Digital patologi - betydning for bioanalytikeruddannelsen

Professionshøjskolen Absalon
og
Københavns Professionshøjskole

Temadag Axlab 28 April 2022

Julie Smith (KP) og Charlotte Lerbech (PHA)

Hvem er vi?

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Professionshøjskolen Absalon, Bioanalytikeruddannelsen - Næstved

On the Road to Digital Pathology in Denmark

- National Survey and Interviews

Senior lecturer Julie Smith, DVM, PhD
University College Copenhagen, Denmark

April 28th, 2021

UNIVERSITY COLLEGE COPENHAGEN

ABSALON
PROFESSIONS-HØJSKOLEN ABSALON

Region Syddanmark

Senior lecturer Julie Smith, DVM, PhD
University College Copenhagen, Denmark

April 28th, 2021

INTRODUKTION

DIGITAL PATOLOGI

Seneste år:

Forskning

Undervisning

Begrænset brug til rutinediagnostik

Nye:

Hurtigere

Højere kvalitet

Mulighed for fuldt digitaliseret workflow

KP

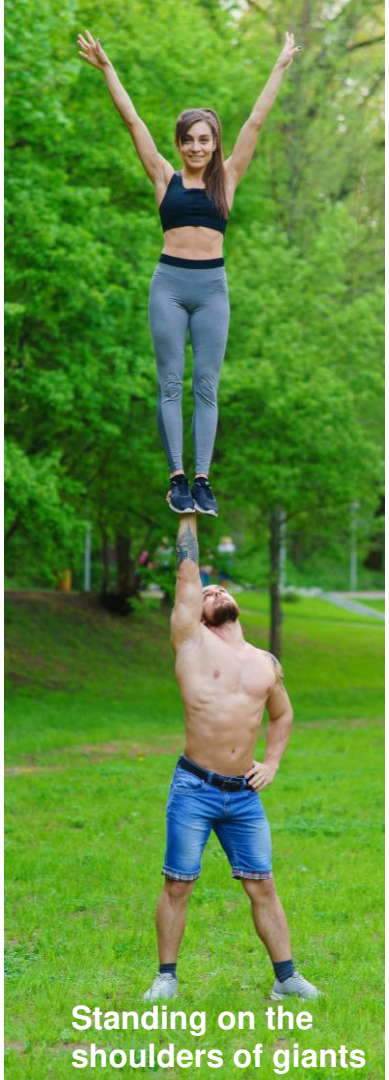
FORMÅL

DANMARK:
I gang med
implementering
af digital patologi

Medarbejdernes oplevelse af transitionen til digital patologi – en national undersøgelse

RELEVANS FOR HVEM?

Interessenter der arbejder med **implementering** af digital patologi, nationalt, regionalt eller lokalt kan lære af **kollegaers erfaringer** fra alle patologiske afdelinger i Danmark



METODE

Mixed model

Data indsamlet **2019-2020**.

1. Spørgeskema

Web-baseret

Alle patologiafdelinger i Danmark, n= 13.

Alle professioner:

klinikchefer,

læger,

akademikere,

sekretærer,

- og bioanalytikere.

2. Interviews:

Fire informanter

Semistruktureret

RESULTS

SURVEY	Non- DP	DP
231	161	70

Gender	♀	♂	ns
	55	14	1

Age group	20-29	30-39	40-49	50-59	60-69	70-79	ns
	8	13	19	17	10	1	2

Years working with DP	0-1	2-3	4-5	6-10	>10
	26	20	15	9	0

Working hours for digital pathology	< 25%	25-50%	> 50%
	63	4	3

RESULTS

SURVEY	Non- DP	DP
231	161	70

80%

Gender	♀	♂	ns
	55	14	1

Age group	20-29	30-39	40-49	50-59	60-69	70-79	ns
	8	13	19	17	10	1	2

Years working with DP	0-1	2-3	4-5	6-10	>10
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RESULTS

SURVEY	Non- DP	DP
231	161	70

Gender	♀	♂	ns
	55	14	1

67%

Age group	20-29	30-39	40-49	50-59	60-69	70-79	ns
	8	13	19	17	10	1	2

Years working with DP	0-1	2-3	4-5	6-10	>10
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Working hours for digital pathology	< 25%	25-50%	> 50%
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Years working with DP	0-1	2-3	4-5	6-10	>10
	26	20	15	9	0

