

**wellcome
connecting
science**



มหาวิทยาลัยขอนแก่น
KHON KAEN UNIVERSITY

Introduction to the course

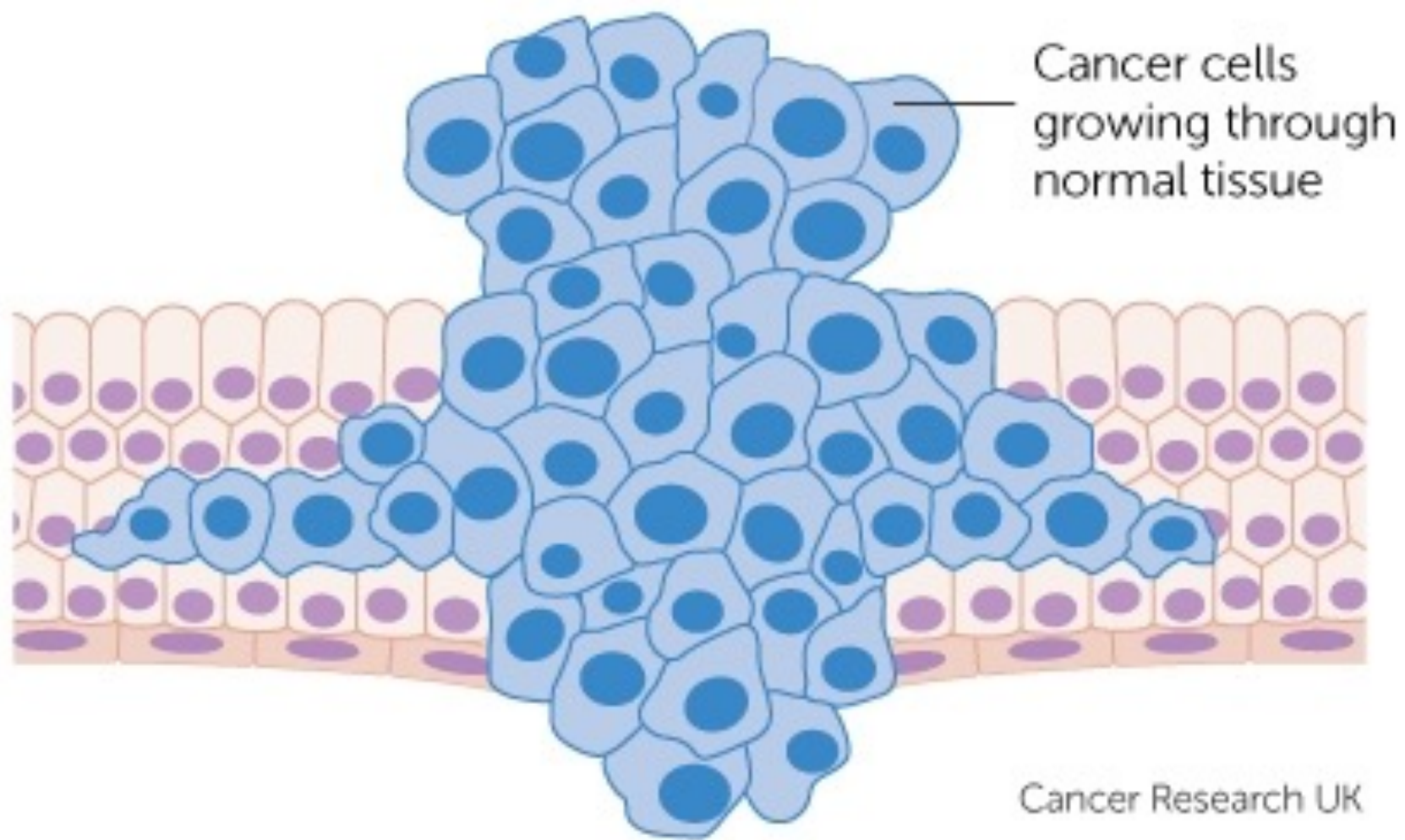


Cancer Genome Analysis - Asia

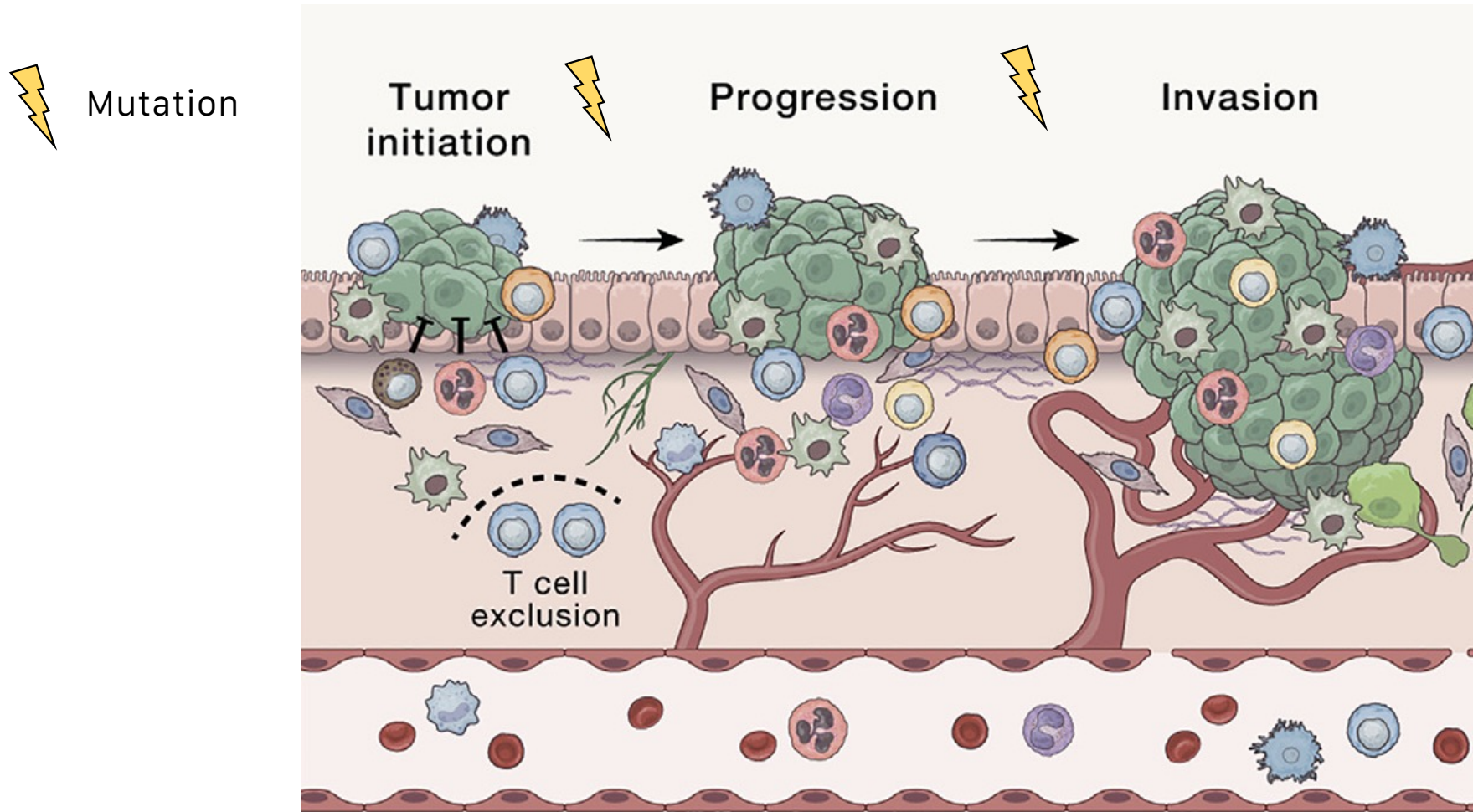
26–31 October 2025

Khon Kaen University, Thailand

What is cancer?



