

AI KOMMER – HVORDAN LIGGE

# ETHODE FORAN

OLAV SCHEWE

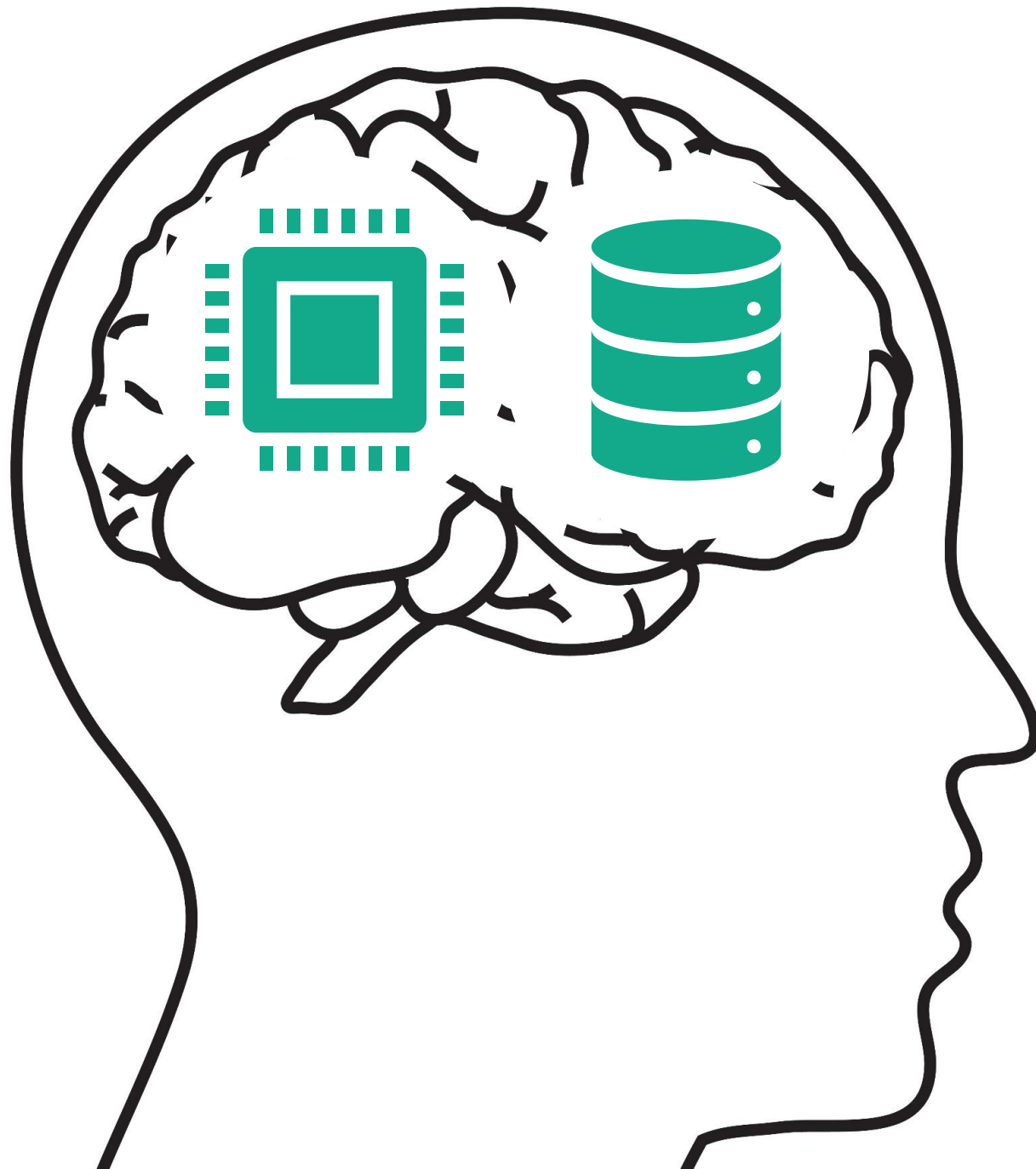
DOKTORGRADSFORSKER, UNIVERSITY OF OXFORD

VISITING FELLOW, HARVARD UNIVERSITY

TIDLIGERE REVISORMEDARBEIDER, EY OG FINANCE MANAGER, DNV

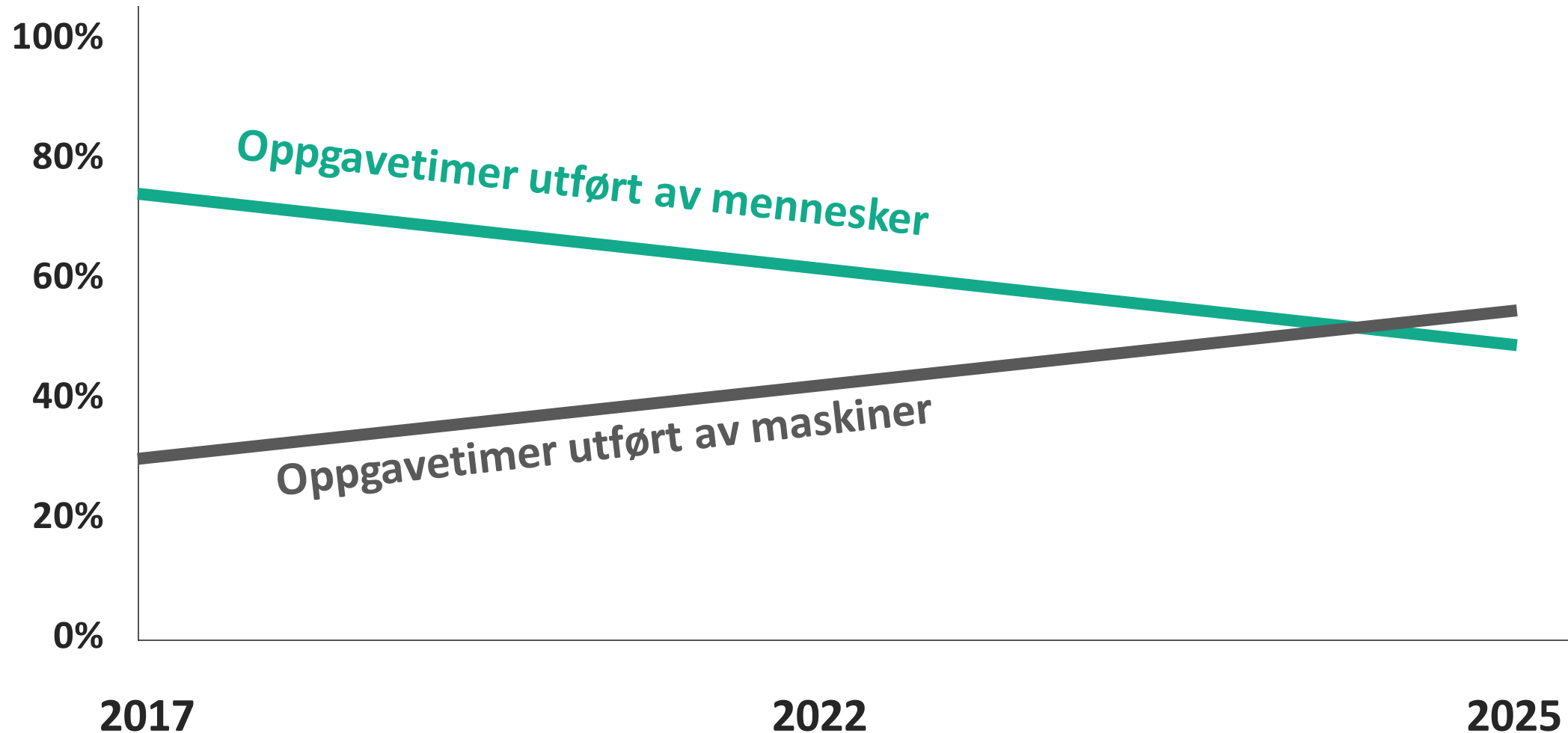






## World Economic Forum:

# Maskiner vil utføre flere oppgaver enn mennesker innen 2025



# Amerikansk studie: Regnskapsførere mest berørt av generativ AI

arXiv:2303.10130v5 [econ.GN] 21 Aug 2023

WORKING PAPER

## GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models

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<sup>1</sup>OpenAI

<sup>2</sup>OpenResearch

<sup>3</sup>University of Pennsylvania

August 22, 2023

### Abstract

We investigate the potential implications of large language models (LLMs), such as Generative Pre-trained Transformers (GPTs), on the U.S. labor market, focusing on the increased capabilities arising from LLM-powered software compared to LLMs on their own. Using a new rubric, we assess occupations based on their alignment with LLM capabilities, integrating both human expertise and GPT-4 classifications. Our findings reveal that around 80% of the U.S. workforce could have at least 10% of their work tasks affected by the introduction of LLMs, while approximately 19% of workers may see at least 50% of their tasks impacted. We do not make predictions about the development or adoption timeline of such LLMs. The projected effects span all wage levels, with higher-income jobs potentially facing greater exposure to LLM capabilities and LLM-powered software. Significantly, these impacts are not restricted to industries with higher recent productivity growth. Our analysis suggests that, with access to an LLM, about 15% of all worker tasks in the US could be completed significantly faster at the same level of quality. When incorporating software and tooling built on top of LLMs, this share increases to between 47 and 56% of all tasks. This finding implies that LLM-powered software will have a substantial effect on scaling the economic impacts of the underlying models. We conclude that LLMs such as GPTs exhibit traits of general-purpose technologies, indicating that they could have considerable economic, social, and policy implications.

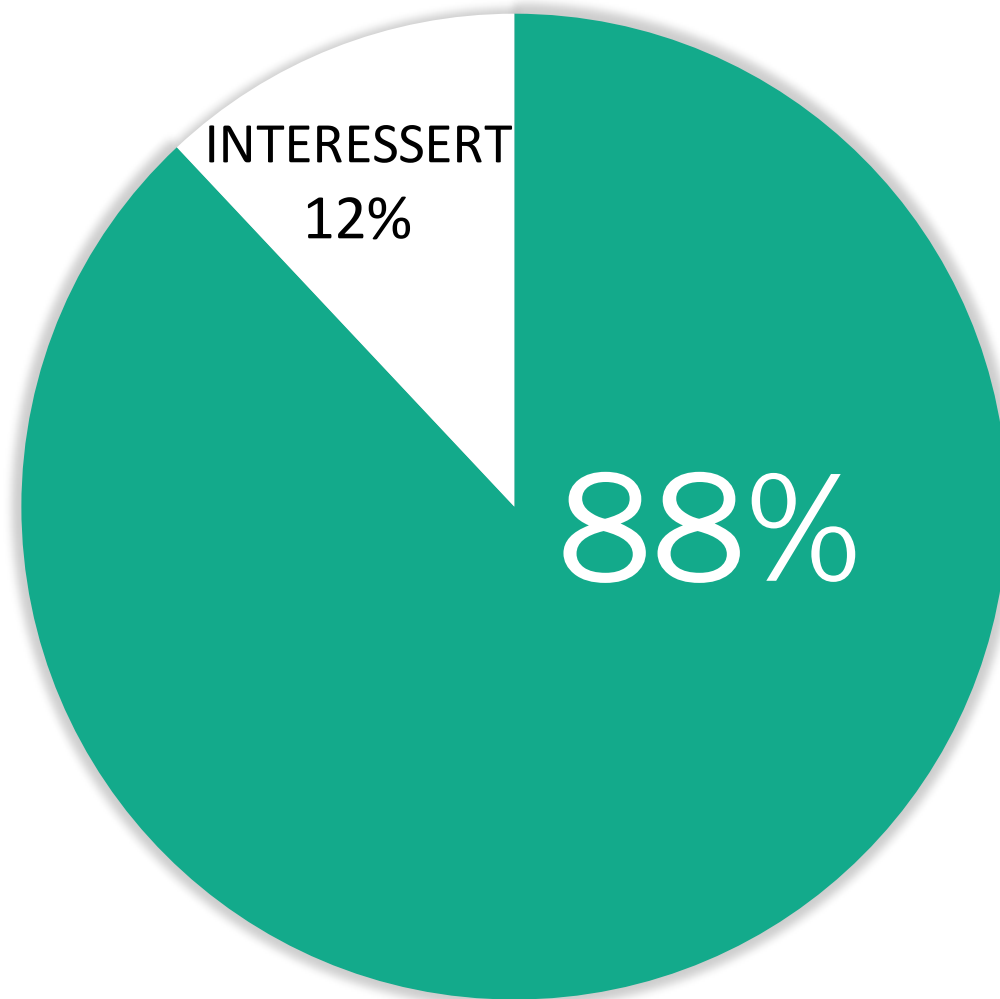
### 1 Introduction

As shown in Figure 1, recent years, months, and weeks have seen remarkable progress in the field of generative AI and large language models (LLMs). While the public often associates LLMs with various iterations of the Generative Pre-trained Transformer (GPT), LLMs can be trained using a range of architectures, and are not limited to transformer-based models (Devlin et al., 2019). LLMs can process and produce various forms of sequential data, including assembly language, protein sequences and chess games, extending beyond natural language applications alone. In this paper, we use LLMs and GPTs somewhat interchangeably, and specify in our rubric that these should be considered similar to the GPT-family of models available via ChatGPT or the OpenAI Playground (which at the time of labeling included models in the GPT-3.5 family but not in the GPT-4 family). We examine LLMs with text- and code-generating abilities, use the term "generative AI" to additionally include modalities such as images or audio, and use "LLM-powered software" to cover tools built on top of LLMs or that combine LLMs with other generative AI models.

<sup>\*</sup>Corresponding author (pamela@openai.com). Authors contributed equally and are listed alphabetically.