66%

Working hours for digital pathology	< 25%	25-50%	> 50%
	63	4	3

RESULTS

SURVEY	Non- DP	DP
231	161	70

Gender	♀	♂	ns
	55	14	1

Age group	20-29	30-39	40-49	50-59	60-69	70-79	ns
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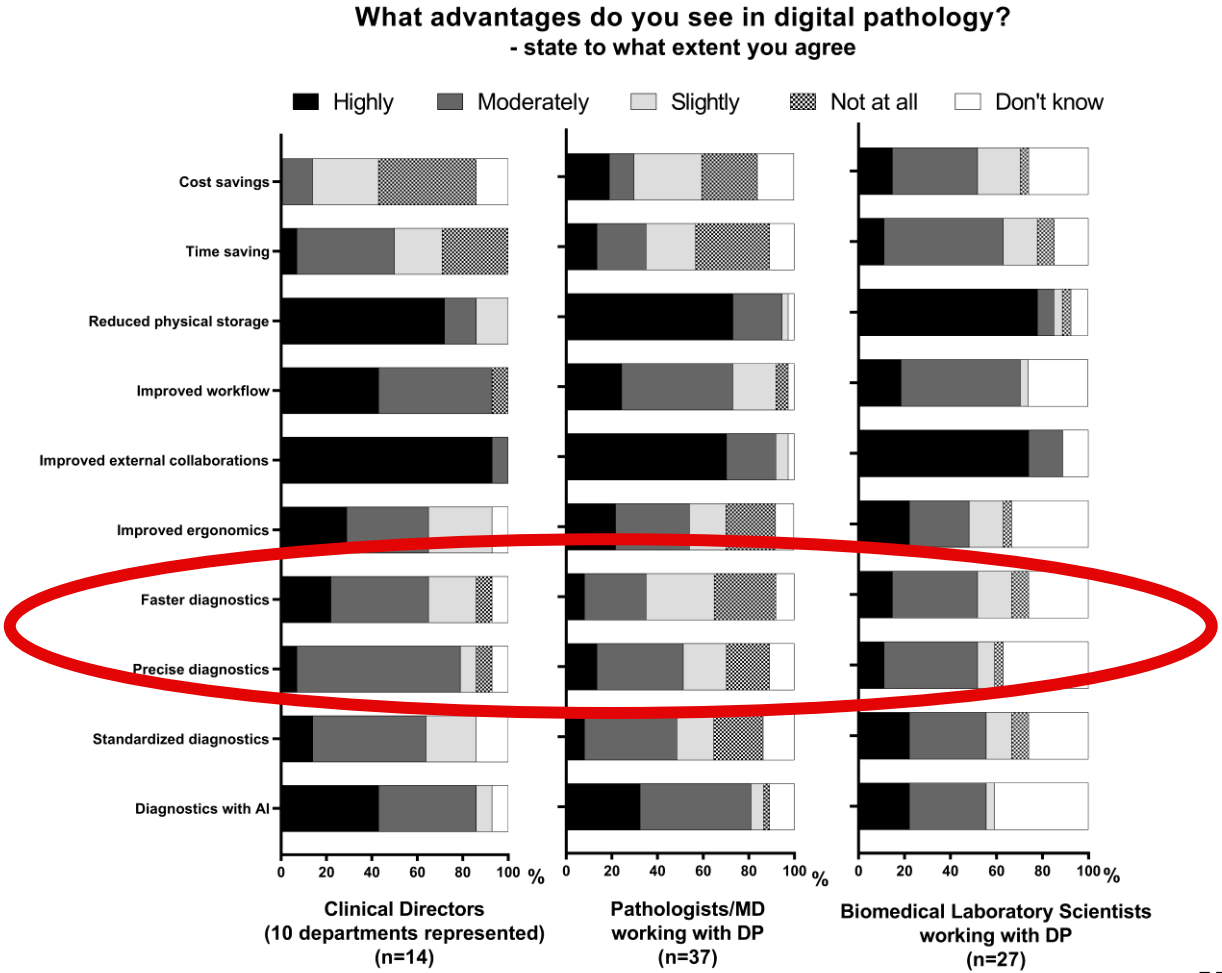
Years working with DP	0-1	2-3	4-5	6-10	>10
	26	20	15	9	0