Cancer develops as cells acquire mutations

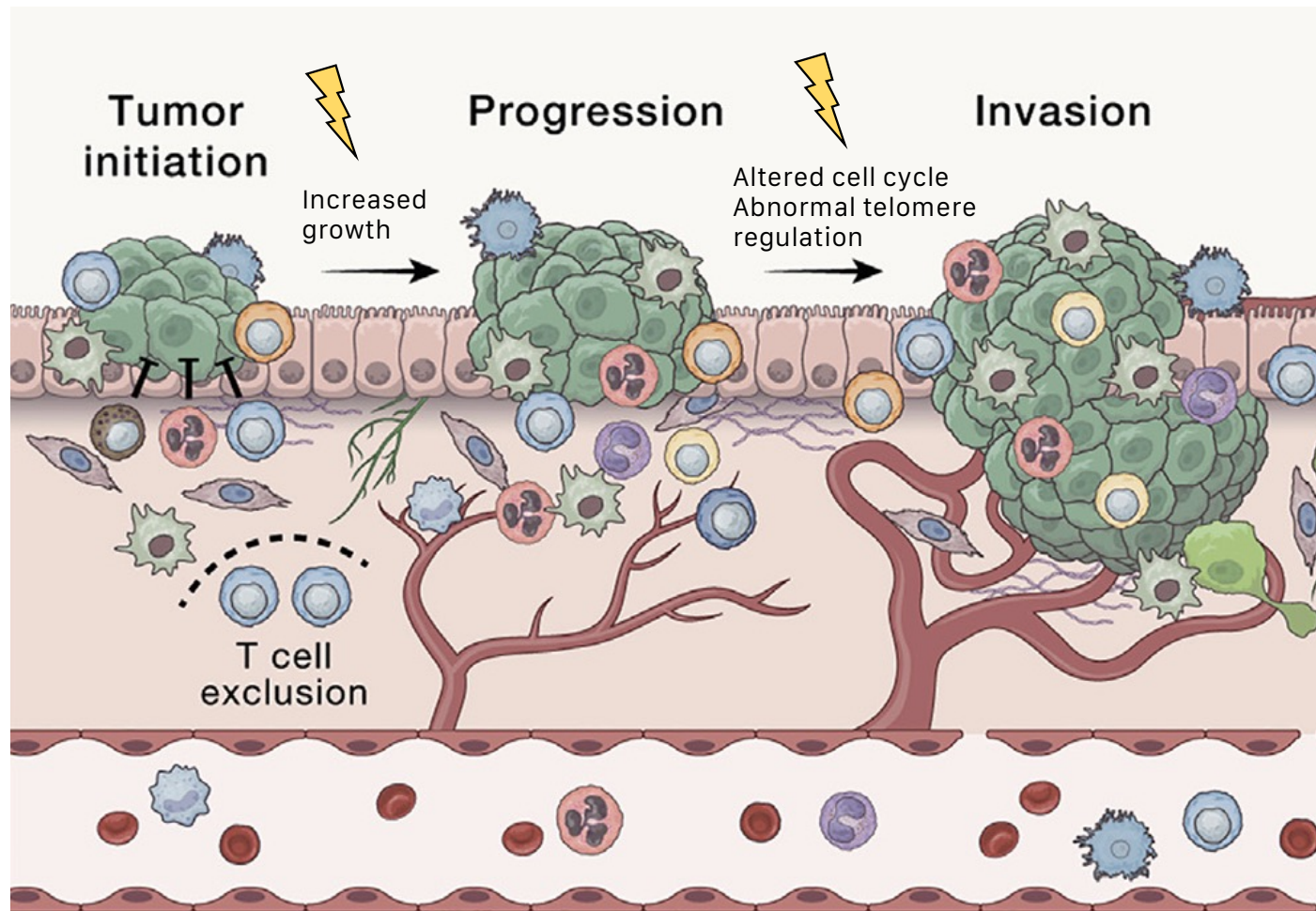


De Visser and Joyce (2023)

Cancer develops as cells acquire mutations

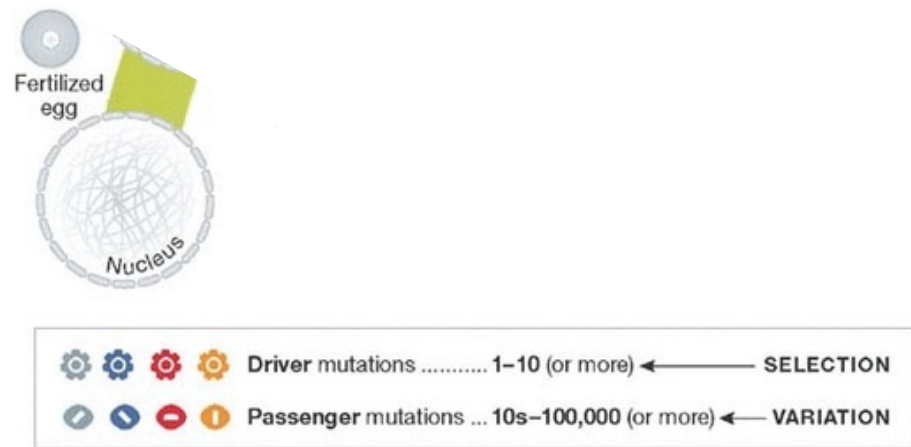


Mutation



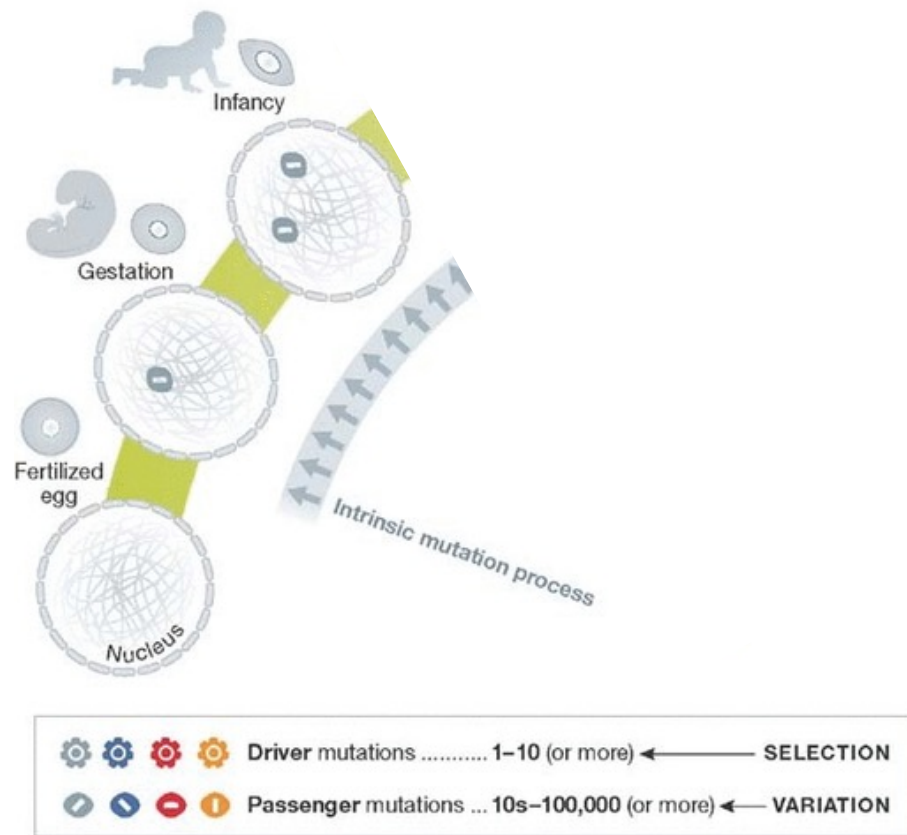
De Visser and Joyce (2023)

