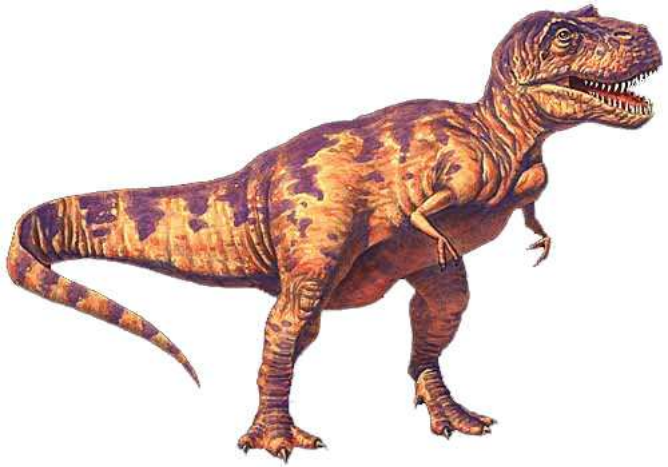
REPORTS

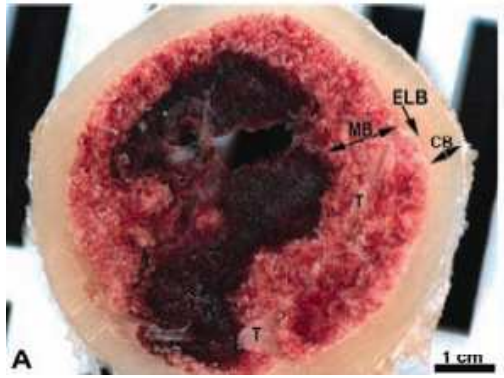
Gender-Specific Reproductive Tissue in Ratites and *Tyrannosaurus rex*

Mary H. Schweitzer,[1,2,3]* Jennifer L. Wittmeyer,[1] John R. Horner[3]

Unambiguous indicators of gender in dinosaurs are usually lost during fossilization, along with other aspects of soft tissue anatomy. We report the presence of endosteally derived bone tissues lining the interior marrow cavities of portions of *Tyrannosaurus rex* (Museum of the Rockies specimen number 1125) hindlimb elements, and we hypothesize that these tissues are homologous to specialized avian tissues known as medullary bone. Because medullary bone is unique to female birds, its discovery in extinct dinosaurs solidifies the link between dinosaurs and birds, suggests similar reproductive strategies, and provides an objective means of gender differentiation in dinosaurs.

Science 3 June 2005 Vol. 308. no. 5727, pp. 1456 - 1460





REPORTS

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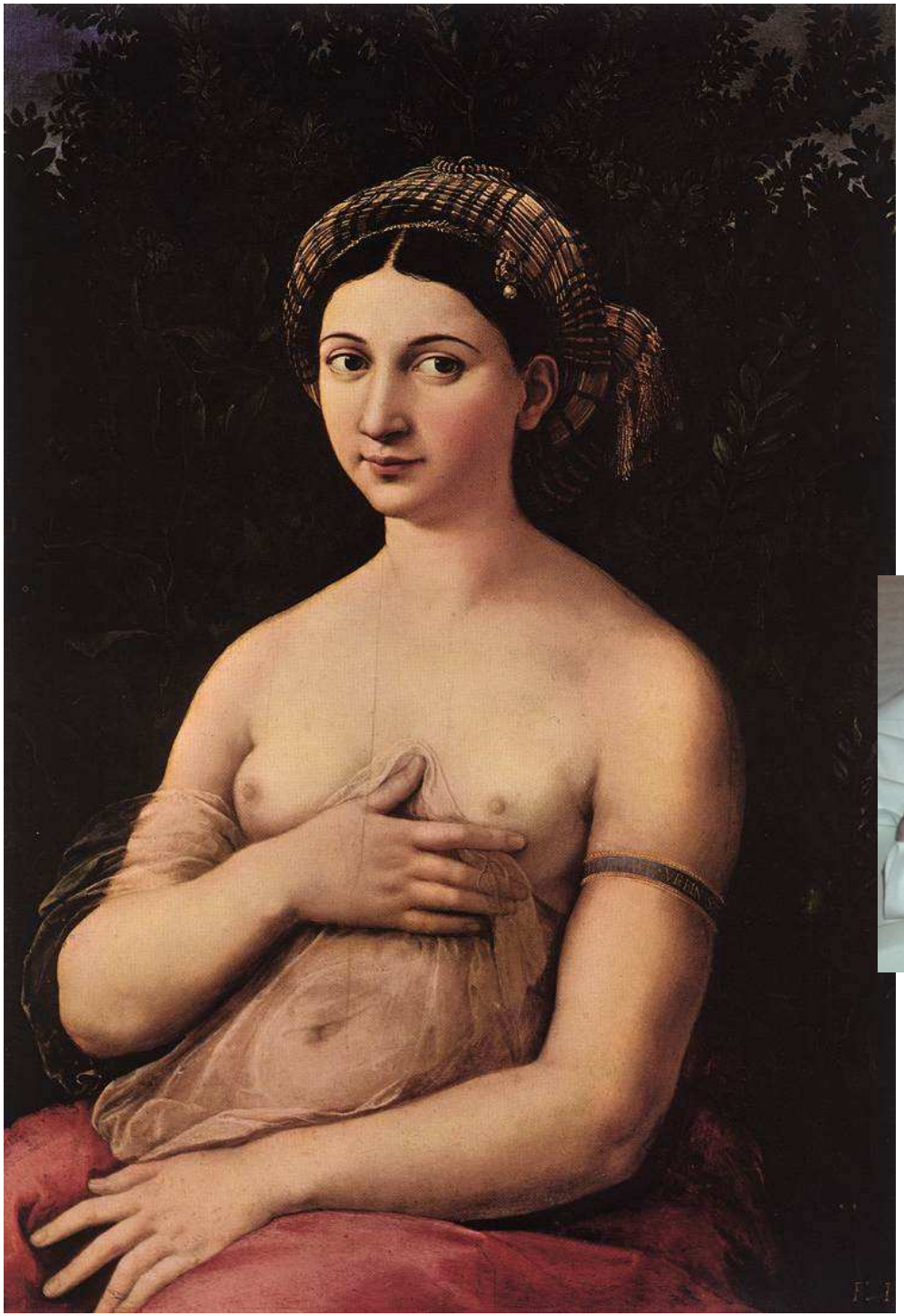
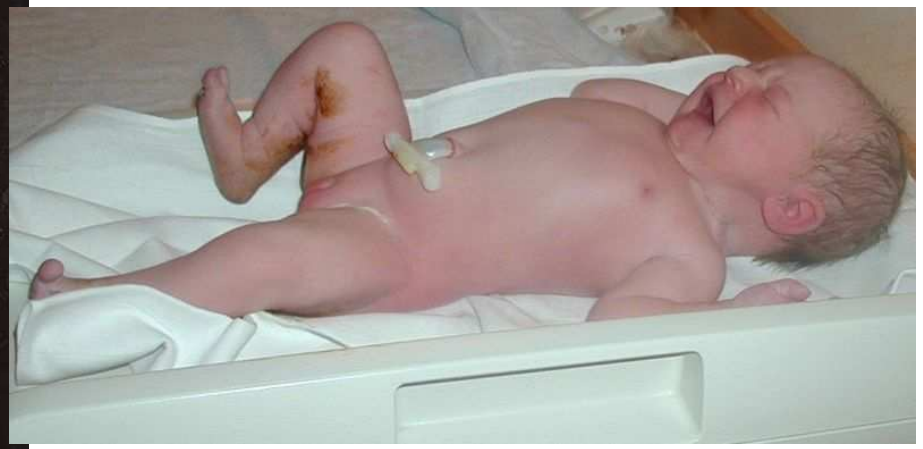
Science 3 June 2005 Vol. 308. no. 5727, pp. 1456 - 1460





On mammary stem cells

Wendy A. Woodward[1,*], Mercy S. Chen[2,*], Fariba Behbod[2] and Jeffrey M. Rosen[2,‡]

[1]Department of Radiation Oncology, The University of Texas MD Anderson Cancer Center, Houston, TX 77030-3498, USA
[2]Department of Molecular and Cellular Biology, Baylor College of Medicine, One Baylor Place, M638a DeBakey, Houston, TX 77030, USA
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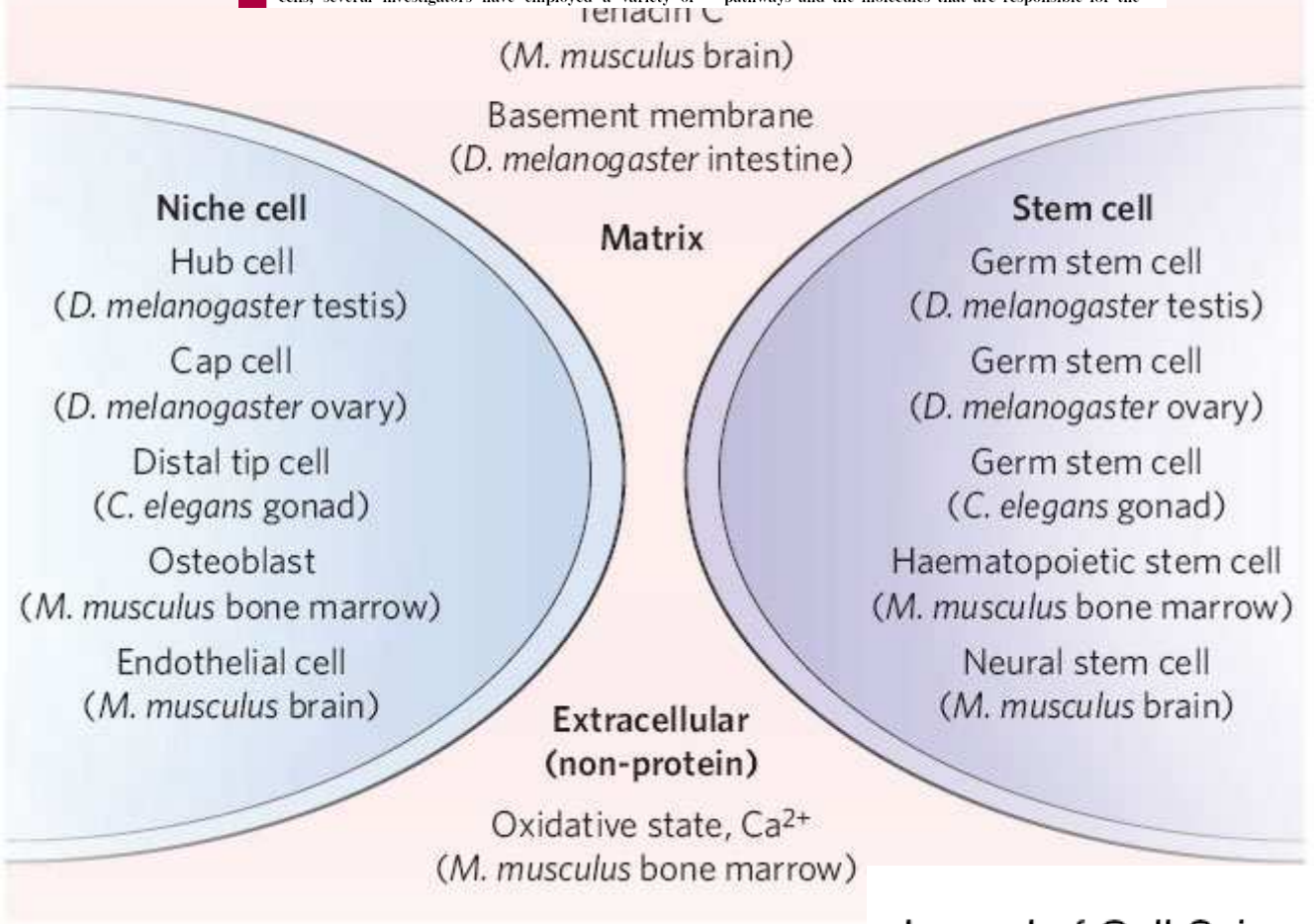
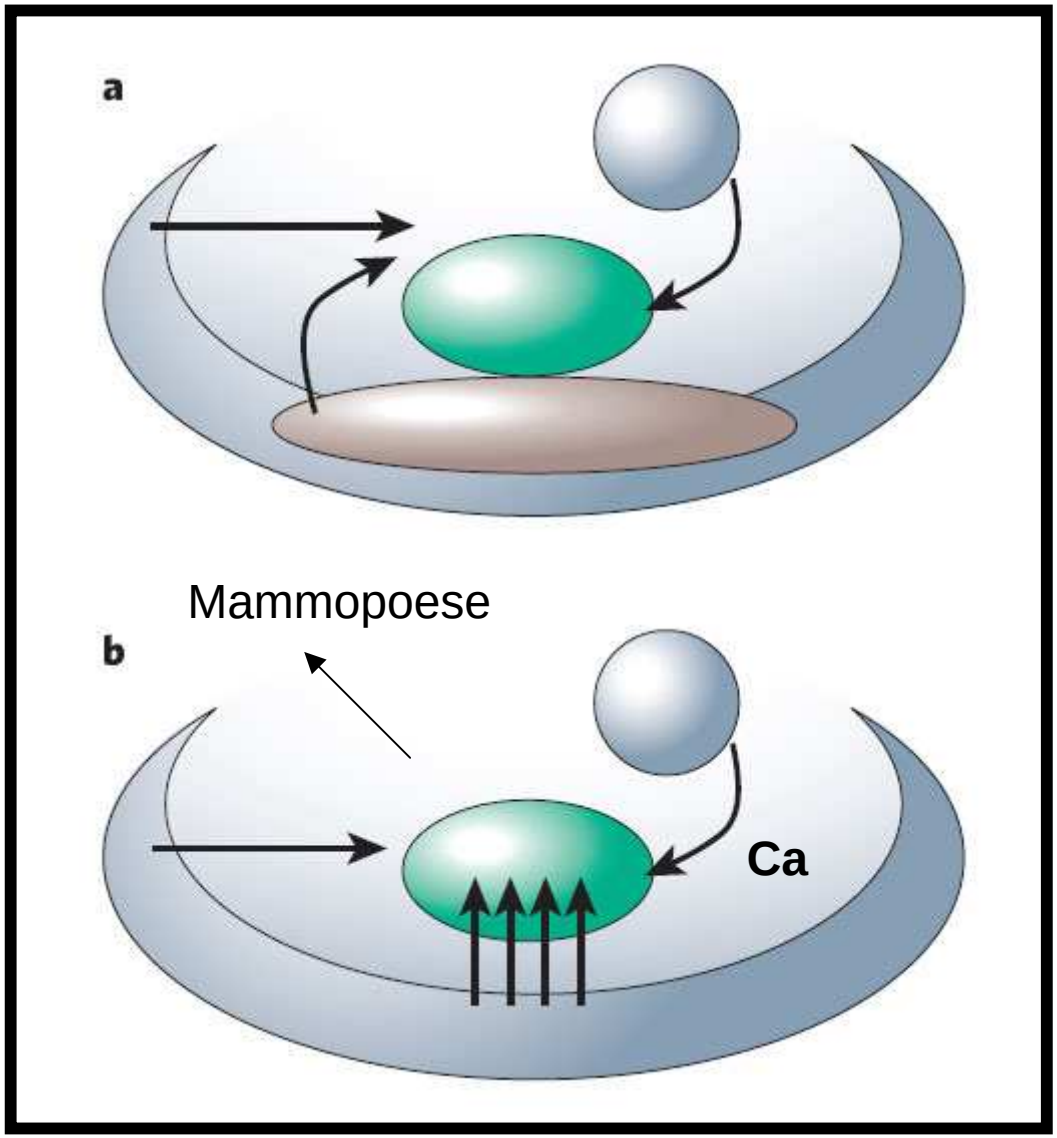
Journal of Cell Science 118, 3585-3594 Published by The Company of Biologists 2005
doi:10.1242/jcs.02532

