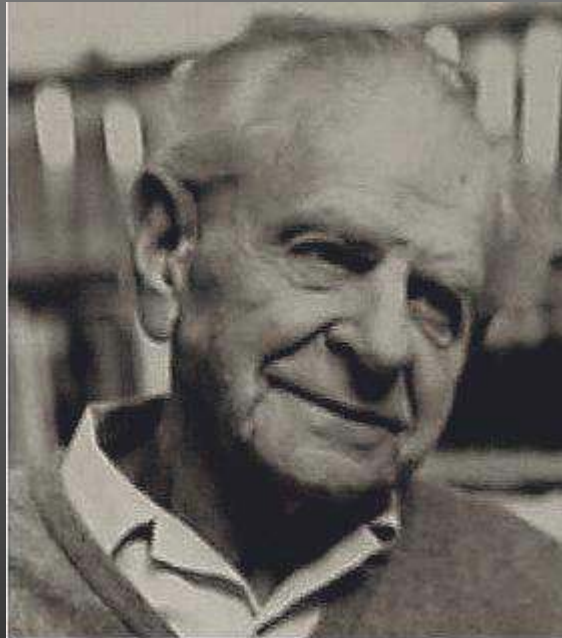


# **Popperian Pathways: the demarcation between quack cancer cures and scientific remedies**



*Sir Karl Popper (1902-1994)*

*Michael Baum UCL November 2007*

## The Philosophy of Science:





**Karl Popper and me 1993**

THE OPEN SOCIETY  
AND ITS ENEMIES  
*THE SPELL OF PLATO*

*To Michael from Karl*  
*17-1-1993*



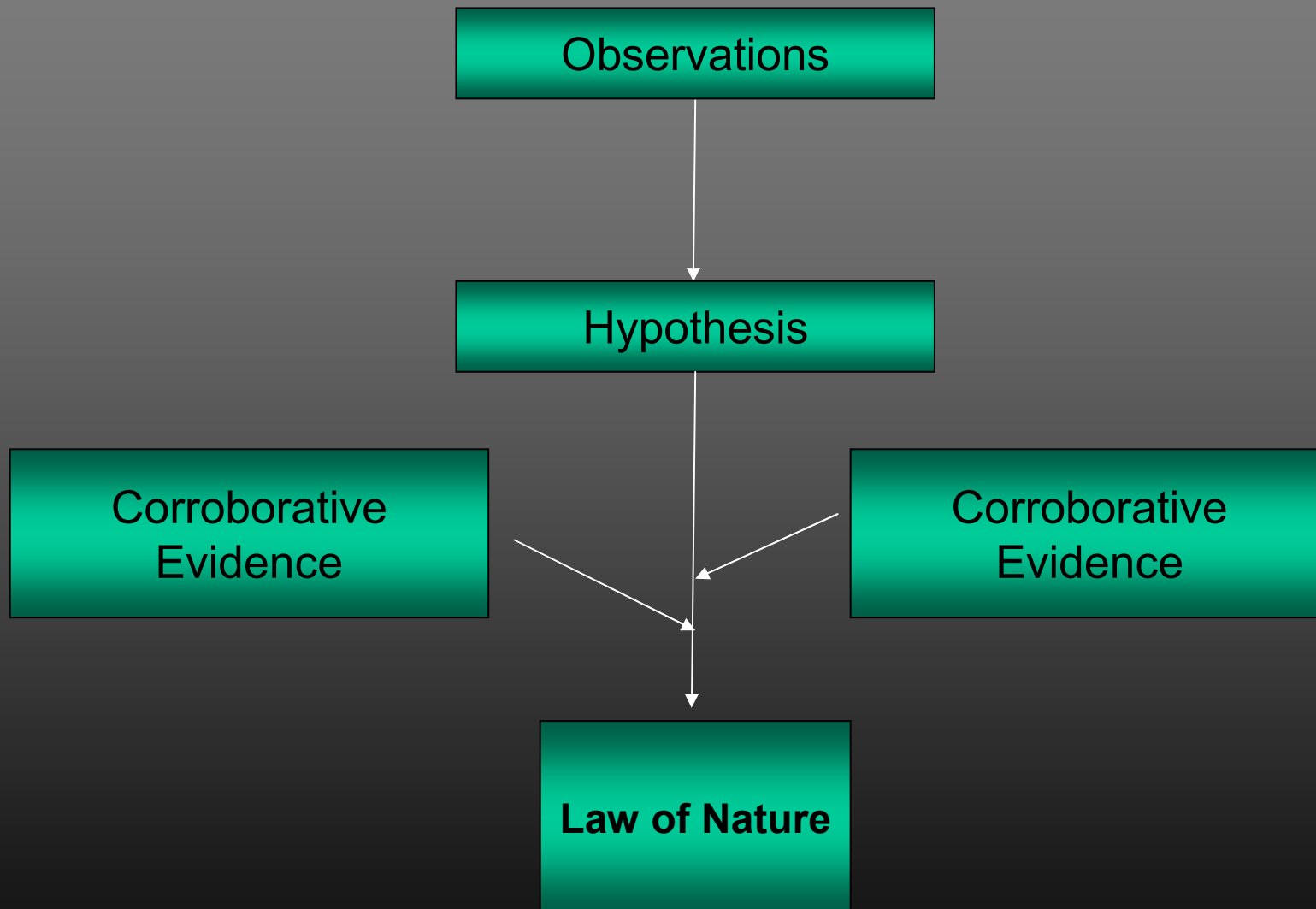
Hospital; a wish to which they both were  
adverse from the beginning...

I read your three offprints with great  
interest. I agree that all biologists are, as  
a matter of course, holists - but not HOLISTS;  
and I found your descriptions of wholism very  
nice indeed; and I think - like you in your  
Australian paper - that the Homoeopaths are  
irrationalists. I also think it very unlikely  
that there are, or will be "alternative"  
approaches of significance. But it is, of  
course, most important that we never  
<sup>we should never forget</sup> know; and that science has often been pushed on  
by, and gained from, the ideas of outsiders. (Both Kepler  
and Newton used astrological ideas; and Cratylus,  
who (rightly) disliked these ideas, (wrongly) failed,  
for this reason, to take Kepler <sup>quite</sup> seriously.) For this  
reason, we ought to remain open-minded.

For me, the most interesting of your papers was  
"Limitations of Non-Science in Surgical Epistemology". I hope  
you may find time, one day, to discuss these issues with me.

yours sincerely Karl Potter

# Inductive Logic



**Logical asymmetry between verification and  
falsification**

**Swans are white**



**Or maybe black**

**If Herbalife truly enhances athletic performance  
then should it be classified like anabolic steroids?**

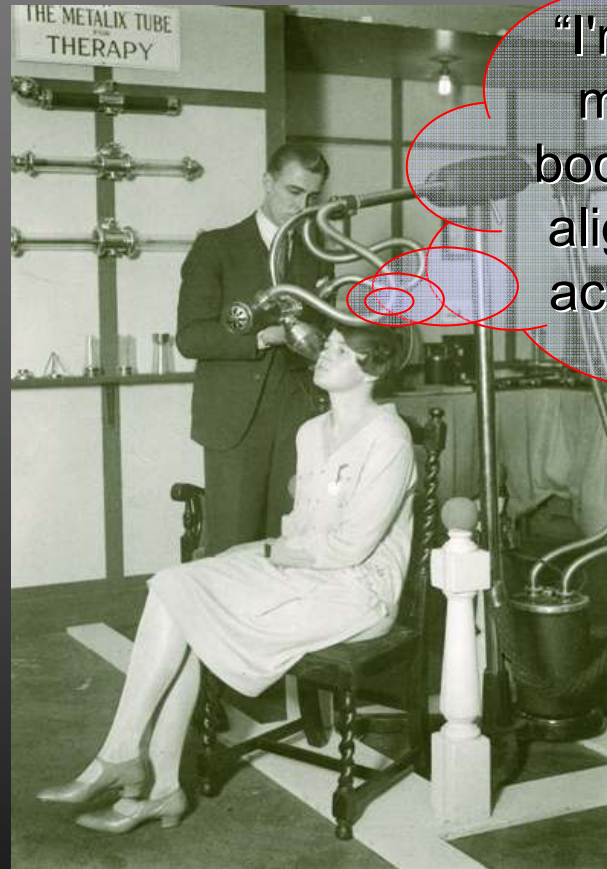




# Tectonic plate amulet to neutralize electromagnetic waves



**NES Energetic Analysis done by an energy field scanner  
which shows up organs blocked by anything from  
environmental and nutritional chemicals to viruses.**



"I'm sure that I need this machine to enable my body's energy fields to re-align themselves and re-activate their innate self-healing abilities".

# EFT

- Emotional Freedom Techniques (EFT) is a psychotherapeutic tool. The theory behind EFT is that negative emotions are caused by disturbances in the body's energy field and that tapping on the meridians while thinking of a negative emotion alters the body's energy field, restoring it to "balance."



# Homeopathy

- The more dilute the evidence the more potent the effect!
- Homeopathy doesn't poison your body,  
**It poisons your mind**





**The Society of Homeopaths**  
*representing professional homeopaths*

## HIV / AIDS Symposium

London: 1st December 2007



Join us at this one-day Symposium in London for a fascinating insight into the role of homeopathy in treating HIV/AIDS.

Our three expert speakers from a variety of backgrounds will present their experiences in the field followed by ample opportunity for participants' questions and discussion during our 'panel' session at the end of the day.

Jonathan Stallick, well known for his pioneering work with patients with HIV/AIDS and his book *AIDS: The Homeopathic Challenge*, will set the context for the day. Hilary Fairclough will tell us about the Maun Homeopathy Project in Botswana which she jointly founded in 2002. This innovative project offers free homeopathy outreach clinics in an area where over 35% of the people are infected with HIV or AIDS, one of the highest rates in the world. Harry van der Zee will introduce us to a completely different and controversial treatment for AIDS in Africa using a new set of healing remedies created by Peter Chappell.

We anticipate that this thought-provoking day will generate much lively debate and discussion and invite all participants to contribute their questions to the panel for the final session.

### Jonathan Stallick



Jonathan Stallick was one of the pioneers of homeopathic treatment of HIV/AIDS at a time when there was widespread fear and ignorance of the disease both in society at large and within homeopathic circles. He worked for some 5 years at two of London's major centres for sufferers of the disease and despite the ever present challenges and threat of 'burn-out' he helped many people. However, his prescribing at that time was unconventional and drew criticism and praise in equal measure from homeopathic colleagues. Later, his book, *'AIDS: The Homeopathic Challenge'* led to demand for his lecturing around the world. At this symposium Jonathan will talk about his fascinating experiences, set the context for the day and hopefully provide inspiration for those still on the road of discovery.

**“The patient was given only 6 months to live but defied the doctor’s predictions, took snake oil daily and lived to a ripe old age”**

