



DUNDEE CANCER CENTRE

Could You Cure Cancer?

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Some questions on cancer:

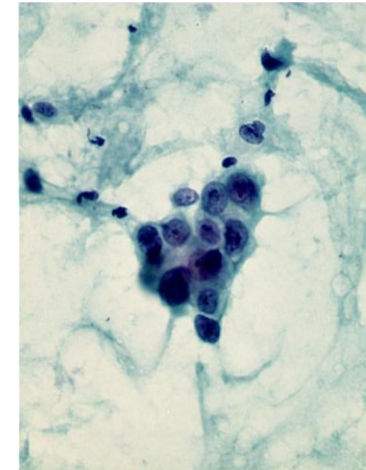


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- What is cancer?
- How does in situ become invasive cancer?
- How does invasive cancer metastasise (spread via vessels) and then grow?
- When treated, why do some cancer cells die and others survive?
- Are there cancer stem cells? How are they reactivated?

What is cancer?

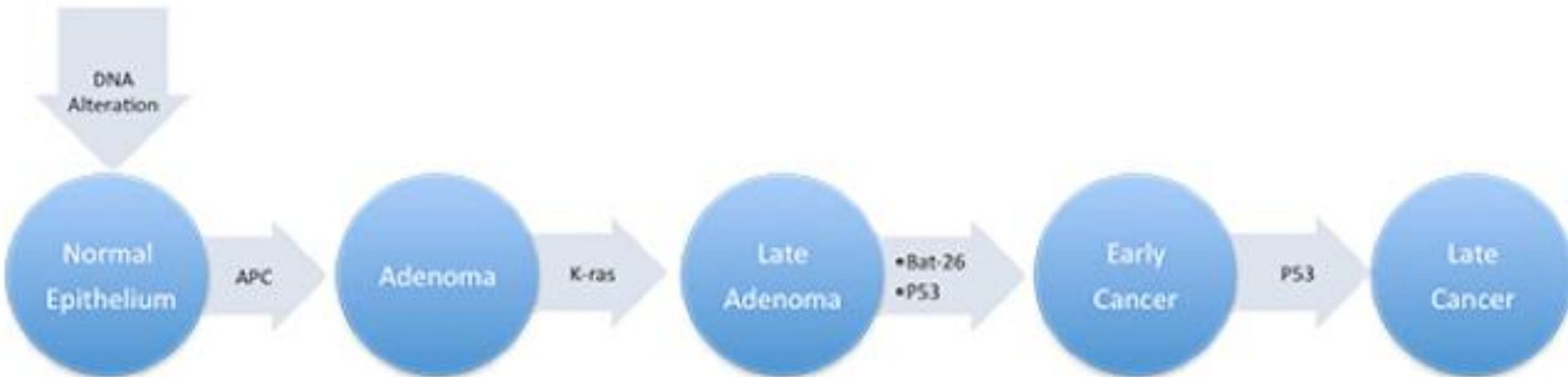
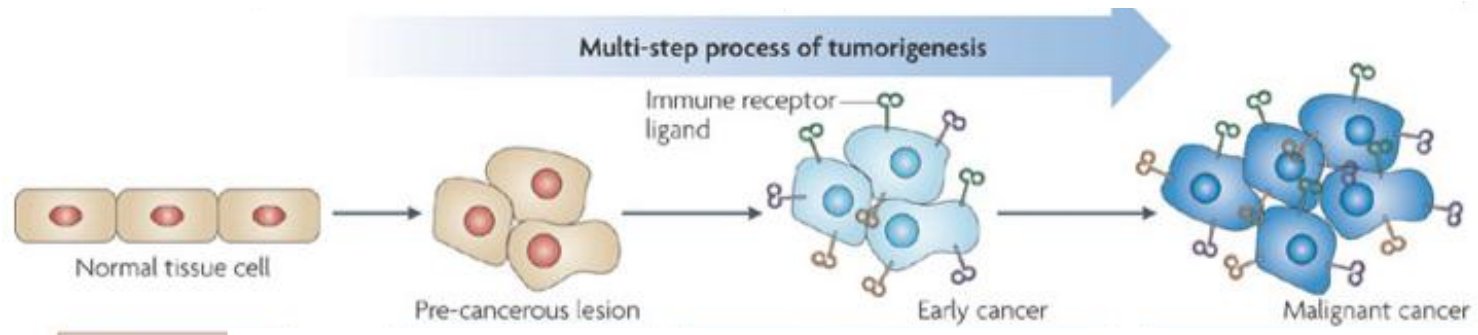
- Uncontrolled growth of cells
- “Wound that never heals”
- Invasion and metastasis
- “Soil and seed” hypothesis
- “War on cancer” – problem solved?