Summary

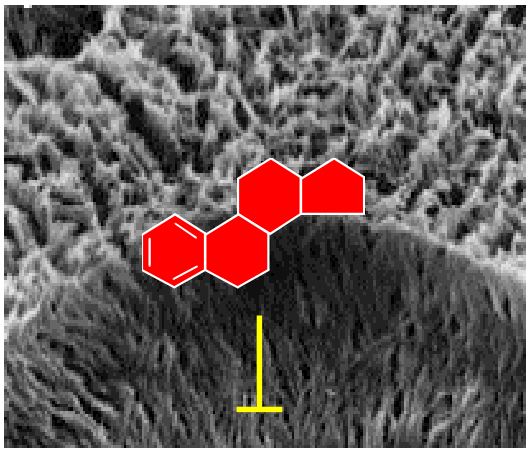
Mammary gland stem cells are a quiescent and self-renewing population within the mammary gland that are capable of giving rise to the differentiated ductal, alveolar and myoepithelial cells. To identify mammary gland stem cells, several investigators have employed a variety of important for the self-renewal and fate determination of mammary gland stem cells. Stem cells within the mammary gland have been proposed to underpin many types of breast cancer. A better understanding of the signal transduction pathways and the molecules that are responsible for the

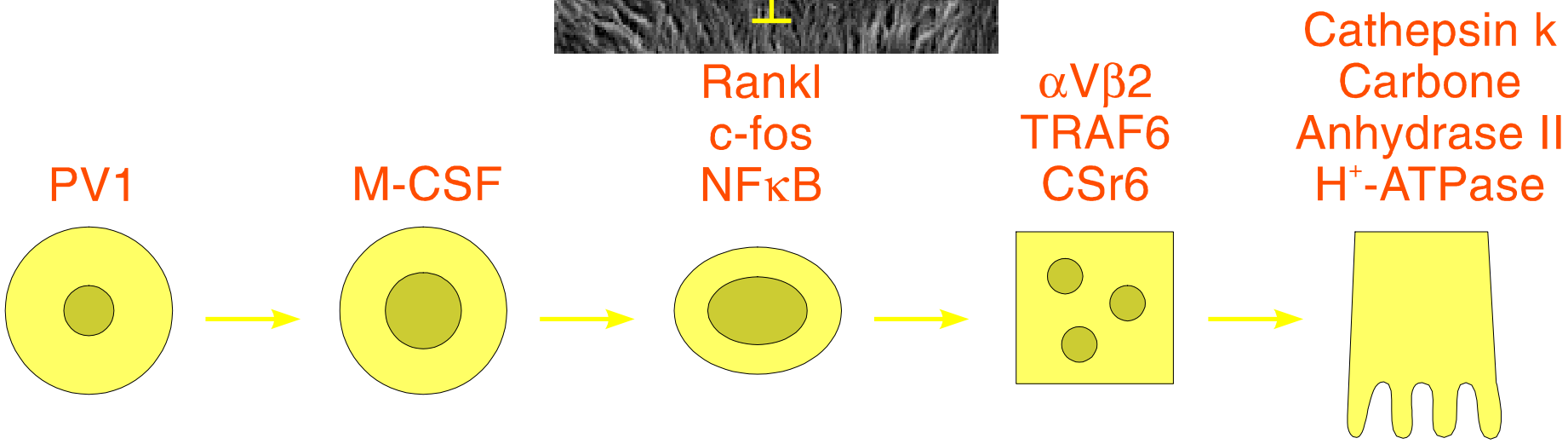




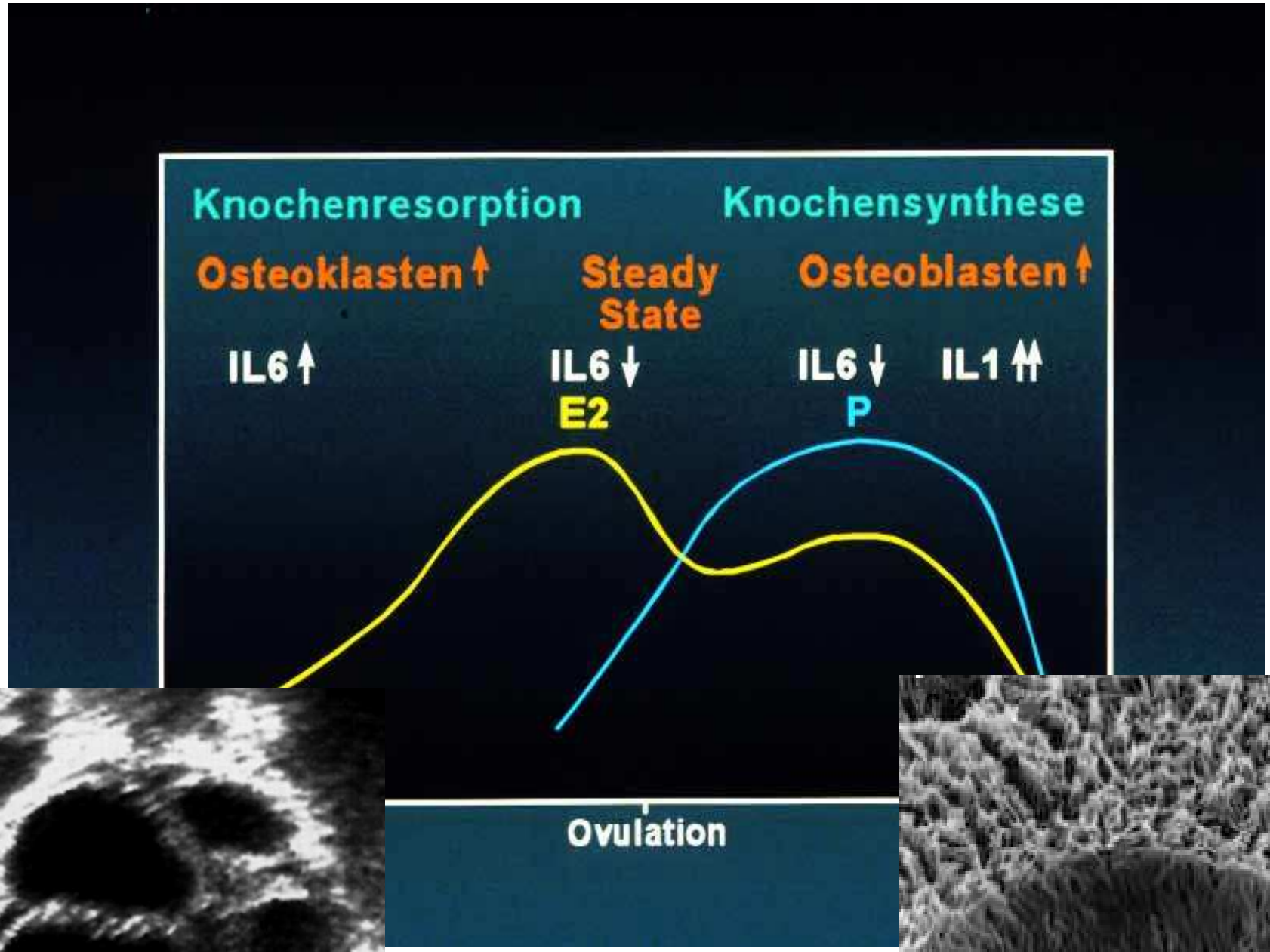
RANK Ligand

Journal of Cell Science 118 (16)





J Steroid Biochem Mol Biol 1997 Apr;61(3-6):167-74


Knochenresorption
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Osteoklasten
Steady State
Osteoblasten
IL6
IL6
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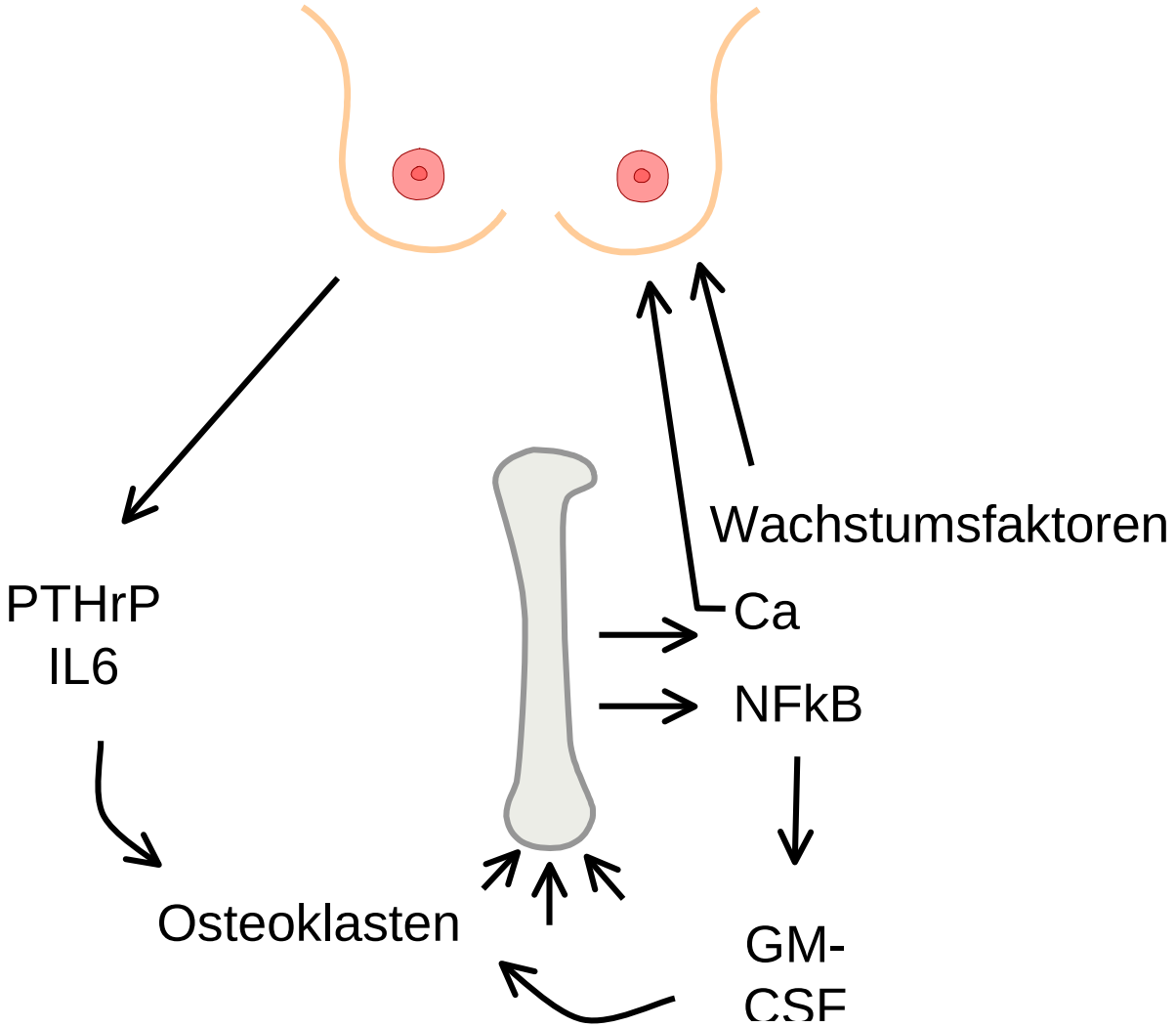
Ovulation