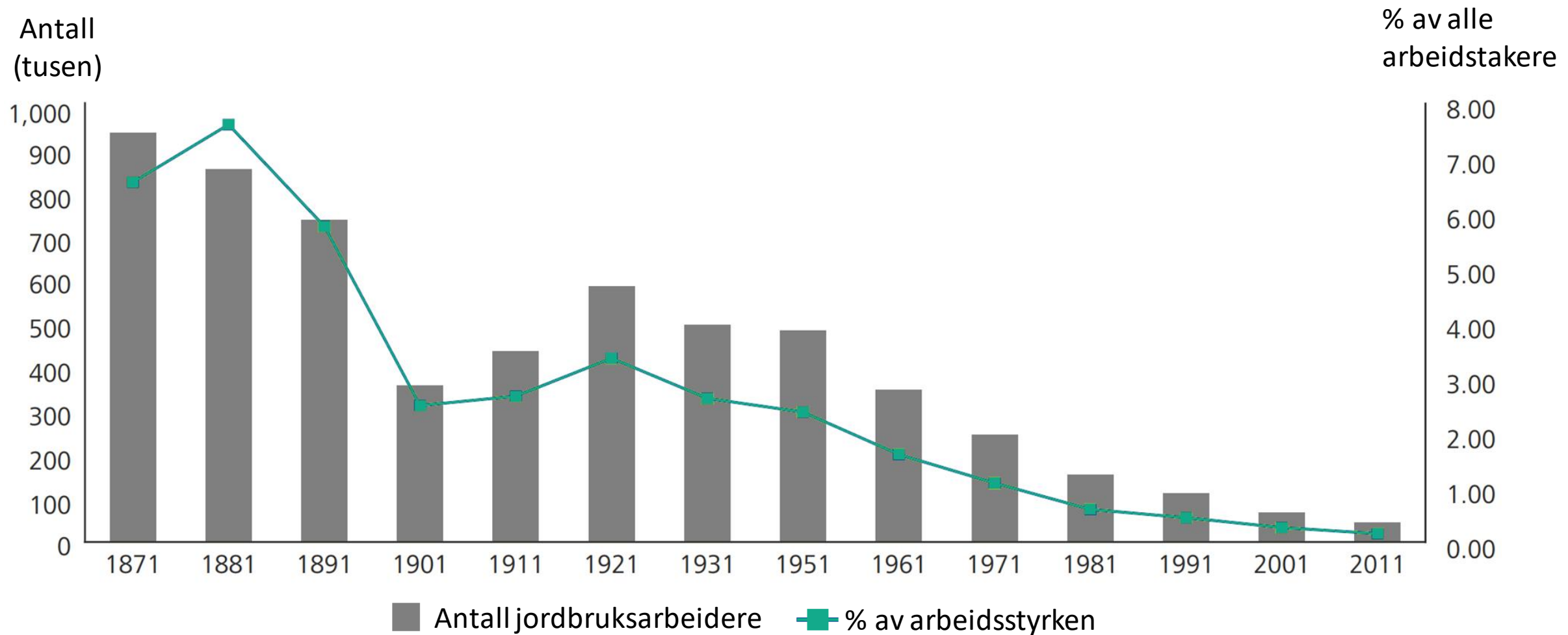
## KPMG Rapport, juni 2023:

SELSKAPER SOM BRUKER ELLER PLANLEGGER Å BRUKE AI I ØKONOMIAVDELINGEN



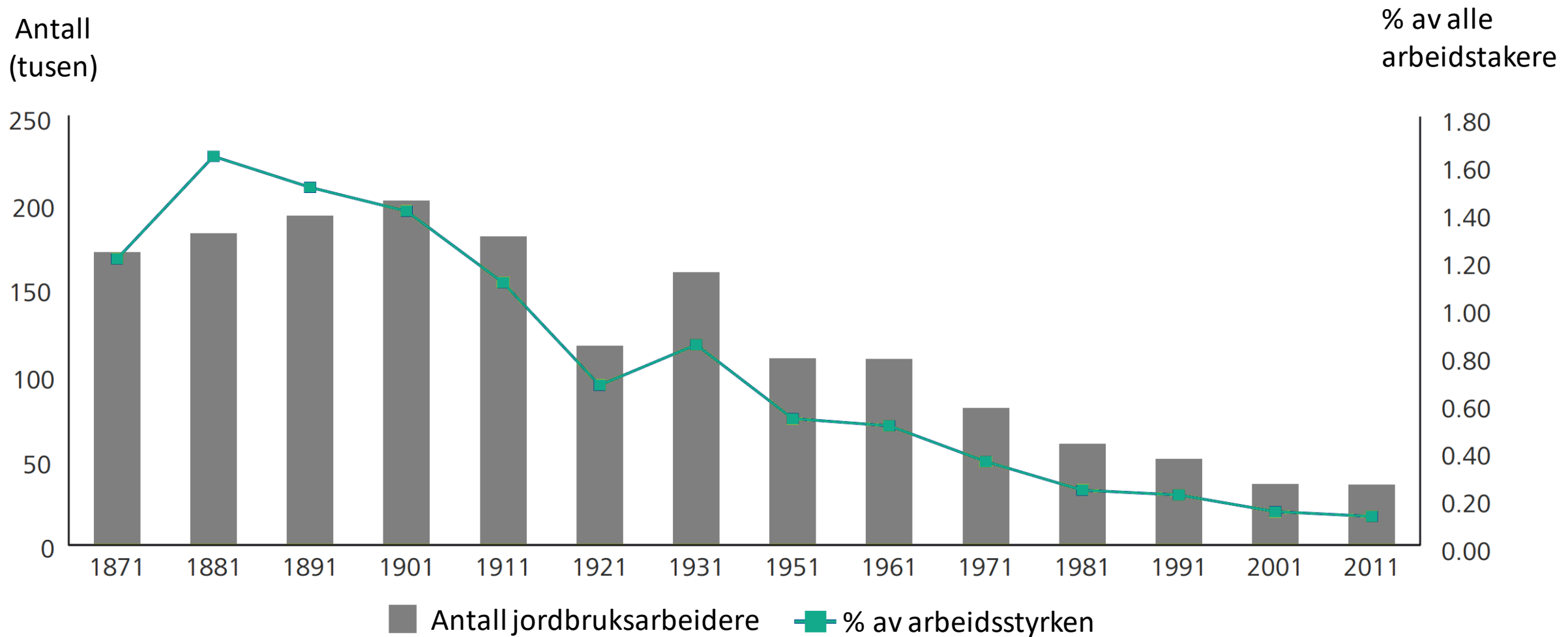
# HVORDAN PÅVIRKER TEKNOLOGI JOBBENE I SAMFUNNET?

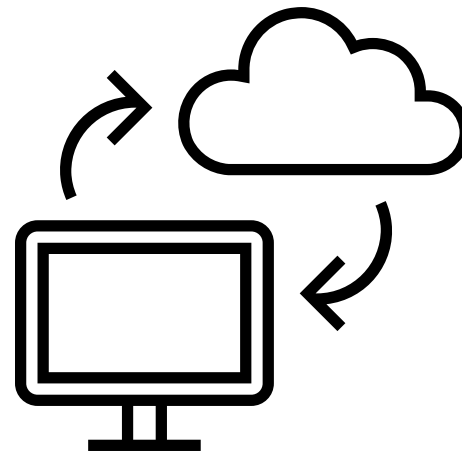
# Utvikling i antall jordbruksarbeidere i Storbritannia



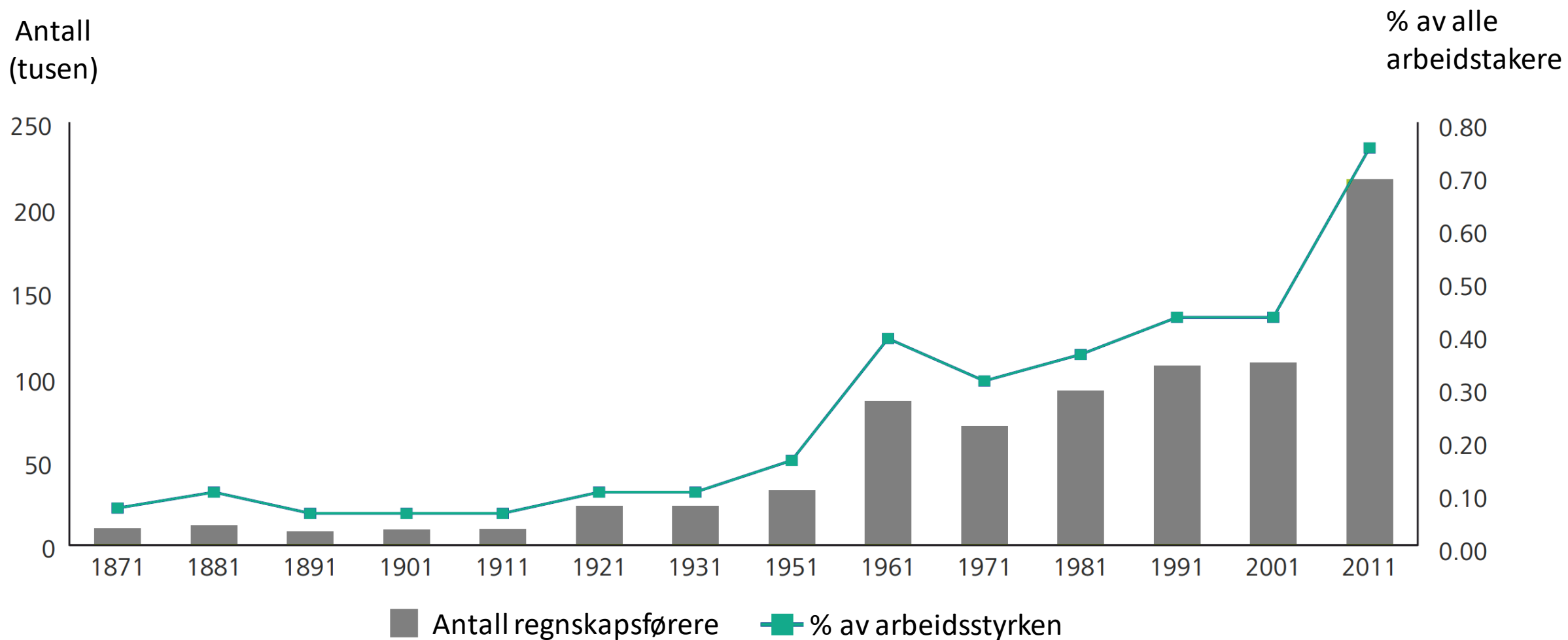


# Utvikling i antall klesvaskere i Storbritannia





# Utvikling i antall regnskapsførere i Storbritannia



# Utvikling i jobber i Storbritannia fra 1992 til 2014

Repetitive,  
ufaglærte jobber

Bankfunksjonærer  
(-66%)



Kompetansebaserte  
jobber

Business Analysts  
(+365%)



# HVORDAN PÅVIRKER TEKNOLOGI JOBBENE I SAMFUNNET?

TEKNOLOGI

ERSTATTER

ENDRER

SKAPER

JOBBER

**Olav:** Vil AI erstatte regnskapsførere?

**ChatGPT:** AI kan endre måten regnskapsførere arbeider på, men det er lite sannsynlig at de vil bli fullstendig erstattet av AI. I stedet kan regnskapsførere dra nytte av AI-verktøy for å forbedre effektiviteten og kvaliteten på sitt arbeid.

Regnskapsførere spiller en viktig rolle i tolkningen av data, rådgivning, strategisk planlegging for bedrifter og løsning av komplekse regnskapsmessige problemer som krever menneskelig vurdering og forståelse.



Om ti år vil finans- og regnskapseksperter ha et helt annet sett med ferdigheter. [...] De vil se mer ut som data-analytikere og systemingeniører.

**Mark D. McDonald**  
Senior Director, Gartner







DELL

DELL

DELL

DEAN SCHWELZ

# UPSKILLING

1 Lære nye  
ferdigheter

2 Bedre til å  
løse problemer

# HVORDAN

- 1 Lære nye ferdigheter
- 2 Bedre til å løse problemer



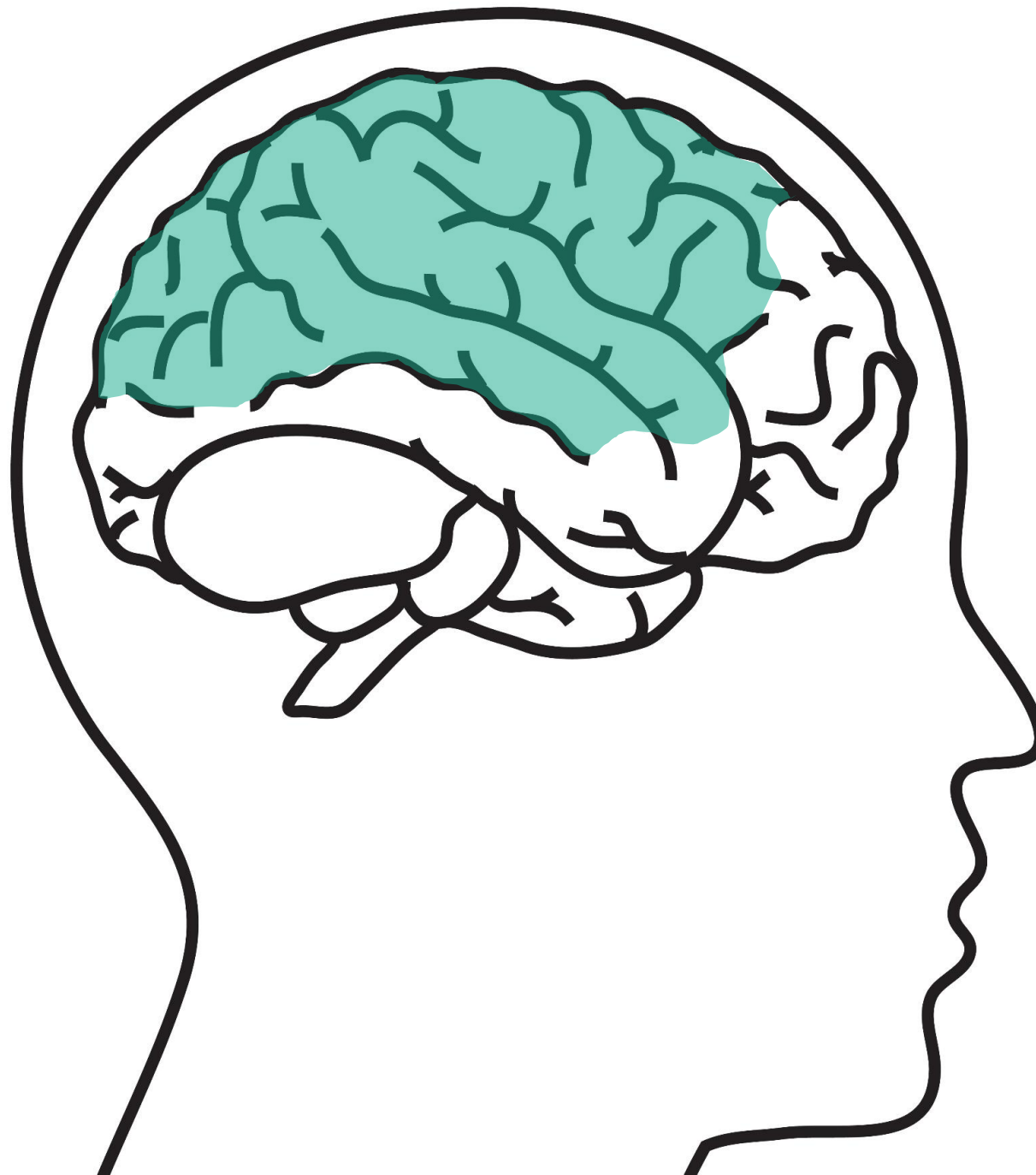
BASERT PÅ  
NEVROVITENSKAPLIG  
INNSIKT

1

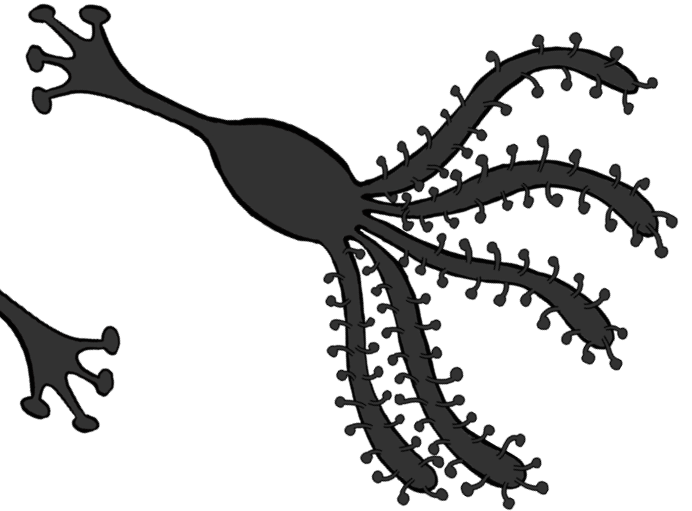
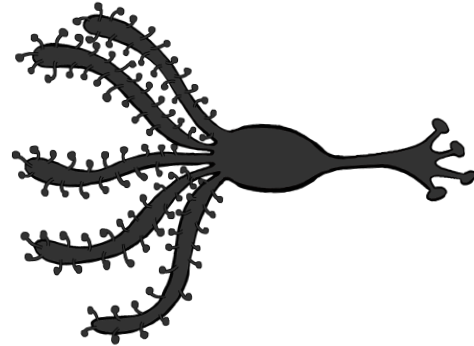
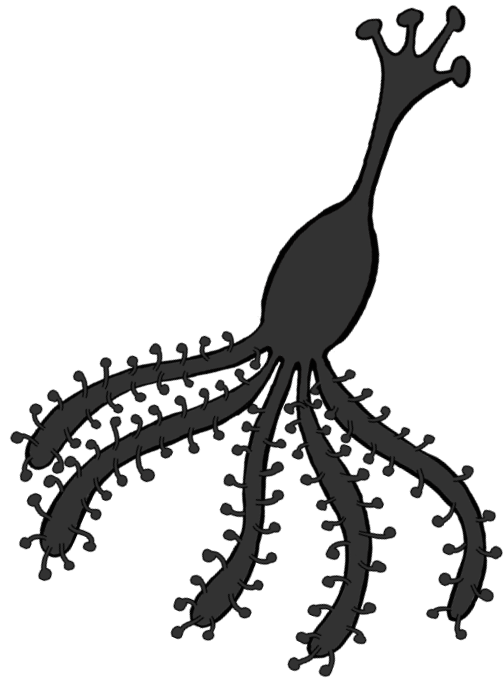
Lære nye  
ferdigheter