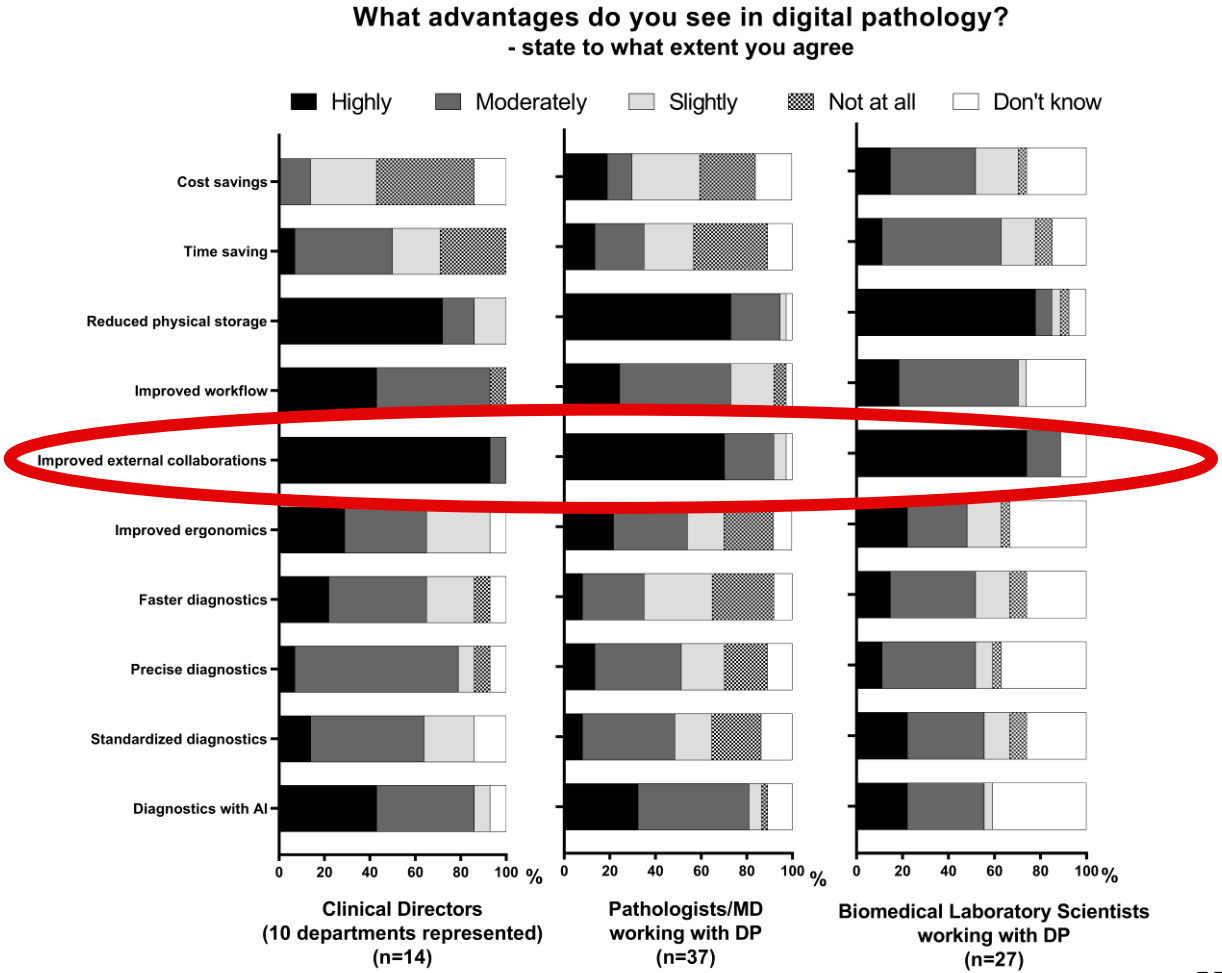
Working hours for digital pathology	< 25%	25-50%	> 50%
	63	4	3

90%

RESULTS


What advantages do you see in digital pathology?
- state to what extent you agree
Highly
Moderately
Slightly
Not at all
Don't know
Cost savings
Time saving
Reduced physical storage
Improved workflow
Improved external collaborations
Improved ergonomics
Faster diagnostics
Precise diagnostics
Standardized diagnostics
Diagnostics with AI
0 20 40 60 80 100 %
Clinical Directors
(10 departments represented)
(n=14)
Pathologists/MD
working with DP
(n=37)
Biomedical Laboratory Scientists
working with DP
(n=27)