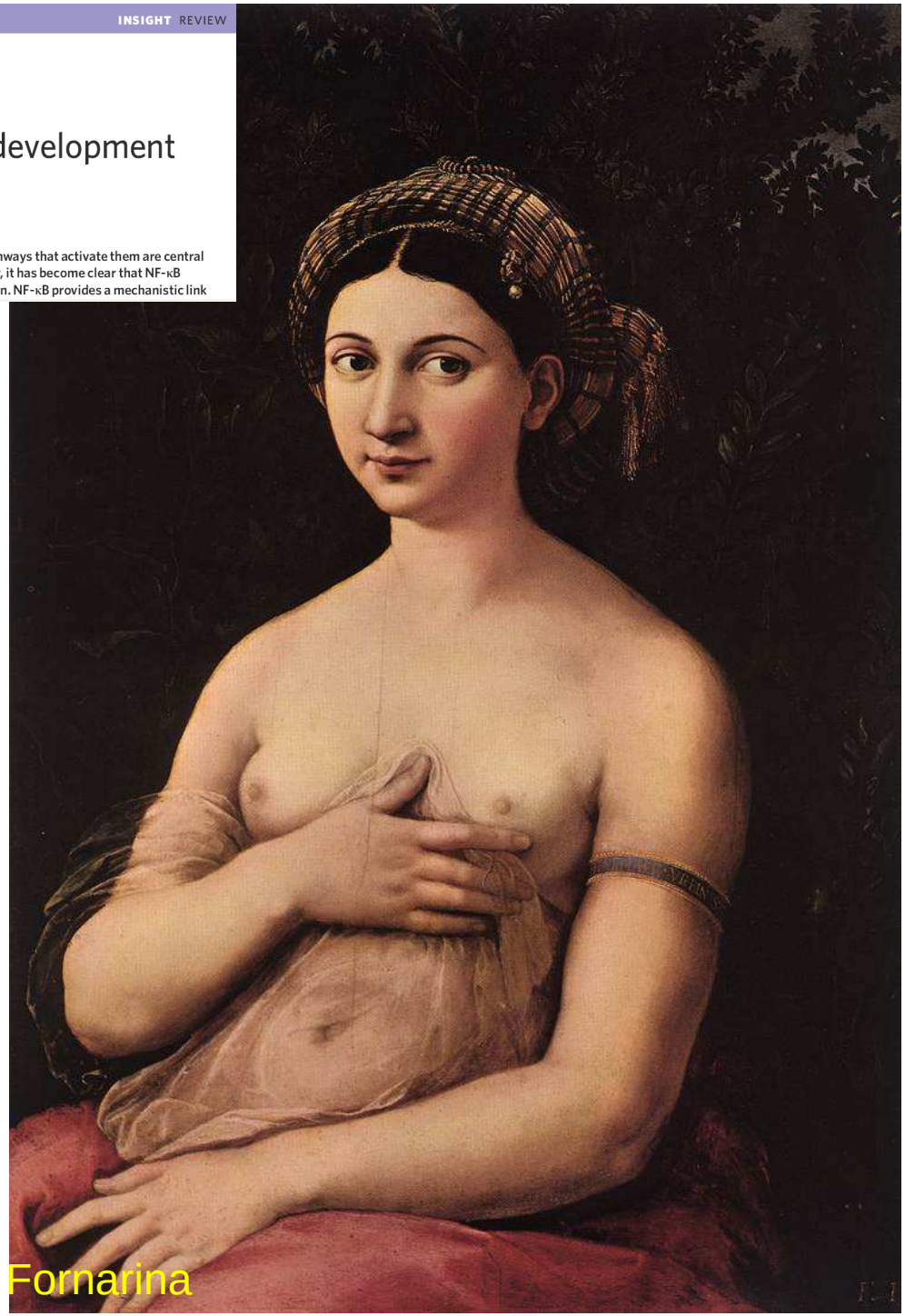
Journal of Cell Science 118 (16)

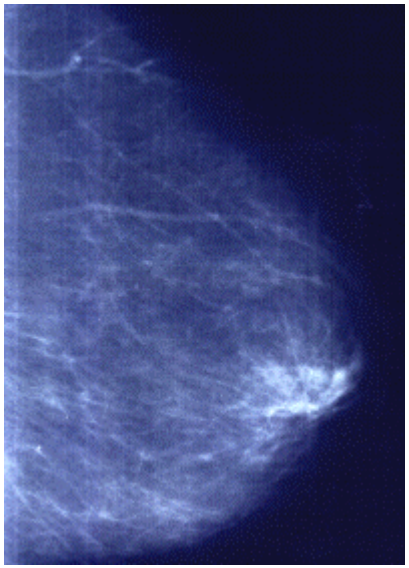
NATURE|Vol 441|25 May 2006|doi:10.1038/nature04870

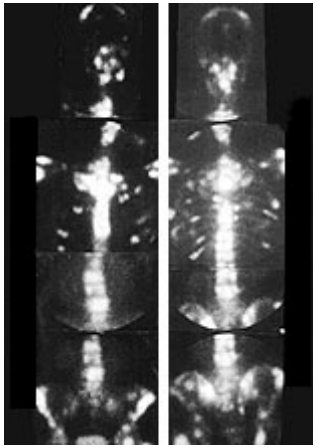
Nuclear factor-κB in cancer development and progression

Michael Karin[1]

Nuclear factor-κB (NF-κB) transcription factors and the signalling pathways that activate them are central coordinators of innate and adaptive immune responses. More recently, it has become clear that NF-κB signalling also has a critical role in cancer development and progression. NF-κB provides a mechanistic link







Lancet,360, 2061 Fornarina

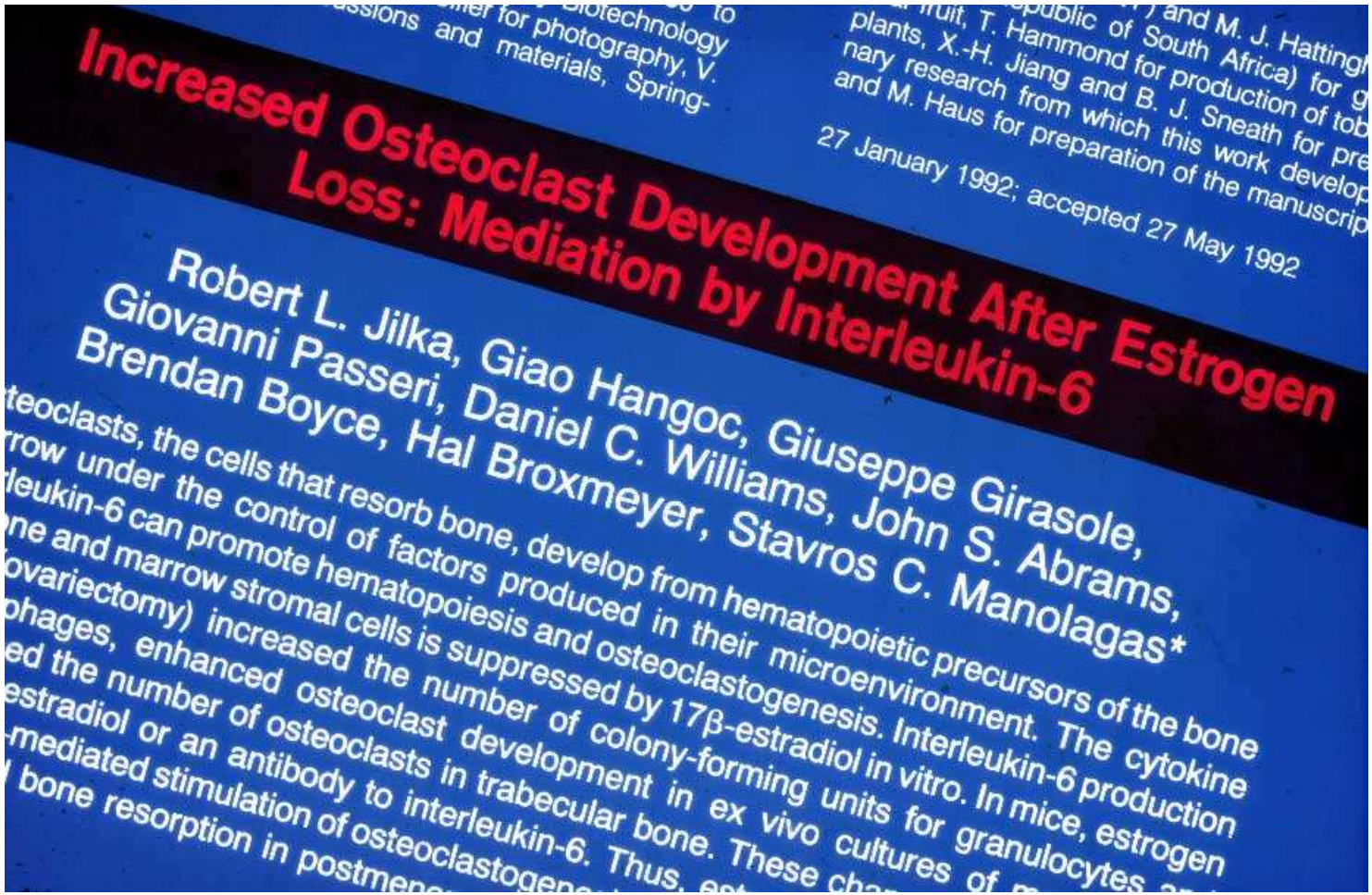
nature Vol 440|30 March 2006|doi:10.1038/nature04524

LETTERS

Regulation of cancer cell migration and bone metastasis by RANKL

D. Holstead Jones[1,2,3]*†, Tomoki Nakashima[1]*, Otto H. Sanchez[4]†, Ivona Kozieradzki[1,2,3], Svetlana V. Komarova[5], Ildiko Sarosi[6], Sean Morony[6], Evelyn Rubin[2,3], Renu Sarao[1], Carlo V. Hojilla[4], Vukoslav Komnenovic[1], Young-Yun Kong[7], Martin Schreiber[8], S. Jeffrey Dixon[9], Stephen M. Sims[9], Rama Khokha[2,4], Teiji Wada[1] & Josef M. Penninger[1,2,3]

Science 257. no. 5066, pp. 88 - 91



Increased Osteoclast Development After Estrogen Loss: Mediation by Interleukin-6

Robert L. Jilka, Giao Hangoc, Giuseppe Girasole, Giovanni Passeri, Daniel C. Williams, John S. Abrams, Brendan Boyce, Hal Broxmeyer, Stavros C. Manolagas*

teoclasts, the cells that resorb bone, develop from hematopoietic precursors of the bone row under the control of factors produced in their microenvironment. The cytokine leukin-6 can promote hematopoiesis and osteoclastogenesis. Interleukin-6 production ne and marrow stromal cells is suppressed by 17β-estradiol in vitro. In mice, estrogen ovariectomy) increased the number of colony-forming units for granulocytes ohages, enhanced osteoclast development in ex vivo cultures of ed the number of osteoclasts in trabecular bone. These estradiol or an antibody to interleukin-6. Thus, -mediated stimulation of osteoclastogen bone resorption in postmen

...sions and materials, Spring-... for photography, V. ... Biotechnology ... to

...public of South Africa) and M. J. Hatting... ...fruit, T. Hammond for production of tob... plants, X.-H. Jiang and B. J. Sneath for pre... nary research from which this work develop... and M. Haus for preparation of the manuscrip...

27 January 1992; accepted 27 May 1992

Wien Med Wochenschr (2004) 154/17–18: 411–415

WMW
Wiener Medizinische Wochenschrift
Printed in Austria

Osteoporosis: Gender-specific aspects

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[1]Department of Pathophysiology and [2]Department of Physical Medicine and Rehabilitation, Medical University of Vienna, and [3]Ludwig Boltzmann Institute of Aging Research, Vienna, Austria

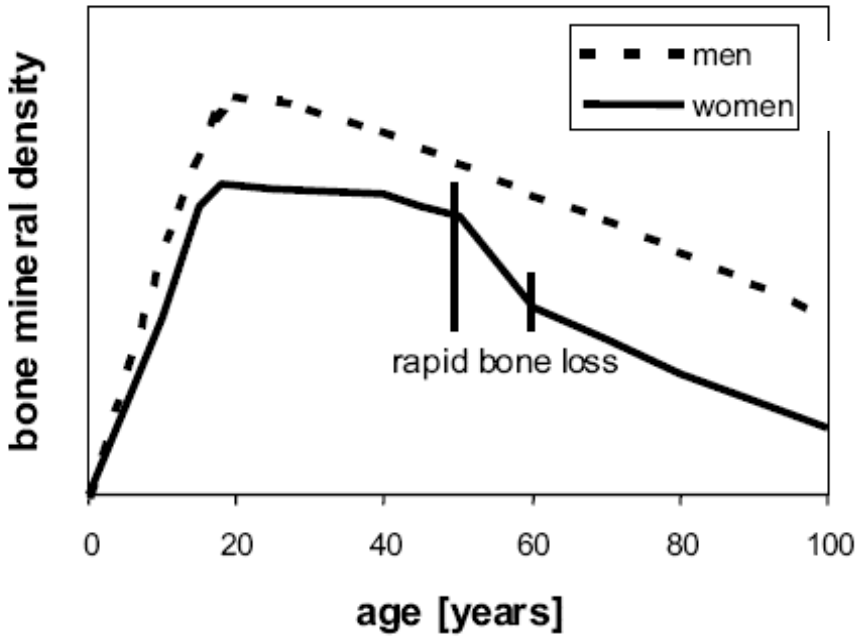

Fig. 1. Bone gain and bone loss in men and women. Adapted from R. Bartl, 2001 [9]

DEXA measurement for osteoporosis in patients between 50 - 60

Gruppe	1	2	3	4	5	6	7	8	Gesamt
patients total	4.115	5.935	6.007	5.896	4.684	3.605	2.134	1.312	**33.688**
T-score below -2,5	694	594	646	580	559	475	313	190	**4.051**
T-score below -2,5 in %	16,87	10,01	10,75	9,84	11,93	13,18	14,67	14,48	**12,03%**
T-score below -3,0	322	261	308	281	270	233	166	103	**1.944**
T-score below -3,0 in %	7,83	4,40	5,13	4,77	5,76	6,46	7,78	7,85	**5,77%**

Osteoporos Int (2006) 17: 565–574
DOI 10.1007/s00198-005-0027-4

ORIGINAL ARTICLE

The effect of age and bone mineral density on the absolute, excess, and relative risk of fracture in postmenopausal women aged 50–99: results from the National Osteoporosis Risk Assessment (NORA)

E. S. Siris · S. K. Brenneman · E. Barrett-Connor · P. D. Miller · S. Sajjan · M. L. Berger · Y.-T. Chen

Both the absolute and the excess risks of fracture were similar among women aged 50-59 and aged 60-69 for osteoporotic fractures overall, wrist/forearm, rib, and, to a lesser extent, vertebral fractures in the NORA cohort.