**This is an urban myth, there ain’t no such patients.**

**“The Patient was only given 6 months to live!”**



**“I don't know why you wanted a second opinion.  
Your doctor's guess is as good as mine.”**

# The history of the treatment of breast cancer

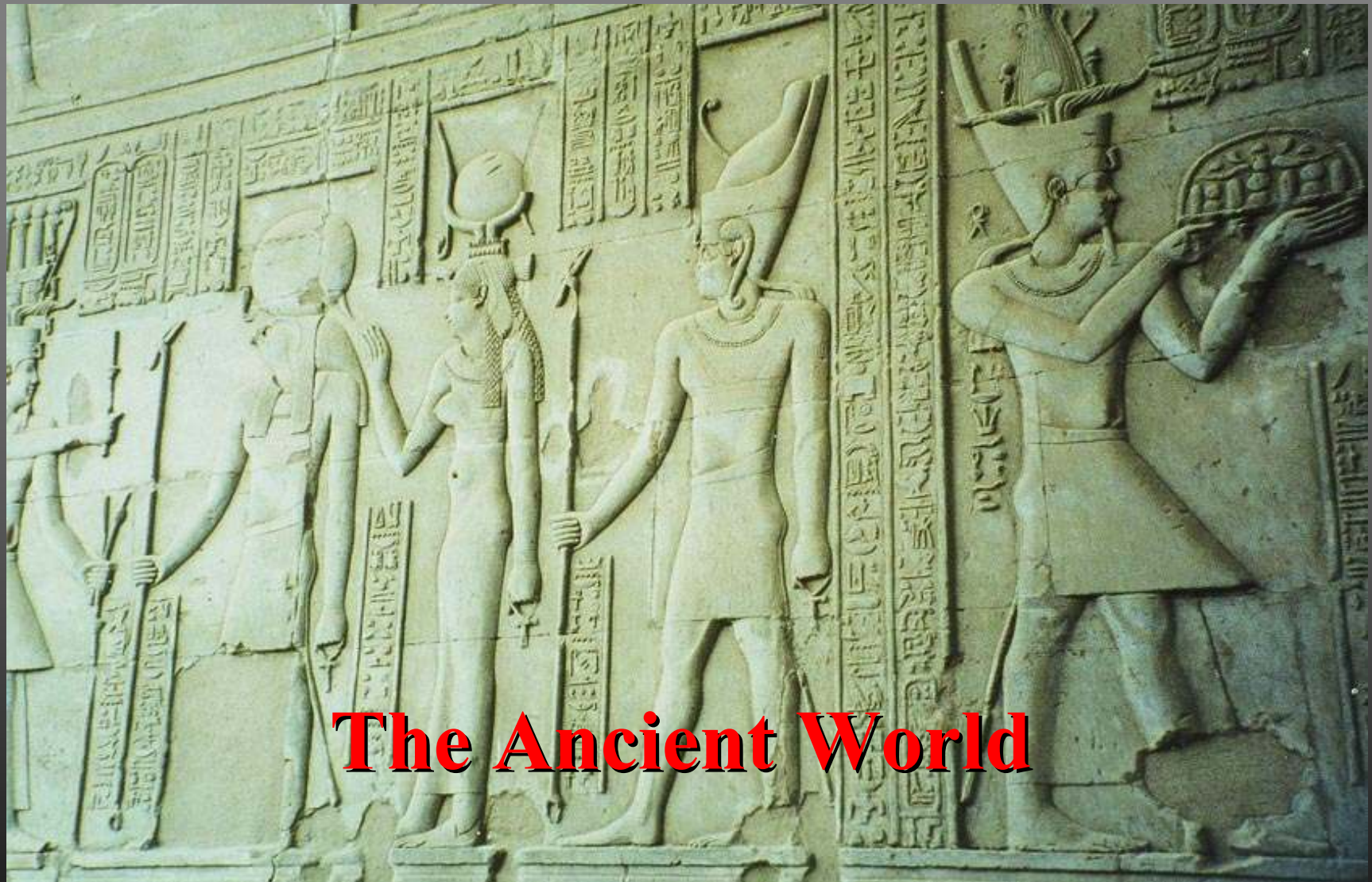




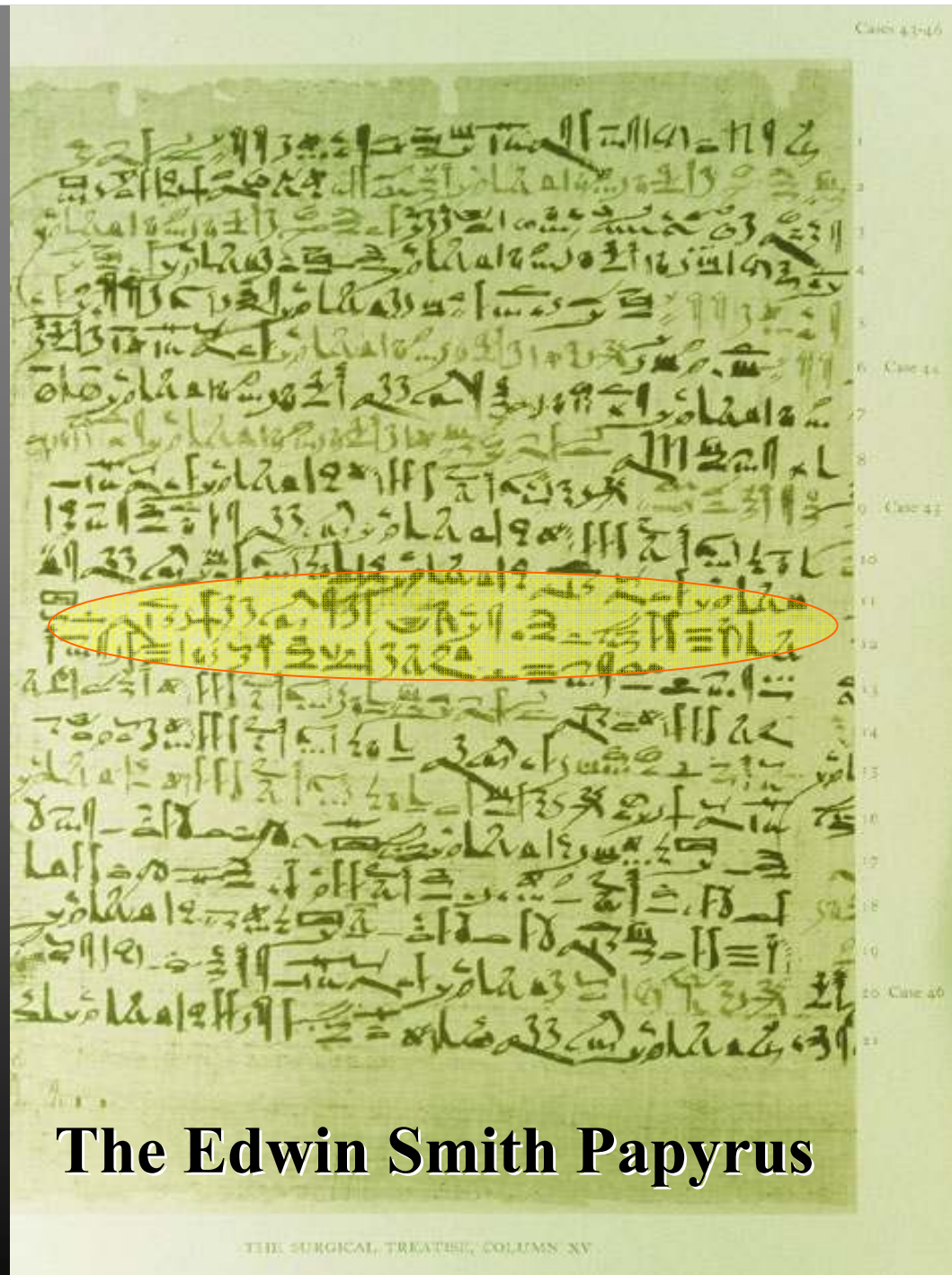








# The Ancient World



**The Edwin Smith Papyrus**













**Ah-ha, you need  
purgation, bleeding  
& leeches**

**Yuk!**

**The influence of Galen**  
**200 CE-1840**

COLORPLATE 62

FRANS VAN MIERIS, THE ELDER, *The Doctor's Visit*, 1657. Oil on oak, 13 1/2 x 10 1/2 in. (34 x 27 cm).  
Kunsthistorisches Museum, Vienna.