The acquisition of mutations is a life-long process



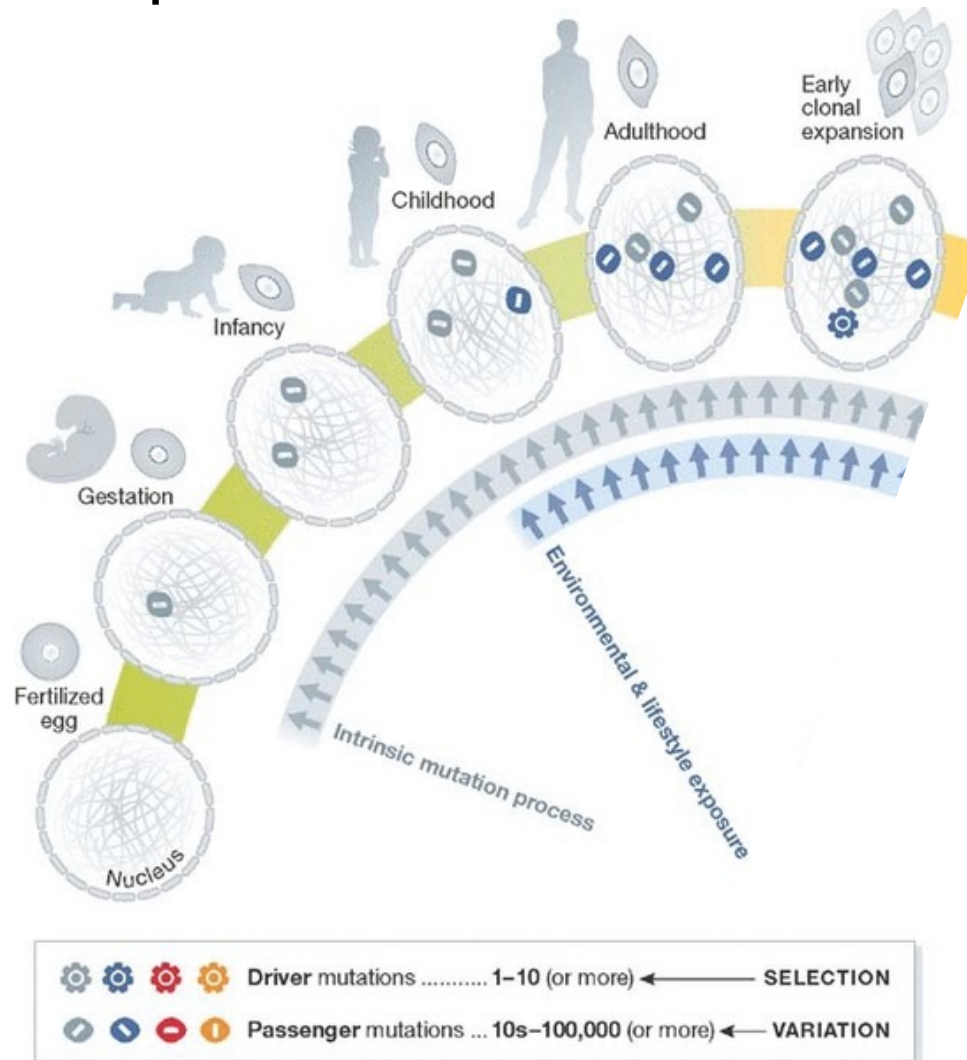
Stratton (2013)

The acquisition of mutations is a life-long process



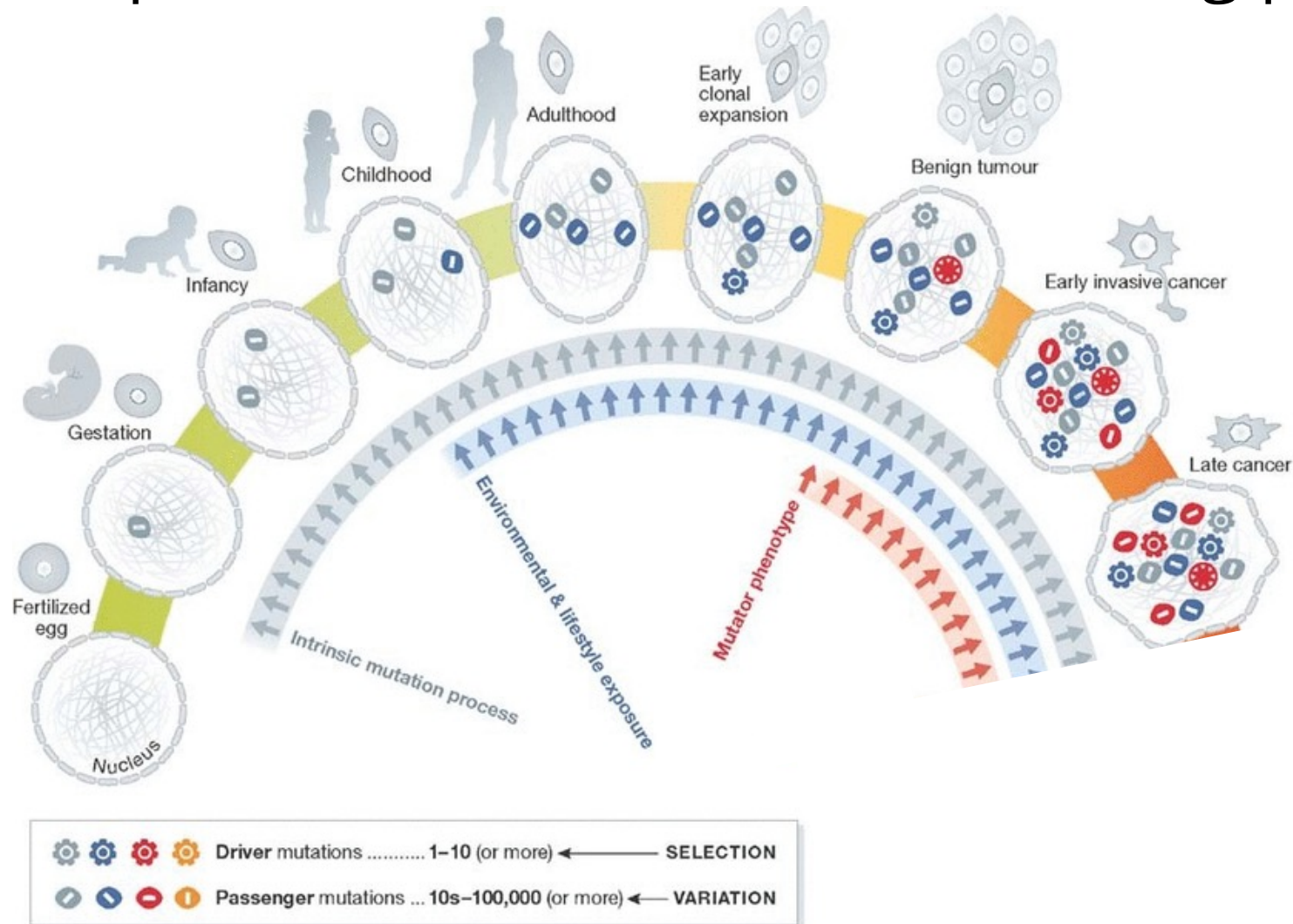
Stratton (2013)