Prevention of bone loss in younger postmenopausal women may be an effective way to prevent or delay fractures in postmenopausal women as they age. When women aged 50-60 present a T-score < -2.0, their long-term risk for future fracture is likely to be high, since bone loss would be expected to continue indefinitely without intervention.

One strategy to reduce fracture risk in older women is long-term intervention to prevent bone loss in women started around the time of menopause, when rates of bone loss are the highest.


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Fragebogen:
1. Alter (zwischen 40 und 90 Jahren) oder Geburtsdatum
Alter:
Geburtsdatum:
J:
M:
T:
2. Geschlecht
Männlich
Weiblich
3. Gewicht (kg)
4. Körpergrösse (cm)
5. Vorausgehende Fraktur
Nein
Ja
6. Hüftfraktur eines Elternteils
Nein
Ja
7. Gegenwärtiges Rauchen
Nein
Ja
10. Sekundäre Osteoporose
Nein
Ja
11. Alkohol 3 und mehr Einheiten
Nein
Ja
12. Knochenmineraldichte (g/cm²)
Auswahl DXA
Löschen
Rechnen
Weight Conversion
Pounds
Kgs
Convert
Height Conversion
Inches
Cms
Convert

FSH Directly Regulates Bone Mass

Li Sun,[1] Yuanzhen Peng,[1] Allison C. Sharrow,[2,3] Jameel Iqbal,[1] Zhiyuan Zhang,[1] Dionysios J. Papachristou,[2,3] Samir Zaidi,[1] Ling-Ling Zhu,[1] Beatrice B. Yaroslavskiy,[2,3] Hang Zhou,[1] Alberta Zallone,[4] M. Ram Sairam,[5] T. Rajendra Kumar,[6] Wei Bo,[7] Jonathan Braun,[7] Luis Cardoso-Landa,[1] Mitchell B. Schaffler,[1] Baljit S. Moonga,[1] Harry C. Blair,[2,3,*] and Mone Zaidi[1,*]

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DOI 10.1016/j.cell.2006.01.051

Cell. 2006 Apr 21;125(2):247-60.

0021-972X/04/$15.00/0
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The Journal of Clinical Endocrinology & Metabolism 89(7):3261–3269

doi: 10.1210/jc.2002-022041

Endogenous Sex Hormones, Sex Hormone-Binding Globulin, and the Risk of Incident Vertebral Fractures in Elderly Men and Women: The Rotterdam Study

HERMIEN W. GODERIE-PLOMP, MARJOLEIN VAN DER KLIFT, WILLEM DE RONDE, ALBERT HOFMAN, FRANK H. DE JONG, AND HUIBERT A. P. POLS

Departments of Internal Medicine (H.W.G.-P., M.v.d.K., W.d.R., F.H.d.J., H.A.P.P.) and Epidemiology and Biostatistics (H.W.G.-P., M.v.d.K., A.H., H.A.P.P.), Erasmus Medical Center, 3000 DR Rotterdam, The Netherlands

In an age-matched, case-control study, we investigated the association between endogenous sex steroid hormones and incident vertebral fractures in both elderly men and women (aged 67.7 ± 6.8 yr). Drawn from the Rotterdam Study, participants required radiographs of the lumbar spine at both baseline and follow-up (average time of follow-up, 6.5 yr) and frozen blood samples, taken at baseline. One hundred and seventy-eight men (45 cases) and 454 women (115 cases) were thus selected. Serum estradiol, SHBG, testosterone, and insulin were measured, along with bone mineral density at both spine and hip. Women in the lowest tertile of serum estradiol (≤15.5 pmol/liter) had a 2.1 times increased risk (95% confidence interval, 1.3–3.5) of incident vertebral fractures, independently of bone mineral density measured at either site. SHBG levels in the lowest two tertiles were associated with a 50% reduction in incident vertebral fracture risk. Women with a combination of both low estradiol and high SHBG had a 7.8 times higher risk of an incident vertebral fracture (95% confidence interval, 2.7–22.5; $P < 0.001$), adjusted for age and weight. This increased risk did not change when non-SHBG-bound estradiol was used instead of total estradiol. For men, no clear association was found, possibly due to insufficient power. No clear association between testosterone and incident vertebral fractures was observed in either men or women. (*J Clin Endocrinol Metab* 89: 3261–3269, 2004)

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MAY 13, 2004 VOL. 350 NO. 20

Homocysteine Levels and the Risk of Osteoporotic Fracture

Joyce B.J. van Meurs, Ph.D., Rosalie A.M. Dhonukshe-Rutten, M.Sc., Saskia M.F. Pluijm, Ph.D., Marjolein van der Klift, M.D., Ph.D., Robert de Jonge, Ph.D., Jan Lindemans, Ph.D., Lisette C.P.G.M. de Groot, Ph.D., Albert Hofman, M.D., Ph.D., Jacqueline C.M. Witteman, Ph.D., Johannes P.T.M. van Leeuwen, Ph.D., Monique M.B. Breteler, M.D., Ph.D., Paul Lips, M.D., Ph.D., Huibert A.P. Pols, M.D., Ph.D., and André G. Uitterlinden, Ph.D.

ABSTRACT

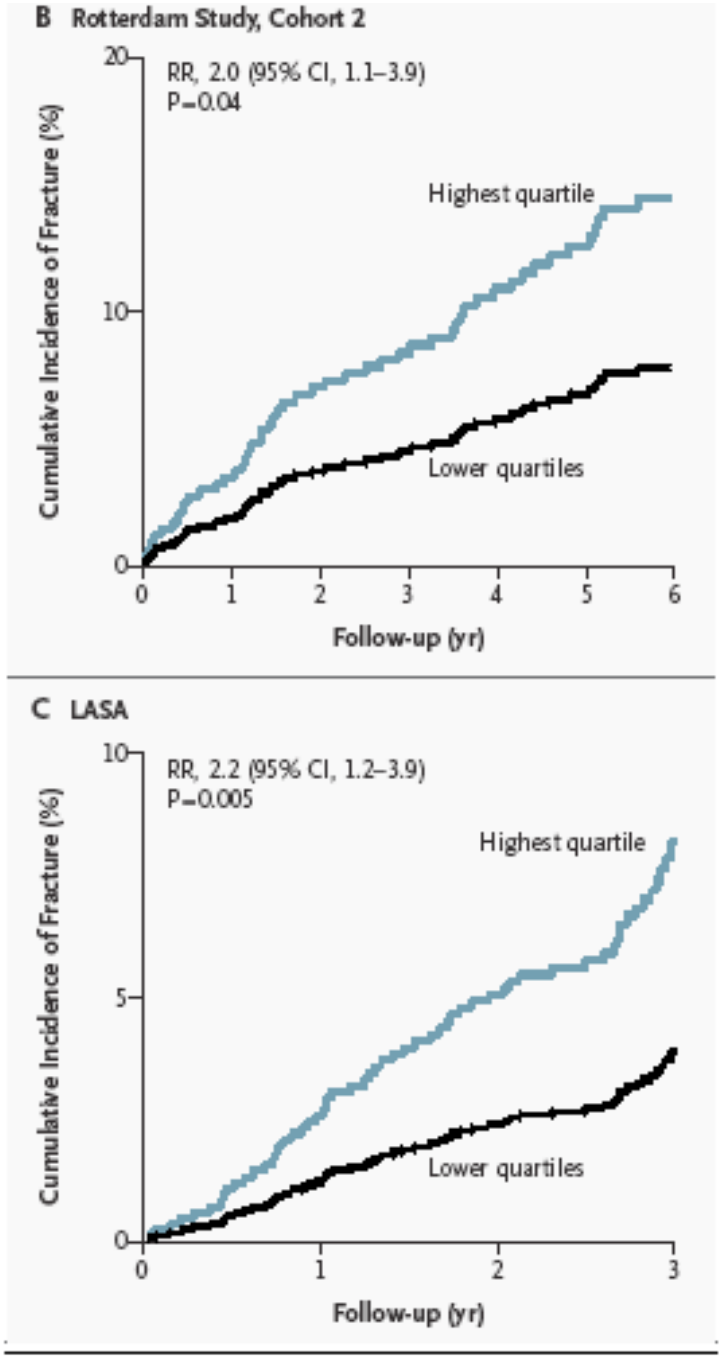
BACKGROUND

Very high plasma homocysteine levels are characteristic of homocystinuria, a rare autosomal recessive disease accompanied by the early onset of generalized osteoporosis. We therefore hypothesized that mildly elevated homocysteine levels might be related to age-related osteoporotic fractures.

METHODS

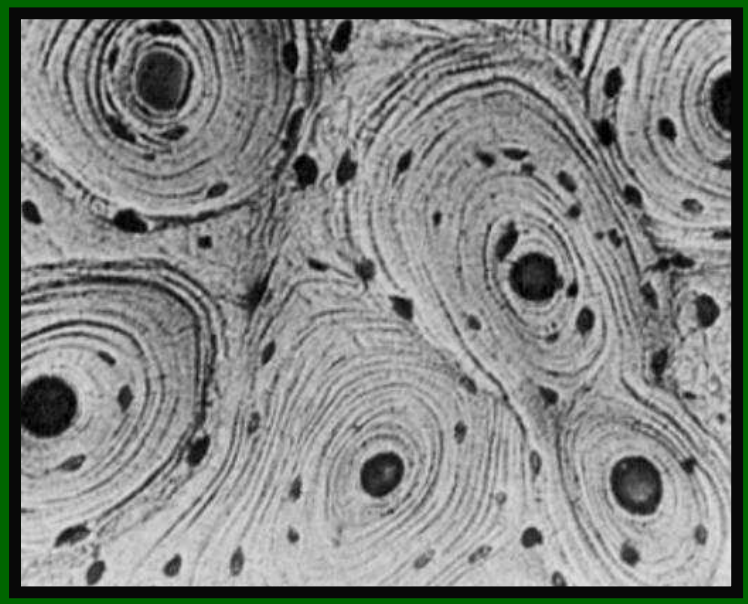
We studied the association between circulating homocysteine levels and the risk of incident osteoporotic fracture in 2406 subjects, 55 years of age or older, who participated in two separate prospective, population-based studies. In the Rotterdam Study, there were two independent cohorts: 562 subjects in cohort 1, with a mean follow-up period of 8.1 years; and 553 subjects in cohort 2, with a mean follow-up period of 5.7

From the Departments of Internal Medicine (J.B.J.M., M.K., J.P.T.M.L., H.A.P.P., A.G.U.), Epidemiology and Biostatistics (A.H., J.C.M.W., M.M.B.B., H.A.P.P., A.G.U.), and Clinical Chemistry (R.J., J.L., A.G.U.), Erasmus Medical Center, Rotterdam; the Division of Human Nutrition, Wageningen University, Wageningen (R.A.M.D.-R., L.C.P.G.M.G.); and the Institute for Research in Extramural Medicine and the Department of Endocrinology, Vrije Universiteit Medical Center, Amsterdam (S.M.F.P., P.L.) — all in the Netherlands. Address reprint requests to Dr. van Meurs


B Rotterdam Study, Cohort 2
RR, 2.0 (95% CI, 1.1–3.9)
P=0.04
Highest quartile
Lower quartiles
Cumulative Incidence of Fracture (%)
20
10
0
0
1
2
3
4
5
6
Follow-up (yr)
C LASA
RR, 2.2 (95% CI, 1.2–3.9)
P=0.005
Highest quartile
Lower quartiles
Cumulative Incidence of Fracture (%)
10
5
0
0
1
2
3
Follow-up (yr)

Cortical Bone

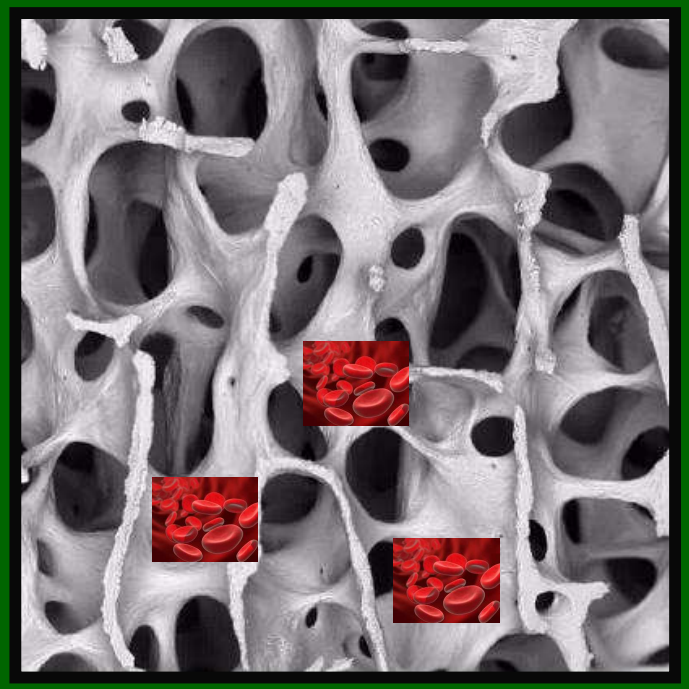
- Dense outer shell of compact bone; defines bone shape
- 80% of skeletal mass
- Essential functions
  - Provides biomechanical strength
  - Attachment site for tendon and muscle
  - Protection against



Dempster DW. *A Primer on the Metabolic Bone Diseases and Disorders of Mineral Metabolism.* 6th ed. 2006:7-11.