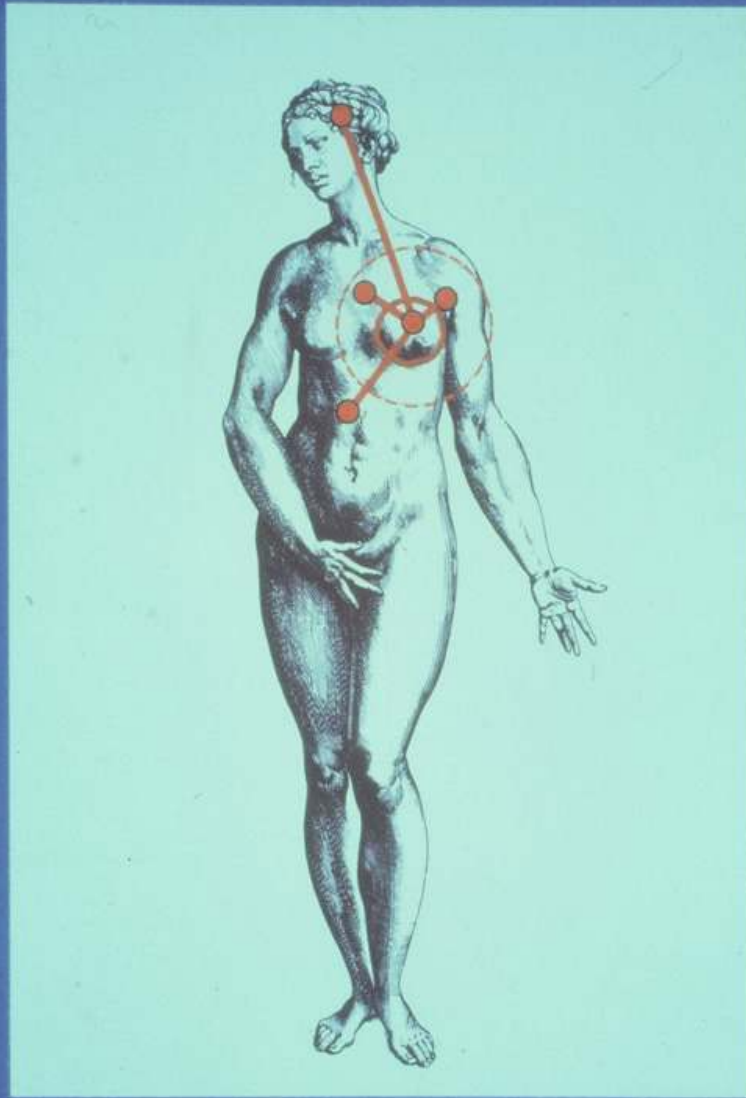


**Virchow**

**1842**

**Anatomical and Surgical  
Revolution**



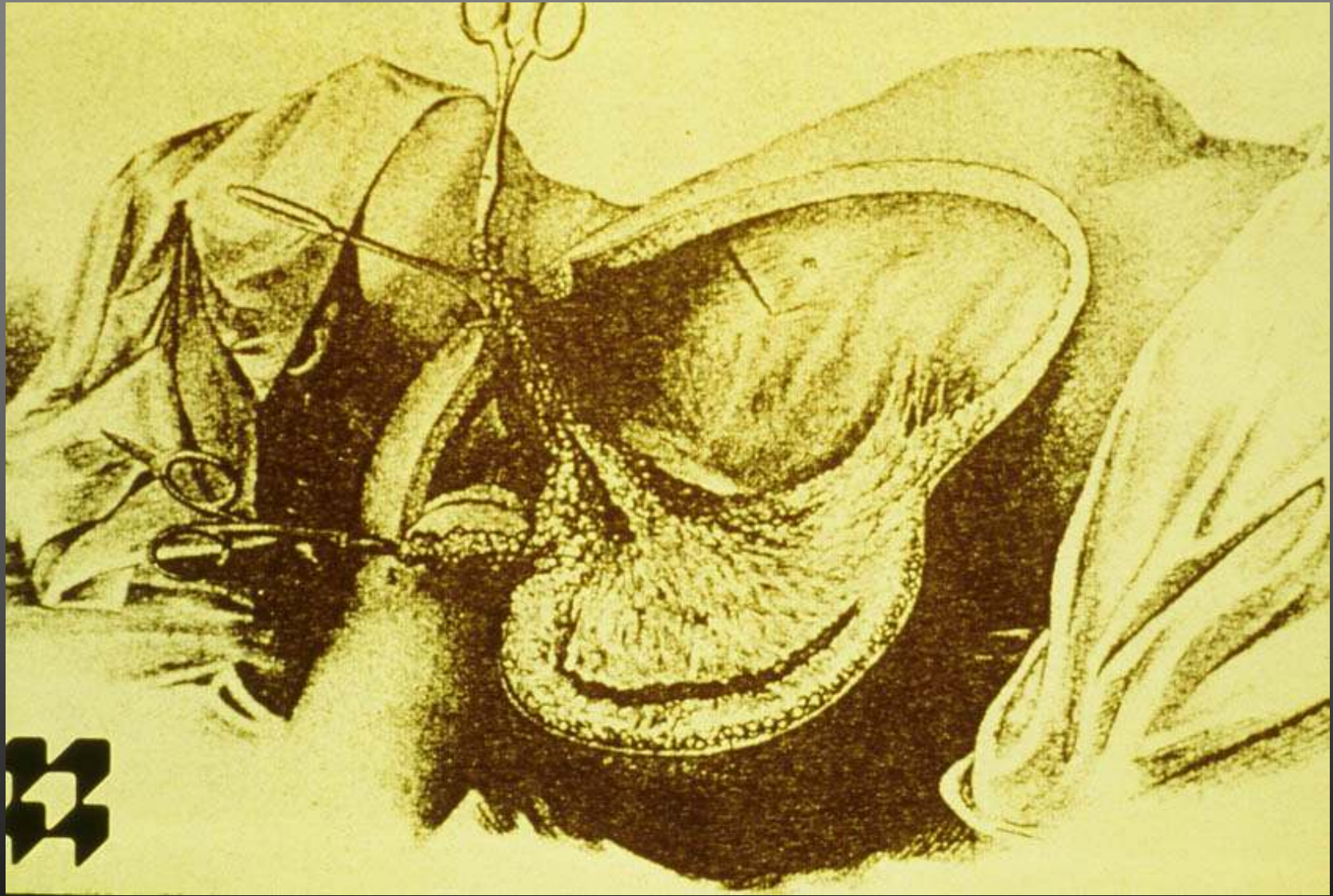


**Halsted's Hypothesis**



**The Agnew Clinic by Thomas Eakins**





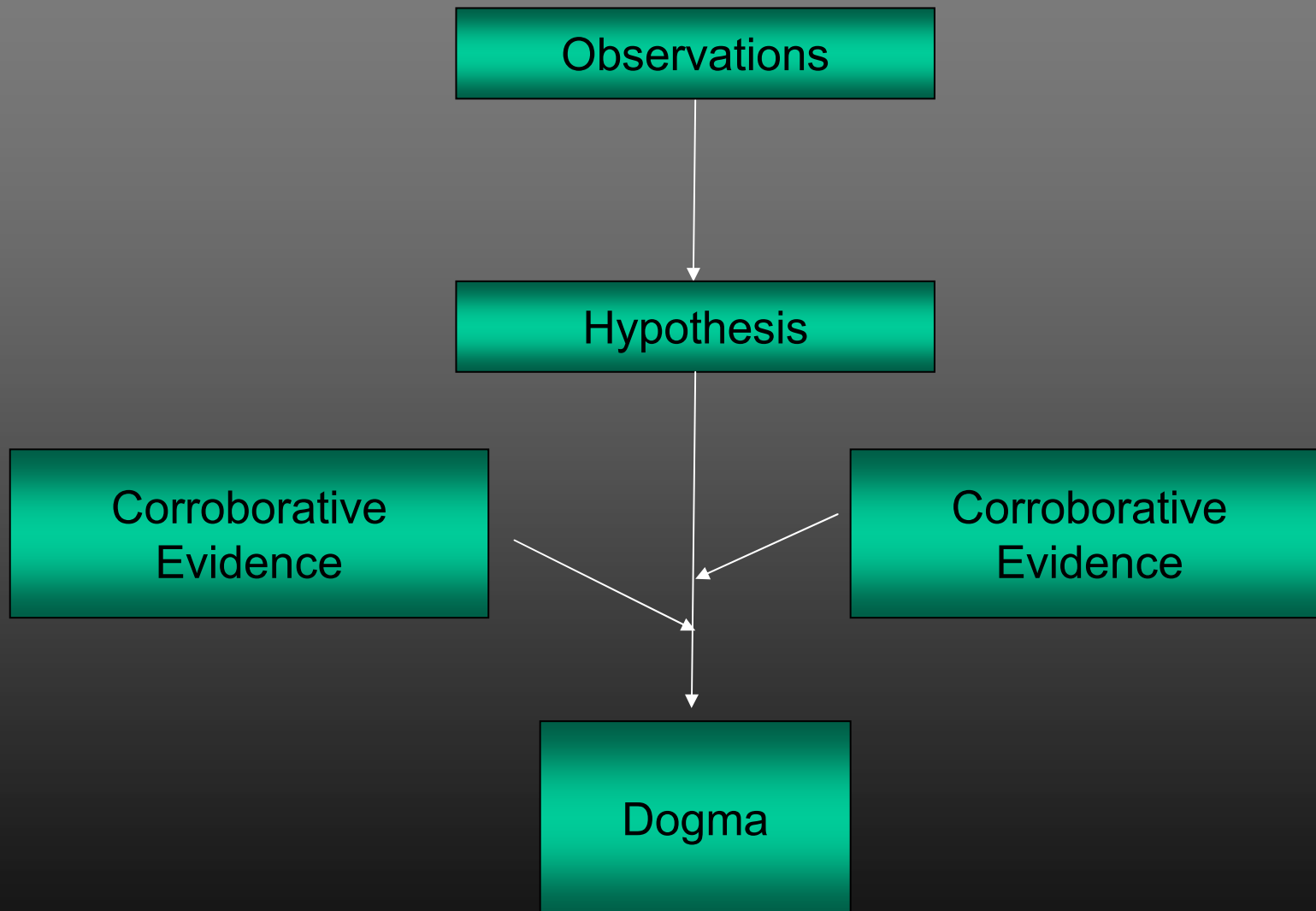


## The Philosophy of Science:



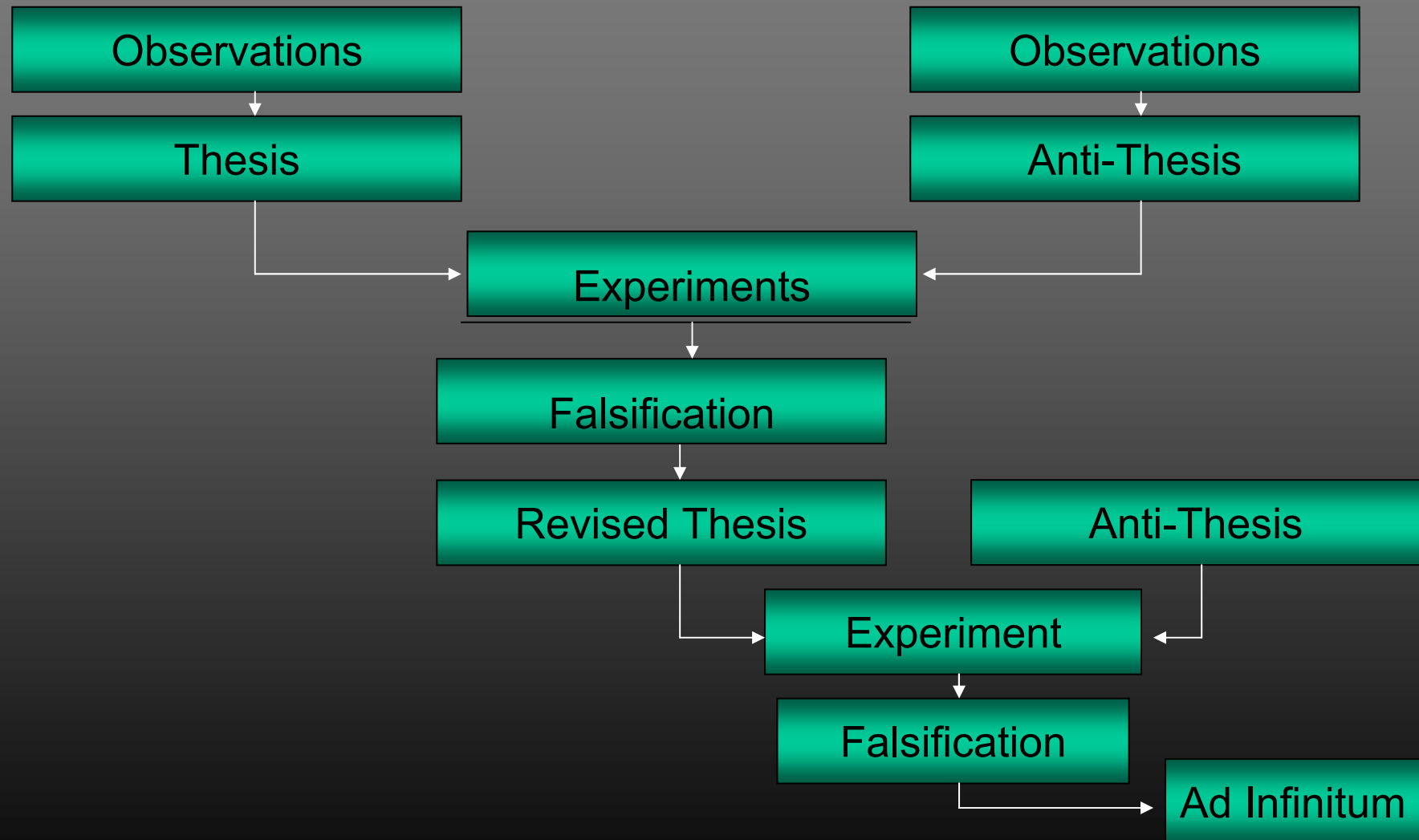


# Inductive Logic



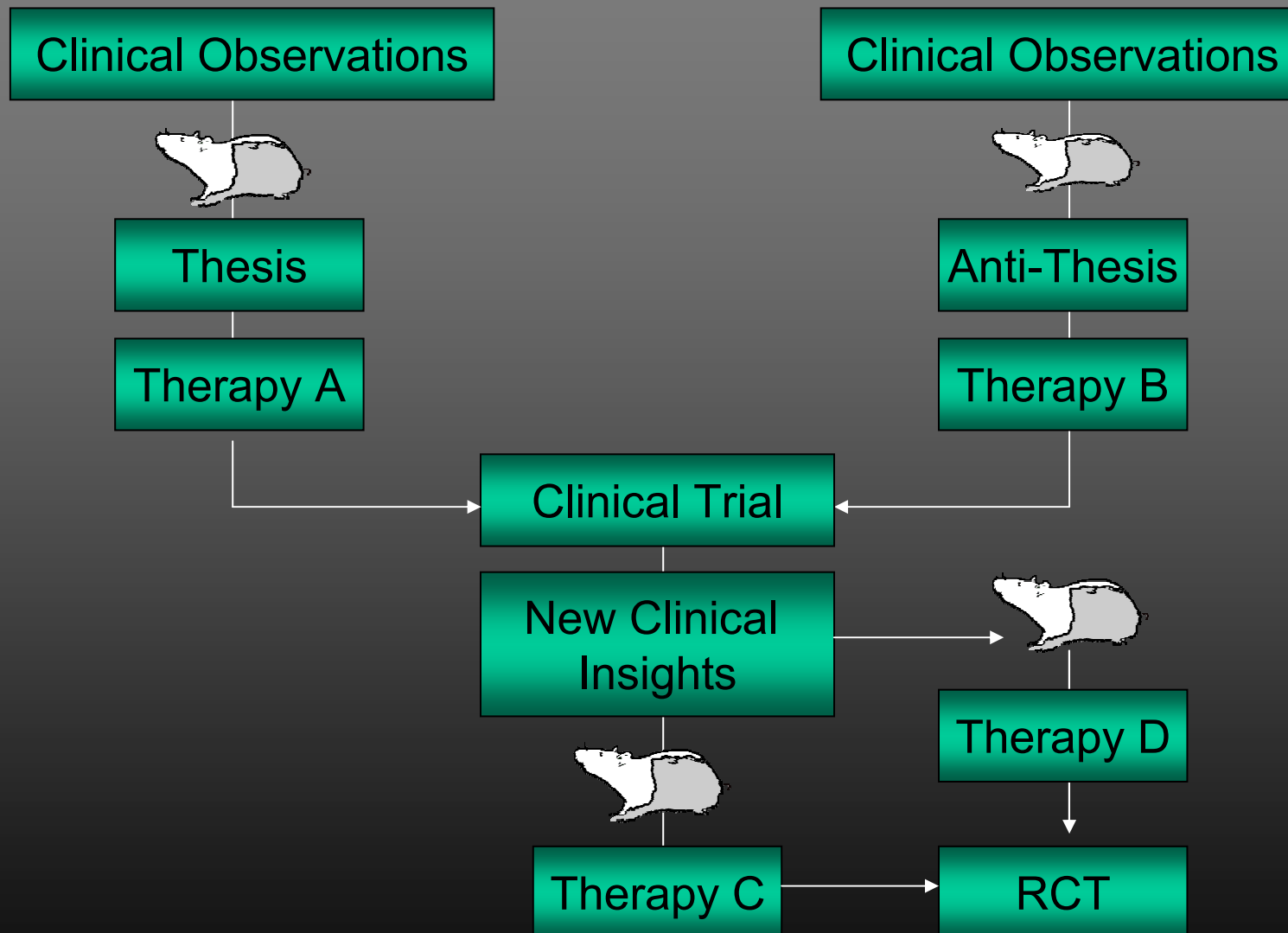


# Popper's Pathways





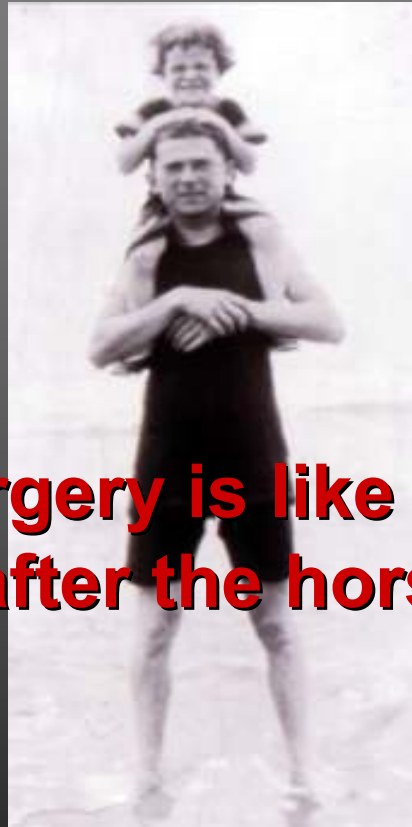
# Clinical Trials



## **Inconsistencies in the Anatomical Model**

- Impossible to define cure.
- It returns however perfectly it may be taken away.
- Lymph node metastases may occur in the absence of an obvious primary.
- Fisher's mouse models.

# Bernie Fisher



**“Radical surgery is like slamming the stable door after the horse has bolted”**

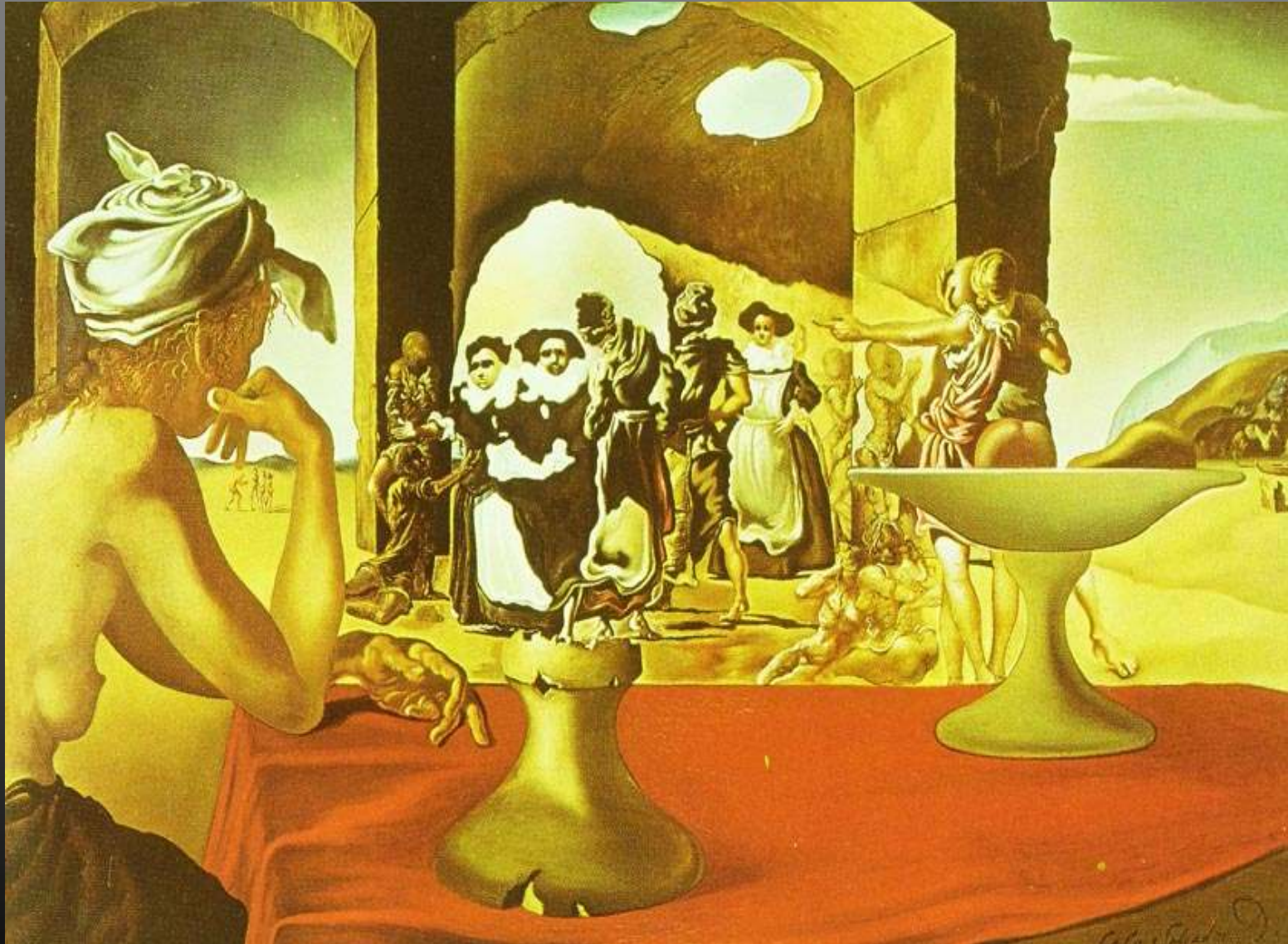
**“We see further because we sit on the shoulders of Giants”**