The acquisition of mutations is a life-long process



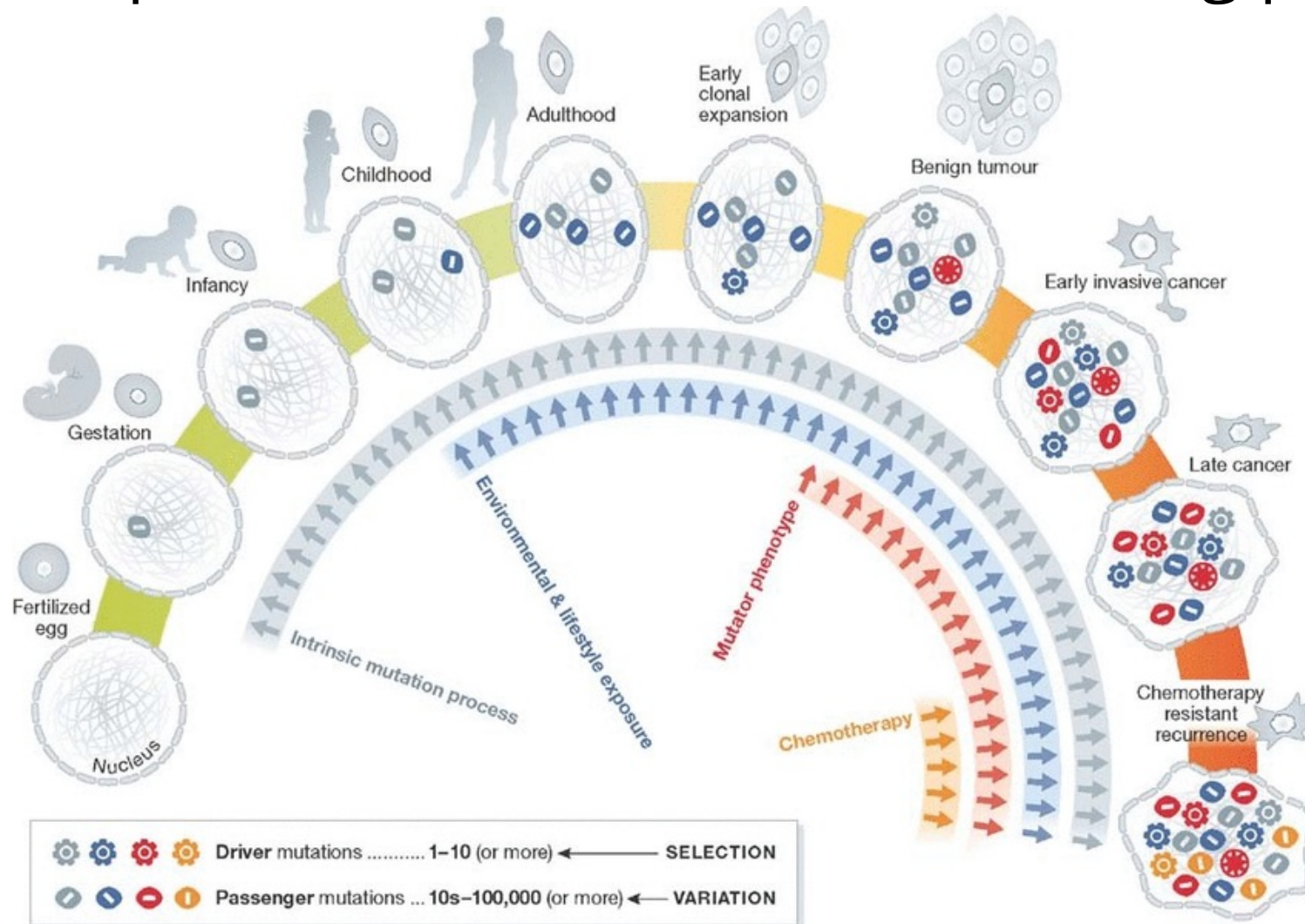
Stratton (2013)

The acquisition of mutations is a life-long process



Stratton (2013)

The acquisition of mutations is a life-long process



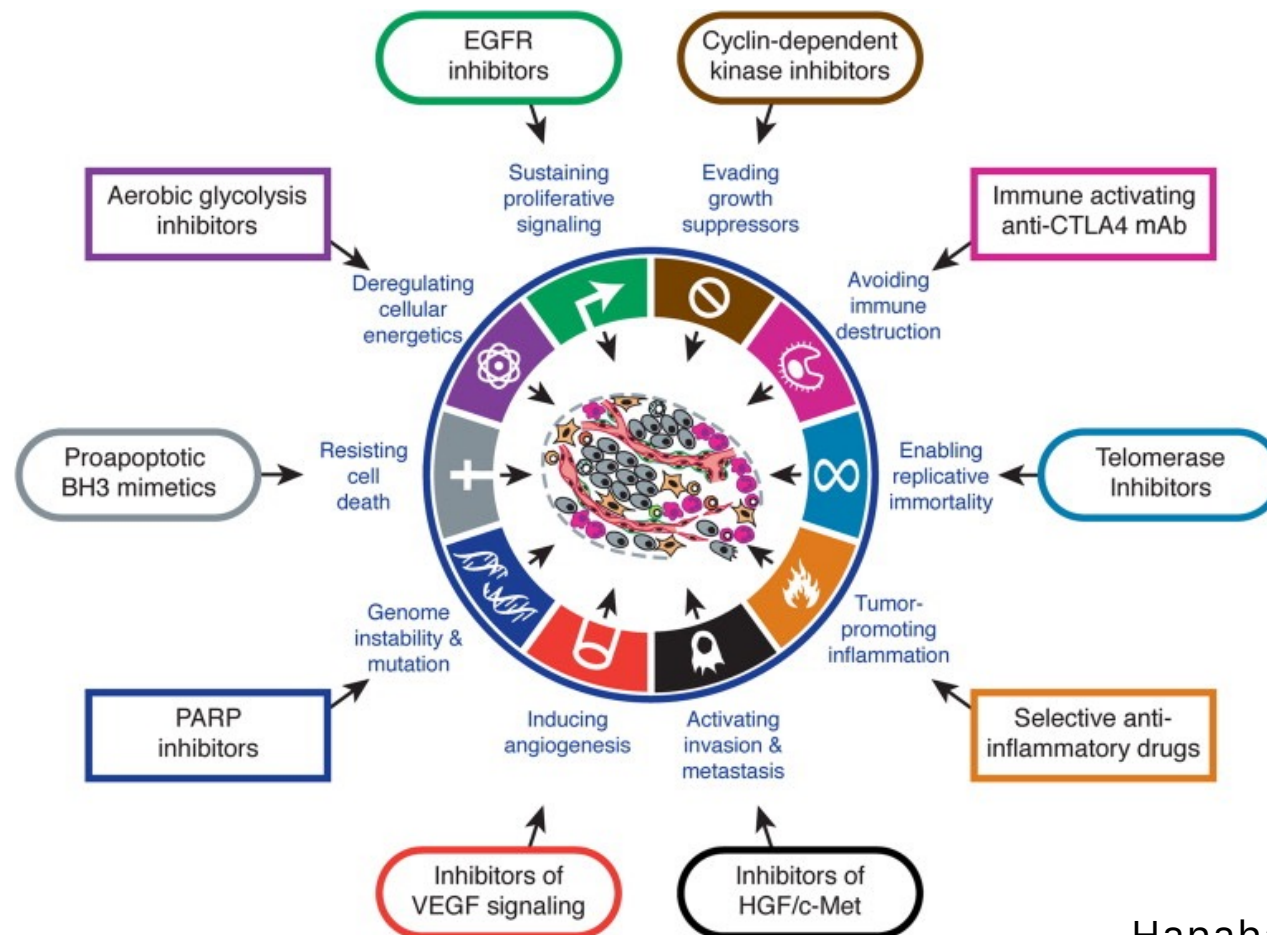
Stratton (2013)