RESULTS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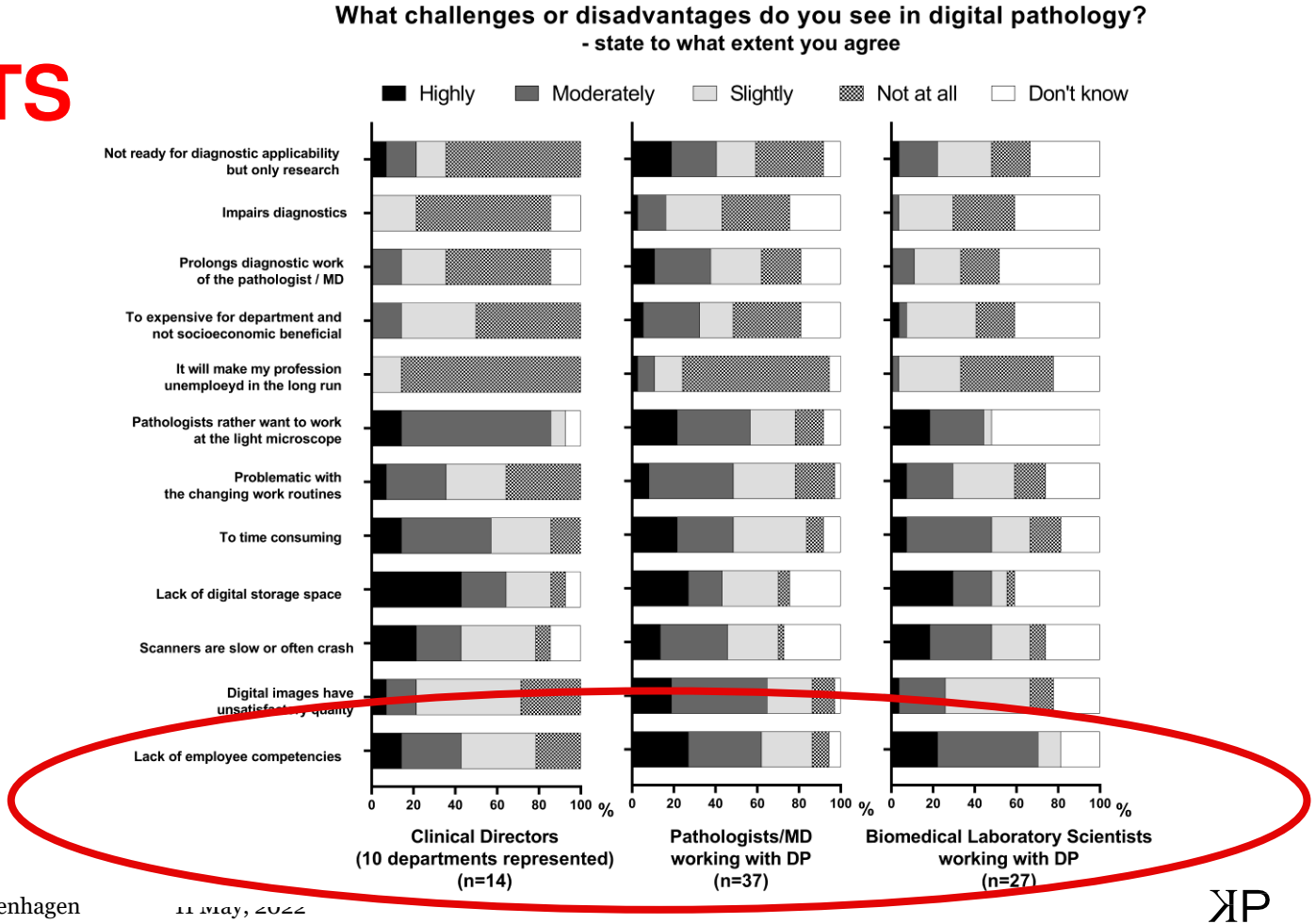
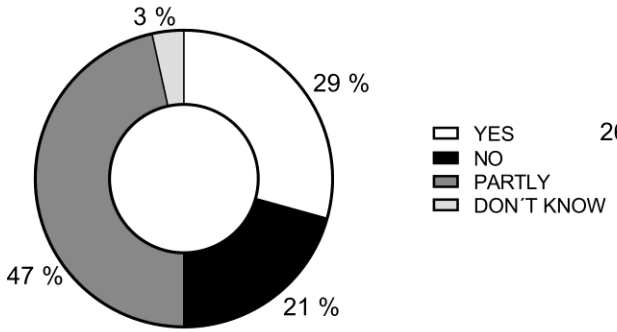
RESULTS