*?Isaac Newton*



# Conceptual Revolutions

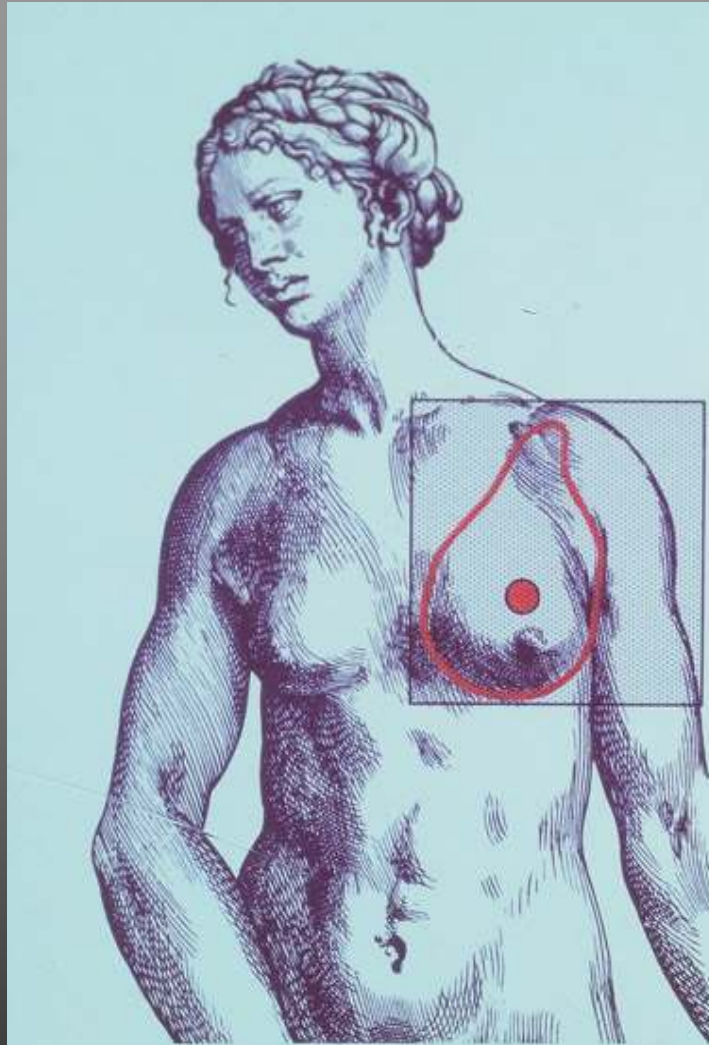
## “Paradigm shift”: Thomas Khun



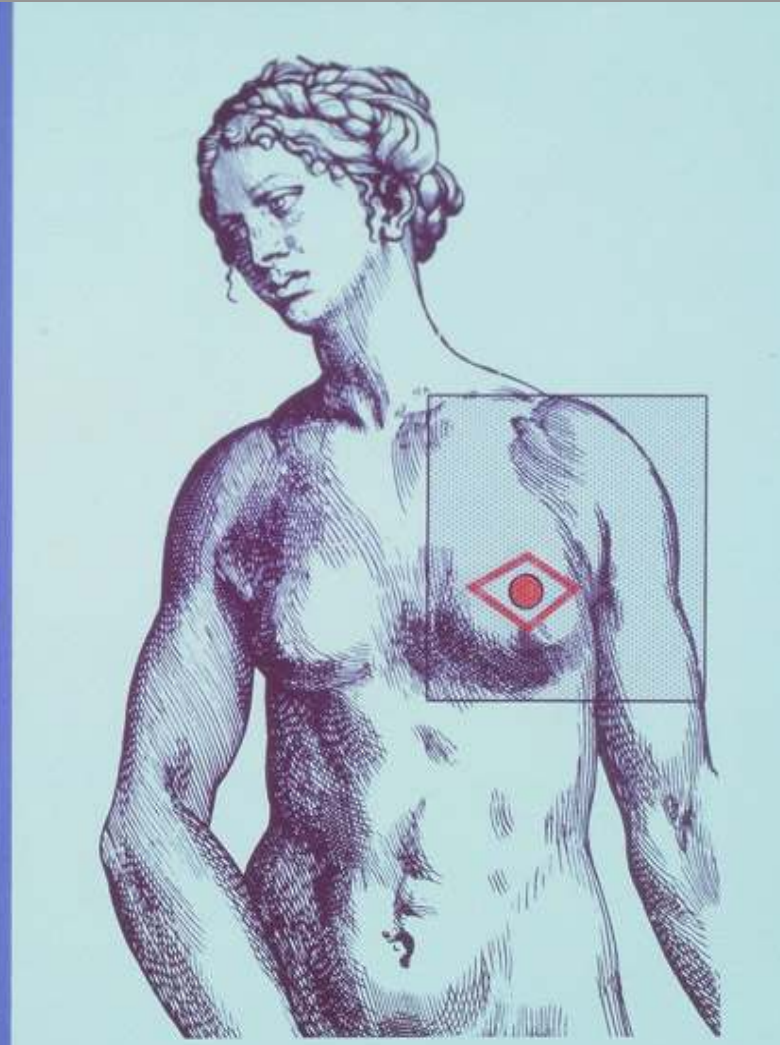
# **Therapeutic consequences:**

- **Breast Conservation**





**Anatomical Model**



**Biological Model**



# Anatomic to Systemic

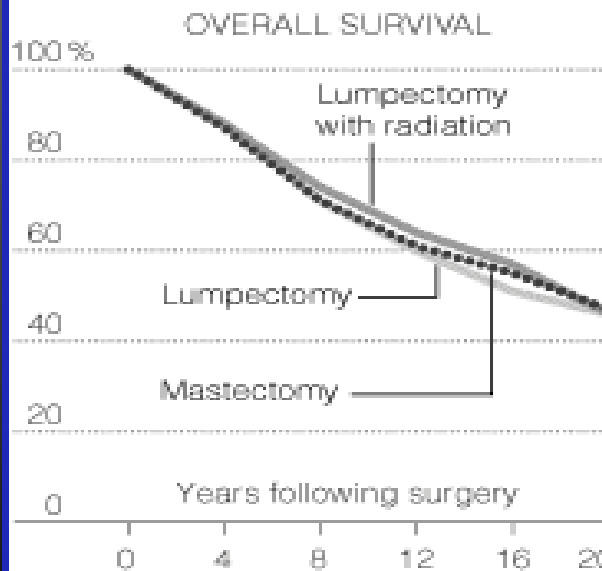


Breast cancer is a systemic disease

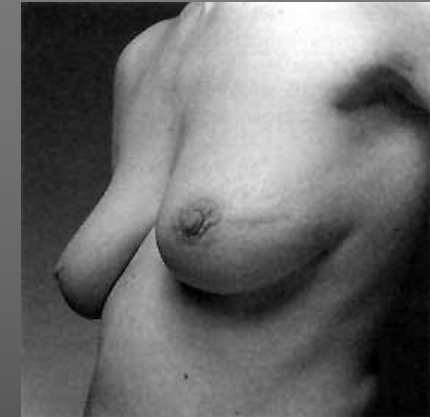


## Mastectomy vs. Lumpectomy

A U.S. study of breast cancer patients showed that there was no significant difference in survival between women treated with mastectomy and those treated with less extensive surgery.



Source: New England Journal of Medicine

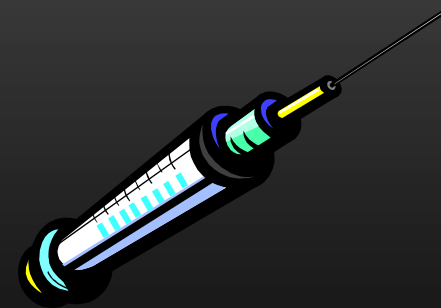


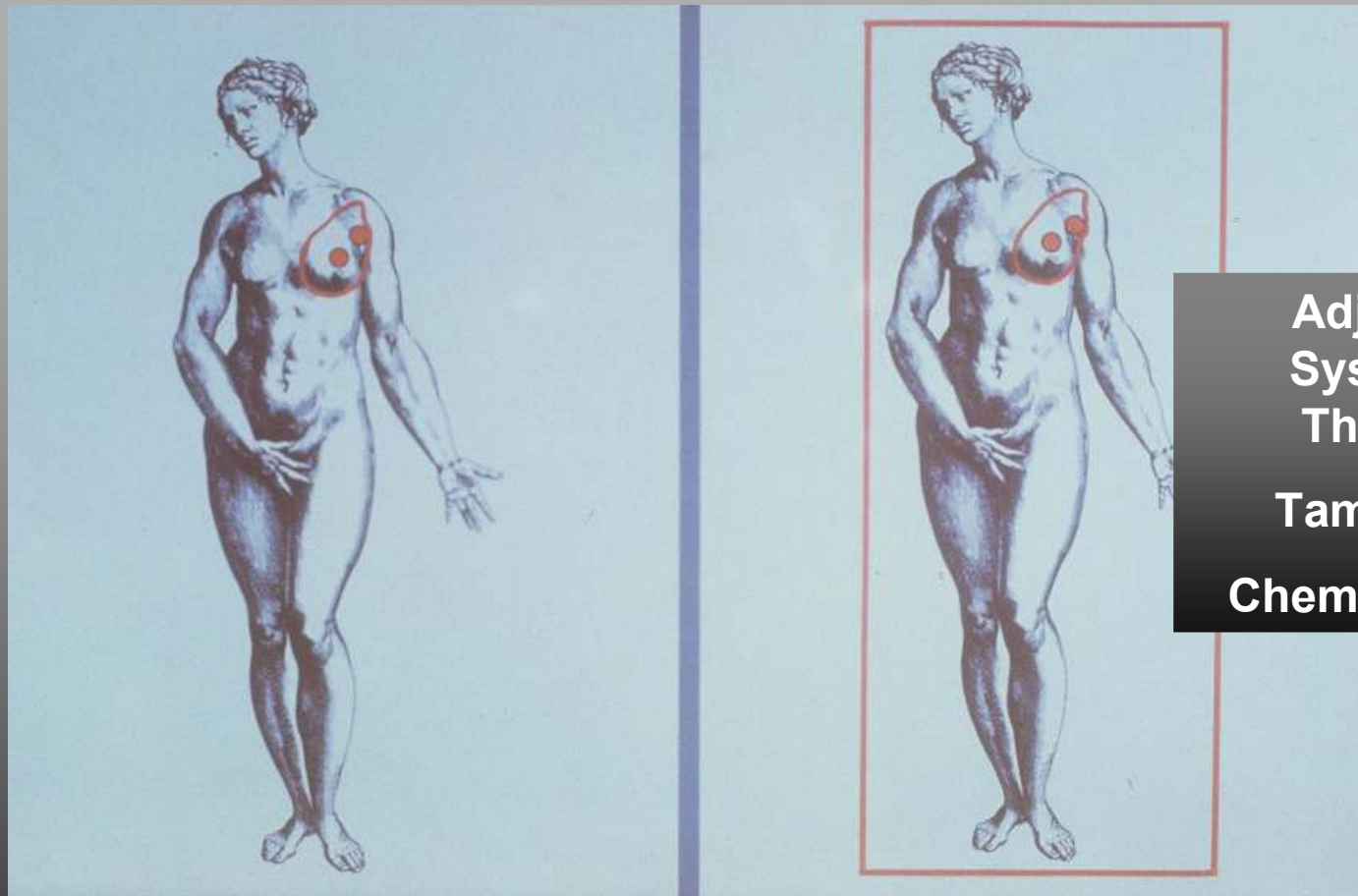
# Therapeutic consequences:

- Breast Conservation



- Adjuvant Systemic  
therapy



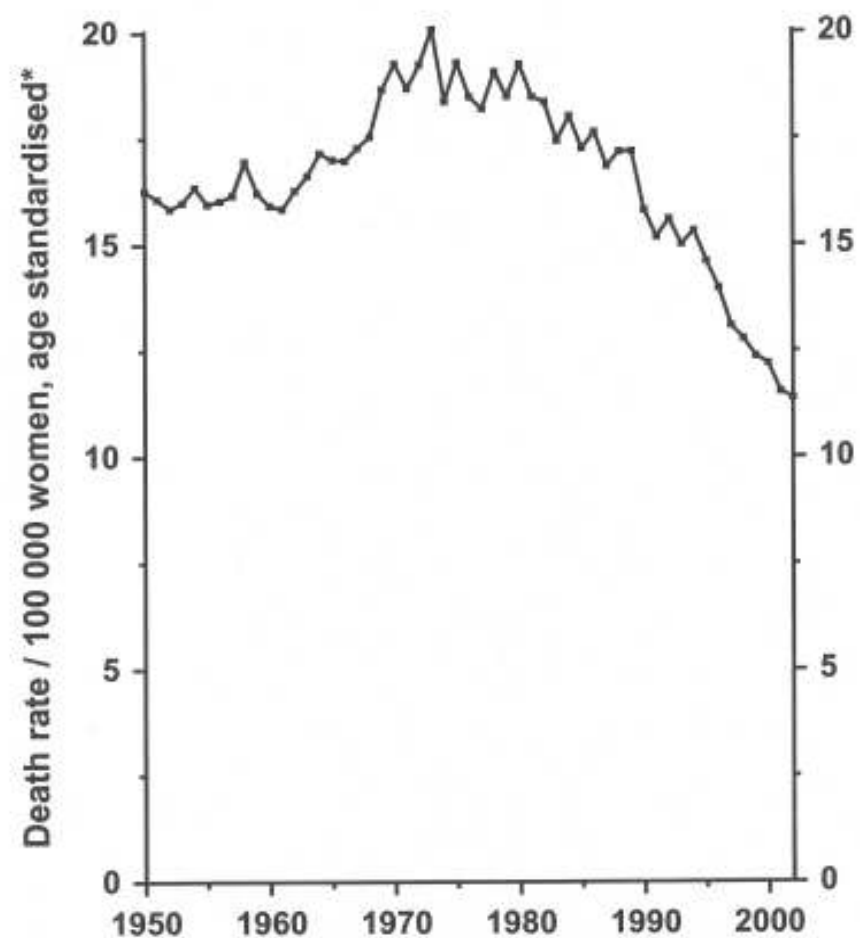


**Anatomical  
Model**

**Biological  
Model**



**UNITED KINGDOM 1950–2002: Females  
Breast cancer mortality at ages 20–49**



\*Mean of annual rates  
in component 5-year age groups

Source: WHO mortality &  
UN population estimates

20-004-2004 10:20:00

**UNITED KINGDOM 1950–2002: Females  
Breast cancer mortality at ages 50–69**

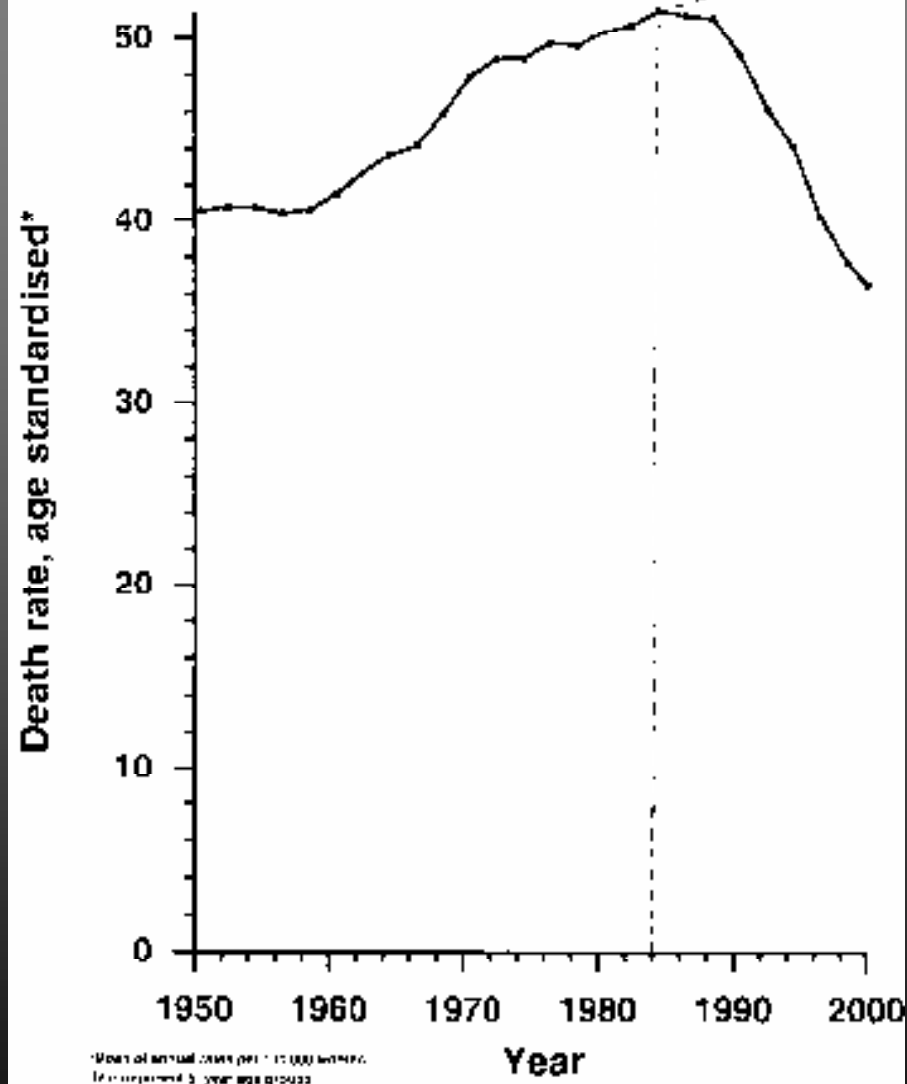


\*Mean of annual rates  
in component 5-year age groups

Source: WHO mortality &  
UN population estimates

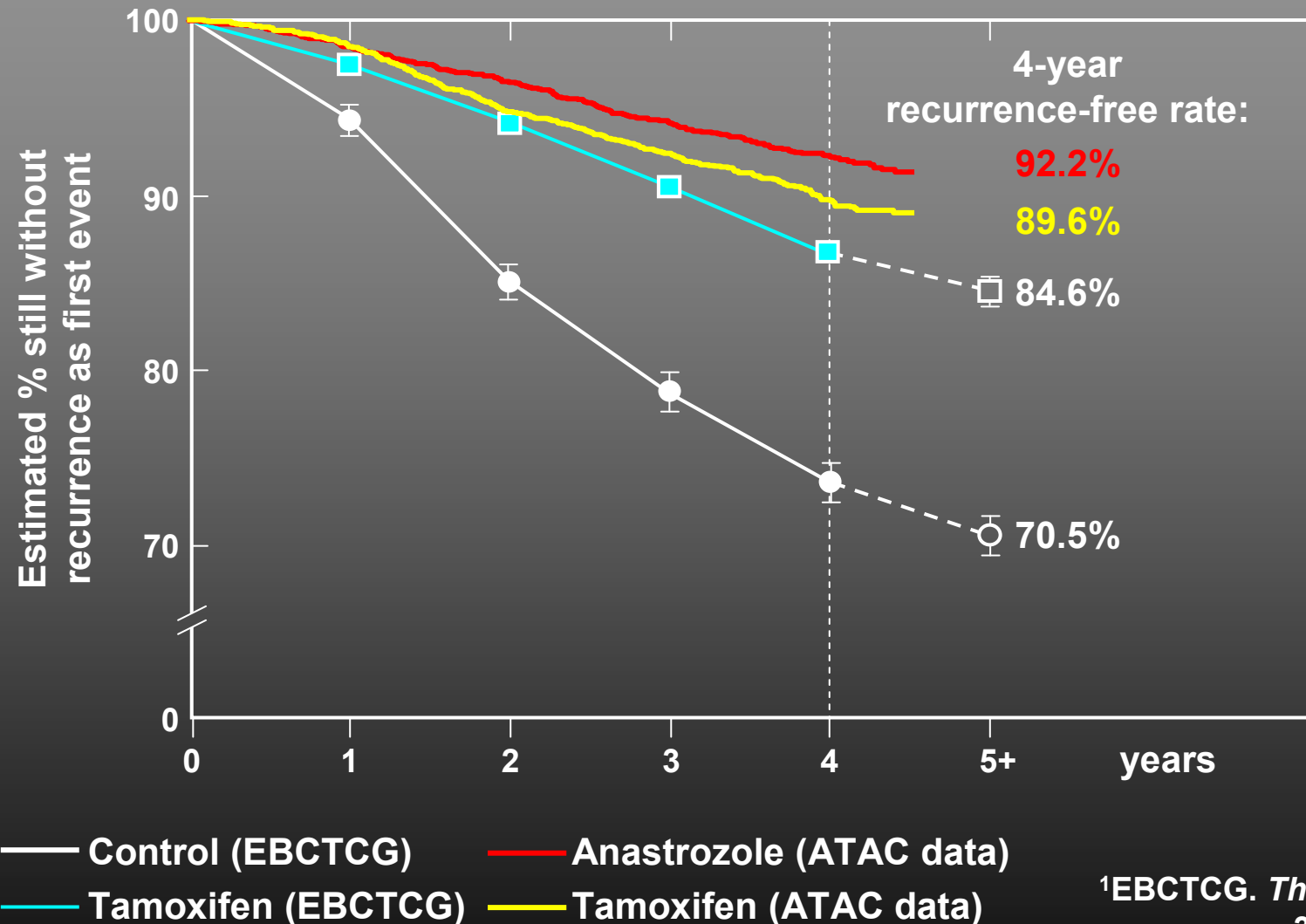
SP-002 - 2004-05-05-01

**ENGLAND AND WALES 1950-2000: Females  
Breast cancer mortality at ages 20-69**



# Comparison of ATAC data with EBCTCG 1995

## Overview<sup>1</sup>: Hormone Receptor +ve Patients >50



<sup>1</sup>EBCTCG. *The Lancet* 1998;  
351: 1451–1467





# **Clinical Inconsistencies in the Biological Model**

- **Anecdotal**
- **Distant metastases at the time of diagnosis.**
- **Hazard rates over time for metastases.**

do occur, but they are exceedingly rare.

G. Penpineal<sup>2</sup> recorded a case in which a woman, 50 years of age, had a small painless tumour in her left breast for twenty-two years. Then three months after an operation for removal of an adenoma of the ovary, the tumour of the breast began to grow rapidly. A year later it was excised and proved to be a Cancer. It recurred twice within the two following years.

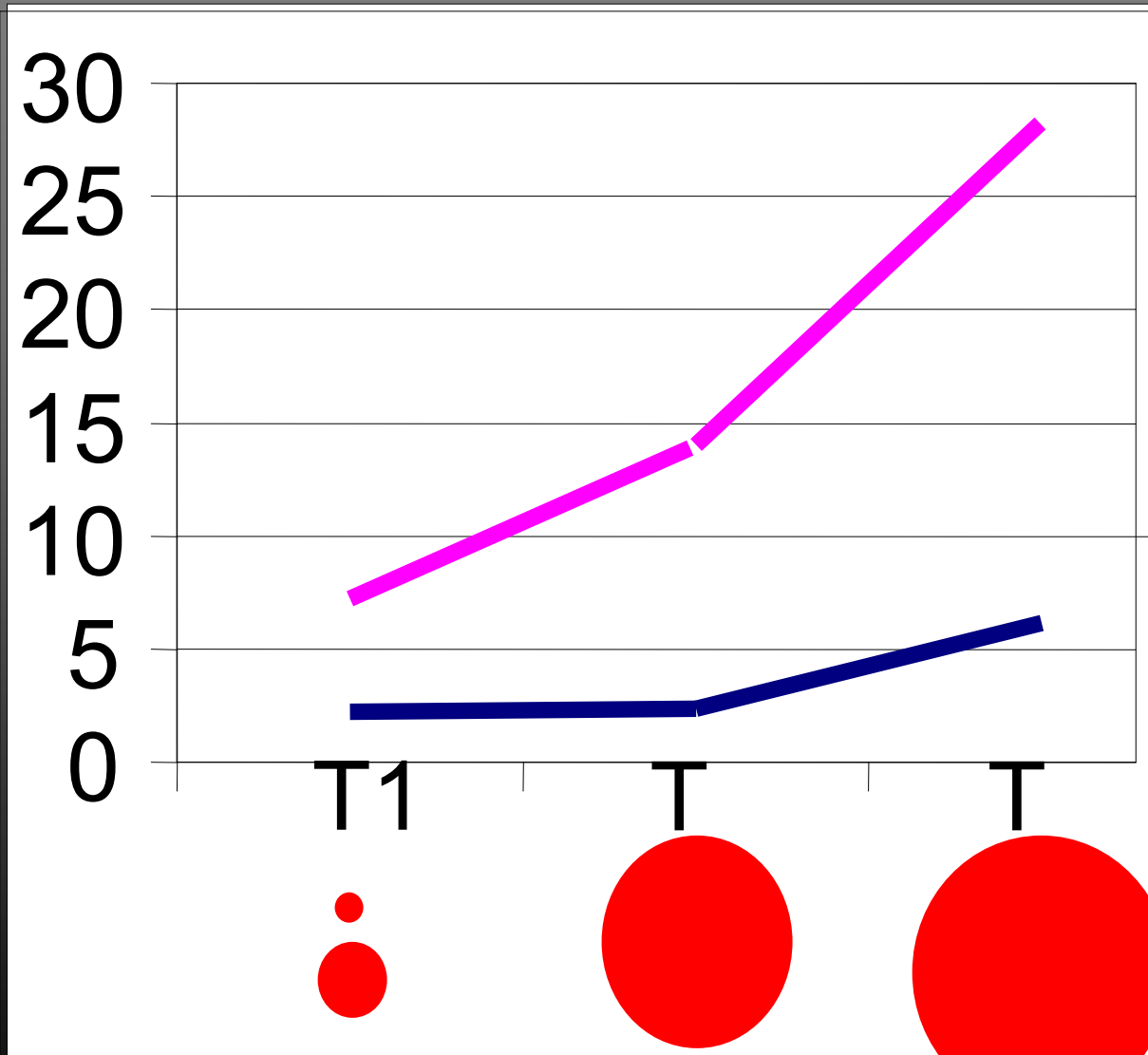
In most of these cases, though the Adenoma and the Cancer are connected anatomically, it appears to be clear from examination after incision that the Cancer has not developed from the Adenoma. J. Hutchinson<sup>3</sup> recorded a

<sup>1</sup> *Lectures on Surgery*, 1829, p. 378.

<sup>2</sup> *Annales de Gynécologie*, 1890, p. 35.

<sup>3</sup> *Transactions of the Pathological Society*, vol. xxxix., 1888, p. 315.