Mutations facilitate the acquisition of cancer hallmarks



Hanahan and Weinberg (2011)

Targeting these hallmarks can lead to effective treatments



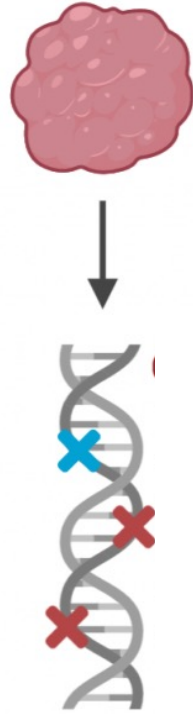
Hanahan and Weinberg (2011)

The study of genomes can help us identify the processes that fuel cancer development

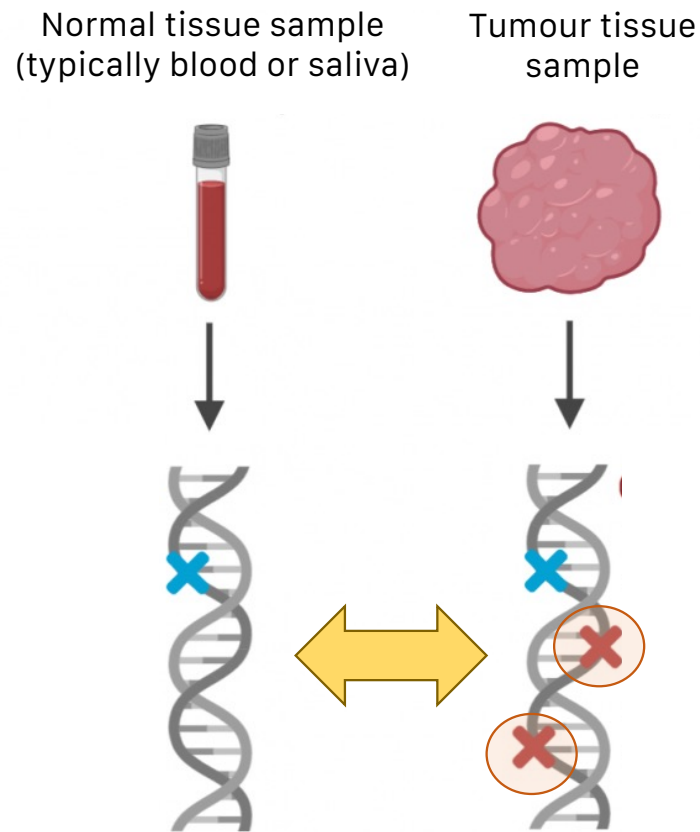
Normal tissue sample
(typically blood or saliva)



Tumour tissue sample



The study of genomes can help us identify the processes that fuel cancer development

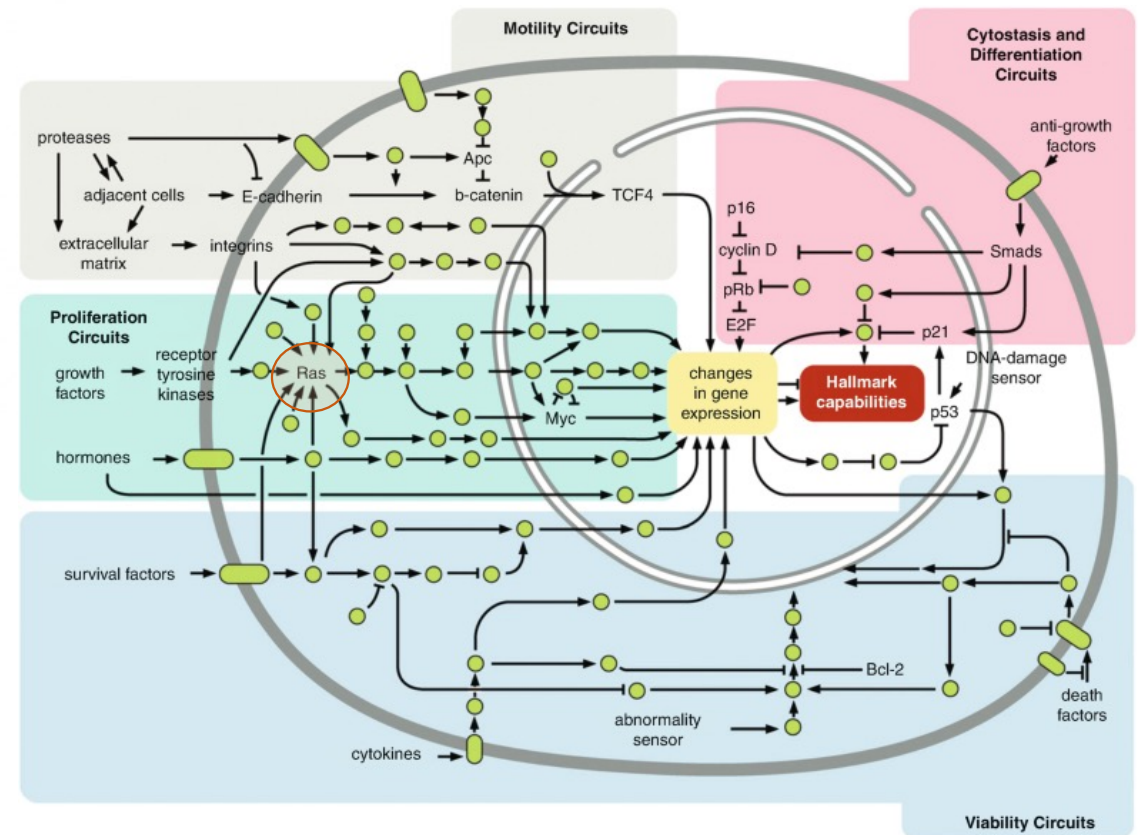
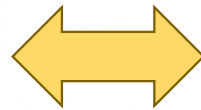
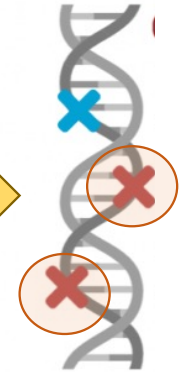