• US cancer	1950	193.9/100,000
mortality:	2001	194.4/100,000

Hanahan and Weinberg: Hallmarks of Cancer 2000, 2011

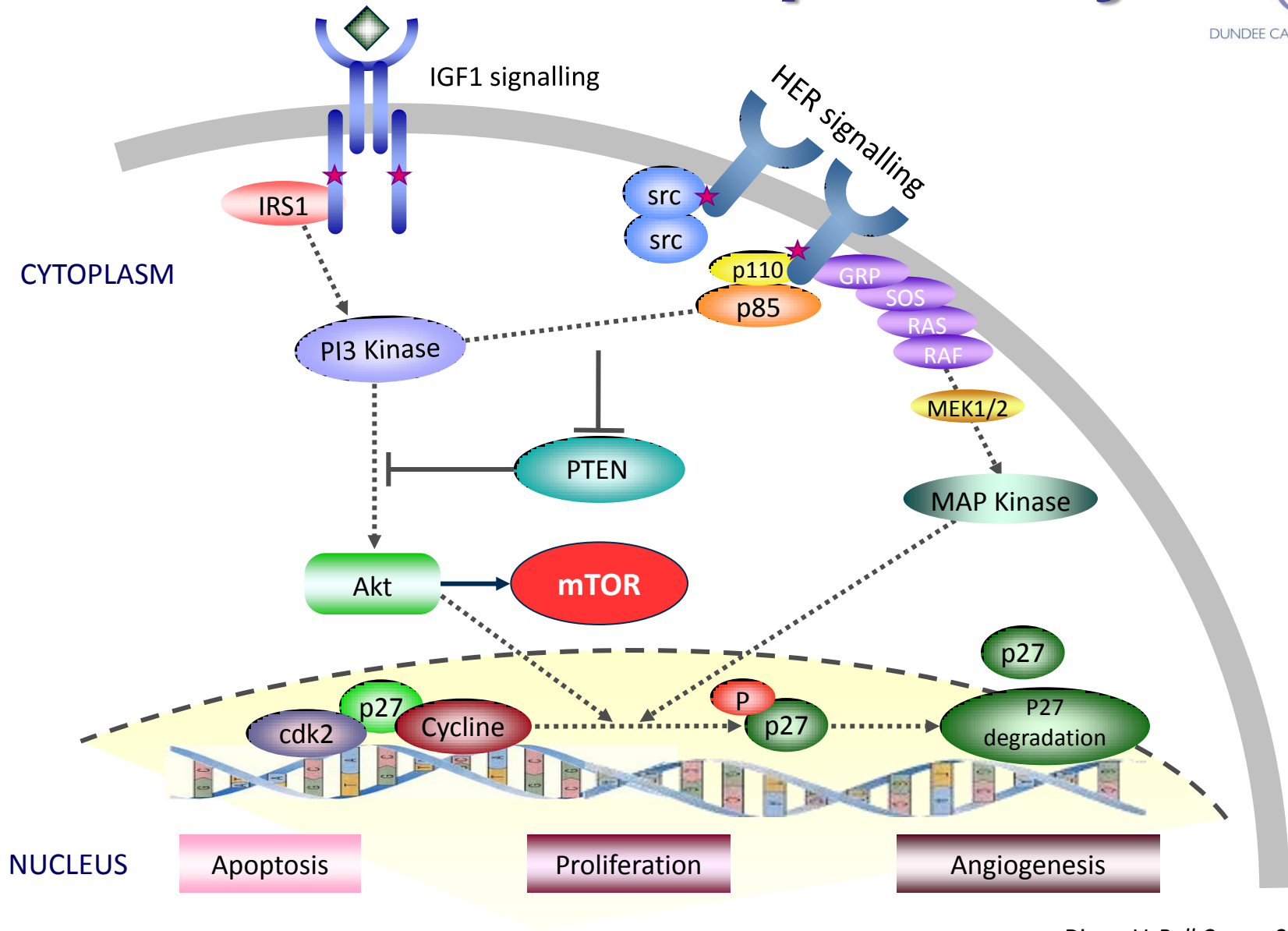
What is cancer?