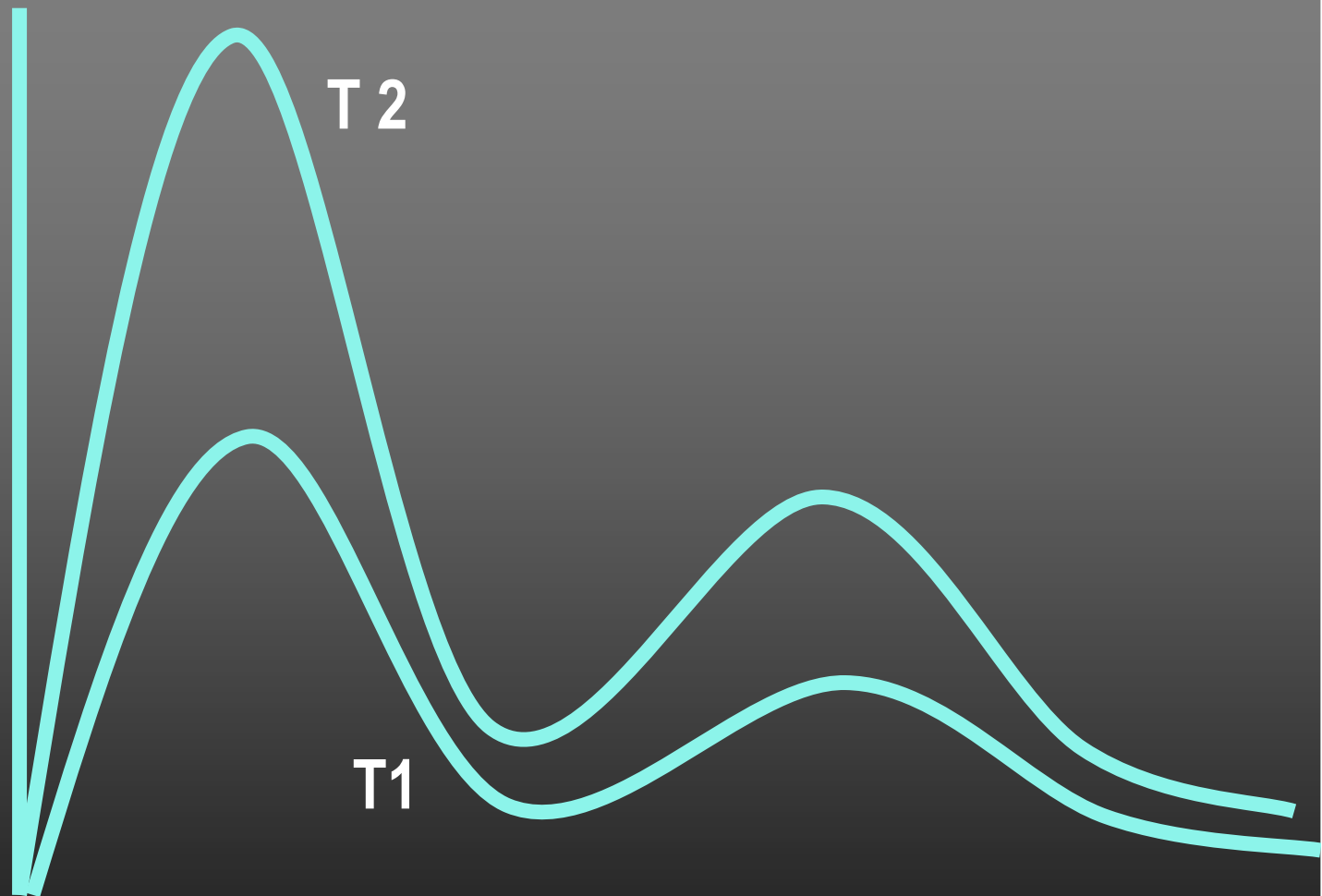


**% dying  
within 2  
years**

**% with  
metastases  
at  
presentation**

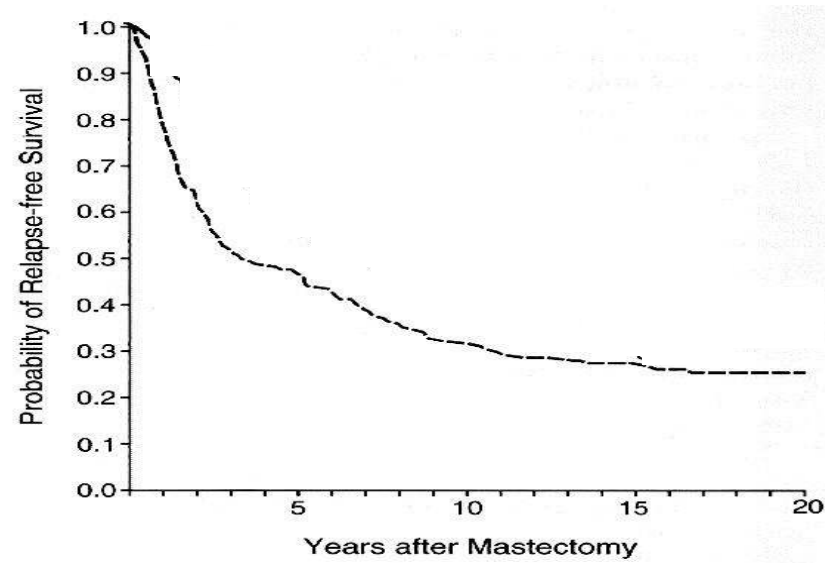


## Diagnosis and treatment



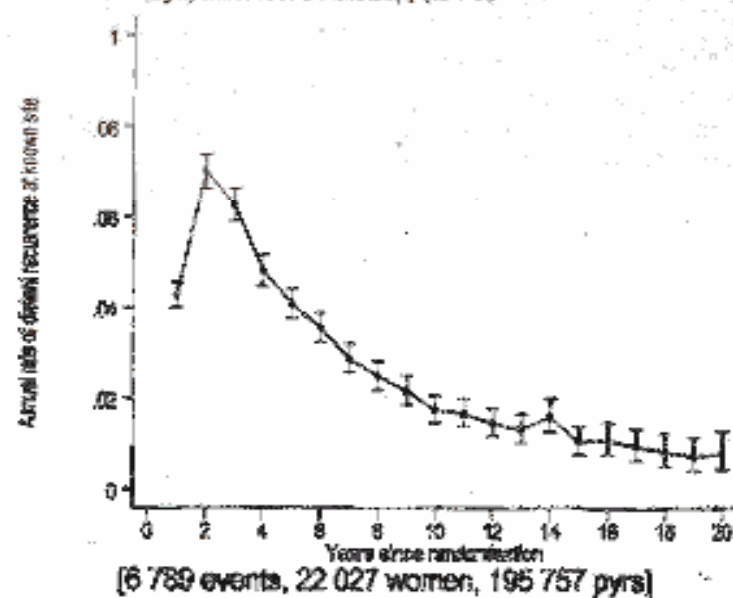
*TIME*

## Milan data in Disease-Free Survival format



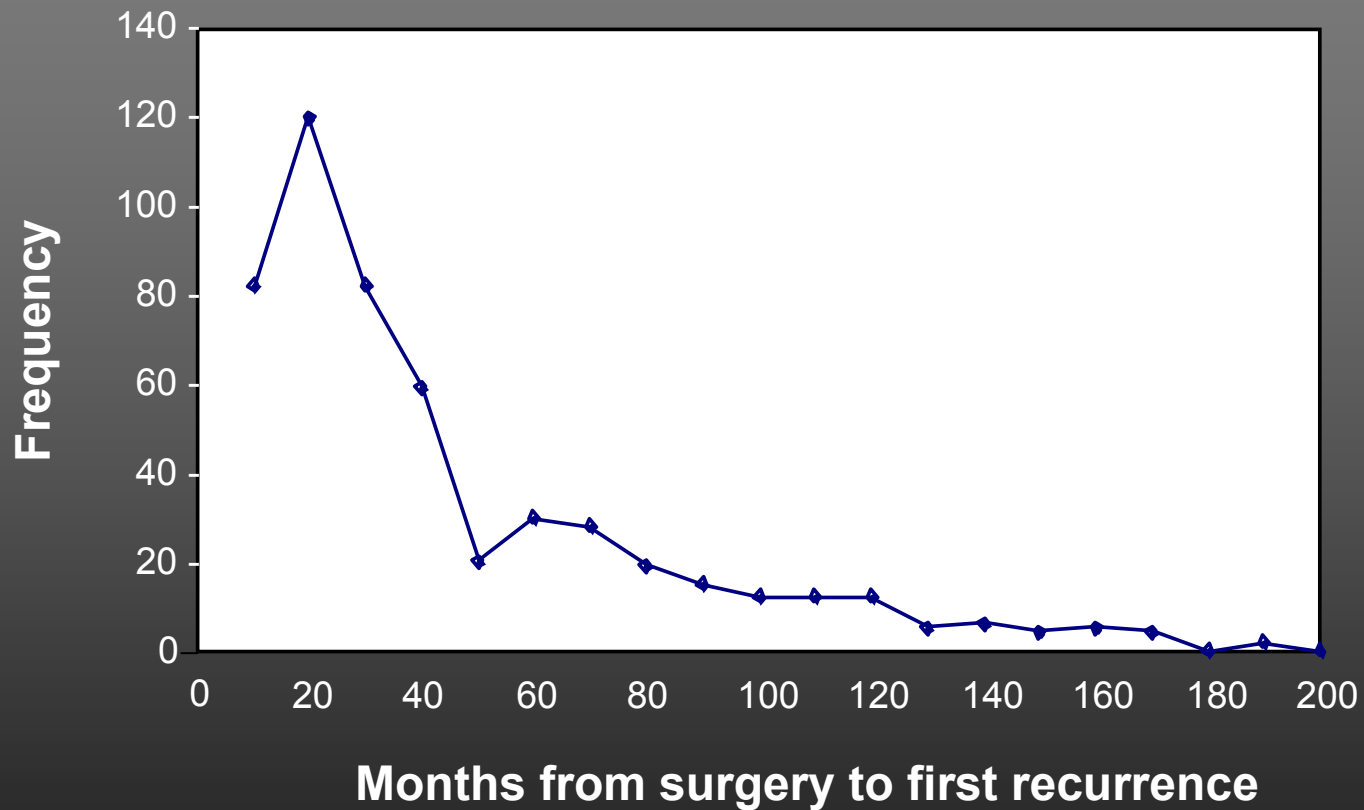
*Bonadonna, Valagussa et al. NEJM 1995*

Annual distant recurrence (at known site) rate among women given surgery but no or little radiotherapy (95% CI)



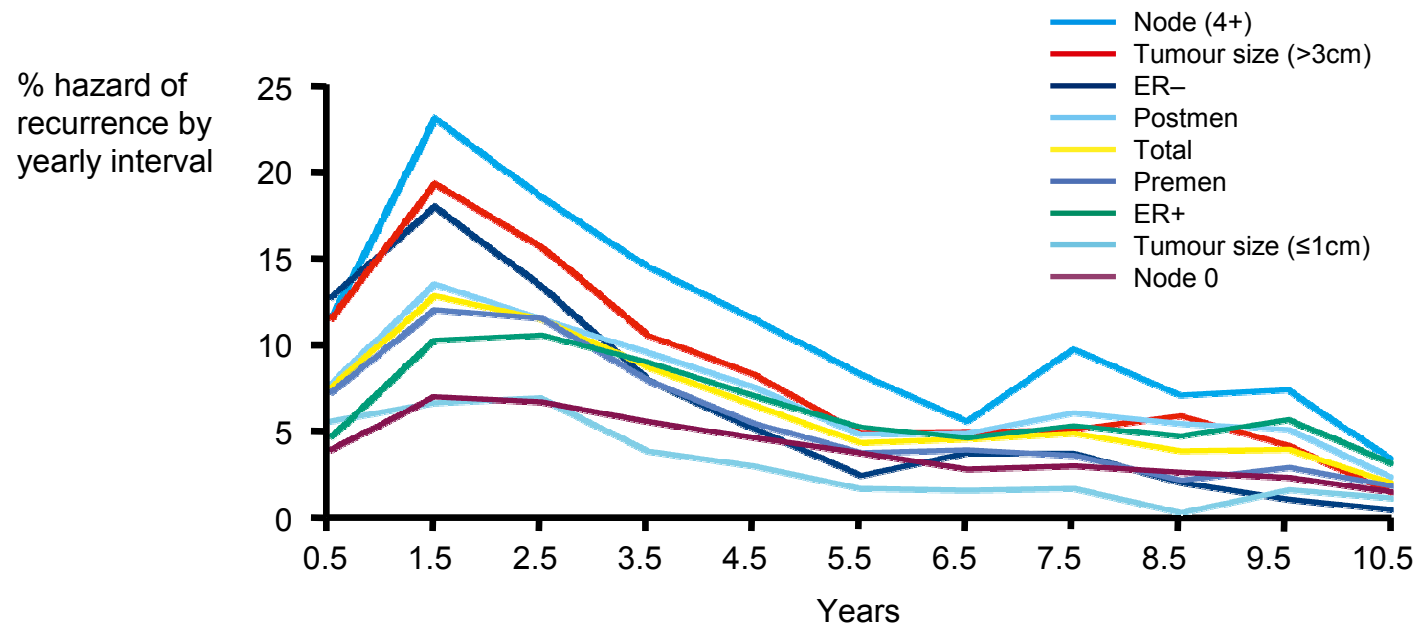
Confidential: Not for citation or publication

# Bimodal relapse pattern observed in mature Milan database (surgery only)





- Risk of recurrence peaks in the first 2-3 years following diagnosis<sup>1,2</sup> and is associated with a poor prognosis<sup>3</sup>



Adapted from Saphner *et al.* A meta-analysis of ECOG studies

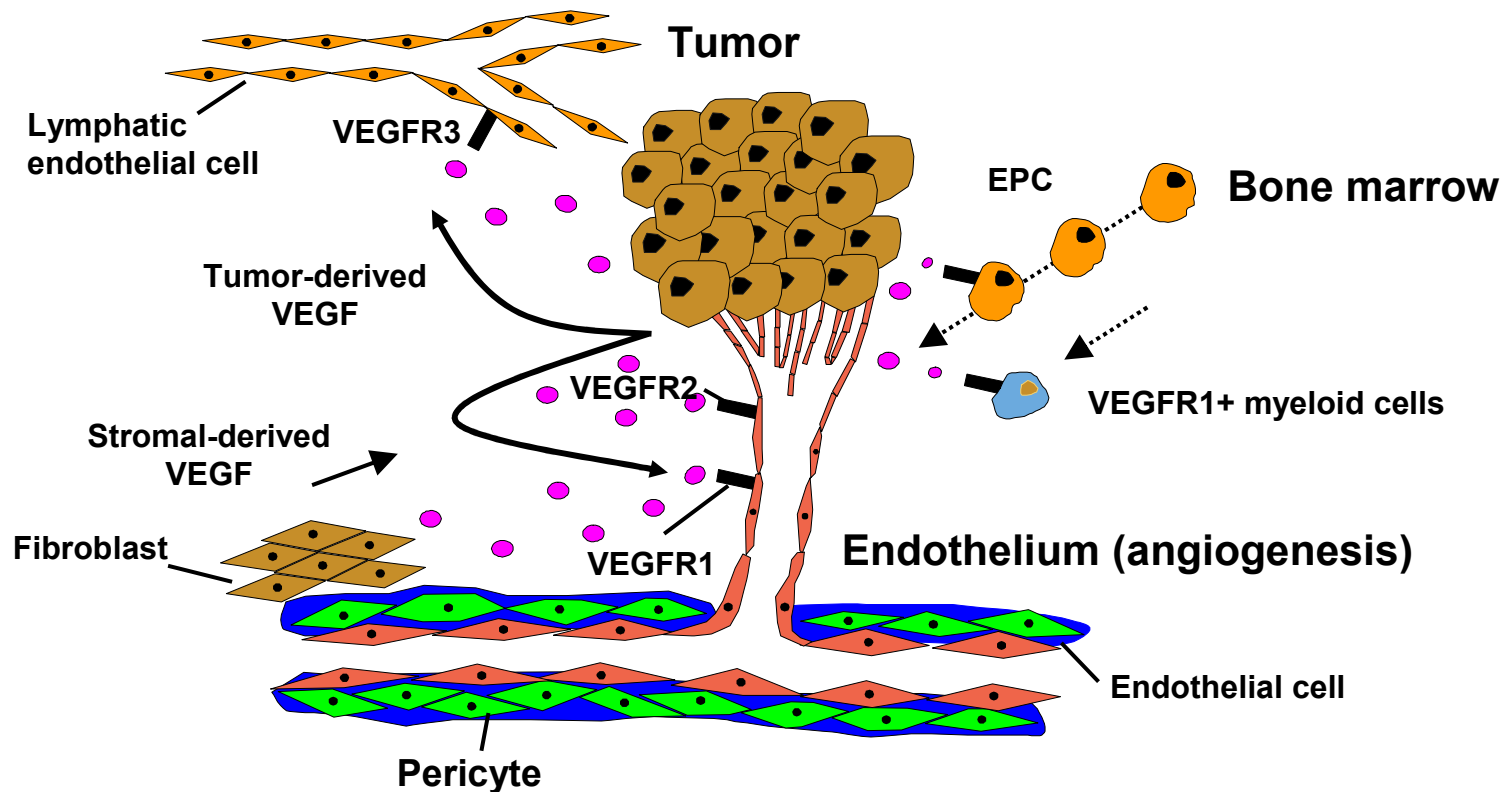
1 Early Breast Cancer Trialists' Collaborative Group. Lancet 1998; **351**: 1451-67.

2. Saphner T *et al.* J Clin Oncol 1996; **14**: 2738-46.

3. Rack B *et al.* Breast Cancer Res Treat 2003; **82**: 83-92

# Angiogenesis is Essential for Tumor Growth Beyond 1–2 mm<sup>3</sup>, as well as for Metastasis<sup>1</sup>

## Lymphatics (lymphangiogenesis)



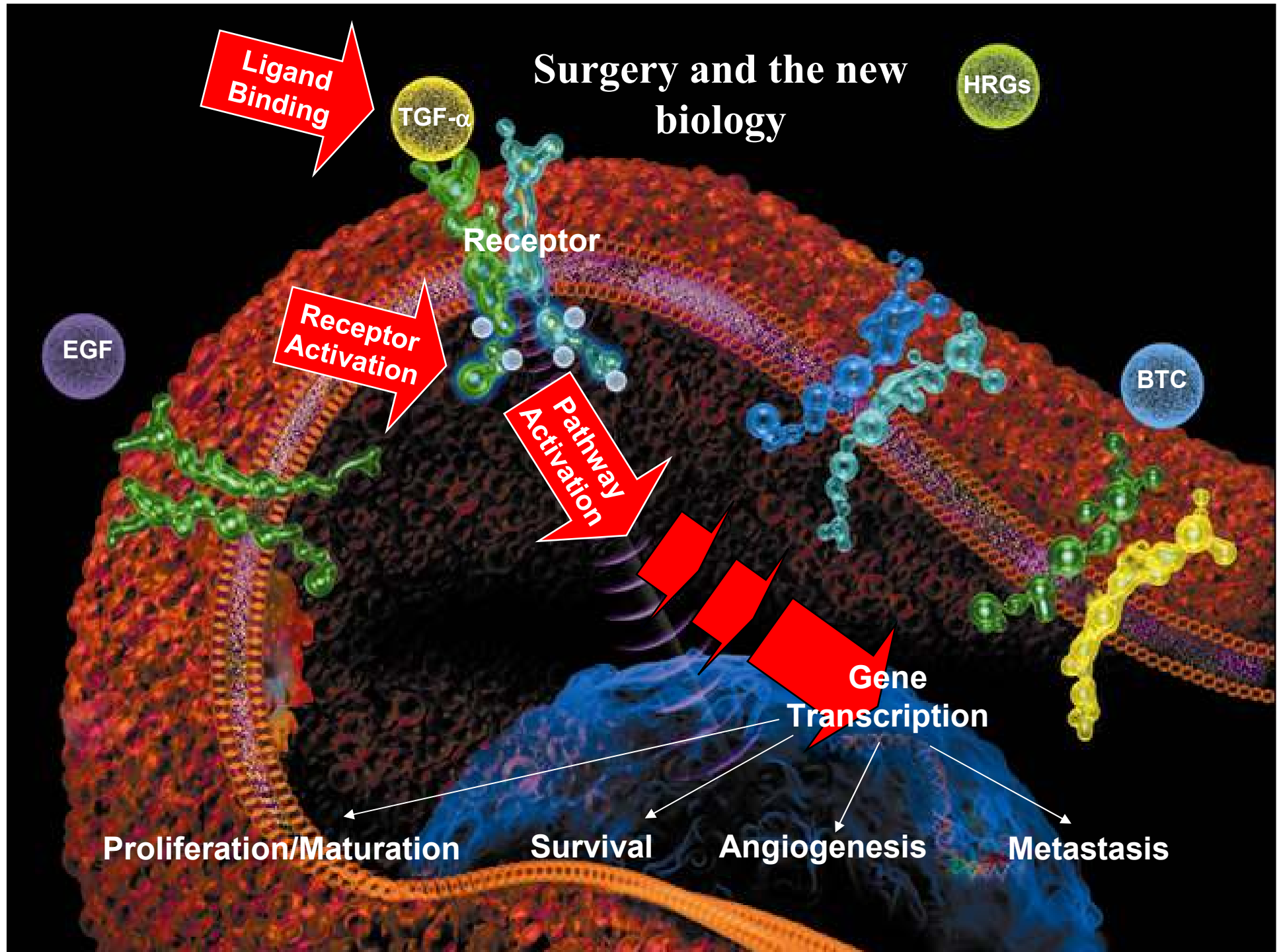
- Tumor growth regulated by a “switch” to a proangiogenic tumor microenvironment<sup>2,3</sup>