What challenges or disadvantages do you see in digital pathology?
- state to what extent you agree
Highly
Moderately
Slightly
Not at all
Don't know
Not ready for diagnostic applicability but only research
Impairs diagnostics
Prolongs diagnostic work of the pathologist / MD
To expensive for department and not socioeconomic beneficial
It will make my profession unemploeyd in the long run
Pathologists rather want to work at the light microscope
Problematic with the changing work routines
To time consuming
Lack of digital storage space
Scanners are slow or often crash
Digital images have unsatisfactory quality
Lack of employee competencies
0 20 40 60 80 100 %
Clinical Directors (10 departments represented) (n=14)
Pathologists/MD working with DP (n=37)
Biomedical Laboratory Scientists working with DP (n=27)

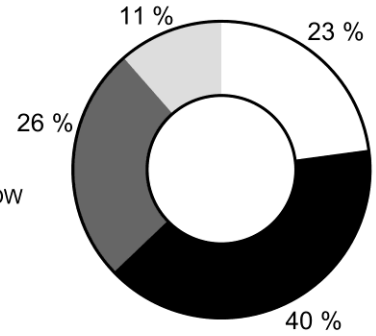
A

Do you feel prepared to work with digital scanning or WSI?



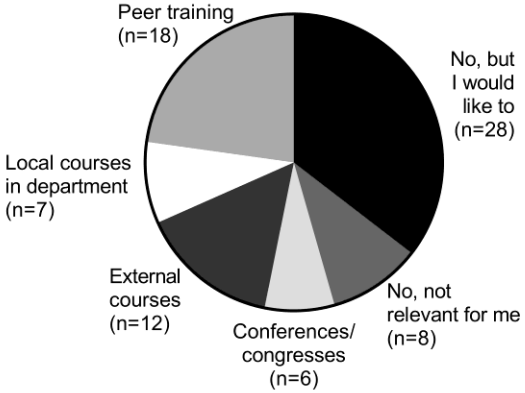
B

Do you feel prepared to work with DAIA?



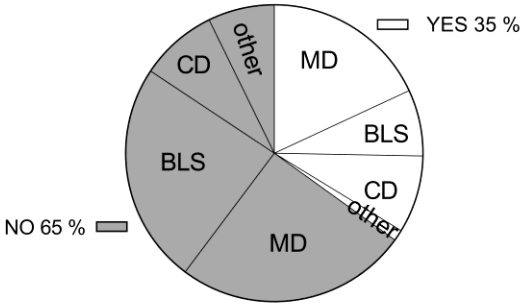
C

Particicated in DP training?



D

Would you be interested to be part of a national DP consortium?



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ORIGINAL PAPER

On the Road to Digital Pathology in Denmark—National Survey and Interviews

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Abstract

Digital pathology (DP) is changing pathology departments dramatically worldwide, yet globally, few departments are presently digitalized for the full diagnostic workflow. Denmark is also on the road to full digitalization countrywide, and this study aim to cover experiences during the implementation process in a national context. Thus, quantitative questionnaires were distributed to all pathology departments in Denmark ($n = 13$) and distributed to all professions including medical clinical directors, medical doctors (MD) and biomedical laboratory scientists (BLS). For a qualitative perspective, we interviewed four employees representing four professions. Data were collected in 2019–2020. From the questionnaire and interviews, we found strategies differed at the Danish departments with regards to ambitions, technological equipment, workflows, and involvement of type of professions. DP education was requested by personnel. Informants were in general positive toward the digital future but mainly had concerns regarding the political pressure to integrate DP before technological advances are sufficient for maintaining rational budgets, workflows, and to sustain diagnostic quality. This study is a glance on the Danish implementation process in its early stages from personnel's point of view. It shows the complexity when large new workflow processes are to be implemented countrywide and with a large diversity of stakeholders like managers, MD, BLS, IT-professionals, and authorities. To ensure best technological and economical solutions and to maintain—or even optimize—diagnostic quality with DP and workflow alignment, we suggest superior inter- and intradepartmental communication. When implementing DP countrywide, a national consortium is warranted with the variety of stakeholders represented.