2

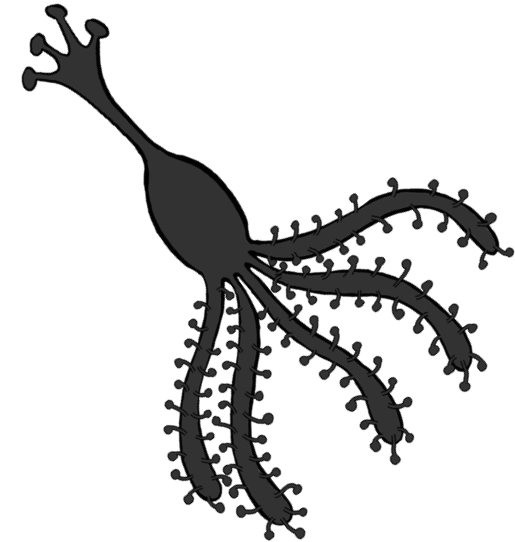
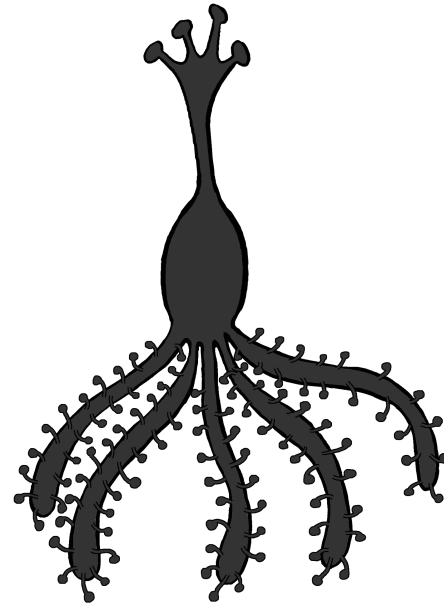
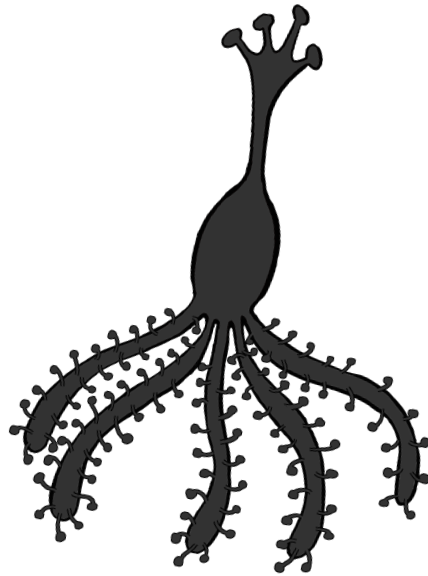
Bedre til å  
løse problemer

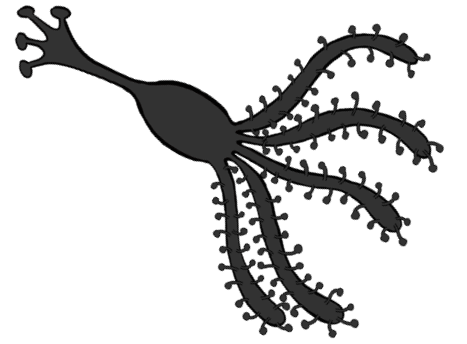
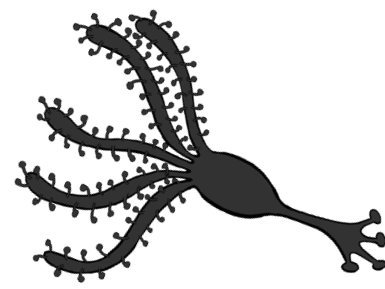
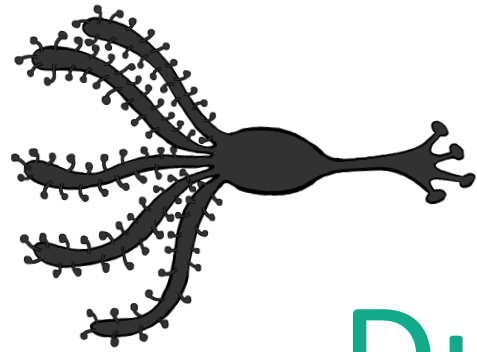
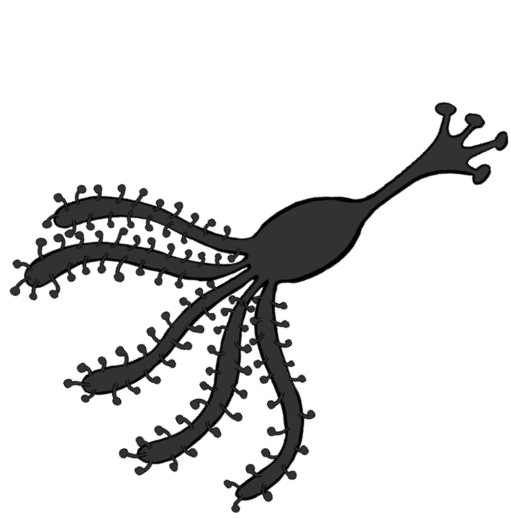






# NERVECELLER

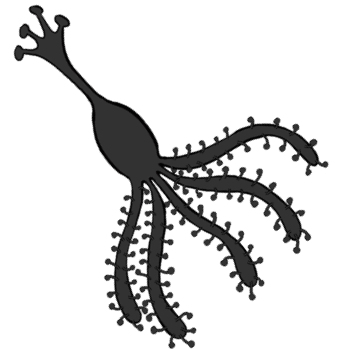
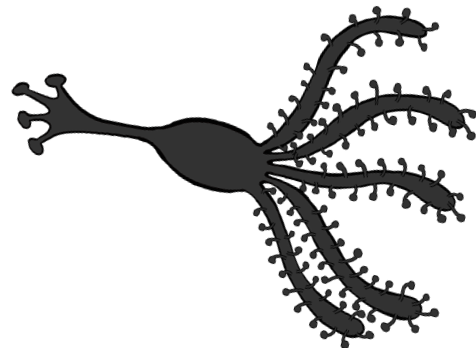
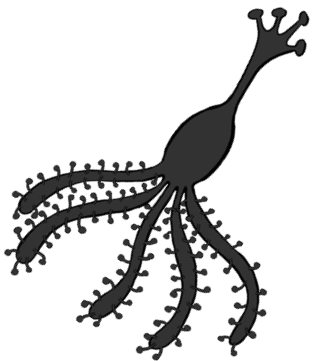