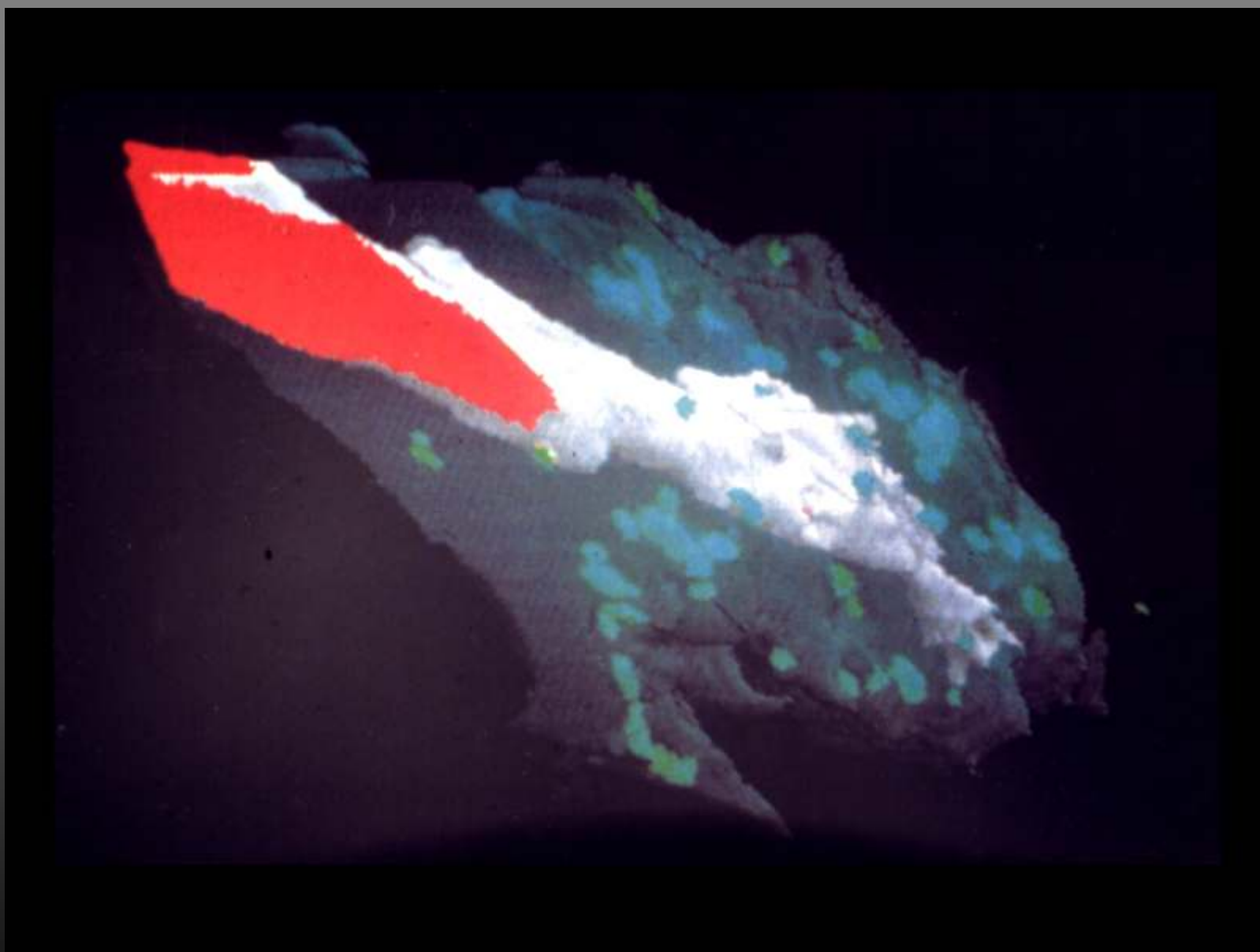
<sup>1</sup>Folkman. *J Natl Cancer Inst* 1990;82:4–6

<sup>2</sup>Bergers, Benjamin. *Nat Rev Cancer* 2003;3:401–410

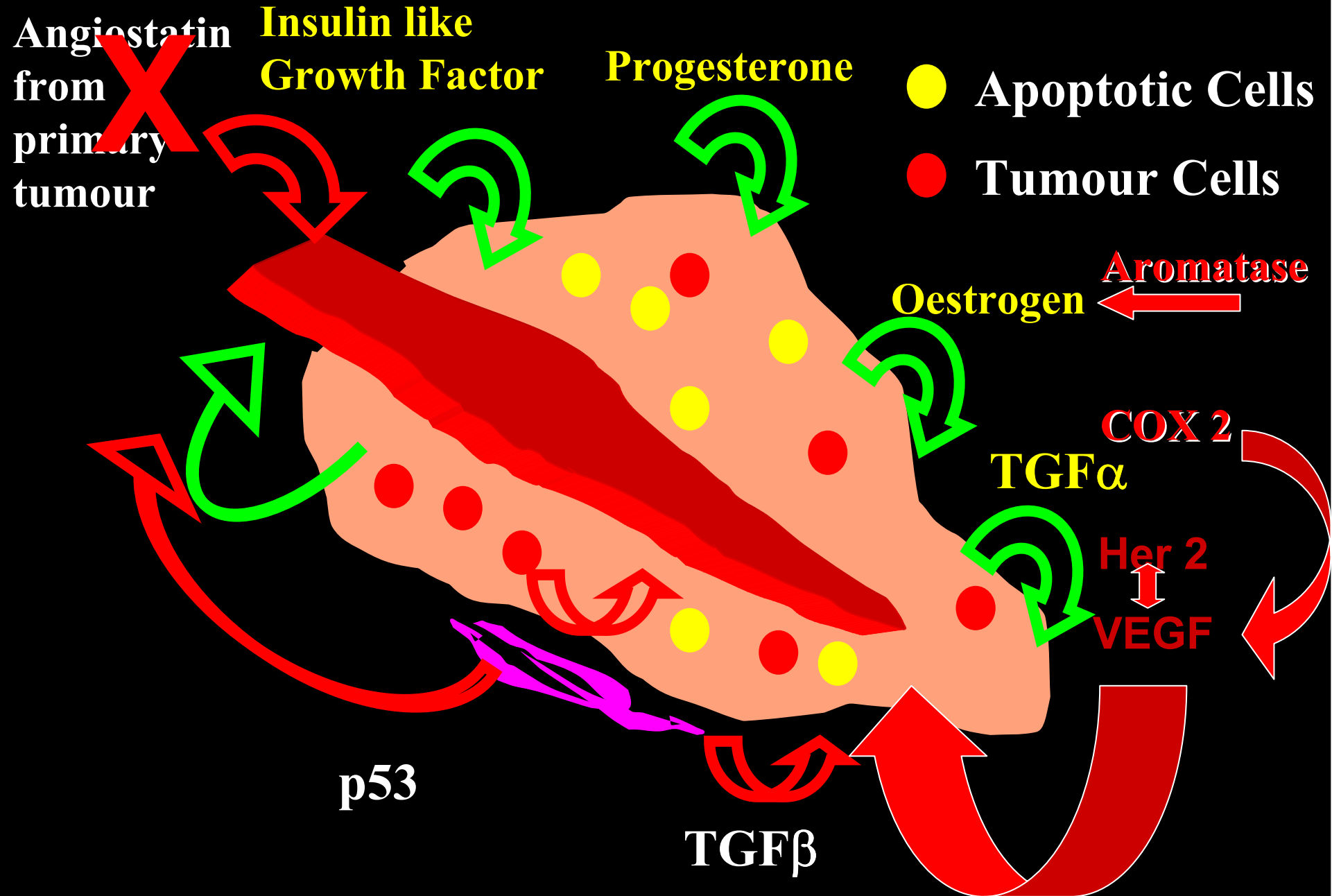
<sup>3</sup>Gupta, Zhang. *Postgrad Med J* 2005;81:236–242

# Surgery and the new biology







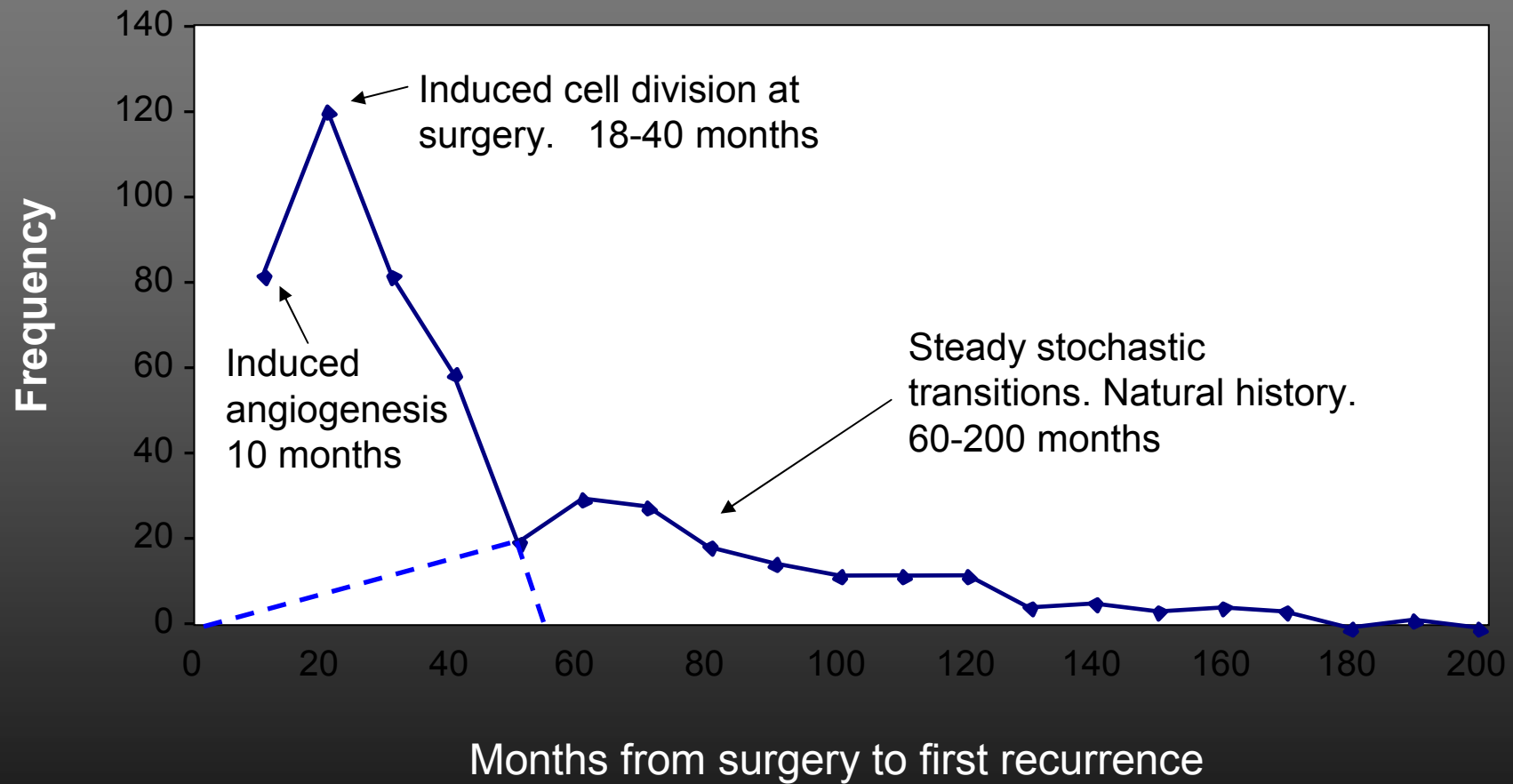


## Similarity of gene expression in fibroblasts in response to wounding to those active in Malignant disease.

*Chang et al PLoS Biol 2004*

- “The way that tumours acquire the ability to create complex tissues does not involve their *de novo* invention of the complex programme of stromal activation. Instead they activate a latent pre-existing wound healing programme, that is encoded in the normal genome.” *Weinberg, the Lancet*

# Hypothetical interpretation of Milan data base



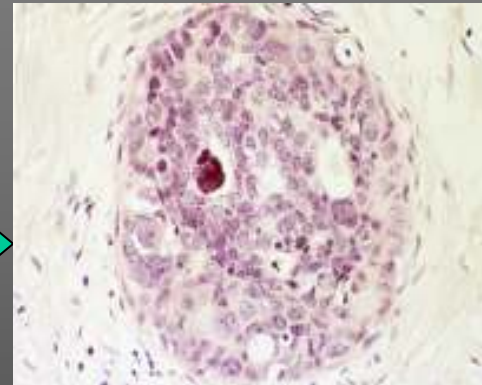
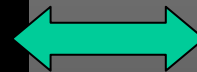
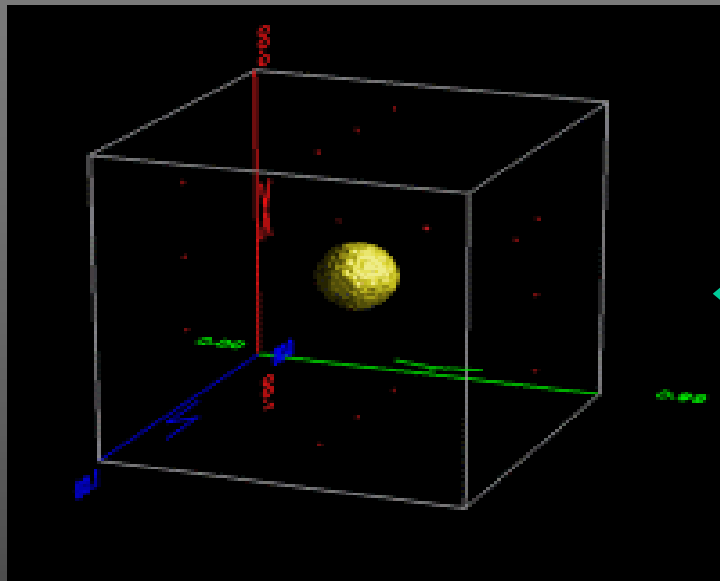




