are moving from a one-size-fits-all approach to personalised healthcare, where each patient is seen as an individual and treated as such.

- **A comprehensive understanding of health and disease in the "era of the omics"**

With the rise of the different fields of "omics", we are getting a better and more complex understanding of health, disease and disease development. A deeper understanding of disease development can lead to screening, earlier detection and intervention. E.g., would it be possible to monitor the development of diabetes using multiomics? These tools will enable a more complete understanding of individual patients. Patients can be treated according to their own molecular characteristics, which will lead to tailored treatment for each.

- **From treatment to prevention**

We are moving from a sole focus on treatment to a shared focus on treatment and prevention. Here, we will walk through primary, secondary, and tertiary prevention and examples of such. The idea is, among other things, to challenge the thought of either solely doing prevention, e.g. with a vaccine, or solely treating a manifested disease, as all the different stages of disease development are worth understanding and targeting. One example is a vaccine against high cholesterol, which is currently in clinical trials.

Workshop 2, 24-25 November 2021: The holistic approach to health and research

This workshop will focus on the holistic perspective of health, behaviour and health literacy.

- **From a reductionistic approach to a holistic approach**

In the past few decades, we have moved from a century of studying biological systems through a reductionist methodology, which dissect every system into its constituent parts, to a holistic approach. The holistic methodology looks at ALL the different parts and dynamic processes at play and their interplay. *New systems biology* is a strategy for, or way of, thinking about research into biological organisms. It aims to grasp the full picture of the extremely complex biology composed of dynamic and interrelated genetic, proteinic, metabolic and cellular components with the help of biology, mathematics and computer science. New systems biology, including omics, contributes to a more holistic understanding.

- **Social determinants of health and "The humanome"**

The determinants of health, introduced in the 1970s by the WHO, show to what degree the health of individuals is affected by their physical environment, the medical care they might receive, genetics and biology, social circumstances and individual behaviour. Medical care only makes up approximately 11% of the determinants of health, while individual behaviour and social circumstances make up 60%. In the holistic approach, all aspects affecting health must be considered. With the increase in wearables and gadgets that can measure multiple parameters and can nudge our behaviour, it is becoming increasingly easy to track our own health and thereby take responsibility. We provide a walkthrough of how we can use the digital twin and triplet in research.

- **Health literacy**

To obtain a healthy lifestyle and prevent lifestyle-related diseases, we must possess a certain degree of health literacy. Health literacy is the ability to understand healthy behaviour and take actions to improve health. People must be able to gain insights into trustworthy health information to educate themselves or others. Health-related research must be communicated in other formats than high-level scientific articles that are not available to the general public. Health literacy is key and should be a priority for all citizens from an early age.

Workshop 3, 26-27 January 2022: Data, data sharing, interoperability and standards

This workshop will focus on the staggering amount of data being produced and the importance of securing data while still allowing sharing of data between systems, institutions and researchers. This can only be done if there is interoperability between systems, which can be achieved through standards. COVID-19 has shown us how scientific collaboration can be achieved across borders and institutions and between researchers on a hitherto unseen scale. The sharing of data and knowledge was the key enabler for the rapid development of vaccines and virus containment strategies.

- **Data is more valuable than oil**

In 2017, T*he Economist* declared data to be the world's most valuable resource of the 21st century, even more so than oil, and with good reason. Data, including health data, are produced at an unparalleled pace, and we currently only use approximately 3% of all this data. It is important that we do not cultivate a culture of data hoarding; instead, data should be both shared and utilised in a trustworthy manner.

- **Behavioural data will be a driver for healthy behaviour**

Future healthcare delivery will rely on a rich and broad array of individual-level data to provide a comprehensive picture of all aspects of an individual's life. Individuals will be encouraged to take responsibility for decision-making, to oversee data access and use, and to be in the driving seat for their health. This version of personalised (or precision) medicine will draw upon data sets from a variety of electronic sources, one of the most important being behavioural data or real-world data (RWD). How can these new types of data benefit the scientists of tomorrow? How can we implement RWD in clinical studies?

- **Interoperability and standards are key for trust and collaboration**

Data is often collected using different methodologies, analysed by non-standardised software, and stored in incompatible formats. Interoperability is, in the broadest sense, the ability to share information such that people and systems can effortlessly understand and learn from it. To simplify an incredibly complex area of health data, interoperability is achieved when systems can connect to each other, define a format and syntax for exchange, provide a common codification for a shared understanding, and organisational structures are implemented to enable giving and receiving consent and trust. Laboratories often use different methodologies and machines with different formats, which complicates direct translation of research results. Interoperability can be achieved by using standards, where data entries are formalised in a way that provides consistent meaning to data shared among different systems. The Human Genome Project was only possible because of strict standards achieved through consensus between the participating institutions. The same should go apply to other research disciplines in order to increase trust in and transparency of data and results.

Workshop 4, 4-5 May 2022: Technology, artificial intelligence and readiness

In this session, the focus is on health technology and digital therapeutics, including how AI is used in basic research, drug development, and diagnosis and will play an even larger role in the future. Furthermore, in the future, everything, including our health, should be easy and on-demand, preferably from our own homes, aided by state-of-the-art innovation and the Internet of Things. We will also discuss the technological and societal readiness for uptake of these innovations.

- **Health technology and cool gadgets**

An introduction to some of the technologies that are revolutionising healthcare. These include wearables, at-home measurements, AR/VR, online clinical experiments, 3D bioprinting, chatbots, ingestible measurements, smart lenses, and more.

- **Digital therapeutics (DTx), a digital pill**

DTx are software-based therapies that deliver evidence-based therapeutic interventions to patients via high-quality software to prevent, manage, or treat a medical disorder or disease. As they often support other types of medical treatment, they play an important role in the holistic health concept.

- **AI in everything**

AI plays a role in many aspects of everything from diagnosis, the interpretation of data and results to screening for possible drug candidates and providing early warning of epidemics. In theory, AI can help in many areas of research and development, but there are still many challenges to overcome for full utilisation of the potential.

- **Readiness**

We will talk about both technological and societal readiness, where are we at today, and where we expect to be in a decade. We will also work with Harvard Kennedy School's concept of technical or adaptive (transformative) change.