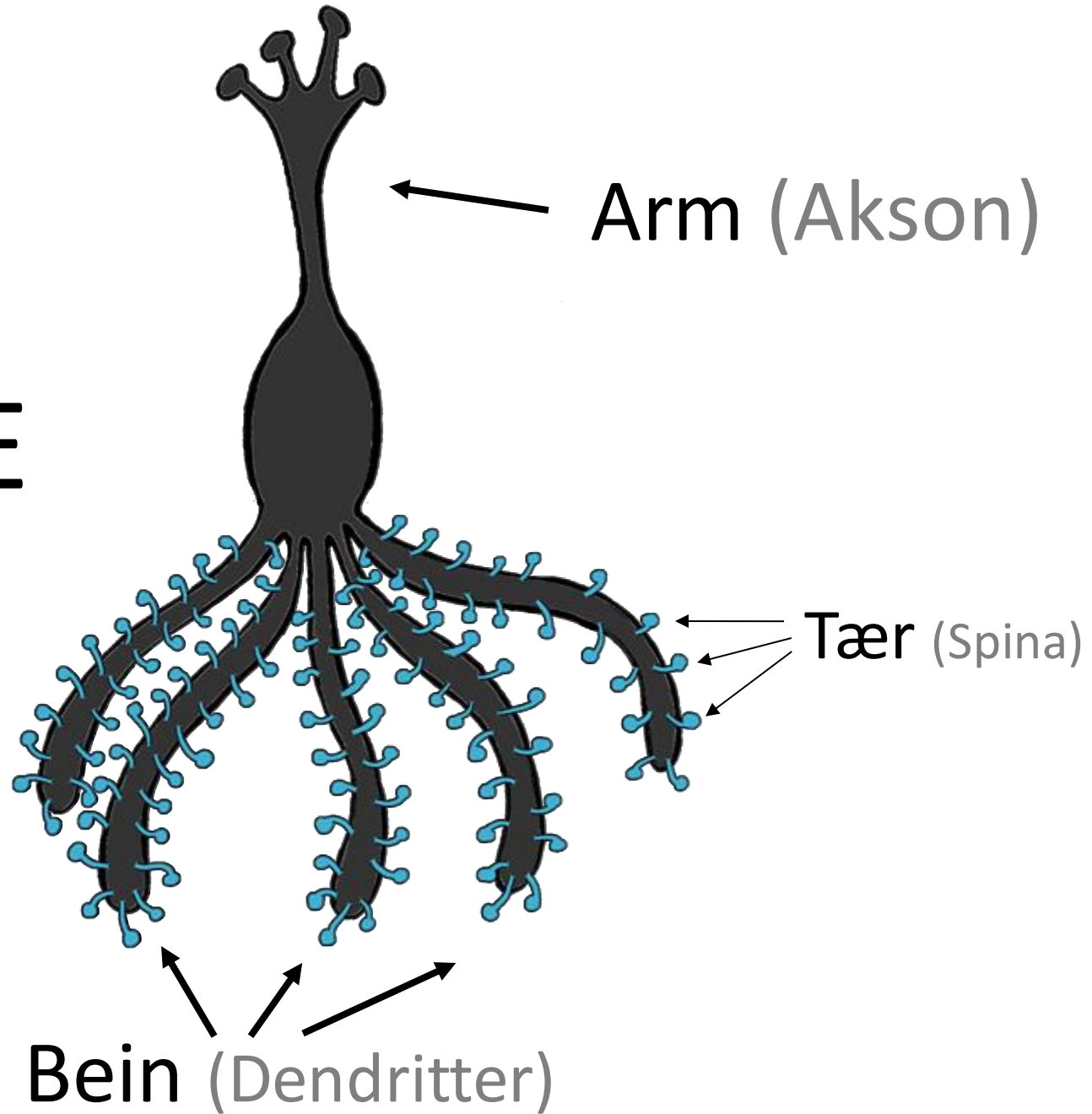
Du har

86 milliarder

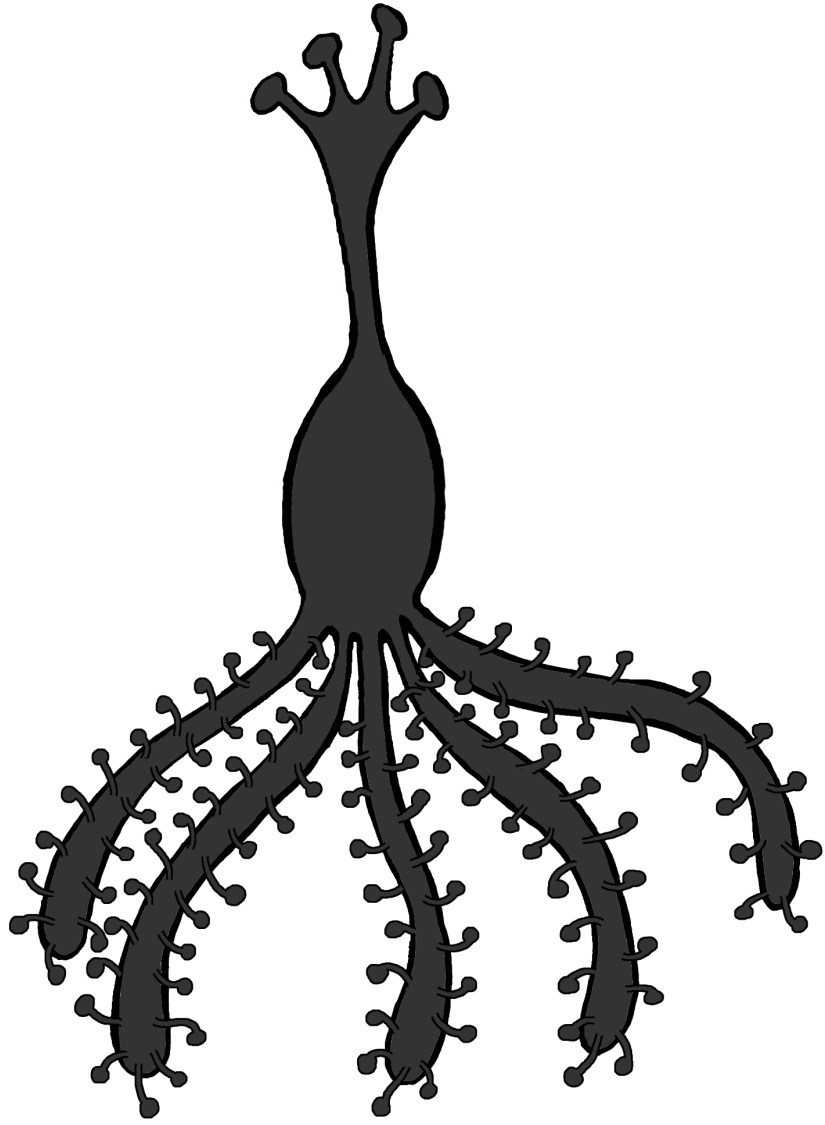
nerveceller i hjernen

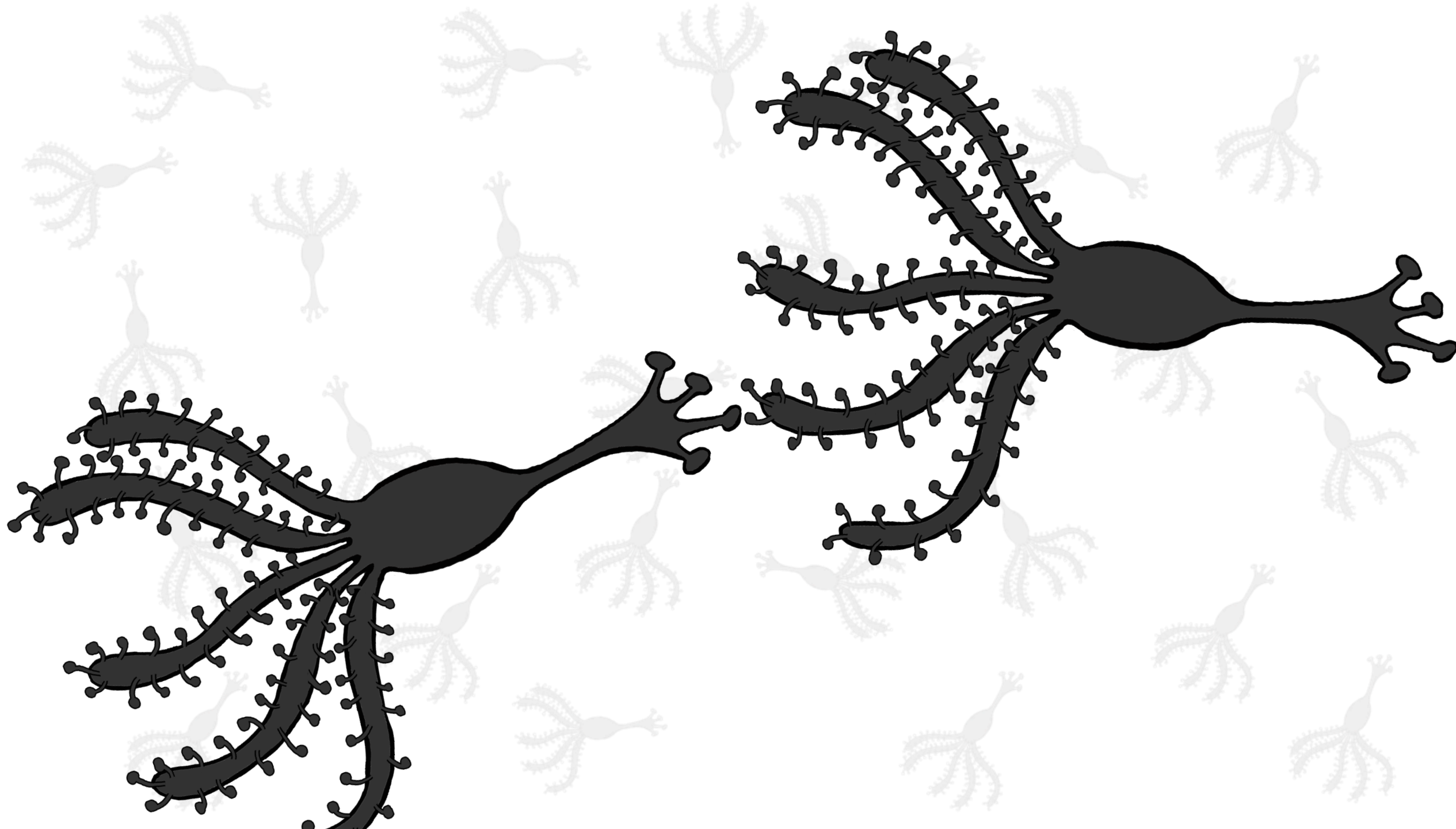


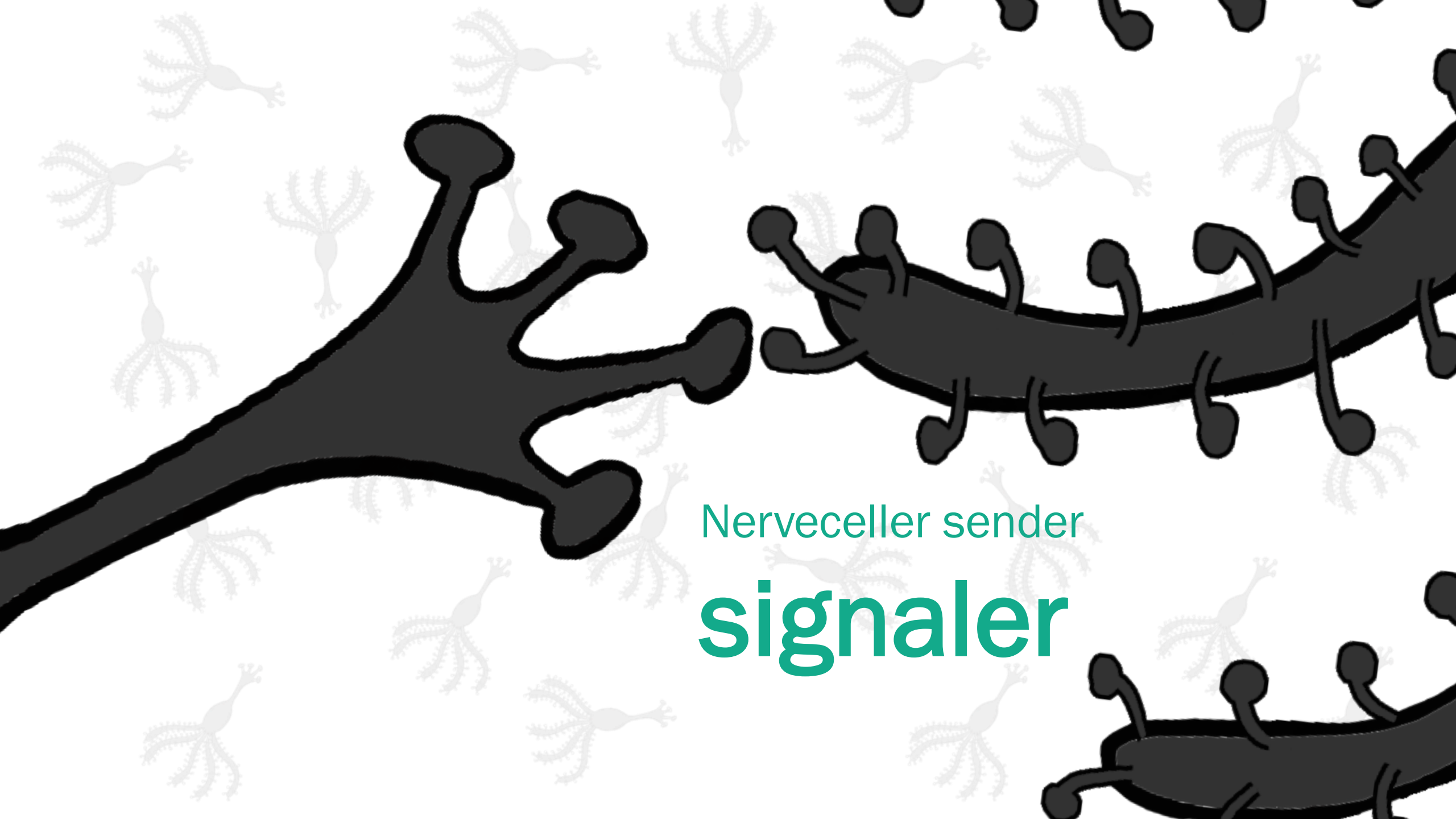
# NERVECELLE



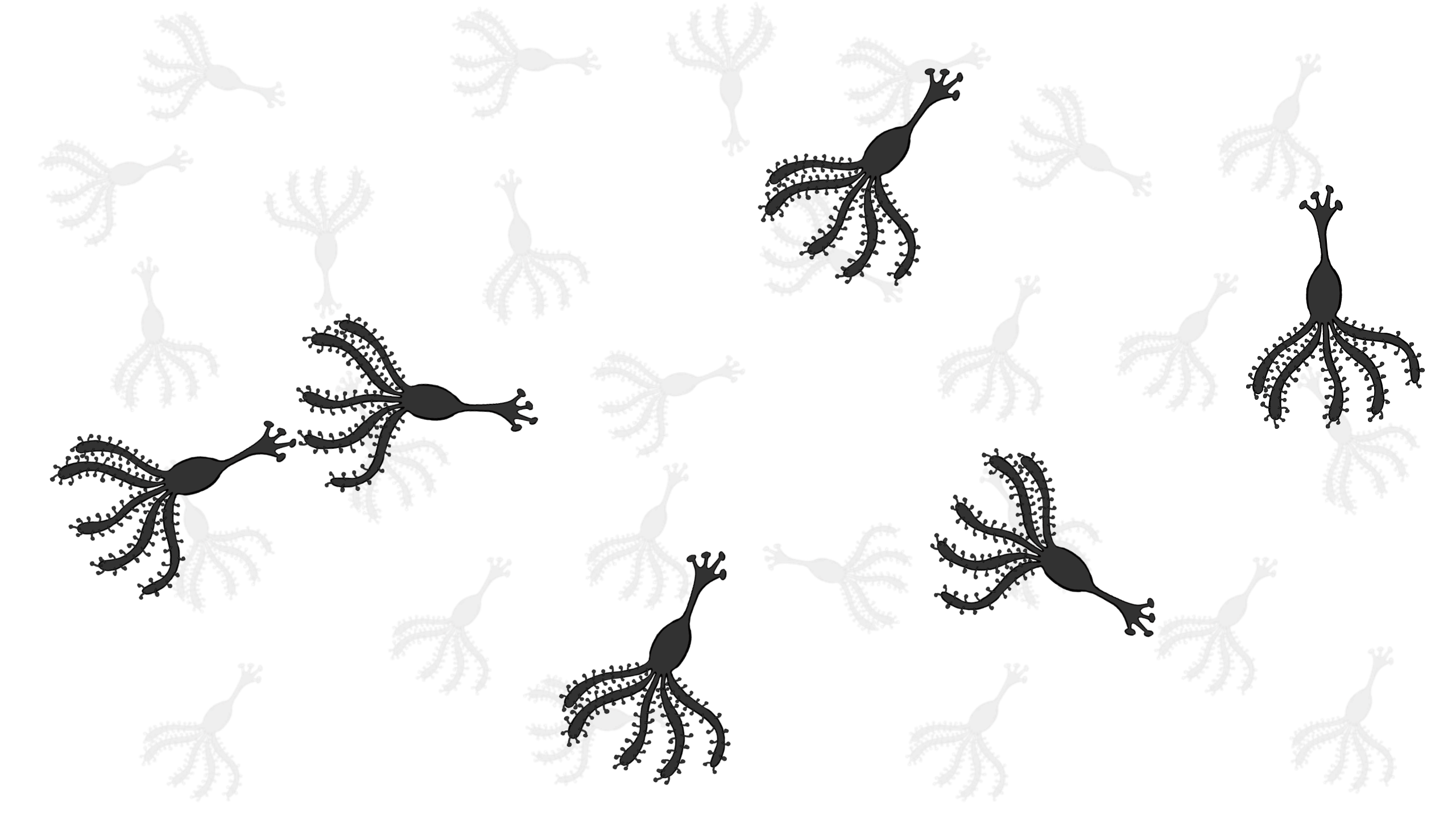




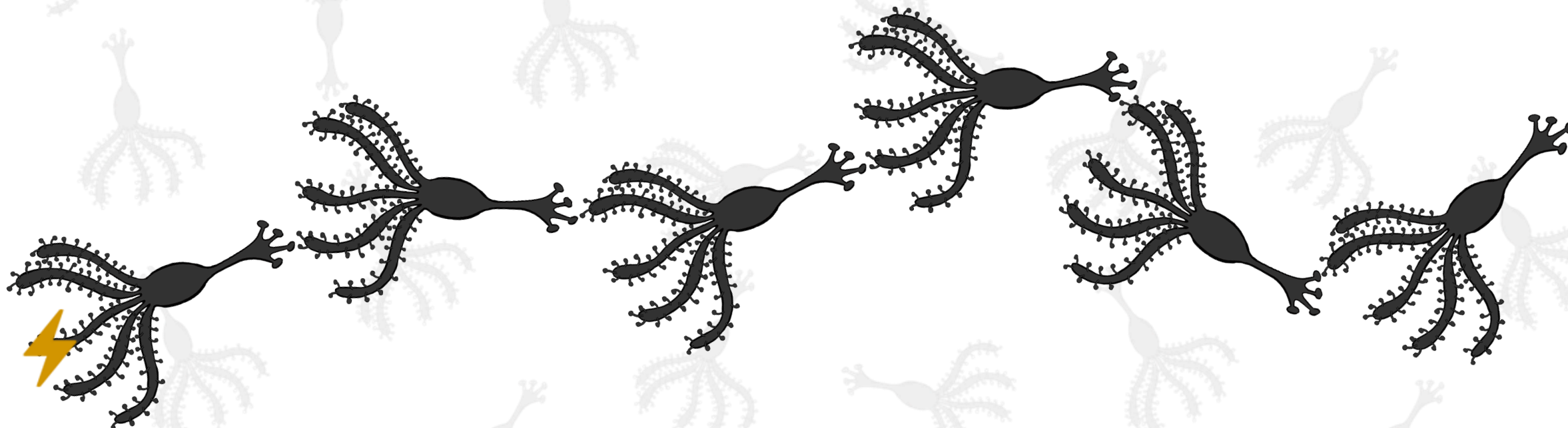


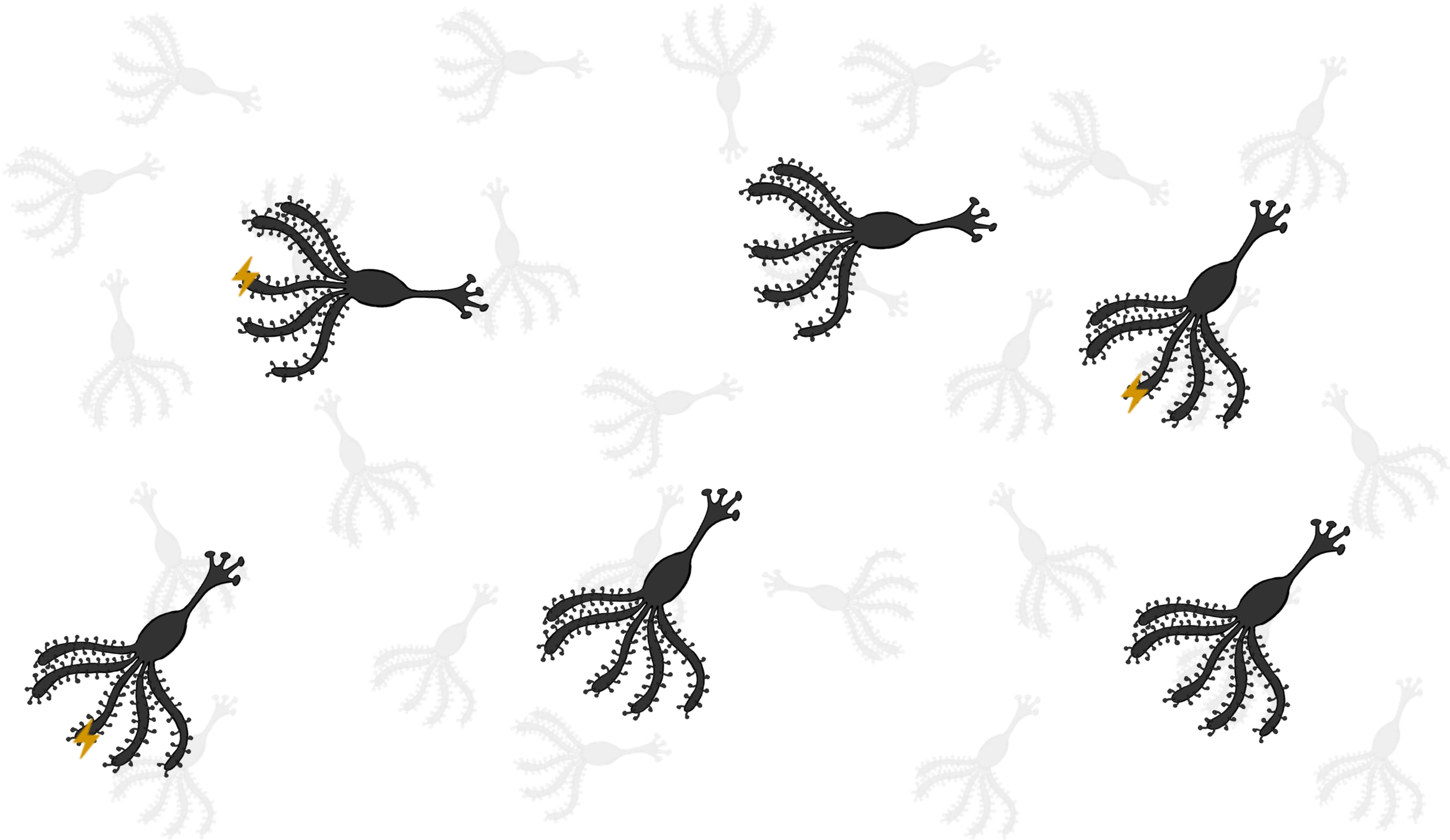


Nerveceller sender  