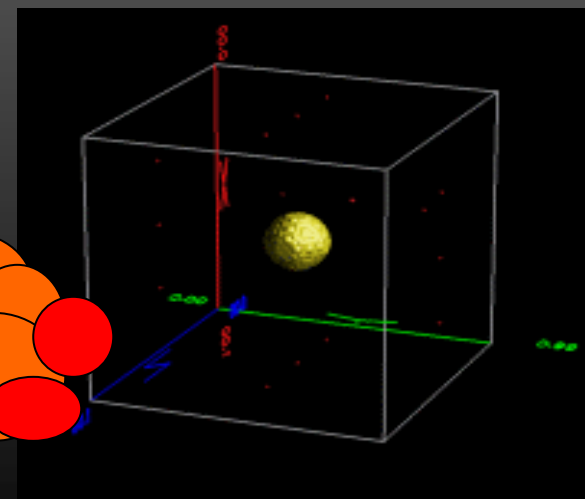
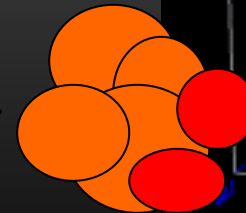
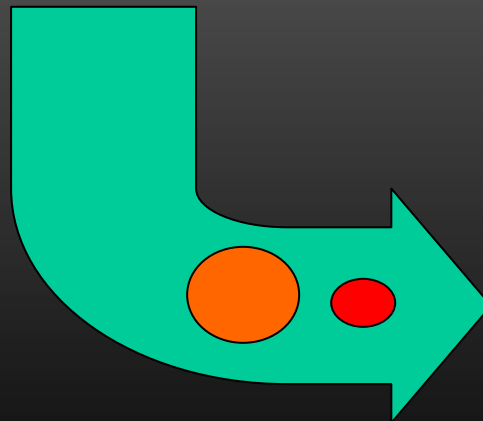


# Does Breast Cancer Exist in a state of Chaos?

Baum & Chaplain European J Cancer 1999

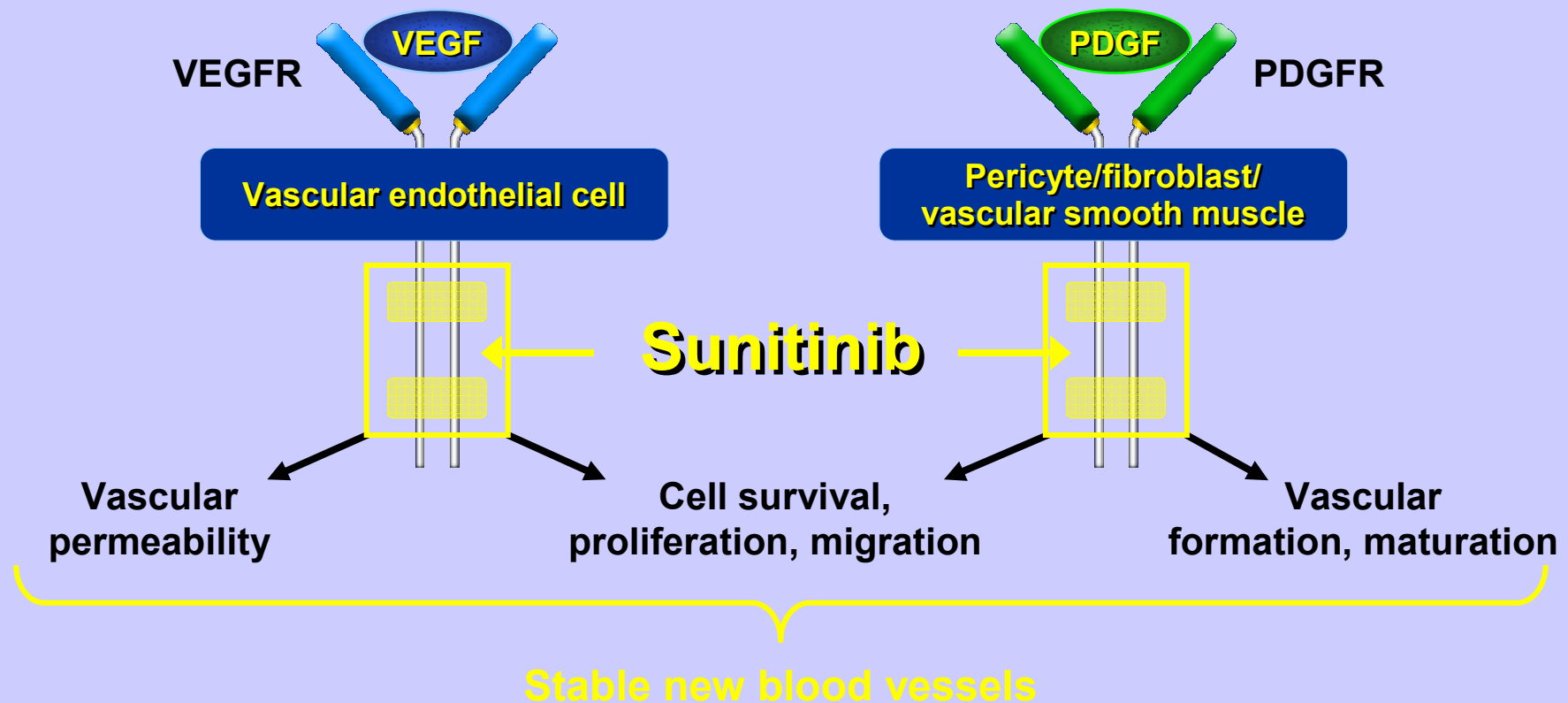


**DCIS**



## Both VEGFR and PDGFR Are Critical for Angiogenesis

*In pre-clinical studies, sunitinib has been shown to inhibit both VEGFR and PDGFR*

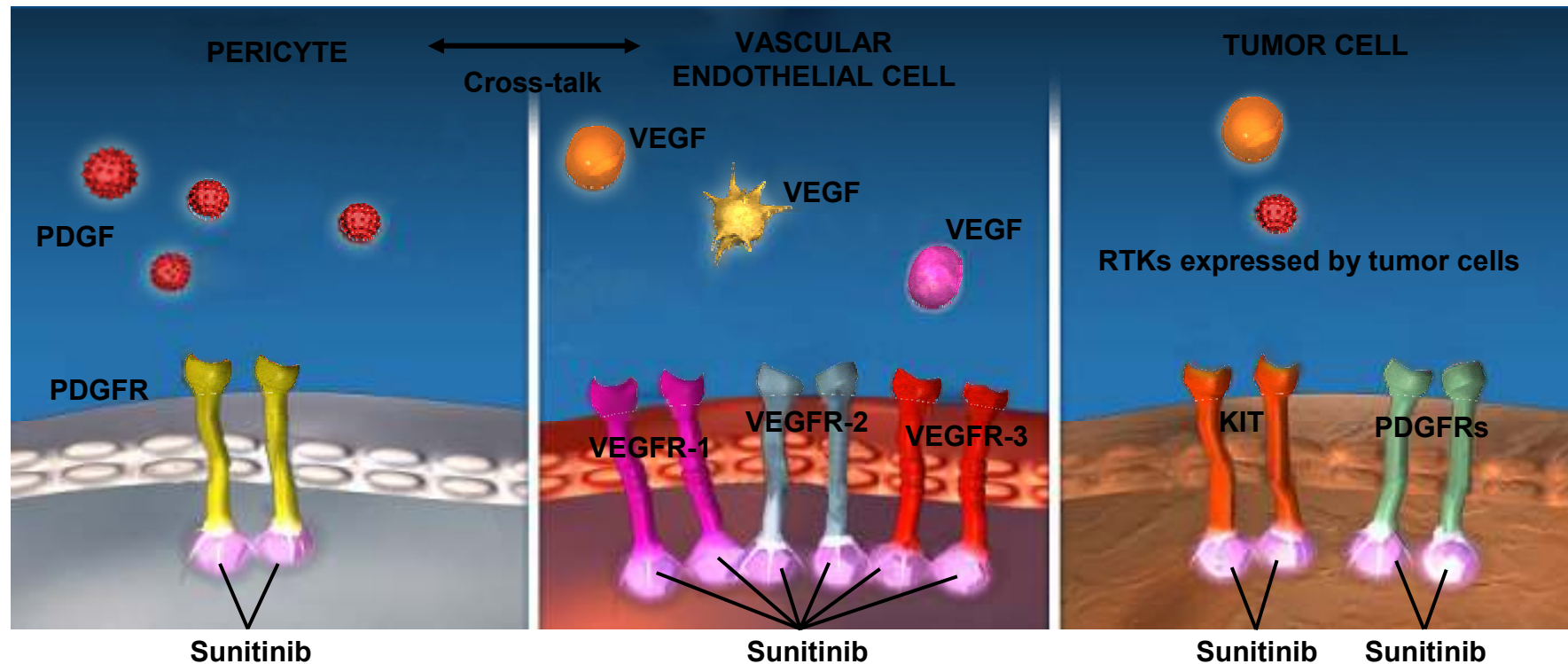


Mendel et al. *Clin Cancer Res* 2003;9:327–337;  
Abrams et al. *Mol Cancer Ther* 2003;2:471-478

# Sunitinib Simultaneously Inhibits RTKs on Tumor Cells, Pericytes and Endothelial Cells

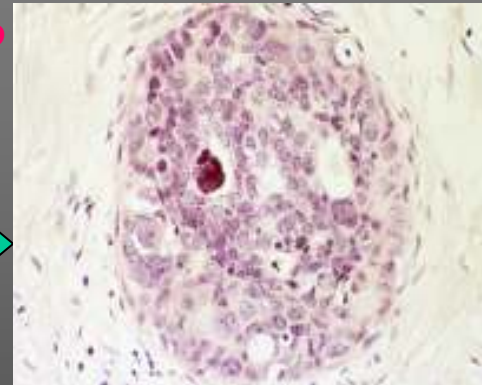
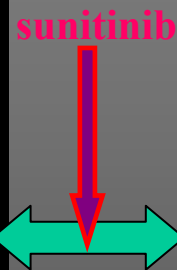
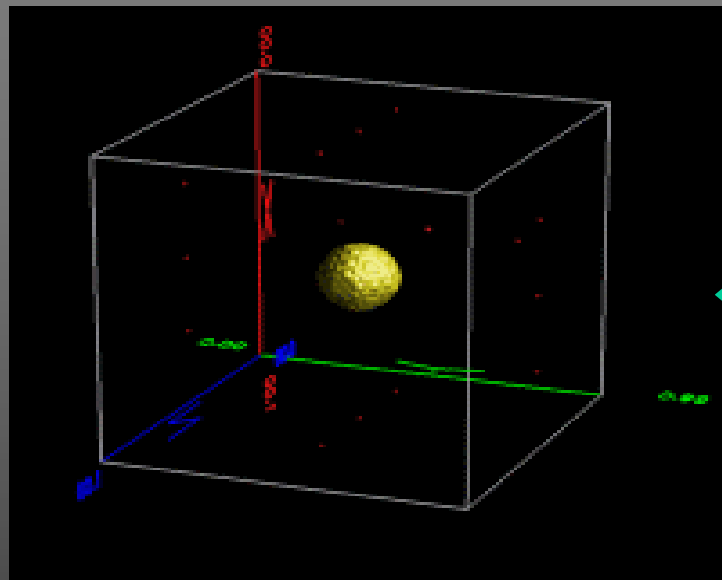
## Antiangiogenic effects

## Antitumor effects

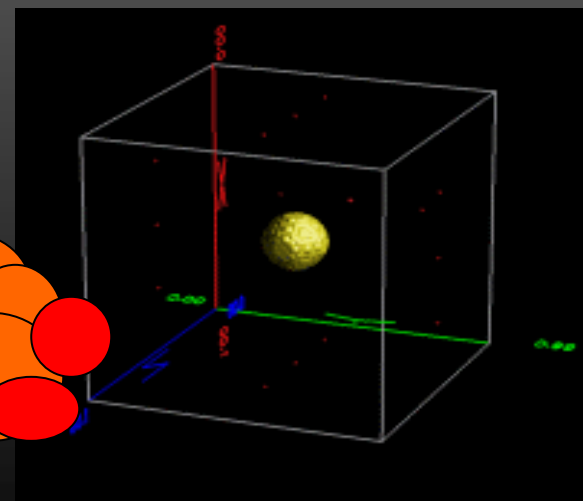
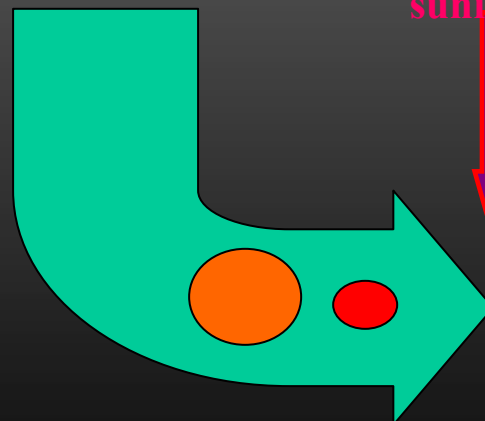


**Multitargeted inhibition results in antiangiogenesis and reversal of tumor growth**

# New therapeutic windows



**DCIS**





" The fact is that one new idea leads to another, that to a third, and so on through the course of time until some one, with whom no one of these ideas was original, combines all together and produces what is justly called a new invention".

Thomas Jefferson

**Traveller, there is no path;  
the path is made by walking”**

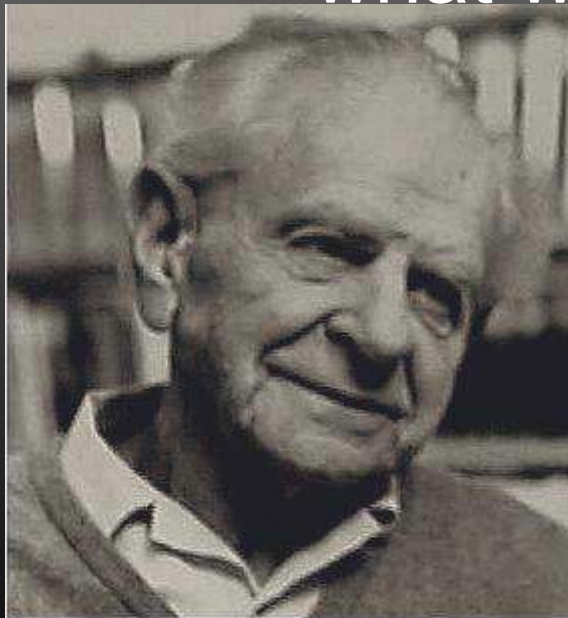
Antonio Machado



I can now rejoice even in the  
falsification of a cherished theory,  
because even this is scientific  
success

**John Carew Eccles**  
**Nobel Lauriat for Physiology 1963**

“It is not truisms that science unveils.  
Rather, it is part of the greatness and the  
beauty of science that we can learn,  
through our own critical investigations,  
that the world is utterly different from  
what we ever imagined-”



*Sir Karl Popper (1902-1994)*

**Popper The Logic of scientific discovery**