The study of genomes can help us identify the processes that fuel cancer development

Normal tissue sample
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Tumour tissue sample

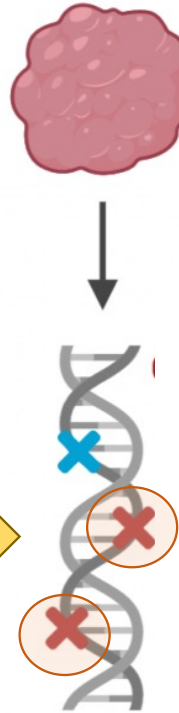


Studying the genome

Normal tissue sample
(typically blood or saliva)



Tumour tissue sample



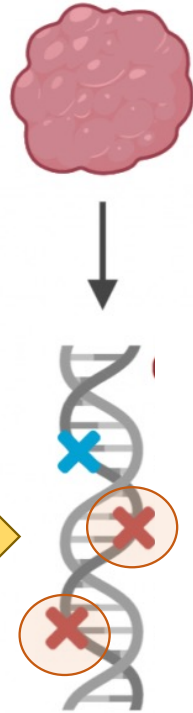
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Studying the genome

Normal tissue sample
(typically blood or saliva)



Tumour tissue sample



Illumina

ACGTTTAGCAT
ACGTT**C**AGCAT

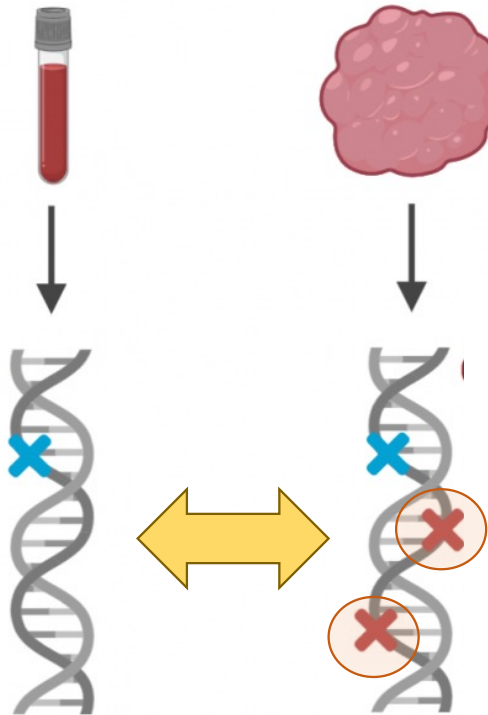
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Studying the genome

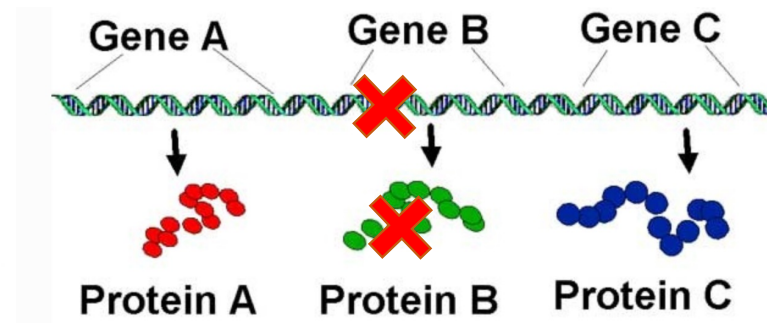
Normal tissue sample
(typically blood or saliva)

Tumour tissue sample



Illumina

ACGTTTAGCAT
ACGTT**C**AGCAT



D Lee

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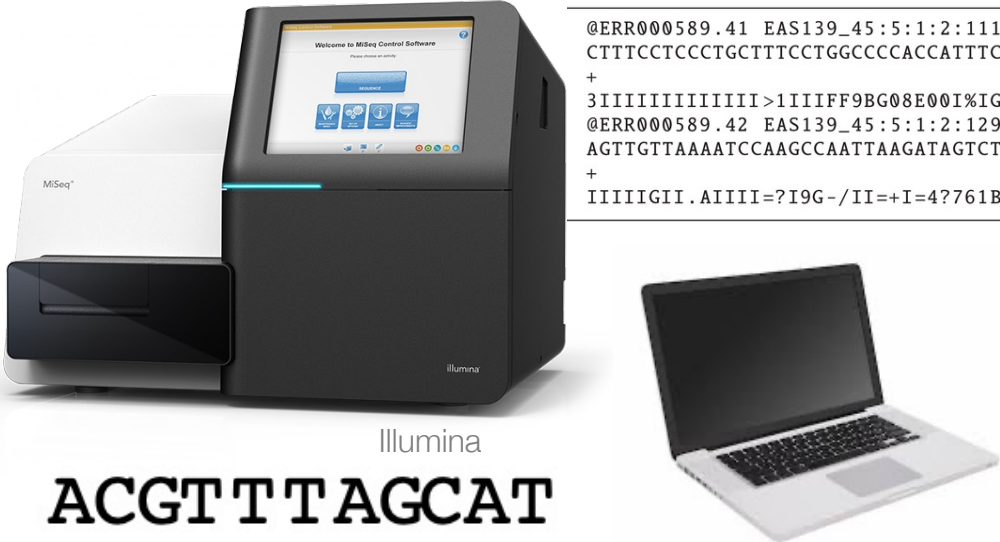
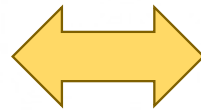
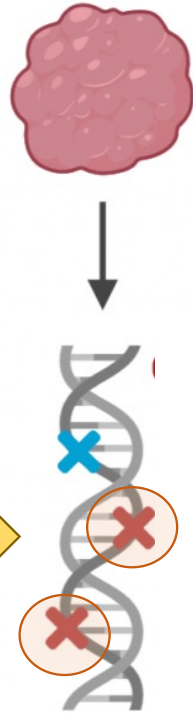
- Actionable mutations
- Driver genes
- Patterns of mutations

Studying the genome

Normal tissue sample
(typically blood or saliva)

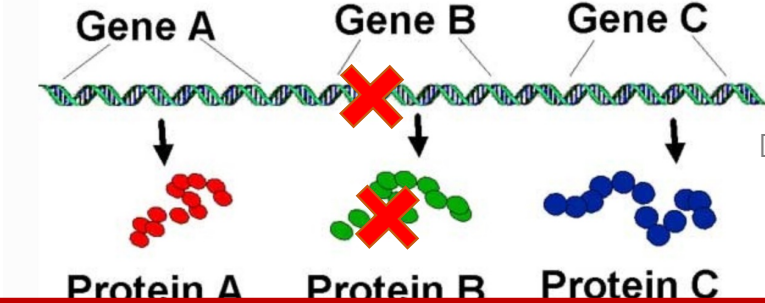


Tumour tissue sample



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```

ACGTTTAGCAT
ACGTT**C**AGCAT



Gene A Gene B Gene C

Protein A Protein B Protein C

- Actionable mutations
- Driver genes
- Patterns of mutations

This course!