Aberrations of cell pathways



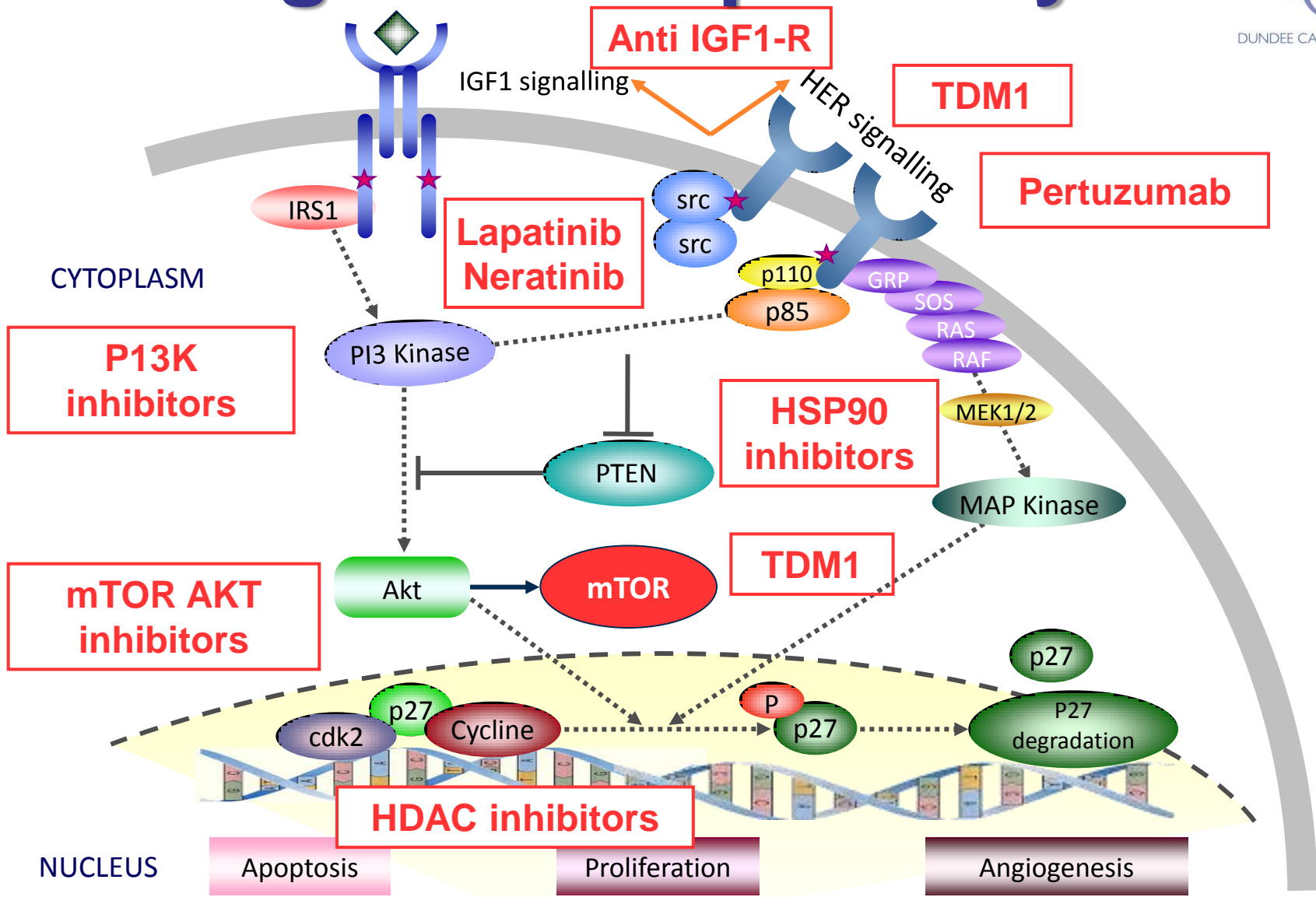
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Drugable cell pathways:



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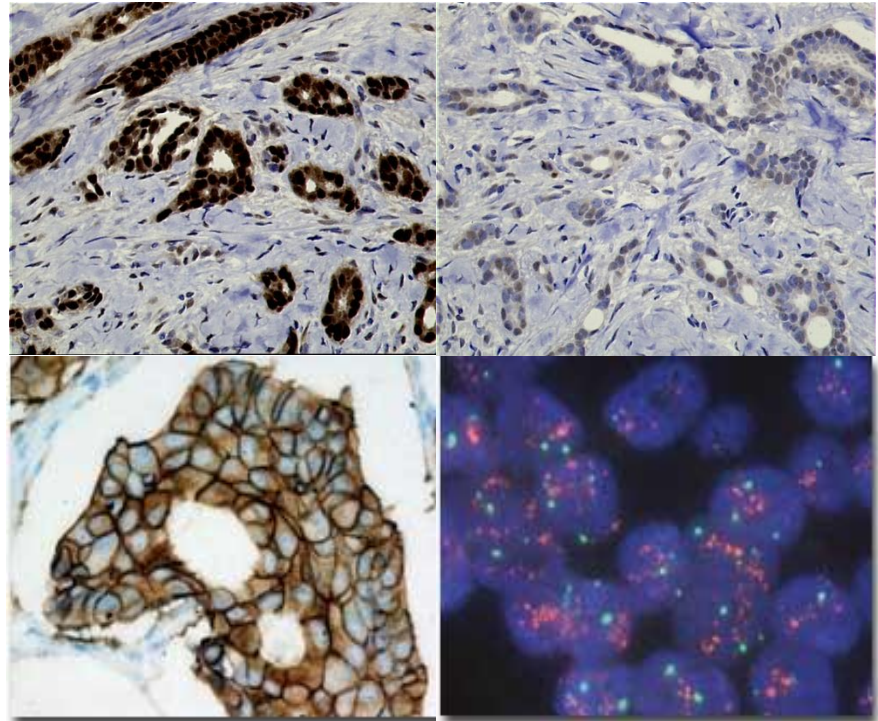
Breast cancer in the UK

- 1 in 8 women
- 46,000 women, 400 men p.a.
- 4,600 women diagnosed with DCIS p.a.
- 4,000 women per month
- 135 women per day
- 12,000 women, 80 men die from breast cancer each year, over 1 per hour