Keywords Digital pathology · Implementation · Qualitative · End-users · Management

Introduction

Presently, many pathology departments aim to get fully digital with digital pathology (DP), providing new opportunities like digital assisted image analysis and artificial intelligence [1]. DP has for a long while been a successful tool in research and education but with limited use in primary diagnostics [2, 3], but new technological advancements have now made DP an interesting player in the diagnostic setting—not only for the DP front-runner laboratories [2, 4–7]. DP is an image-based environment that involve the work process after staining procedures: From scanning glass slides to end-diagnosis [8]. Barely a decade ago, approximately only a third of pathologists believed that the digital images had potential use in primary diagnostics [9], but with timely results and sufficient quality to ensure patient safety transferring laboratories to DP is perhaps becoming inevitable.

Implementing DP can be a national confined process [9], or driven locally by laboratories [9]. In several countries, digitalization may not have started, but the awareness of its coming is widely accepted with a knowledge of it being a laborious and costly process [2, 4, 6, 7]. At a UK department on the brink of starting the process of becoming a DP department, employees disclosed their concerns about

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Tak for opmærksomheden

UNIVERSITY COLLEGE COPENHAGEN

Region Syddanmark

PROFESSIONS-HØJSKOLEN ABSALON

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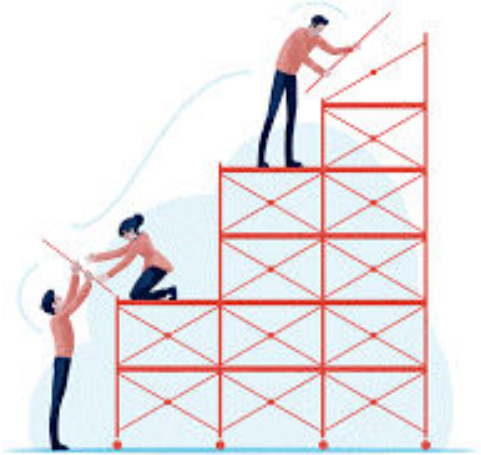
Uddannelsen – skaber fundamentet



Uddannelse – fra undersøgelsen

Viser at bio arbejder med **digital scanning** (64%), **diagnostik ved virtuel mikroskopi** (16%), og deltager i **forskning/udviklingsprojekter** i relation til digital patologi (26%)

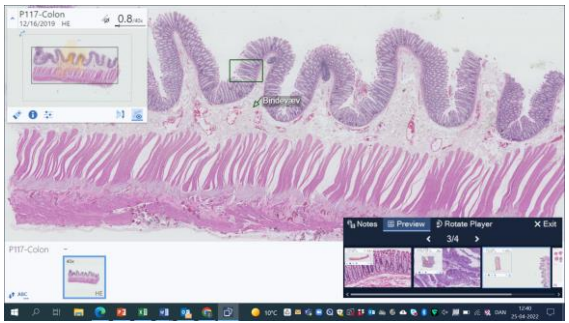
”**DP vil kræve flere bio ressourcer** – nogle skal sørge for at kvalitet og prøve-flow overholdes”

Indførsel af teknologi vil på sigt kunne tiltrække en **ny type bioanalytiker**

”Udviklingsmuligheder ift **efteruddannelse** i digitale/IT løsninger af bioanalytikere”

”Uddannelser skal favne og give **kompetencer der understøtte DP** arbejde (så ikke IT- ingeniører overtager)”

Vigtige pointer for bioanalytikeruddannelsen?



Prøvens vej gennem HELE laboratoriet – Forståelse for at hele processen påvirkes

Ny type bioanalytiker studerende – med styrket teknologisk fokus og interesse

Praksis transfer – at vi fortsat har et stærkt samarbejde med praksis for at styrke transfer (vigtigt når det er nyt for både os på uddannelsen og praksis)

Opgaveglidning – mulighed for at bioanalytikere svarer negative prøver → betyder de studerende skal have styrket deres videns grundlag fra uddannelsen

DP på PHA

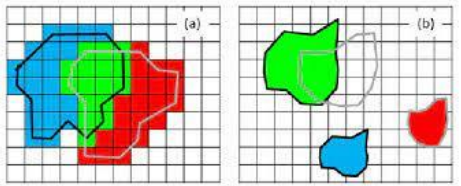
Integrations fase – vi er kun lige startet med at have digitalt patologi som del af undervisningspraksis hos Absalon