Trabecular Bone

- A sponge-like network of delicate plates of bone known as trabeculae
- 20% of skeletal mass
- Essential functions
  - Mineral metabolism
  - Strength and elasticity
- Higher turnover rate compared to cortical bone



Howship lacunae

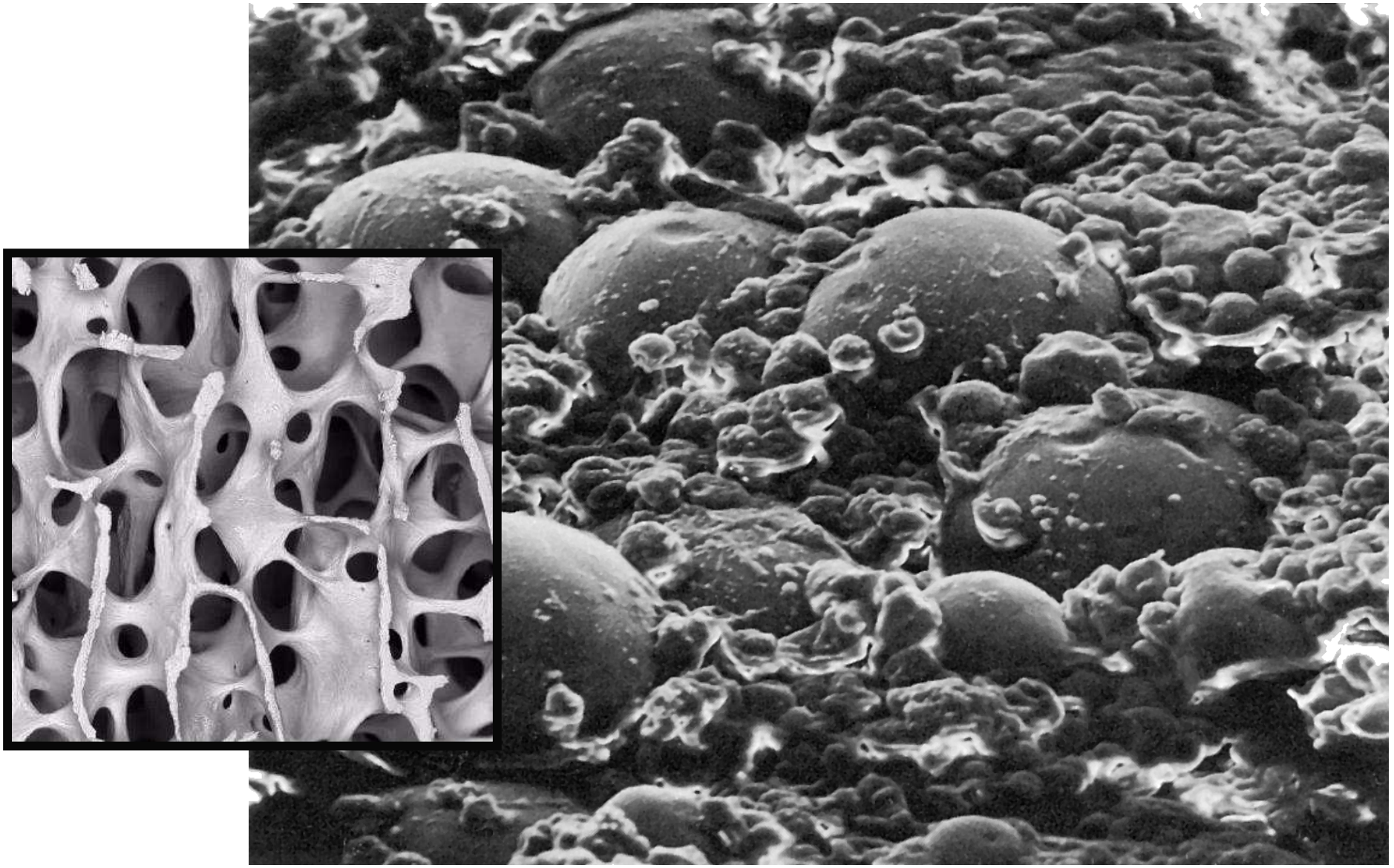
Dempster DW. *Primer on the Metabolic Bone Diseases and Disorders of Mineral Metabolism.* 6th ed. 2006: 7-11;
Image courtesy of A. Boyde

Vol 466|12 August 2010|doi:10.1038/nature09262 nature

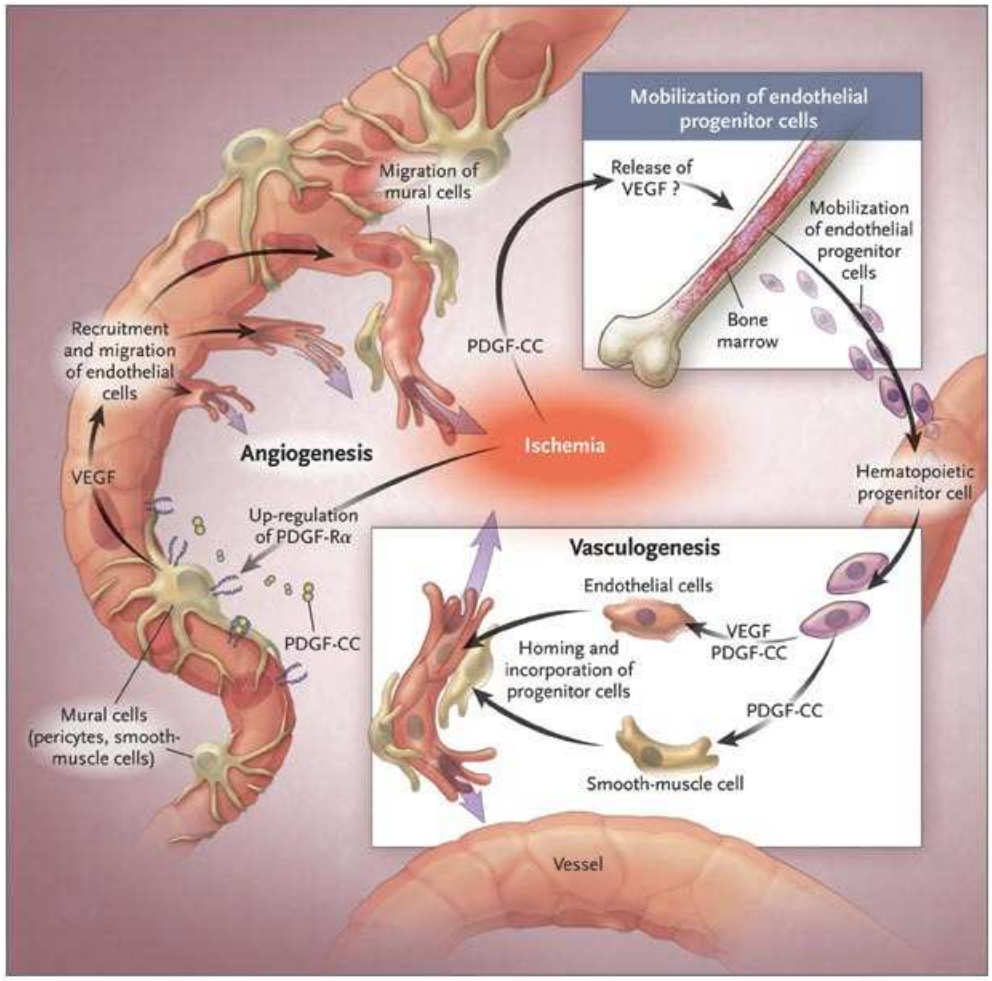
ARTICLES

Mesenchymal and haematopoietic stem cells form a unique bone marrow niche

Simón Méndez-Ferrer[1,2]†, Tatyana V. Michurina[3], Francesca Ferraro[4], Amin R. Mazloom[5], Ben D. MacArthur[5]†, Sergio A. Lira[1], David T. Scadden[4], Avi Ma'ayan[5], Grigori N. Enikolopov[3] & Paul S. Frenette[1,2,6]

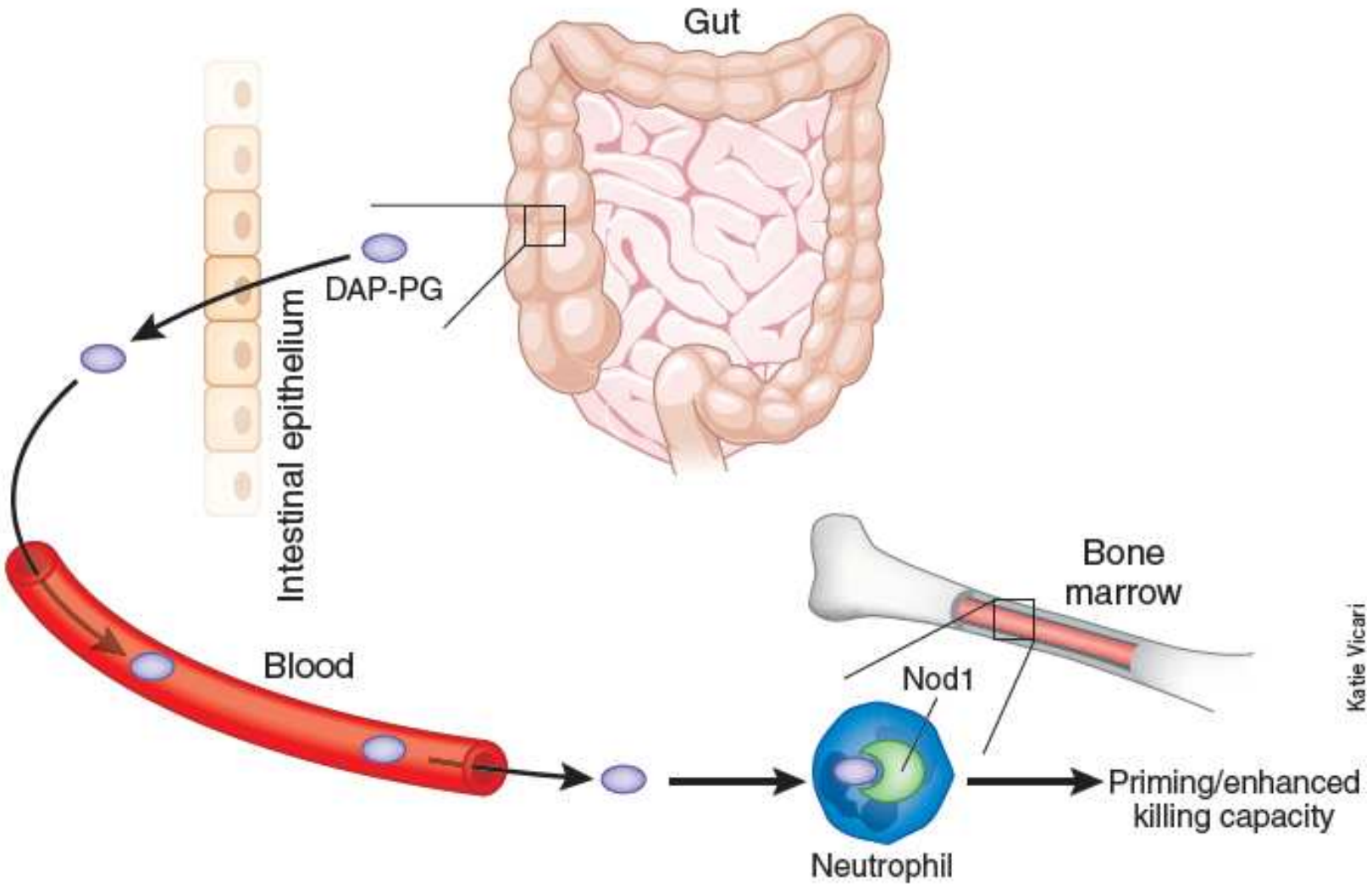


Quelle:Mehdi Tavassoli, Joseph Mendel Yoffey,
Bone MarrowStructure and Function
Alan R. Liss, Inc. 1983



Osteoblastic cells regulate the haematopoietic stem cell niche

L. M. Calvi[1]*, G. B. Adams[3]*, K. W. Weibrecht[3], J. M. Weber[1], D. P. Olson[3], M. C. Knight[4], R. P. Martin[3], E. Schipani[4], P. Divieti[4], F. R. Bringhurst[4], L. A. Milner[2], H. M. Kronenberg[4] & D. T. Scadden[3]


Gut
DAP-PG
Intestinal epithelium
Blood
Bone marrow
Nod1
Neutrophil
Priming/enhanced killing capacity
Katie Vicari

Gut microbes extend reach to systemic innate immunity

Dana J Philpott & Stephen E Girardin

MICROFLORA

↓

DIAMINOPIMETIC SÄURE PEPTIDOGLYCAN

↓

NEUTROPHILE AKTIVITÄT

VOLUME 16 | NUMBER 2 | FEBRUARY 2010 NATURE MEDICINE

Cell

Endocrine Regulation of Energy Metabolism by the Skeleton

Na Kyung Lee,[1] Hideaki Sowa,[1] Eiichi Hinoi,[1] Mathieu Ferron,[1] Jong Deok Ahn,[3] Cyrille Confavreux,[1] Romain Dacquin,[4] Patrick J. Mee,[5] Marc D. McKee,[6] Dae Young Jung,[7] Zhiyou Zhang,[7] Jason K. Kim,[7] Franck Mauvais-Jarvis,[8] Patricia Ducy,[2] and Gerard Karsenty[1,*]