**signaler**

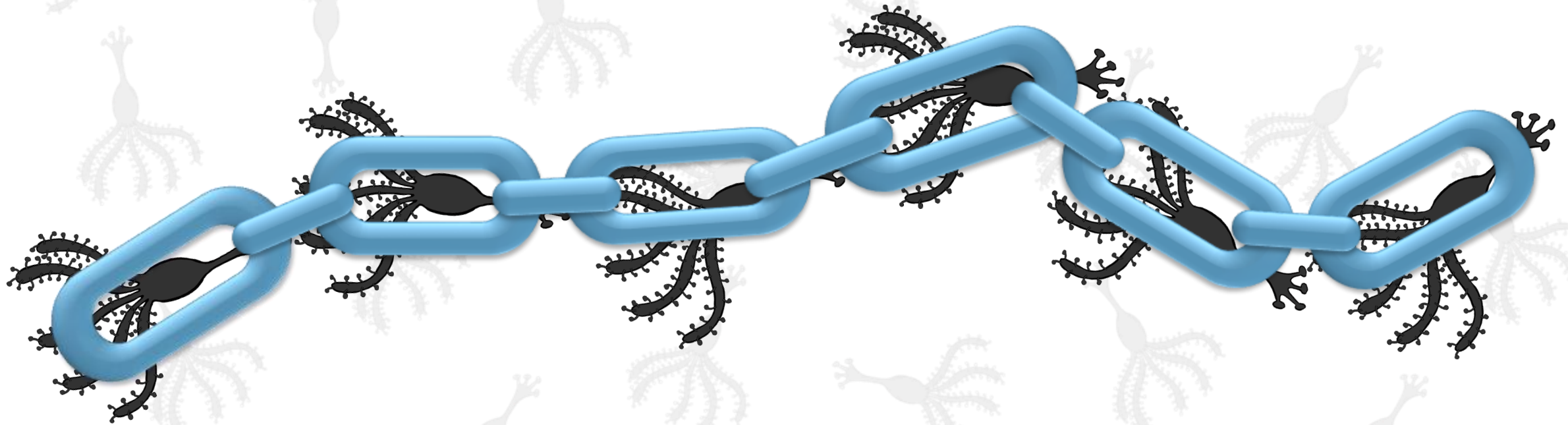


Nerveceller danner  
lenker når du lærer





Sterke lenker = god læring





Ekspertise



HVORDAN



# 1. Styrke nervelenkene over tid med repetisjon



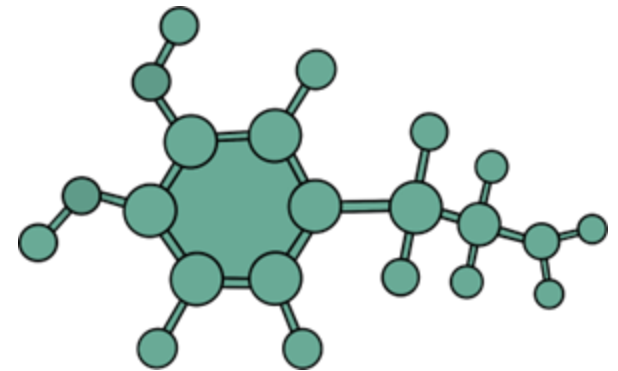
# 2. Lage sterke forbindelser ved første eksponering



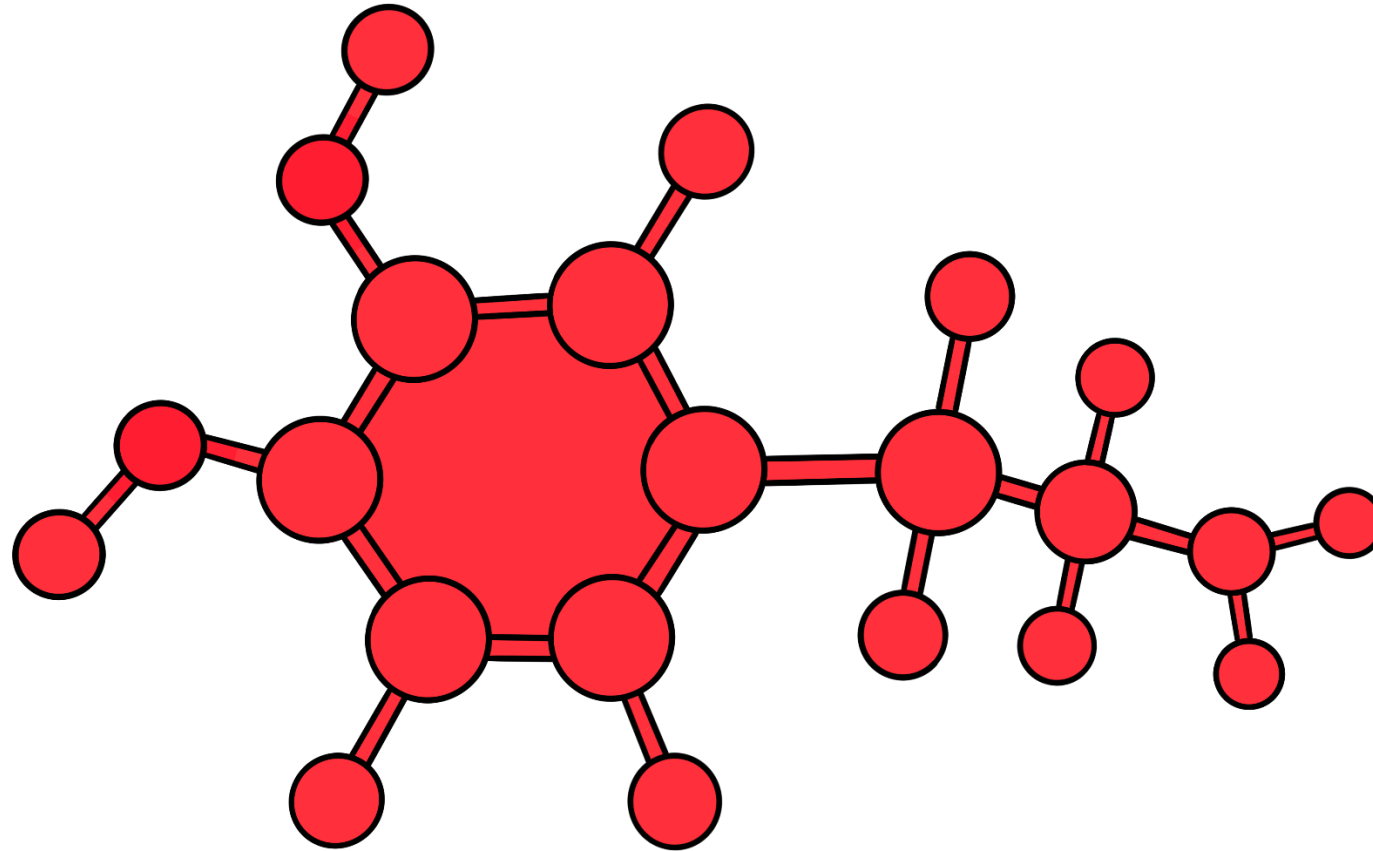
BILDER



ASSOSIASJONER



DOPAMIN



Dopamin

“Motivasjonsmolekylet”