Undervisning på 4 semester i digital patologi

<u>Laboratorie praksis - færdigheder</u>

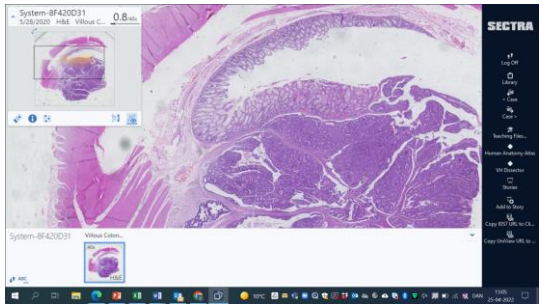
Almen histologi 2 semester

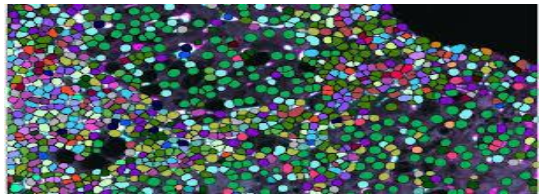
Patologisk projekt (Cancer) 4 semester



Teknologi valgfag 7 semester

Første skridt på vejen - PHA





Biokemi og kemi

Histologi – mikroskopisk anatomi

Makroskopisk udskæring, fixering, indlejring i paraffin og skæring på mikrotom (semi-automatisk)

Teknologi forståelse og kvalitetssikring

Patologisk anatomi

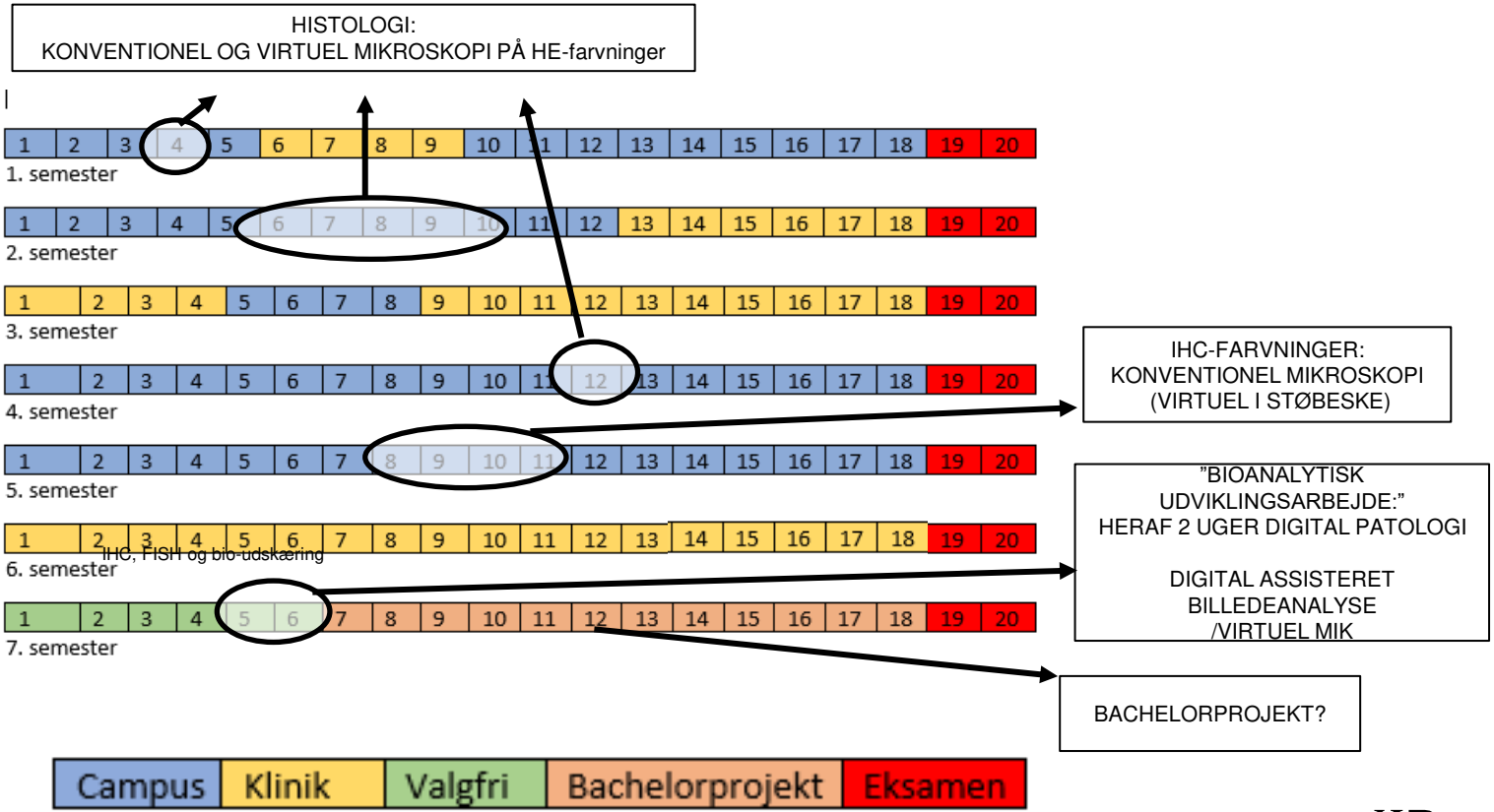
Viden om kunstig intelligens og digitale analyser