Topics we will cover

- Data formats and QC



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- How do I interpret sequencing and mutation files?
- How do I know if my data looks good?

Topics we will cover

- Data formats and QC
- Mutation calling



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```



ACGTTTAGCAT
ACGTTC**AGCAT**

- How do I identify mutations in my sequencing data?
- How do I know this is a good quality set of mutations?

Topics we will cover

- Data formats and QC
- Mutation calling
- Identifying gene drivers



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ACGTTTAGCAT
ACGTT**C**AGCAT



- How do I identify which genes are driving the cancer I'm studying?

Topics we will cover

- Data formats and QC
- Mutation calling
- Identifying gene drivers
- Mutational signature analysis

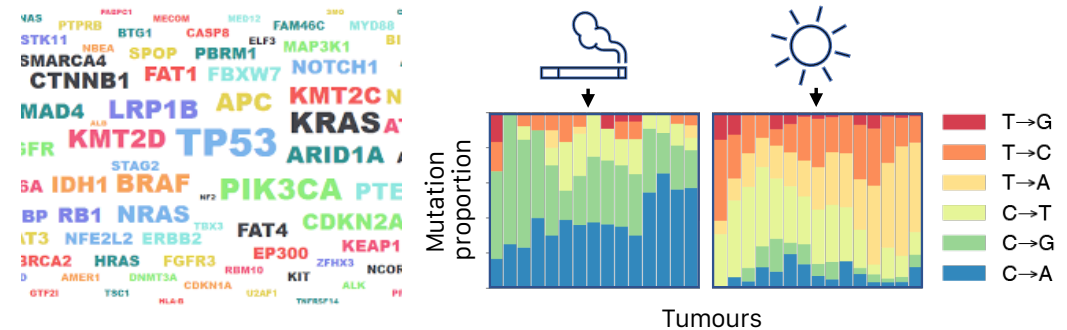


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ACGTTTAGCAT

ACGTT**C**AGCAT



- How do I identify patterns of mutations in my samples?
- How do I associate them to etiological factors?

Topics we will cover

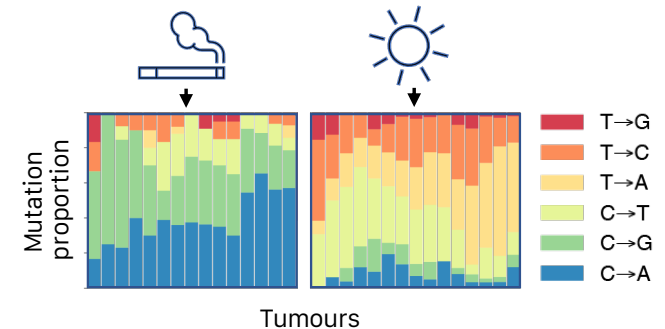
- Data formats and QC
- Mutation calling
- Identifying gene drivers
- Mutational signature analysis
- Special sessions: Clinical challenges and the role of genomics, tumour board



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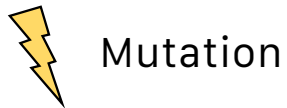


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- How is genomics used to guide clinical decisions?

Cancer develops as cells acquire mutations



Mutation

DAY 2:

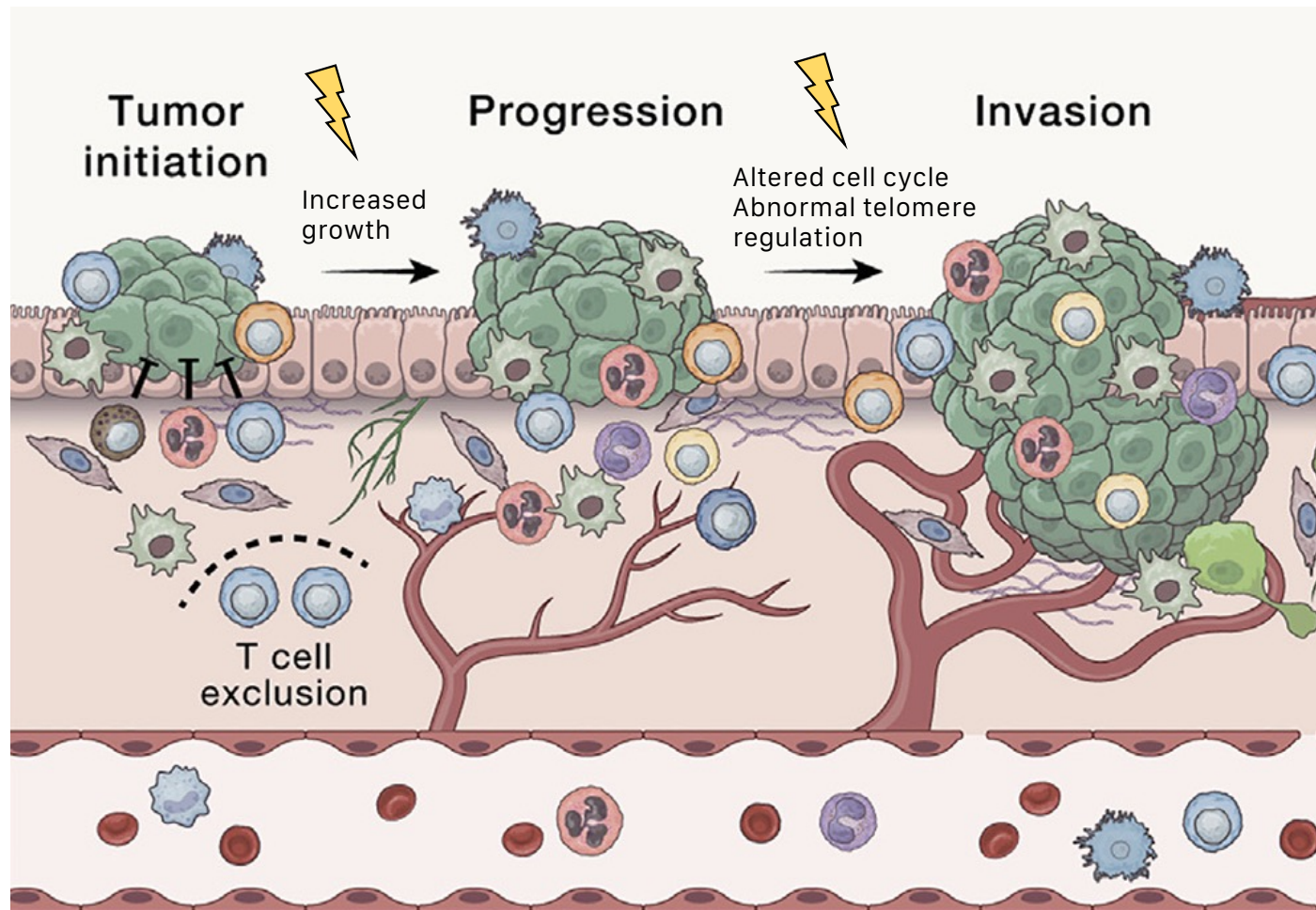
- Identification of mutations

DAY 4:

- Identification of potential etiological factors

DAY 3:

- Identification of driver genes





THROUGHOUT:

How does this inform clinical decisions?