**MOTIVASJON**



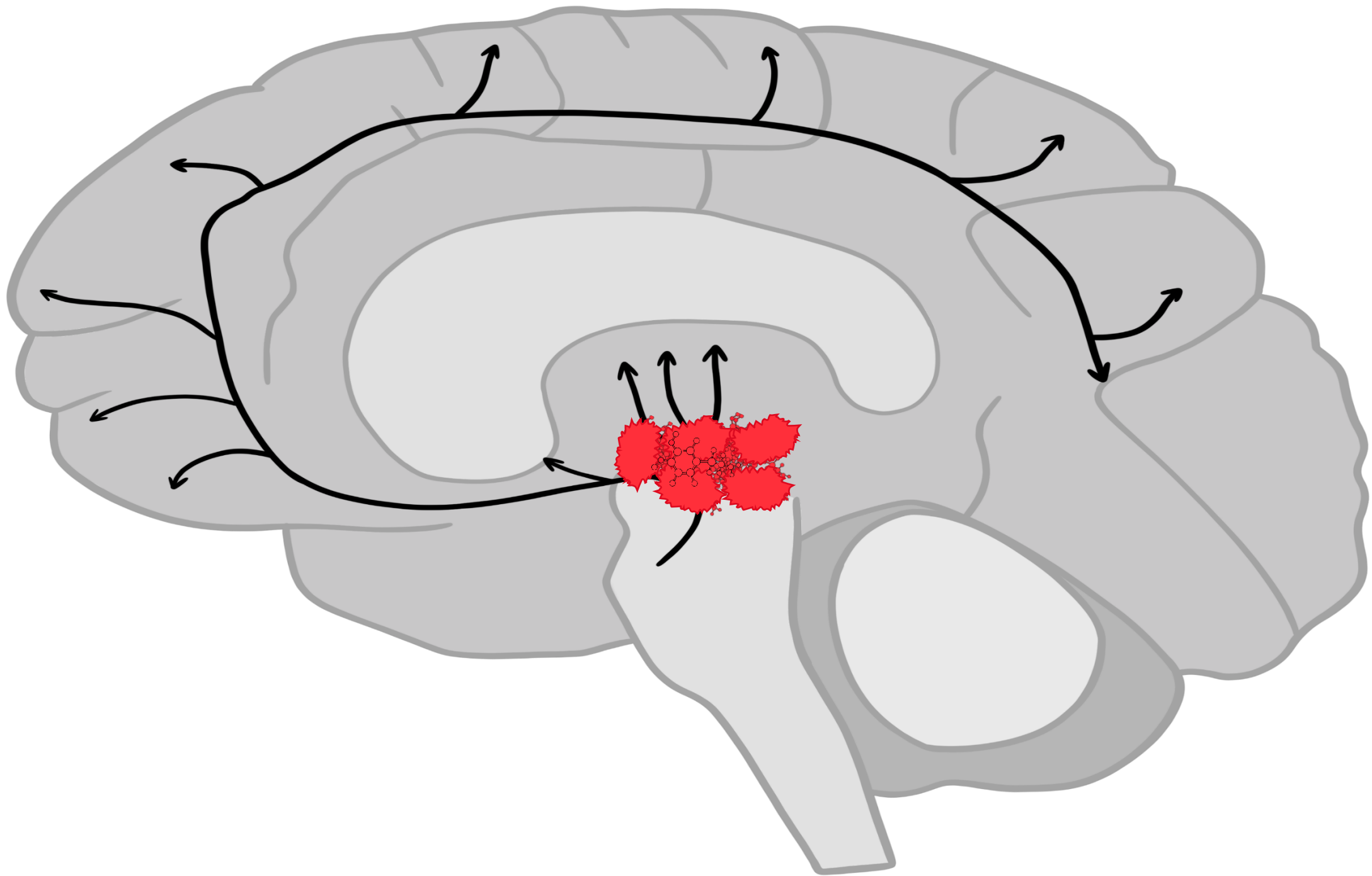
**DOPAMIN**

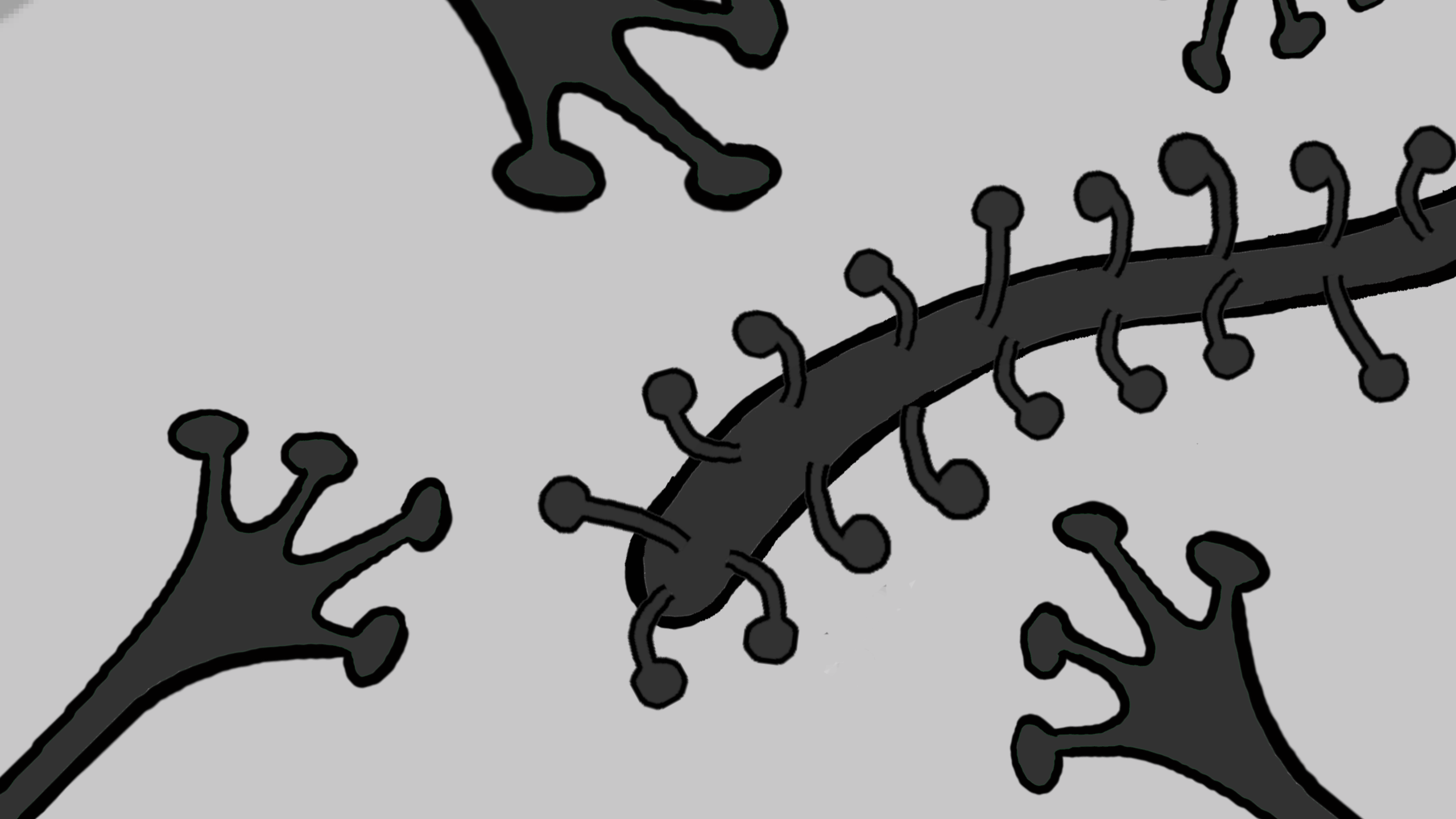


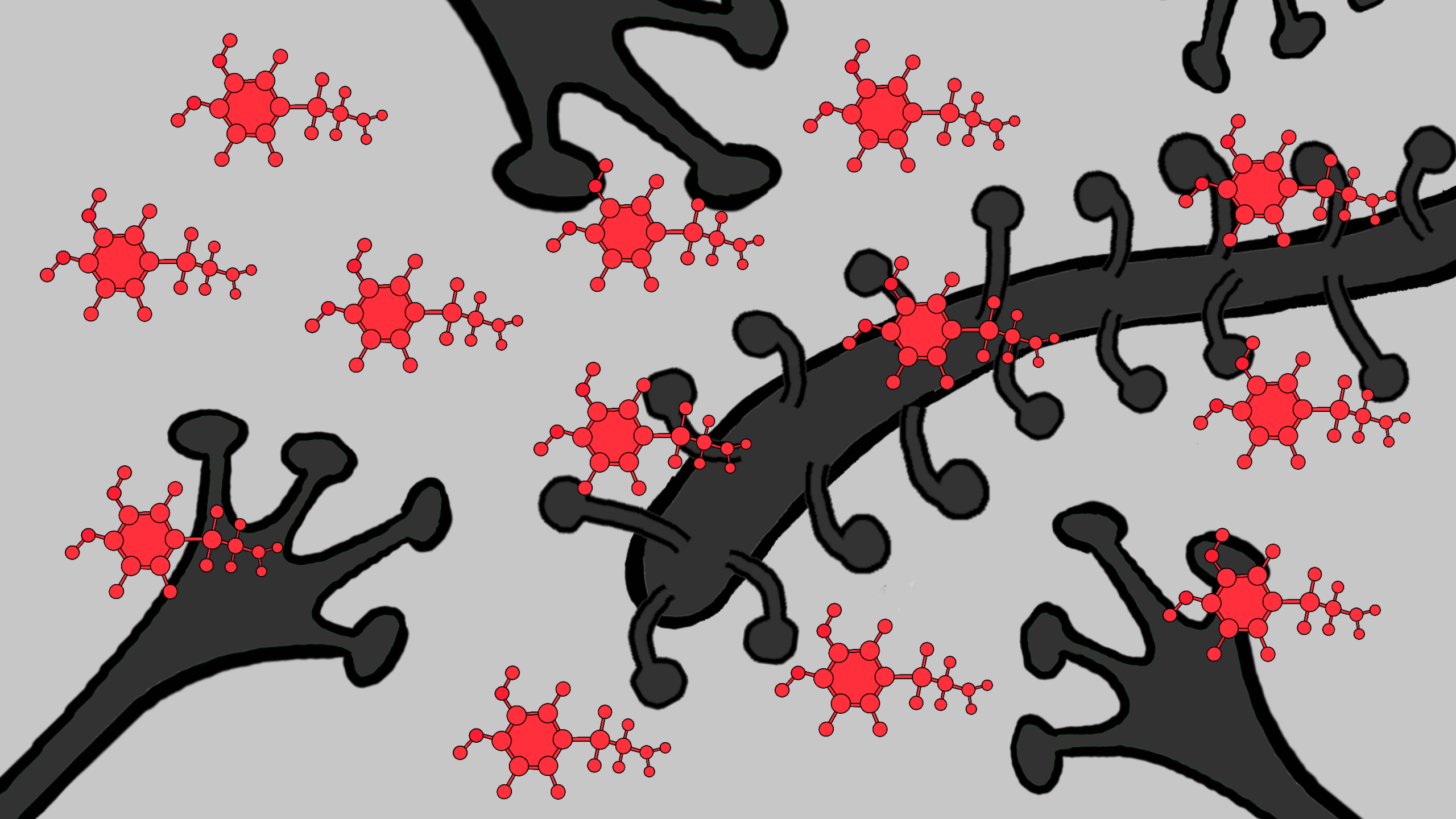
**FOKUS & INNSATS**

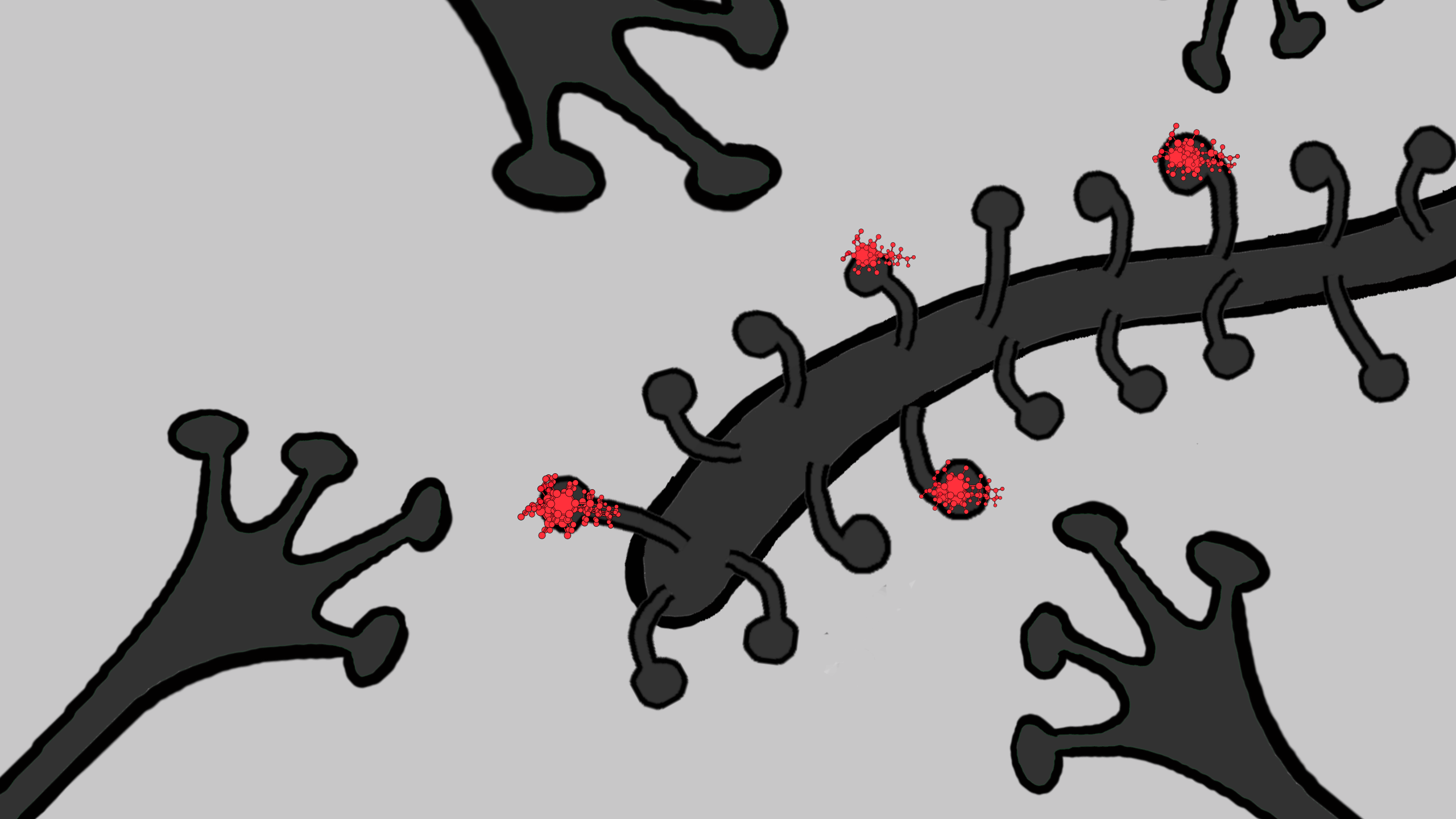


**LÆRING**

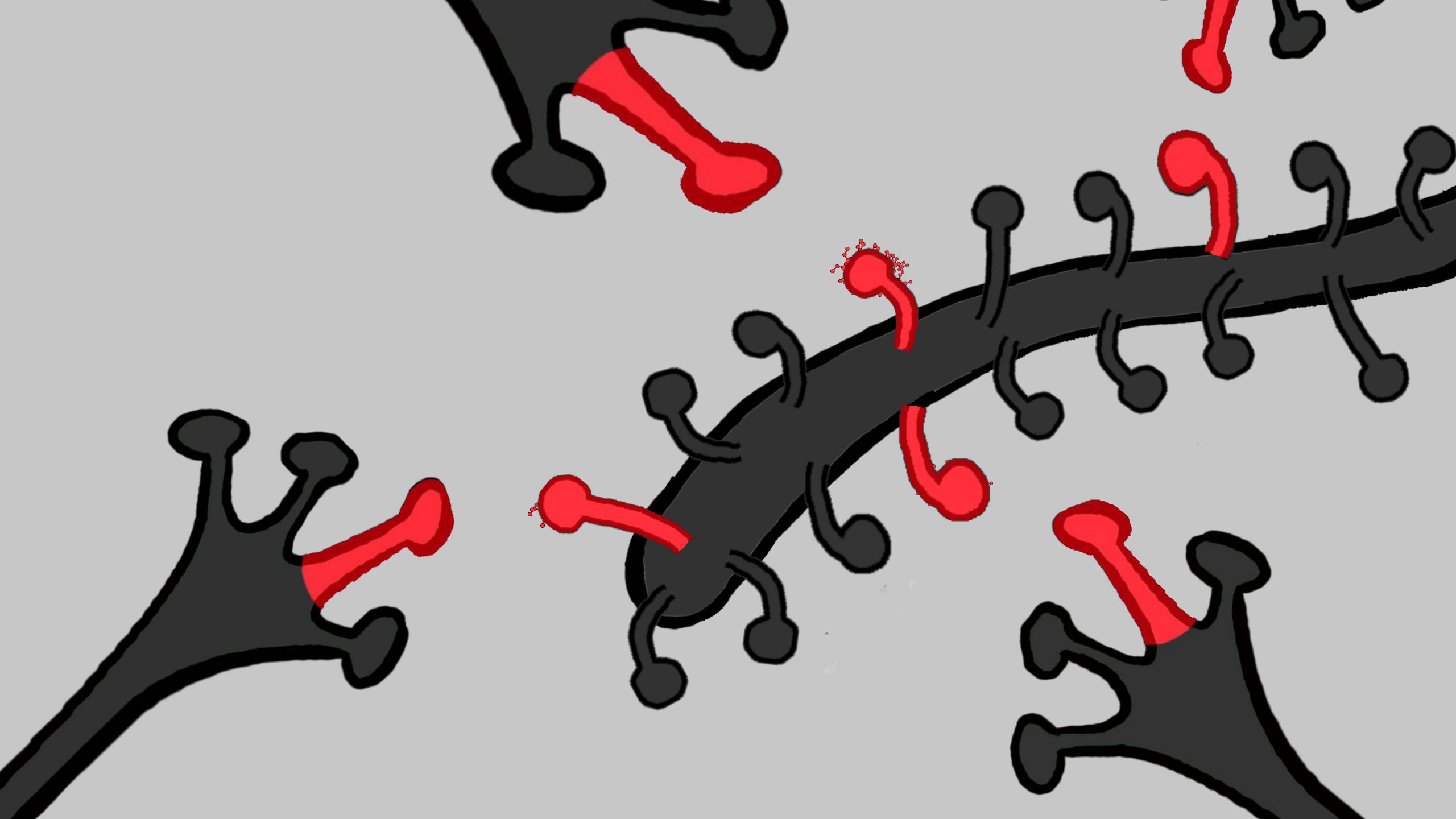


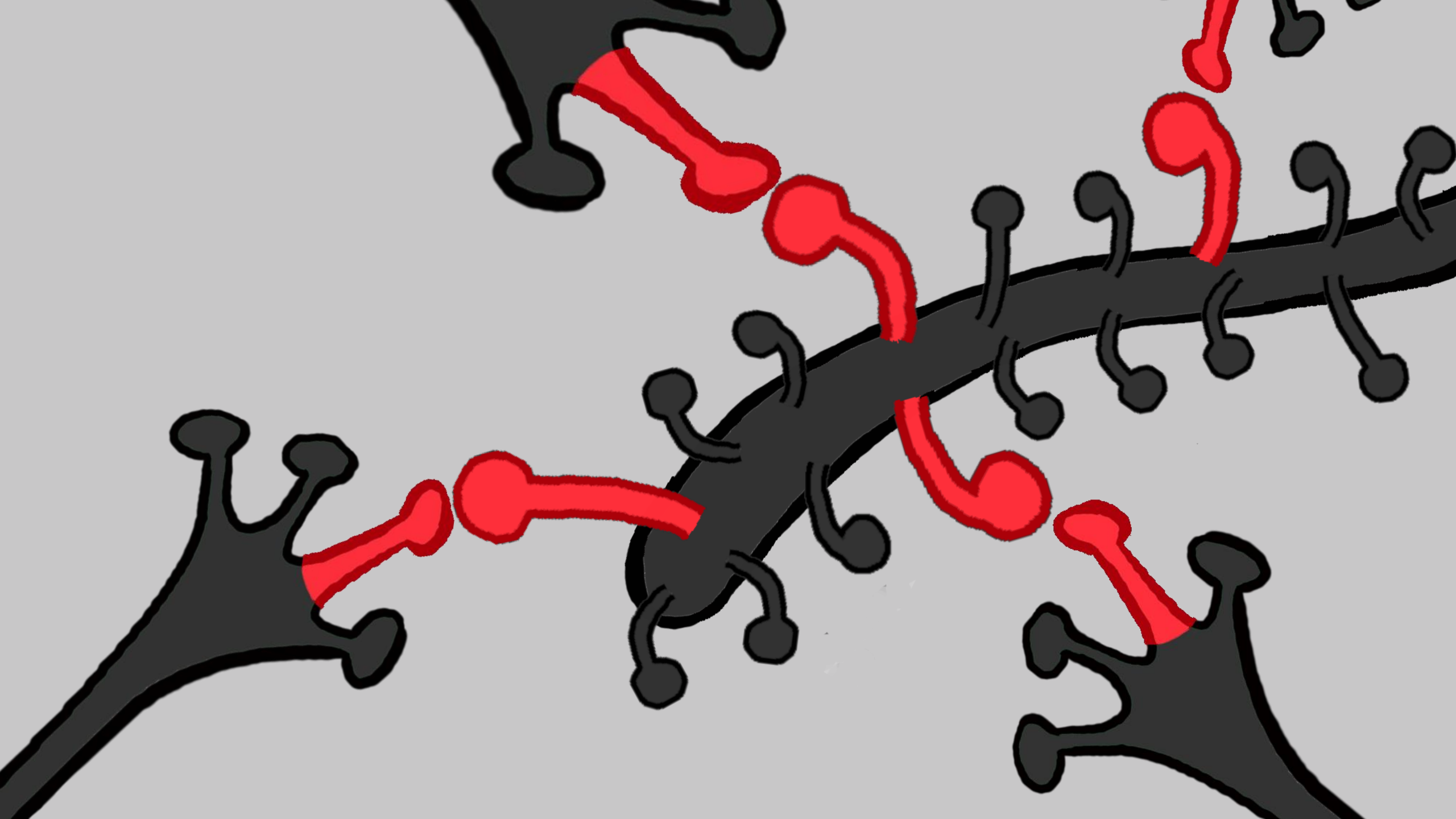












**MOTIVASJON**



**DOPAMIN**



**FOKUS & INNSATS**



**LÆRING**

**MOTIVASJON**



**DOPAMIN**



**FOKUS & INNSATS**



**LÆRING**

MOTIVASJON

NYSGJERRIGHET



DOPAMIN



FOKUS & INNSATS



LÆRING





RÅD



Utnytt og bygg på  
motivasjon og nysgjerrighet





# NOVARTIS



## Curious

Curious minds with a constant desire to learn fuel the development of innovative medicines and breakthrough healthcare solutions.



## Inspired

Our purpose answers the desire many people have for meaning and fulfillment in their work, empowering them to be their best every day.



## Unbossed

Our people are most creative and productive when they are empowered to shape their work environment and pursue their ideas.