- 550,000 people alive today in the UK following a breast cancer diagnosis

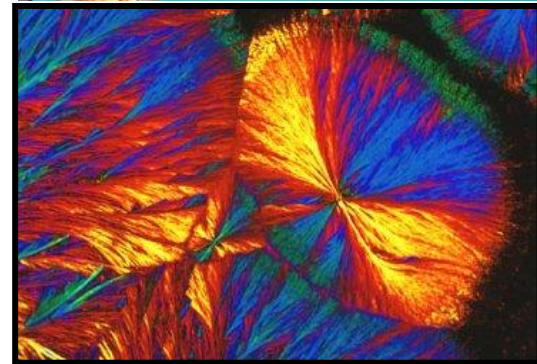
Breast cancer subtyping

- Luminal
ER+/PR+
- HER2+
- Triple Negative
Breast Cancer
(TNBC):
ER-/PR-/HER2-

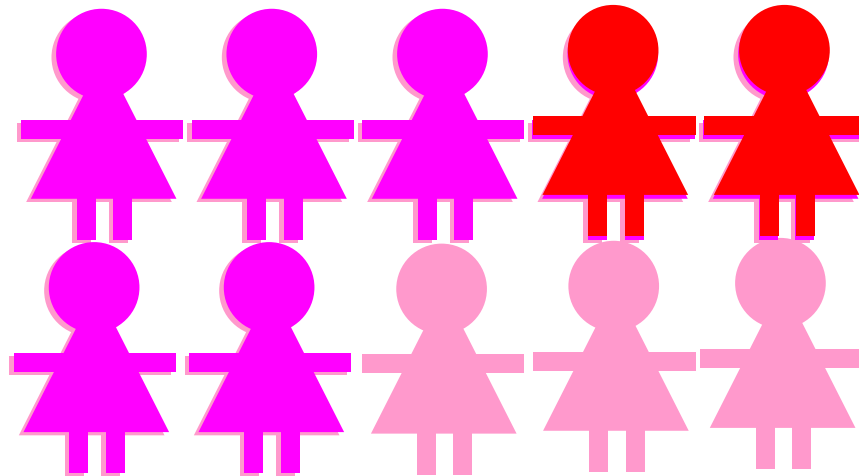


Treatments for (breast) cancer:

- Surgery
- Radiotherapy
- Endocrine therapy
- Chemotherapy
 - adjuvant
 - neoadjuvant
- Biological therapy



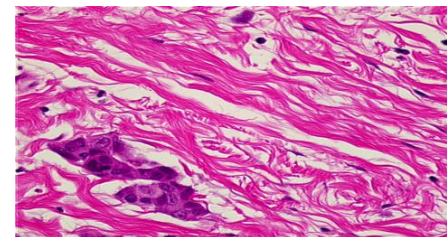
Estrogen receptor (ER) is the target of endocrine treatment and is expressed in ~70-80% of breast cancers



Upto 30% develop drug resistance which accounts for many deaths

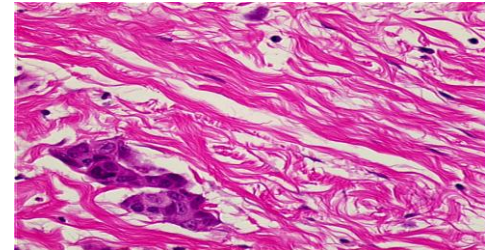
Why give neoadjuvant therapy?

- Patient's perspective:
 - test individual in vivo efficacy of drugs,
 - improve surgical options,
 - identify patients with long term survival
- Complete pathology response (2% - 80%)
- Depends on subtype (TNBC; HER2+)
- Depends on drugs used
- What about residual disease?

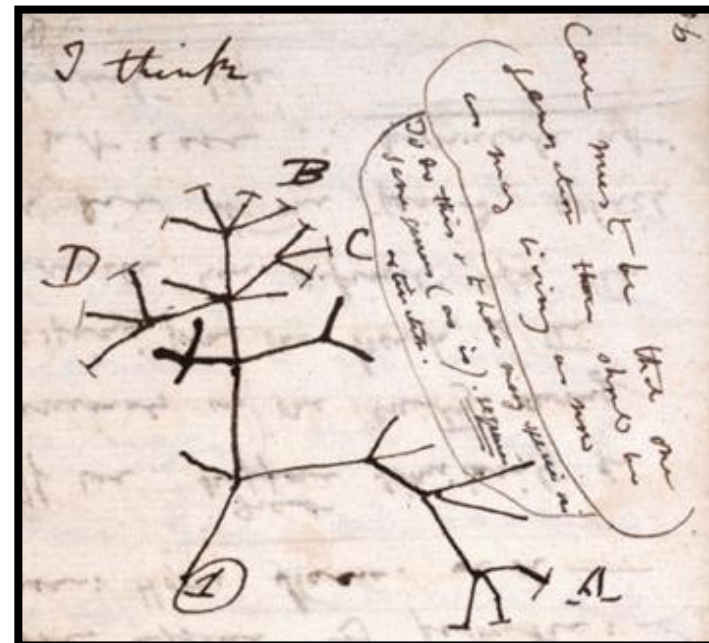


What about residual cancer?

- Nests of cancer cells, reflecting heterogeneity:



- Are we looking at an evolutionary tree:
- Cancer stem cells?





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- When treated, why do some cancer cells die and others survive?
- Are there cancer stem cells? How are they reactivated?
- **Questions we need to address**
.....could YOU cure cancer?



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