De Visser and Joyce (2023)

Topics we will cover

		Cancer Genome Analysis 26 October - 31 October 2025, Khon Kaen University, Thailand									
	Sunday October 26	Monday October 27	Tuesday October 28	Wednesday October 29	Thursday October 30	Friday October 31					
8:00		Bus to venue	Bus to venue	Bus to venue	Bus to venue	Bus to venue	8:00				
8:30		Unraveling Cholangiocarcinoma: Clinical Challenges and the Role of Genomics Sirinya Sitthirak	Mutation Calling Daniela Robles, Eric Dawson, Sirinya Sitthirak	Driver gene & oncoplots Nivedita Mukherjee, Eric Dawson	Mutational signature analysis Eric Dawson, Jia Wern Pan, Daniela Robles	Multidisciplinary Tumor Board: Integrating Genomics into Clinical Practice Thanit Imemkamon Apinya Jusakul	8:30				
9:00							9:00				
9:30							Data formats & QC Daniela Robles & Arporn (Koi) Wangwiwatsin	Group Projects Eric Dawson Support: All Training Team	9:30		
10:00							10:00				
10:30		Break	Break	Break	Break	10:30					
11:00	Registration and Lunch	Data formats & QC Daniela Robles & Arporn (Koi) Wangwiwatsin	Mutation Calling Daniela Robles, Eric Dawson, Sirinya Sitthirak	Driver gene & oncoplots Nivedita Mukherjee, Eric Dawson	Mutational signature analysis Eric Dawson, Jia Wern Pan, Daniela Robles	Group Projects Eric Dawson Support: All Training Team	11:00				
11:30							11:30				
12:00							Cis-regulatory effect of HPV integrations in cervical cancer Sabarinathan Radhakrishnan (virtual)	Chornobyl to Tahiti: uncovering the effects of ionizing radiation in the genome using accessible accelerated computing designs - Eric Dawson	Genome-wide association studies in Cancer Onnapa Kongphan	Genomics-driven precision immunotherapy for Malaysian breast cancer Jia Wern Pan	12:00
12:30							12:30				
13:00		Introductions WCS, KKU, Training Team, Participants	Lunch	Lunch	Lunch	Lunch	13:00				
13:30							13:30				
14:00	14:00										
14:30	Intro to the course Daniela Robles	Data formats & QC Daniela Robles & Arporn (Koi) Wangwiwatsin	Mutation Calling Daniela Robles, Eric Dawson, Sirinya Sitthirak	Driver gene & oncoplots Nivedita Mukherjee / Eric Dawson	Mutational signature analysis Eric Dawson, Jia Wern Pan, Daniela Robles	Project Presentations	14:30				
15:00	Break						15:00				
	Opening ceremony KKU						15:00				
15:30	Advanced Learning Skills (ALS) Martin Aslett, Isabela Malta	Break	Break	Break	Break	Bus to hotel	15:30				
16:00	Intro to Cancer Genomics Arporn (Koi) Wangwiwatsin	Discussions: Data sharing and data management Jia Wern Pan	Mutation Calling Daniela Robles, Eric Dawson, Sirinya Sitthirak	Germline mutations calling / UK Biobank Eric Dawson	Mutational Signatures and Risk Factors: Decoding the Origins of Cholangiocarcinoma Sirinya Sitthirak	Group Projects Eric Dawson, Daniela Robles Support: All Training Team	16:00				
16:30							16:30				
17:00		Cancer genomics & research in Asia (Online Databases) Apinya Jusakul	Discussion: Ethical consideration when retrieving samples from patients. Daniela Robles	Mutation Calling in Cholangiocarcinoma: Identifying Key Genetic Alterations for Clinical Decision-Making - Sirinya Sitthirak	Driver Genes in Cholangiocarcinoma: Connecting Genomic Alterations to Clinical Outcomes - Sirinya Sitthirak		17:00				
17:30	Networking and Dinner	Day wrap-up	Day wrap-up	Day wrap-up	Day wrap-up		17:30				
18:00		Bus to hotel	Bus to hotel	Bus to restaurant	Bus to hotel			18:00			
				Dinner at restaurant							
			Bus to hotel								

Seminars on cancer genomics and related work in Latin America

- Sabarinathan Radhakrishnan (India)
- Eric Dawson (USA)
- Onnapa Kongphan (Thailand)
- Jia Wern Pan (Malaysia)

Training on Advanced Learning

- Martin Aslett and Isabela Malta (WGCAC, UK)

Group projects



- Melanoma
- Lung
- Pancreatic
- Liver

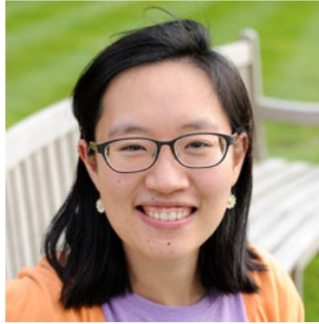


Marcos Díaz Gay

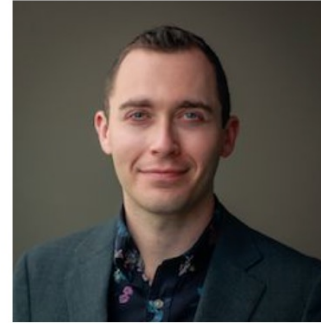
Training team



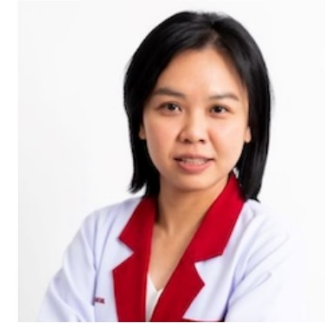
[Daniela Robles-Espinoza](#)
LIIGH-UNAM, Mexico



[Arporn \(Koi\) Wangwiwatsin](#)
Khon Kaen University,
Thailand



[Eric Dawson](#)
EarthFrame, Corp.
Phileal, LLC



[Apinya Jusakul](#)
Khon Kaen University,
Thailand



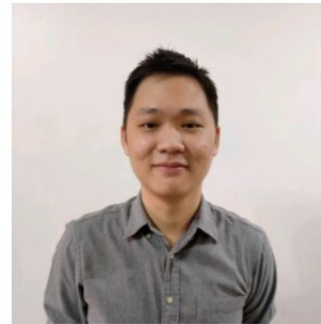
[Sirinya Sitthirak](#)
Khon Kaen University,
Thailand



[Sabarinathan Radhakrishnan](#)
The National Centre
for Biological
Sciences, India



[Onnapa Kongphan](#)
Khon Kaen University,
Thailand



[Jia Wern Pan](#)
Cancer Research
Malaysia, Malaysia



[Haslina Makmur](#)
Cancer Research
Malaysia, Malaysia



[Nivedita Mukherjee](#)
The National Centre
for Biological
Sciences, India

Organisers



Monica Abrudan



[Martin Aslett](#)



[Isabela Malta](#)



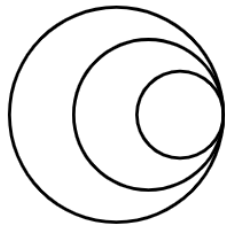
[Alice Matimba](#)



Karon Chappell



[Vaishnavi Gangadhar](#)



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