1

Lære nye  
ferdigheter

2

Bedre til å  
løse problemer

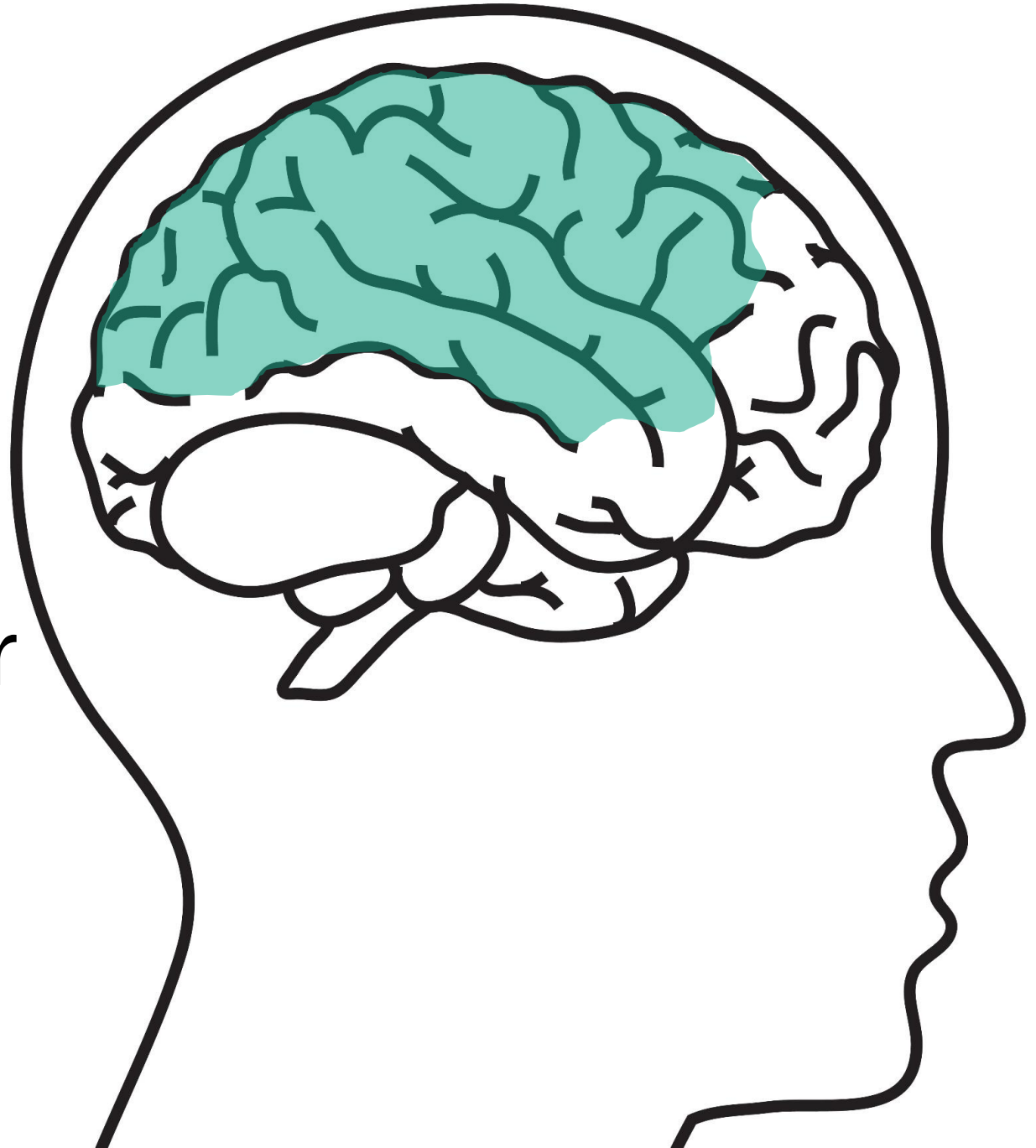


1

Lære nye  
ferdigheter

2

Bedre til å  
løse problemer









Hva var det igjen...









# Fokusert modus

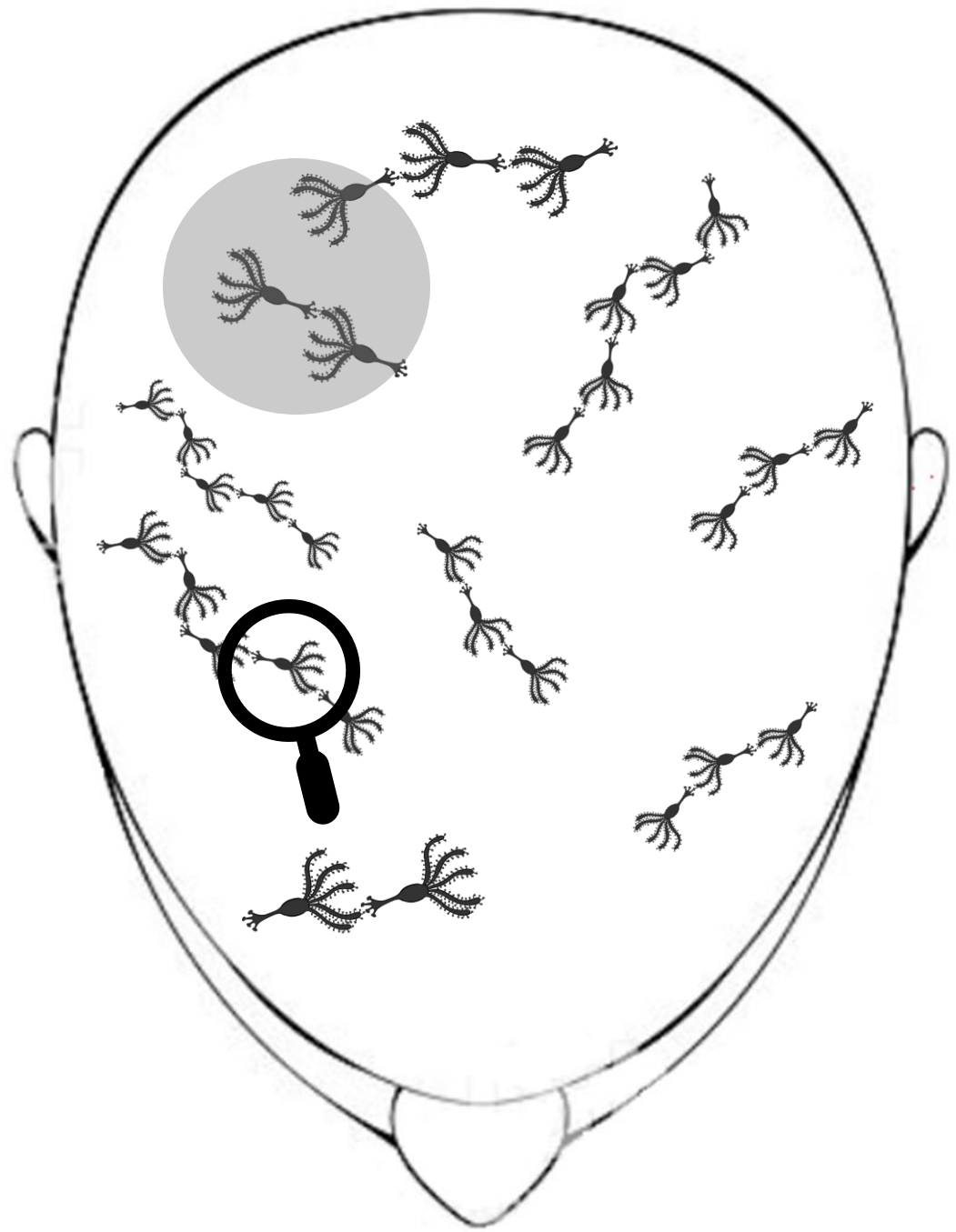
(Task-positive network)

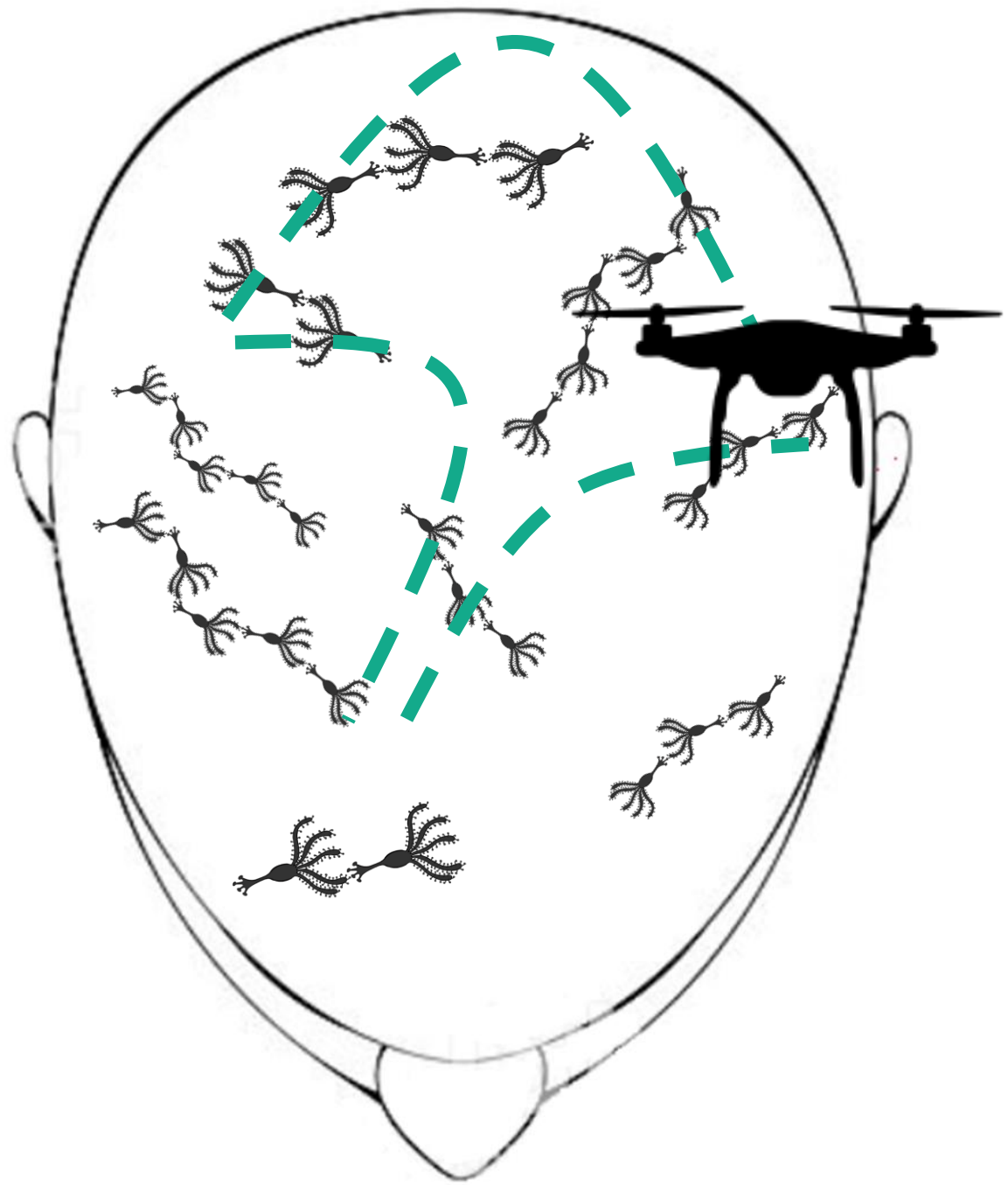


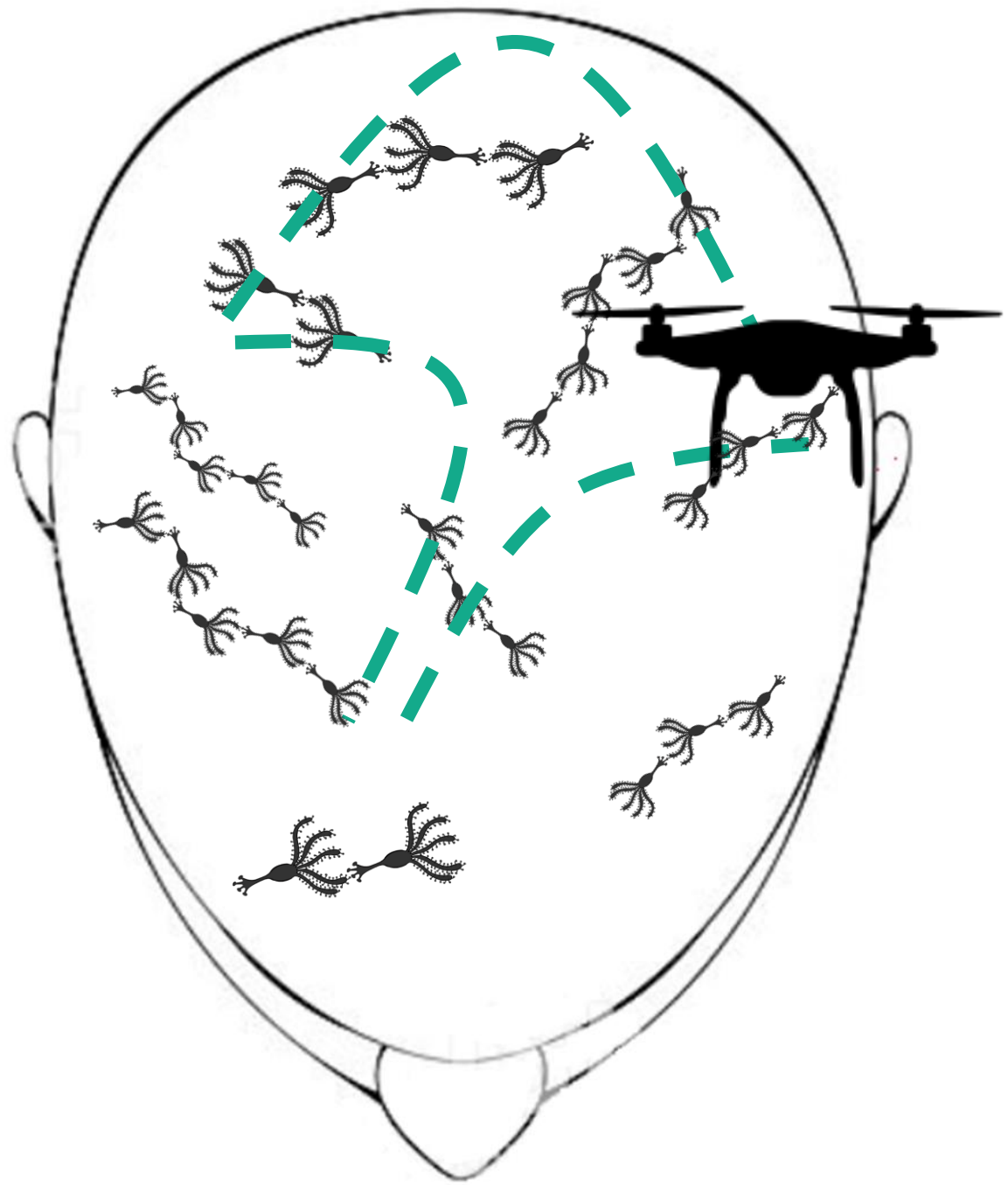
# Avslappet modus

(Task-negative network)

(Default mode network)