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College of Physicians and Surgeons, Columbia University, New York, NY 10032, USA
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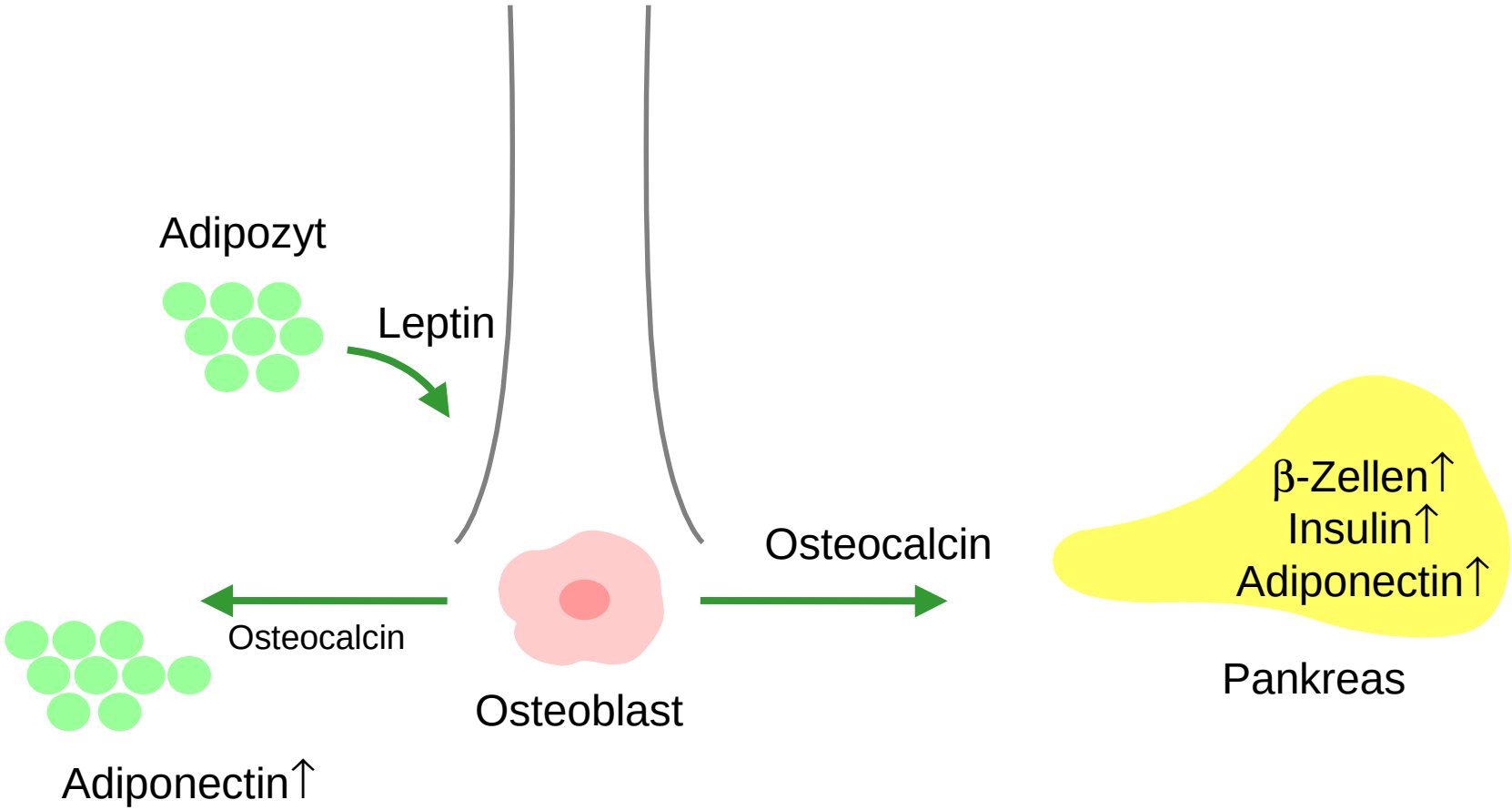
DOI 10.1016/j.cell.2007.05.047

Cell. 2007 Aug 10;130(3):456-69.

The bones of contention

The skeleton may provide more than just structural support. **Alla Katsnelson** investigates the rise of bone as a metabolic regulator.

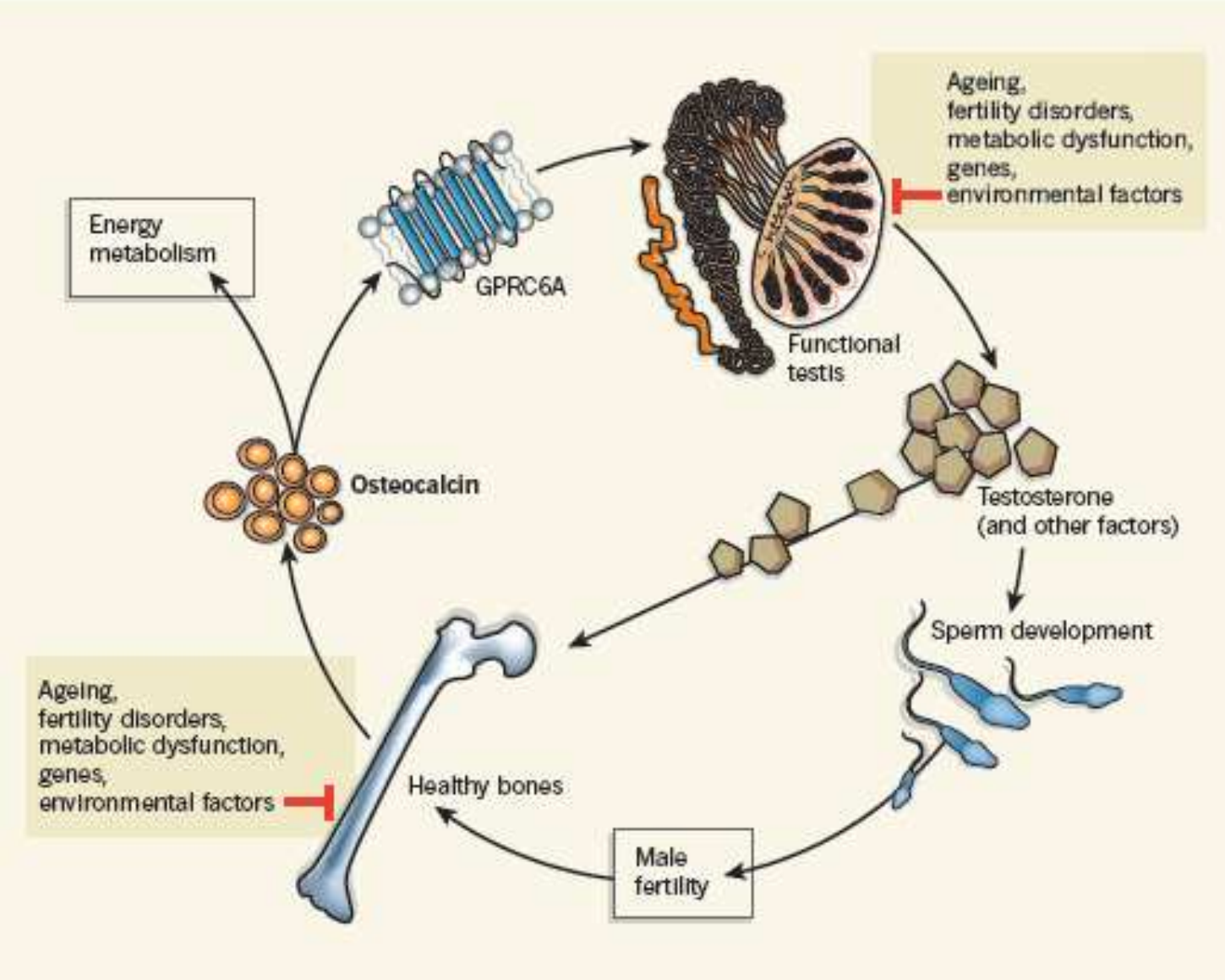
NATURE|Vol 466|19 August 2010


Adipozyt
Leptin
Osteocalcin
β-Zellen↑
Insulin↑
Adiponectin↑
Pankreas
Osteocalcin
Osteoblast
Adiponectin↑

Cell 130, 456

Endocrine Regulation of Male Fertility by the Skeleton

Franck Oury,[1,6] Grzegorz Sumara,[1,6] Olga Sumara,[1] Mathieu Ferron,[1] Haixin Chang,[3] Charles E. Smith,[4] Louis Hermo,[4] Susan Suarez,[3] Bryan L. Roth,[5] Patricia Ducy,[2] and Gerard Karsenty[1,*]


Ageing,
fertility disorders,
metabolic dysfunction,
genes,
environmental factors
Energy
metabolism
GPRC6A
Functional
testis
Osteocalcin
Testosterone
(and other factors)
Sperm development
Ageing,
fertility disorders,
metabolic dysfunction,
genes,
environmental factors
Healthy bones
Male
fertility

Physiology

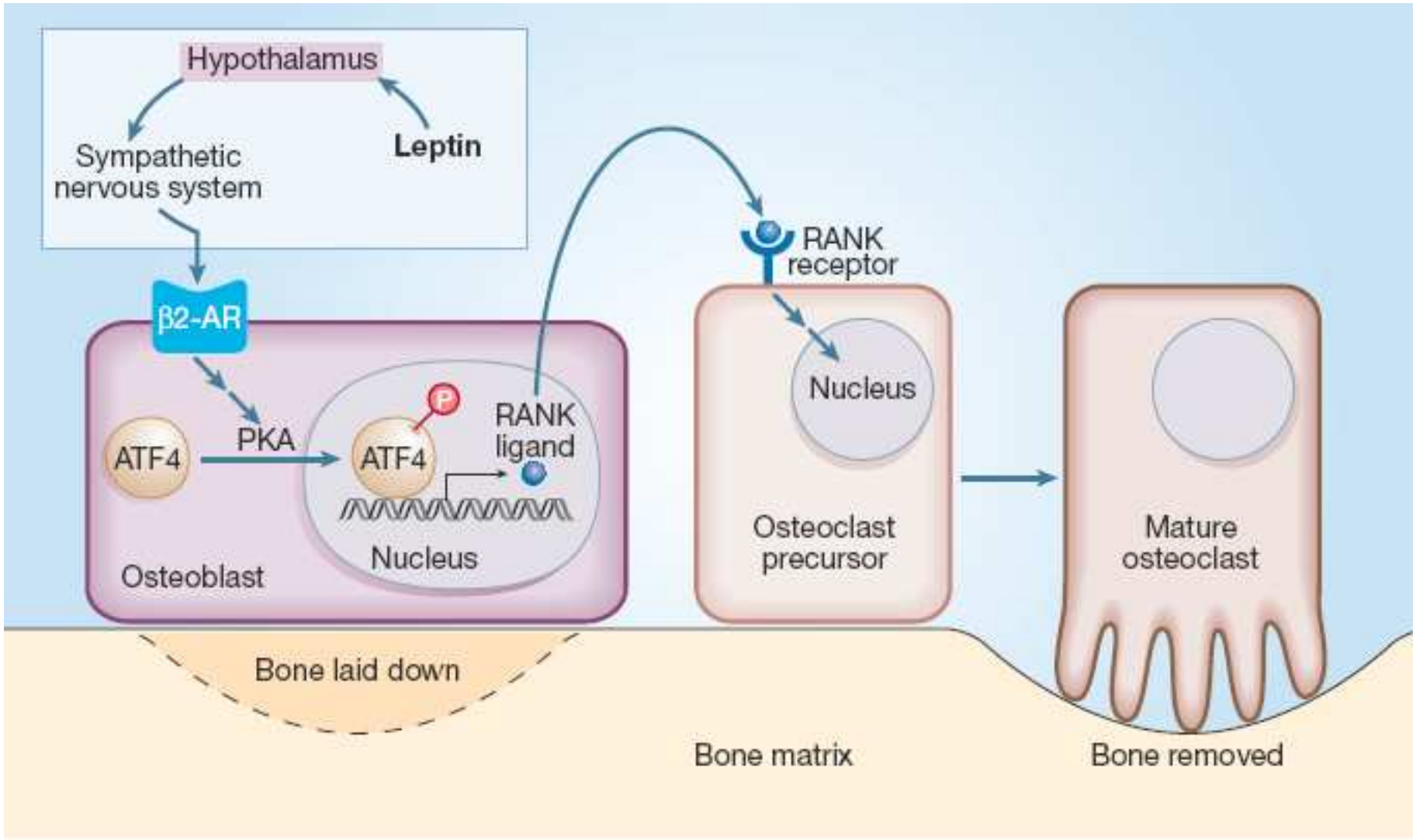
Do neural signals remodel bone?

Joel K. Elmquist and Gordon J. Strewler

The hormone leptin is best known for its influence on body weight. But it also controls bone mass, and recent work in mice is beginning to uncover the neuroendocrine systems involved.