Forståelse for digitale billeder og filer

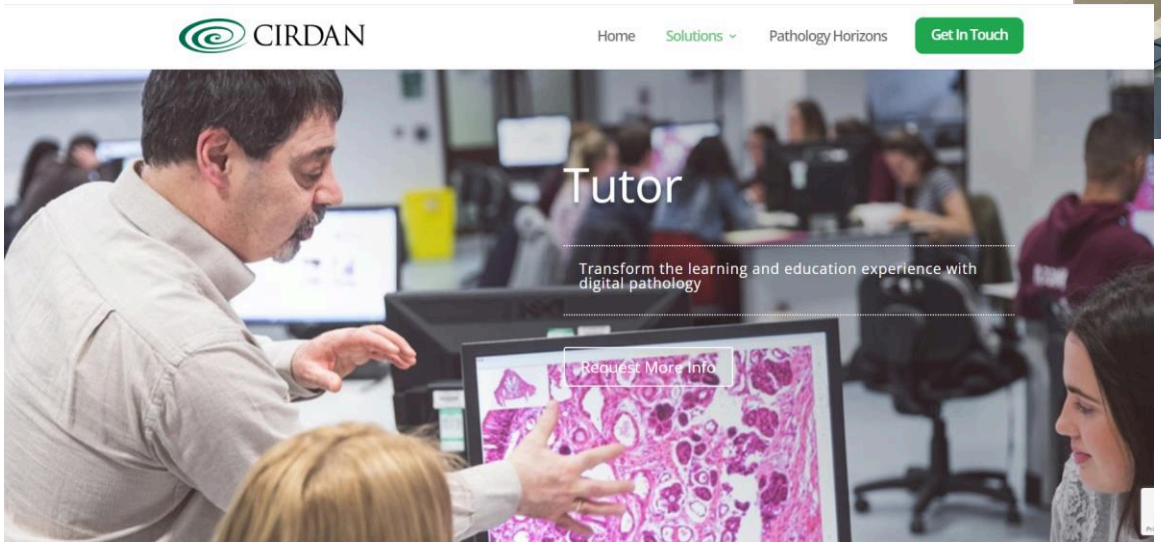
KP

Semesteropbygning KP

Digital patologi



VIRTUEL MIKROSKOPI-
PATHXL TUTOR



Fremtiden:

- Udvide vores digital samling med specialfarvninger og de hyppigste immunfarvninger (kontroller).
- Vi har ikke til hensigt at udfase den konventionelle mikroskopi.

DIGITAL ASSISTERET BILLEDEANAYSE
VISIOPHARM

7. SEMESTER VALGFRI – 2 UGER DIGITAL PATOLOGI

- Antal studerende: 20-35 studerende

- 3 forskellige cases herunder kvantificering af CD31, Ki67 og SMA. Studerende arbejder med digital billedanalyse samt bearbejder resultater

- For at sikre alignment med praksis er cases udviklet i samarbejde med hhv. RBL, Visiopharm, og Novo.

- Faglige oplæg:
  Stig Hansen (OUH),
  Oliver Carlsson (Visiopharm)

Studerende udprøves ved en individuel skriftlig eksamen, hvor læringsudbytter ønskes opfyldt.

FORDELE OG UDFORDRINGER

FORDELE:

- Studerende: Spændende at arbejde med sidste nye.
- Studerende er digitale så det falder dem let.
- Tæt samarbejde med klinikken giver bedre transfer
- Forberede til fremtiden

UDFORDRINGER

- Digital patologi kræver tæt og opfølgende samarbejde med It-afd. (ressourcer).
- Kontrakt fornyelser / økonomi (feks licenser / Har ikke skanner)
- Stort arbejde at indsamle materiale til virtuel mikroskopi samt udvikling af nutidige relevante cases

Tak for i lyttede – spørgsmål?