TENK PÅ DET SOM ER  
VANSKELIG, SÅ SLUTT Å  
FOKUSERE PÅ DET



# Avslappet modus jobber best....



Pause



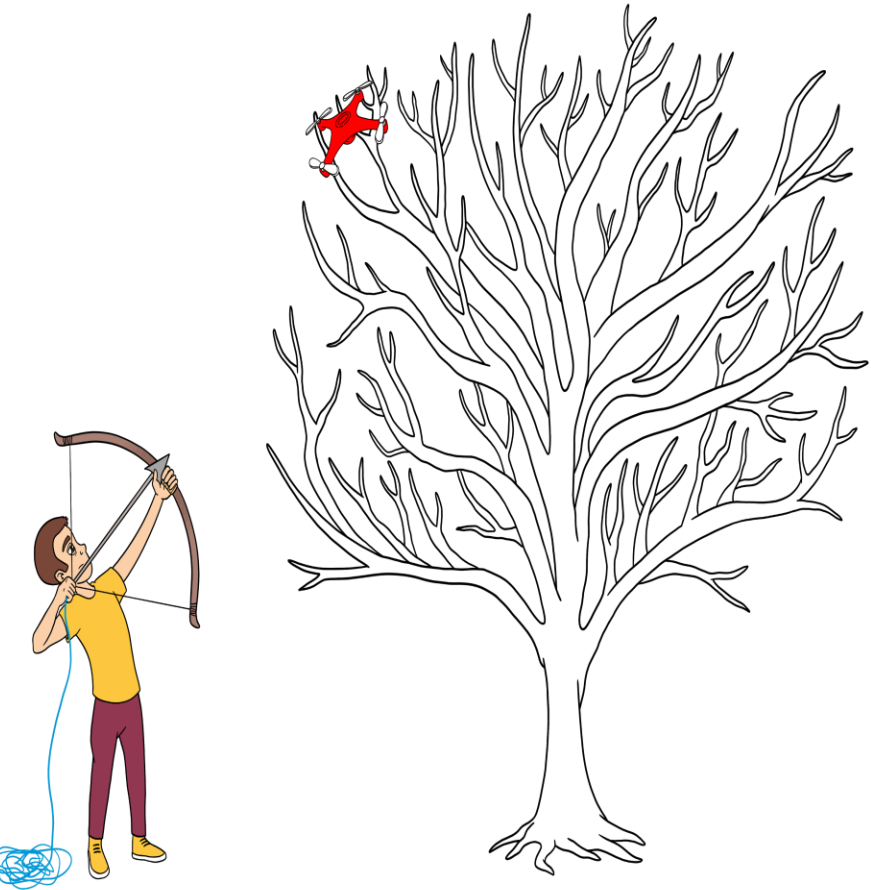
Gåtur



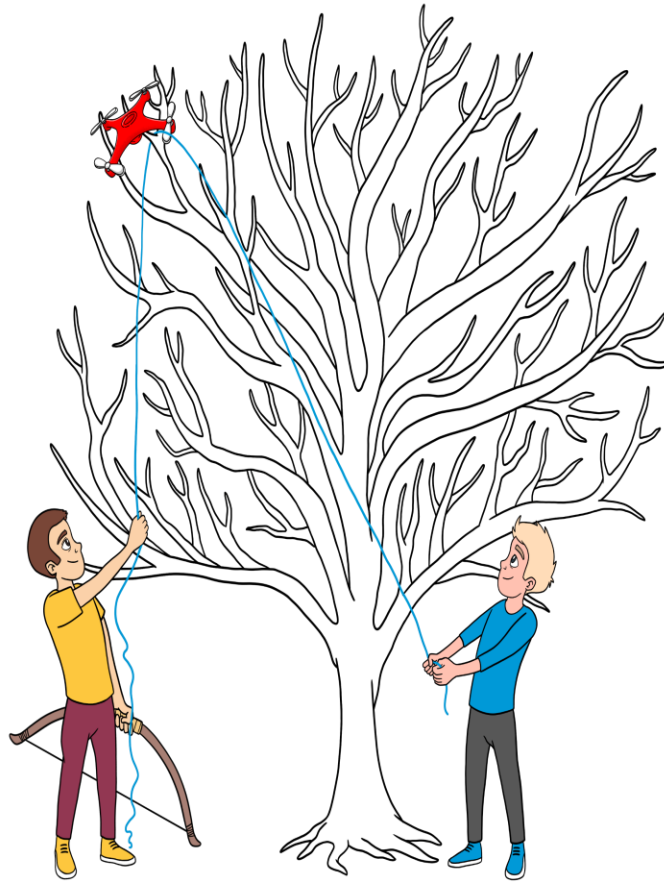
Enkel  
aktivitet



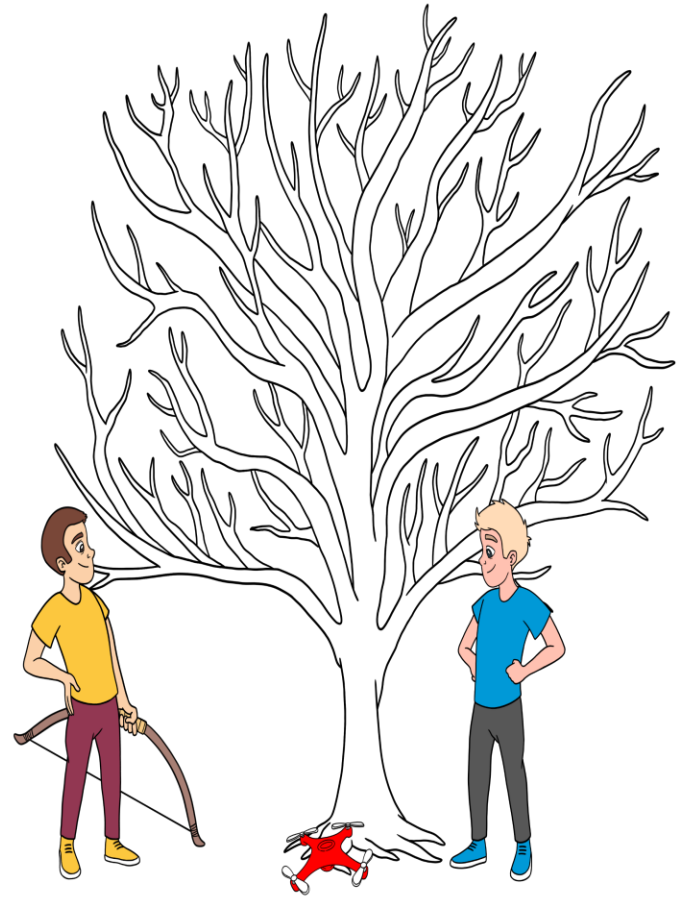
1



2



3



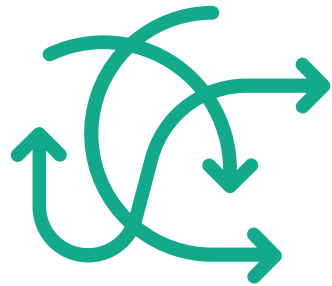




RÅD

# Begynn på vanskelige oppgaver før pauser

1



START MED NOE  
KREVENDE

2



PAUSE/GJØR  
NOE ANNET

3



FORTSETT

# KREVENDE OPPGAVER SOM KREVER NYTENKING

8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	

# KREVENDE OPPGAVER SOM KREVER NYTENKING

8

9

10

11

12

13

14

15

16

17

18

Jobb i små perioder ad  
gangen med oppgaver som  
krever nytenkning

# Agenda

1) **VANSKELIG TEMA**

2) **ENKELT TEMA**

3) **ENKELT TEMA**

4) **ENKELT TEMA**

5) **ENKELT TEMA**

# Gjøremålsliste

**#1 VANSKELIG OPPGAVE**

**#2 ENKEL OPPGAVE**

**#3 ENKEL OPPGAVE**

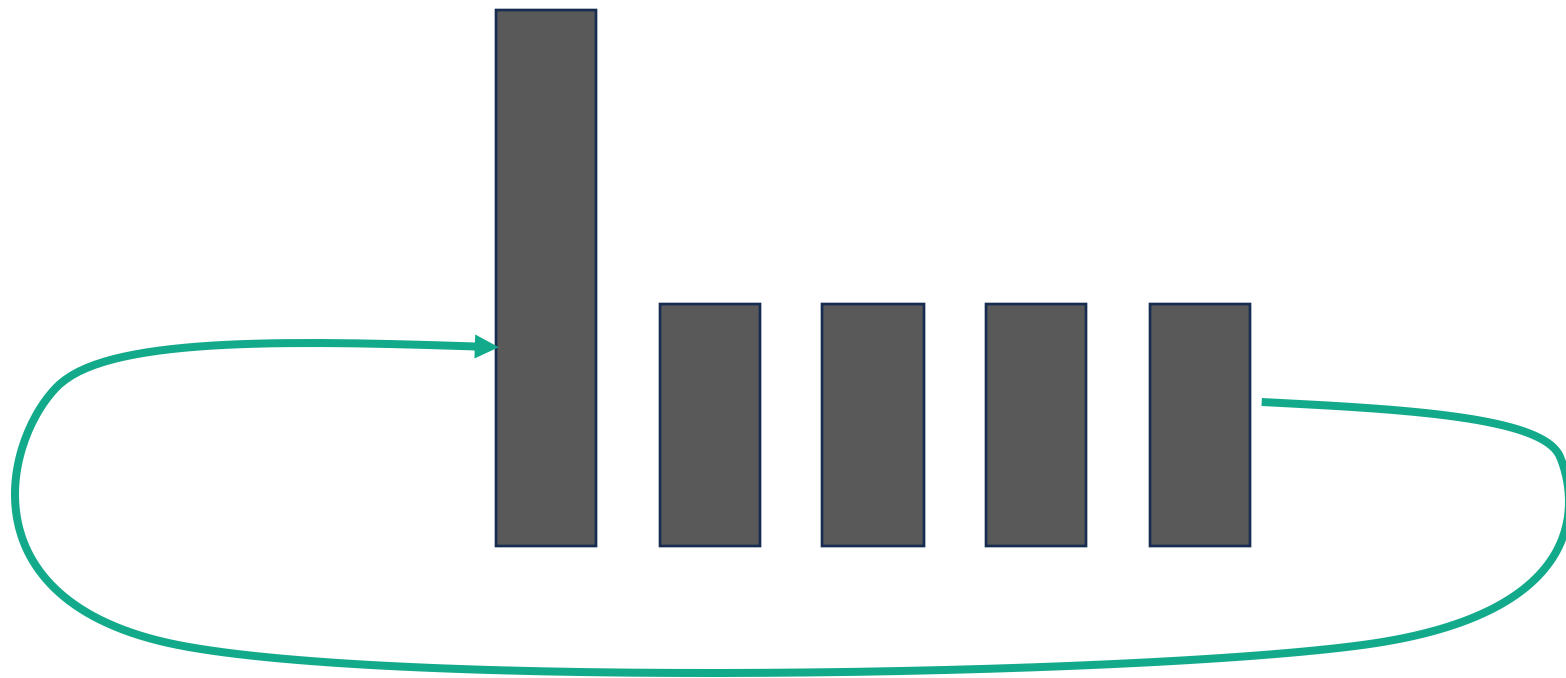
**#4 ENKEL OPPGAVE**

**#5 ENKEL OPPGAVE**

**#1 VANSKELIG OPPGAVE**

RÅD

# VANSKELIG-ENKEL-VANSKELIG

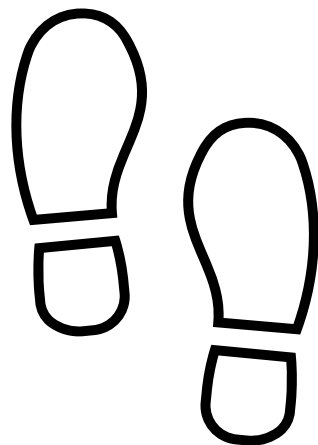






RÅD

# WALK & TALK



1

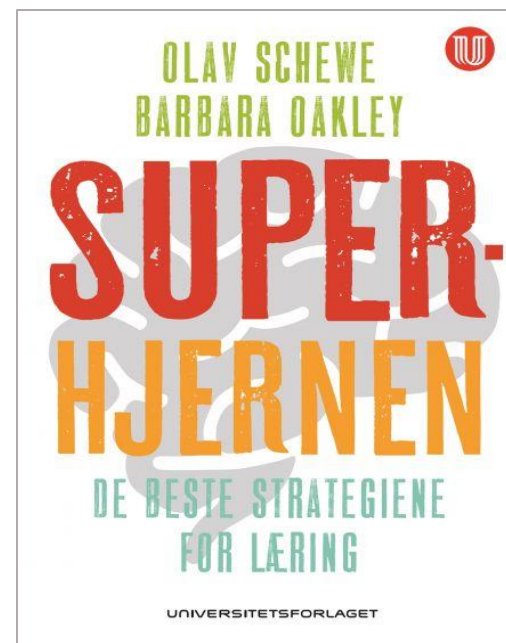
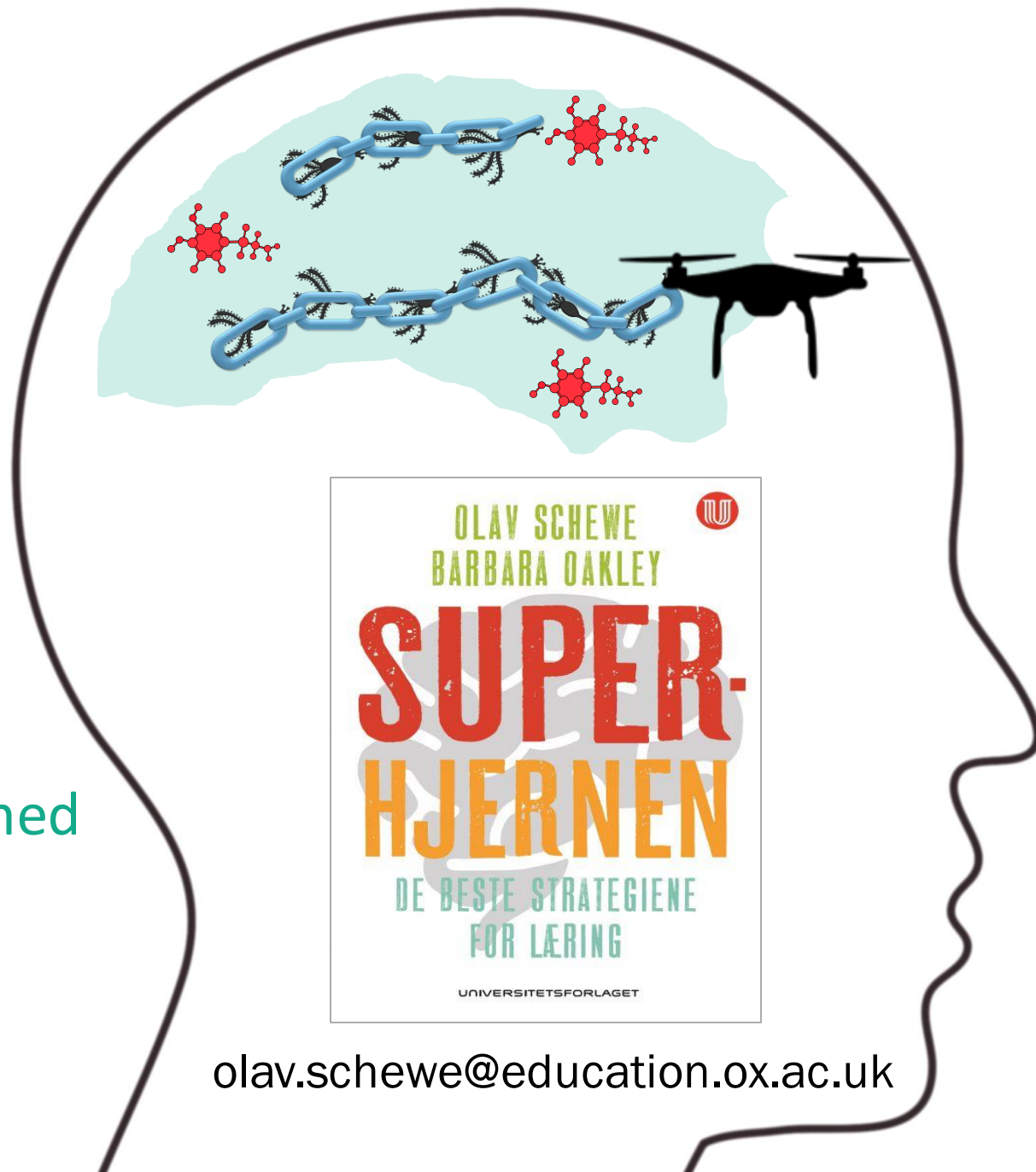
## Lær nye ferdigheter effektivt

- Utnytt og bygg på motivasjon og nysgjerrighet

2

## Bli bedre til å løse problemer

- Begynn på en vanskelig oppgave før pauser
- Jobb i små perioder ad gangen med oppgaver som krever nytenkning
- Vanskelig-enkel-vanskelig
- Walk & talk



[olav.schewe@education.ox.ac.uk](mailto:olav.schewe@education.ox.ac.uk)