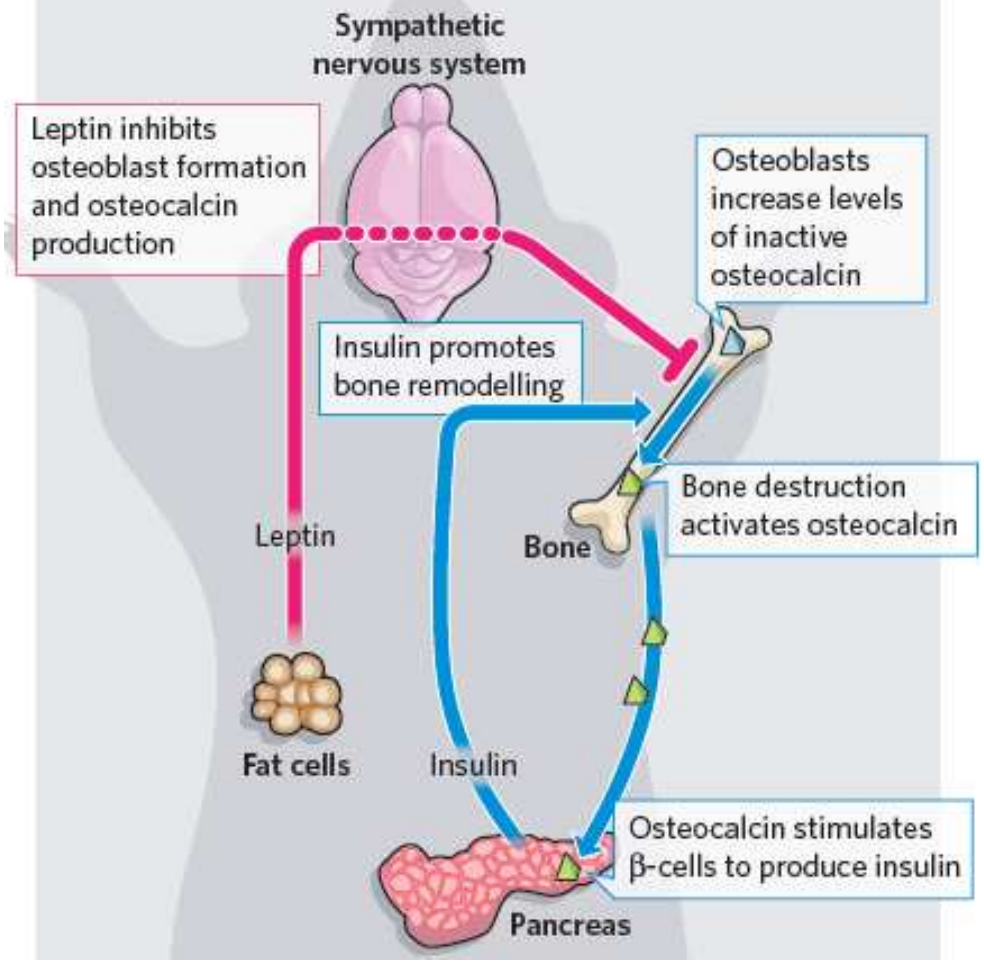
The hypothalamus is the part of the brain that maintains homeostasis, which includes regulating the autonomic nervous system — the unconscious system for monitoring and controlling the state of the body's internal organs. A key input to the hypothalamus is leptin, a hor-

for the effects of leptin on bone mass. The authors examined mice lacking the β2-adrenergic receptor (β2-AR) — one of several adrenergic receptors that respond to noradrenaline, a neurotransmitter released by sympathetic neurons. The mutant mice are resistant to the bone-reducing effects


Hypothalamus
Sympathetic nervous system
Leptin
β2-AR
PKA
ATF4
ATF4
P
RANK ligand
Nucleus
Osteoblast
Bone laid down
RANK receptor
Nucleus
Osteoclast precursor
Mature osteoclast
Bone matrix
Bone removed

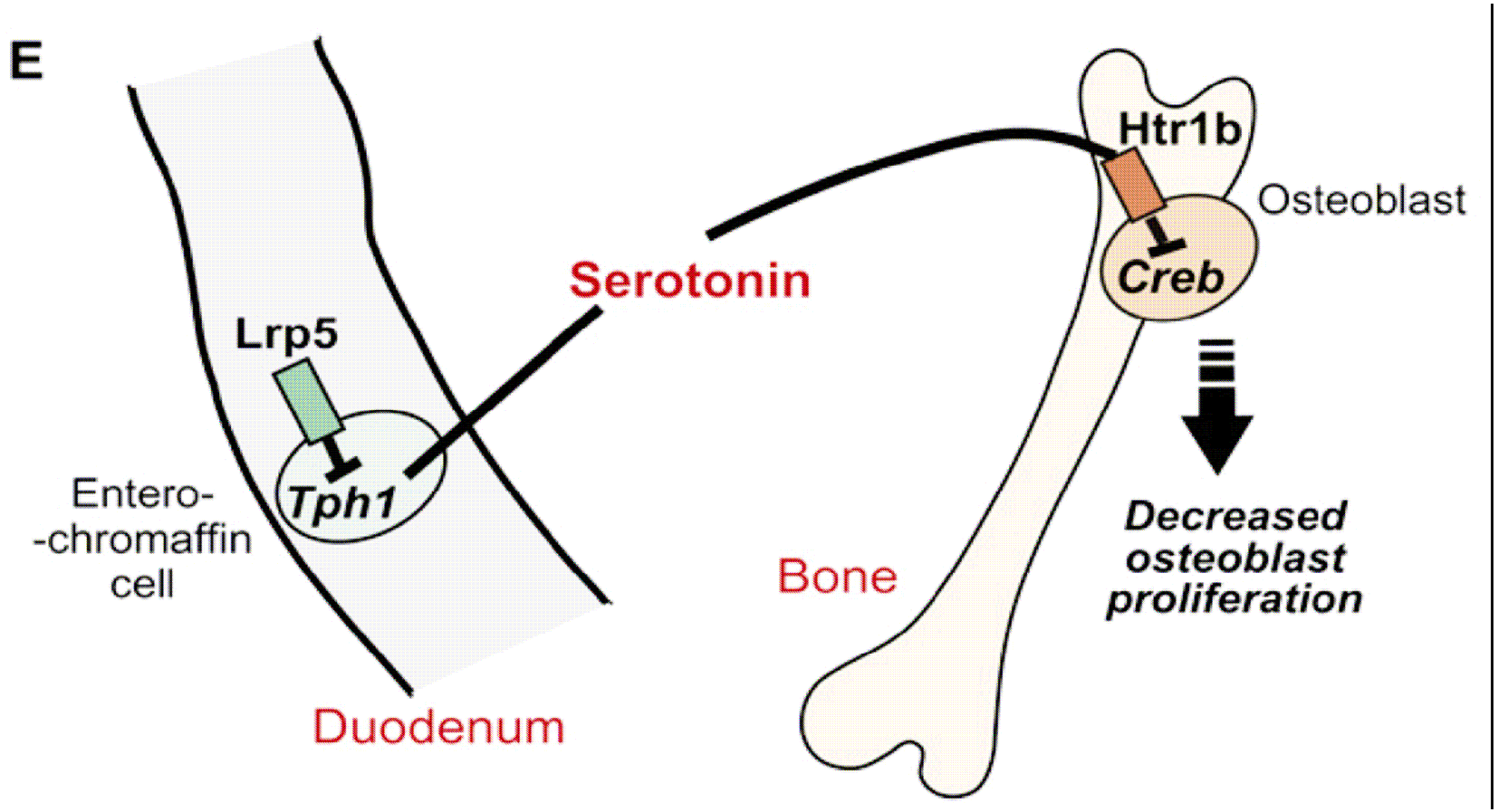
CLOSE TO THE BONE

Bone remodelling includes both building of bone (by cells called osteoblasts) and destruction of bone (by osteoclasts). This dynamic, energy-intensive process seems to interact with metabolism in multiple ways.



NATURE|Vol 466|19 August 2010

Genetic Interaction between Lrp5 and Serotonin



Yadav VK et al. Cell. 2008 Nov 28;135(5):825-37.

ORIGINAL INVESTIGATION

Use of Antidepressants and Rates of Hip Bone Loss in Older Women

The Study of Osteoporotic Fractures

Susan J. Diem, MD, MPH; Terri L. Blackwell, MA; Katie L. Stone, PhD; Kristine Yaffe, MD; Elizabeth M. Haney, MD; Michael M. Bliziotes, MD; Kristine E. Ensrud, MD, MPH

Background: Serotonin transporters have recently been described in bone, raising the possibility that medications that block serotonin reuptake could affect bone metabolism.

Methods: We assessed current use of selective serotonin reuptake inhibitors (SSRIs) and tricyclic antidepressants (TCAs) and obtained serial bone mineral density (BMD) measurements in a cohort of 2722 older women (mean age, 78.5 years) participating in the Study of Osteoporotic Fractures, a prospective cohort study of community-dwelling women. Hip BMD was measured at the sixth examination and an average of 4.9 years later at the eighth examination. We categorized women as nonusers (used no SSRIs or TCAs at either examination; n=2406), SSRI users (used SSRIs but no TCAs at either examination; n=198), or TCA users (used TCAs but no SSRIs at either examination; n=118). Depressive symptoms were identified using a cutoff score of at least 6 on the Geriatric Depression Scale.

Results: After adjustment for potential confounders, including the Geriatric Depression Scale score, mean total hip BMD decreased 0.47% per year in nonusers compared with 0.82% in SSRI users ($P<.001$) and 0.47% in TCA users ($P=.99$). Higher rates of bone loss were also observed at the 2 hip subregions for SSRI users. Results were not substantially altered when women who scored at least 6 on the Geriatric Depression Scale were excluded from the analysis.

Conclusion: Use of SSRIs but not TCAs is associated with an increased rate of bone loss at the hip in this cohort of older women.

Arch Intern Med. 2007;167:1240-1245

WIRKUNG VON SSRI

AUF KNOCHEN

CANADIAN MULTICENTER

OSTEOPOROSIS STUDY

OR 2,1 (1,3-3,4)

Richards JB, CMOSRSG 2007 The impact of selective serotonin reuptake inhibitors on the risk of fracture. Arch Intern Med 167:188–194

ROTTERDAM STUDY

OR 2,35 (1,37-1,48)

Ziere G, 2008 Selective serotonin reuptake inhibiting antidepressants are associated with an increased risk of nonvertebral fractures. Clin Psychopharmacol 28:411–417

Ultralow-Dose Micronized 17β-Estradiol and Bone Density and Bone Metabolism in Older Women

A Randomized Controlled Trial

Karen M. Prestwood, MD

Anne M. Kenny, MD

Alison Kleppinger, MS

Martin Kulldorff, PhD

Context Estrogen therapy is known to prevent osteoporosis, but studies have shown that conventional doses increase adverse events. Whether lower doses, one quarter of standard treatment, prevent bone loss is not known.

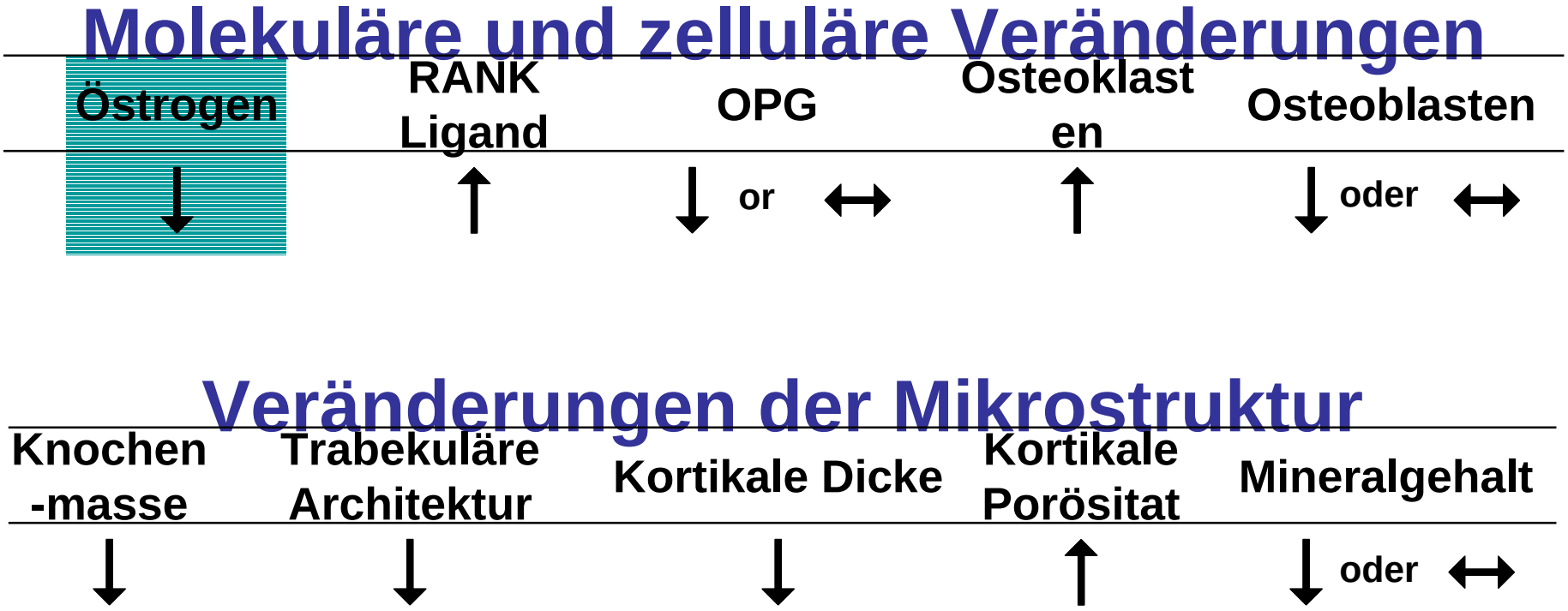
Objective To examine the effect of 3 years of treatment with 0.25 mg/d of micronized 17β-estradiol on bone mineral density (BMD) and bone turnover in healthy older postmenopausal women.

Supra low estrogen replacment therapy

- estradiol-valerat oder benzoat 0.025
- ethanol 96 % 4,0
- propylenglycol ad 10,0 ad

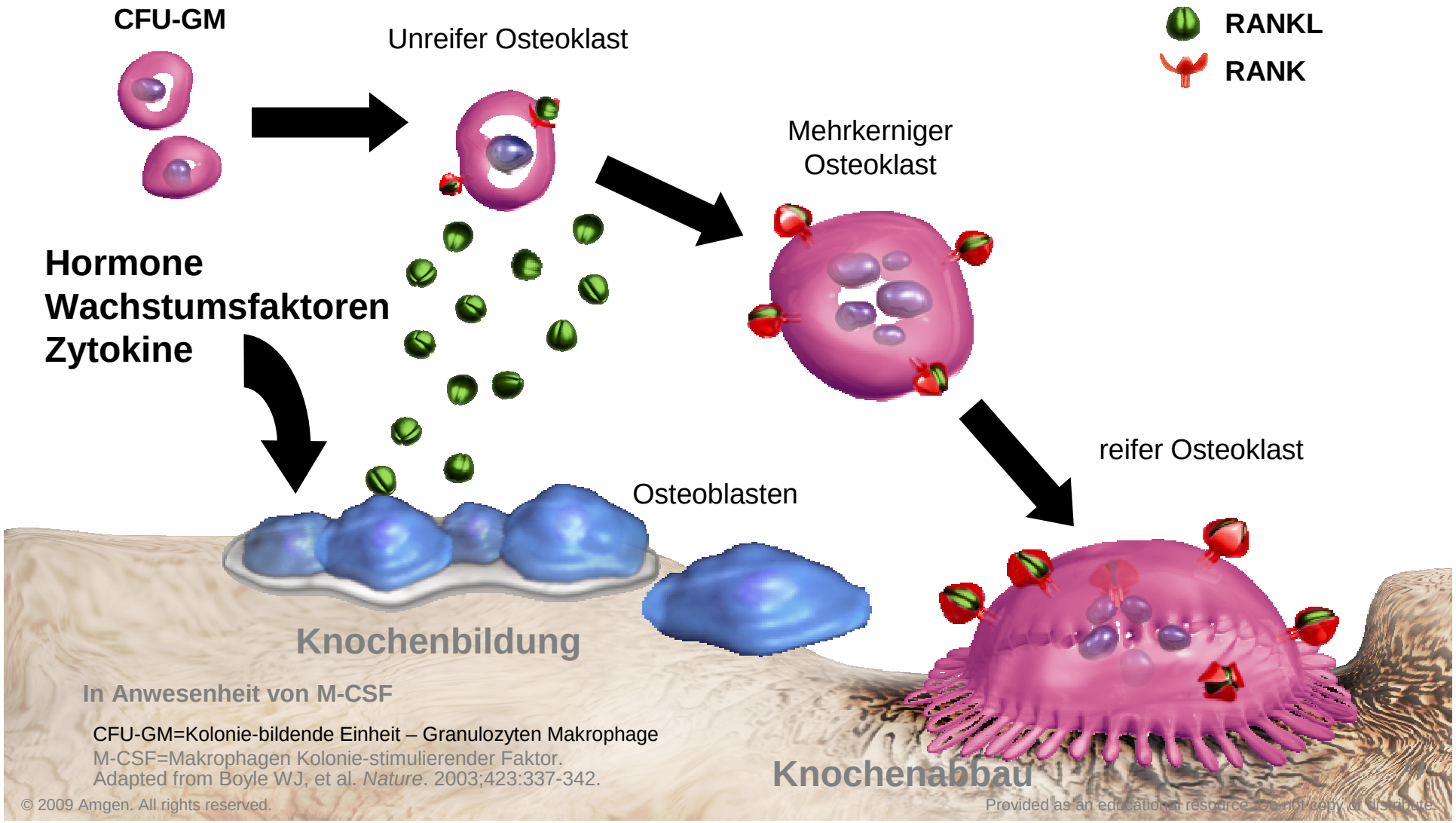
- MDS: estradiol-drops
- 10 drops are 1 mg estradiol
- Event.Sacch.Natrium 0.05 g

auf den Knochenstoffwechsel auswirken

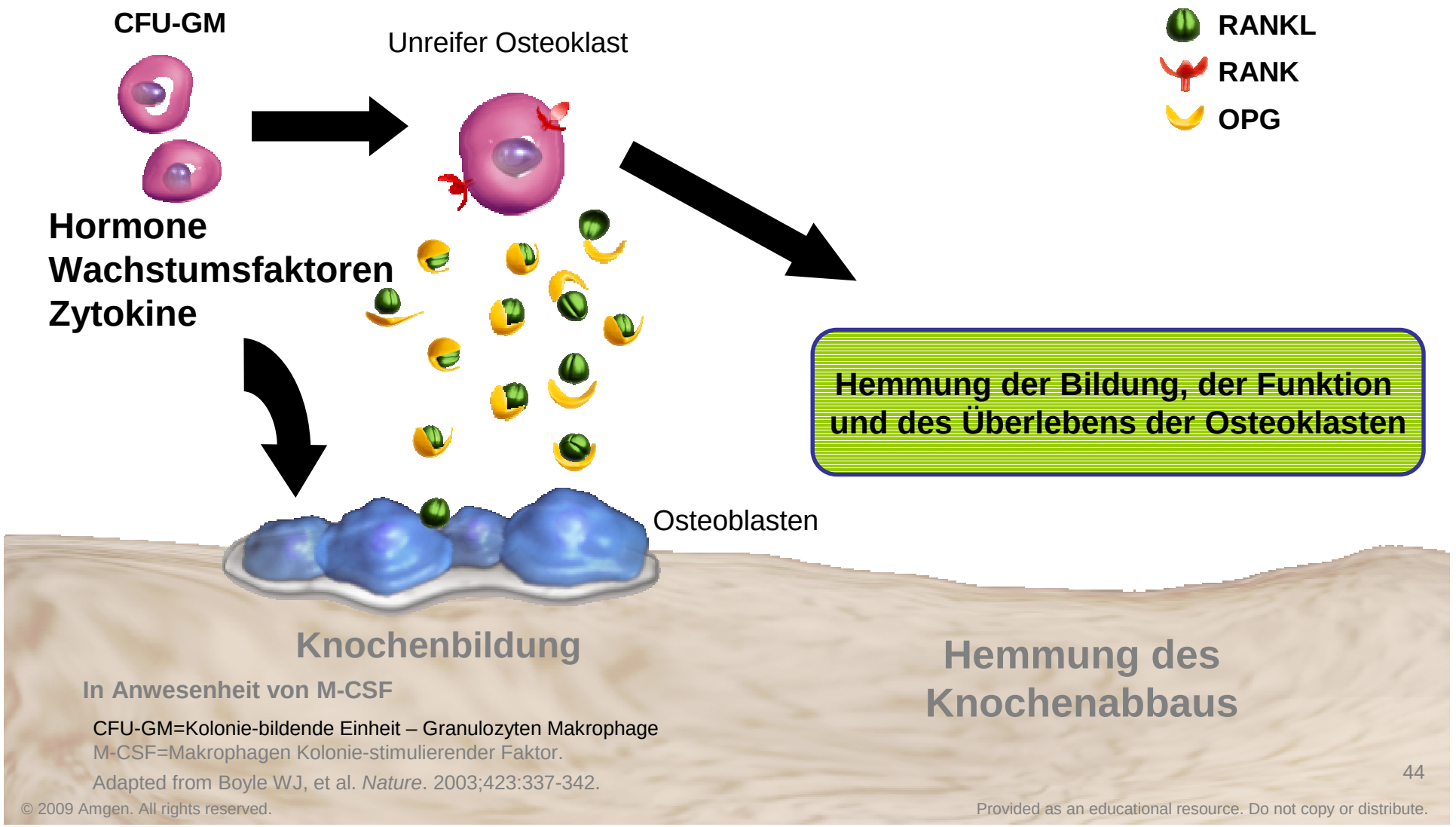


Eghbali-Fatourechi G, et al. *J Clin Invest*. 2003;111:1221-1230.
Hofbauer LC, et al. *Endocrinology*. 1999;140:4367-4370.
Shevde NK, et al. *Proc Nat Acad Sci*. 2000;97:7829-7834.
Riggs BL, et al. *J Bone Miner Res.* 1998;13:763-773.
Chavassieux P, et al. *Endocrine Rev*. 2007;28:151-164.

RANK Ligand ist Mediator des Knochenabbaus



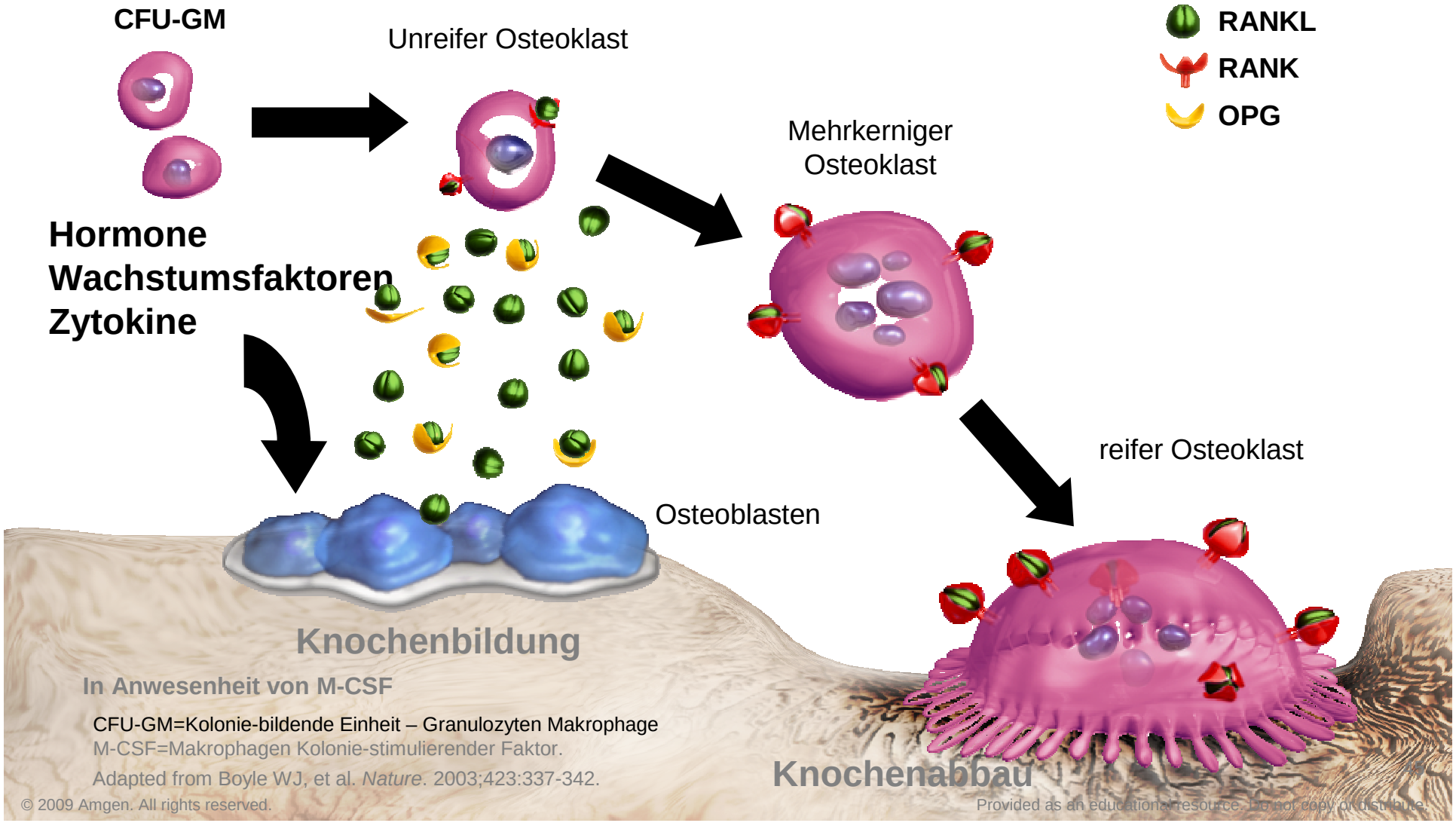
Osteoprotegerin (OPG) schützt vor Knochenabbau



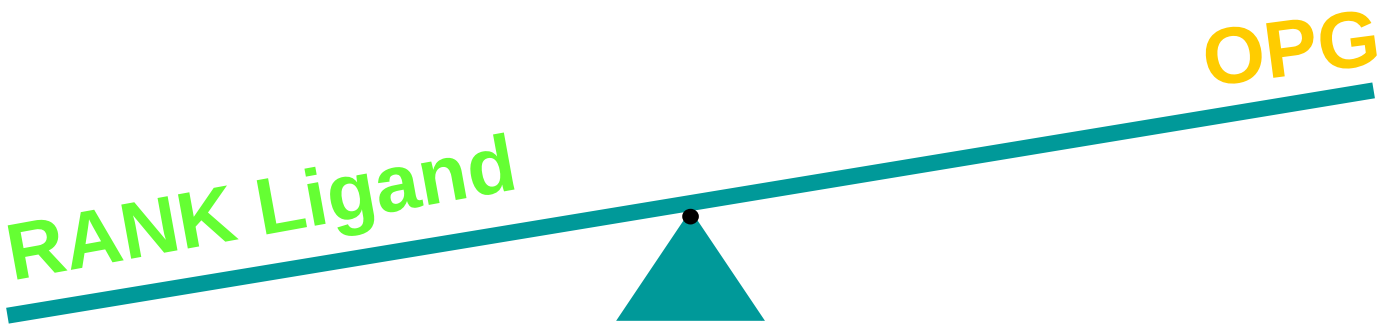
CFU-GM=Kolonie-bildende Einheit – Granulozyten Makrophage
M-CSF=Makrophagen Kolonie-stimulierender Faktor.

Adapted from Boyle WJ, et al. *Nature*. 2003;423:337-342.

vom Verhältnis der OPG- und RANKL Expression ab



führt zu einer erhöhten Knochenresorption



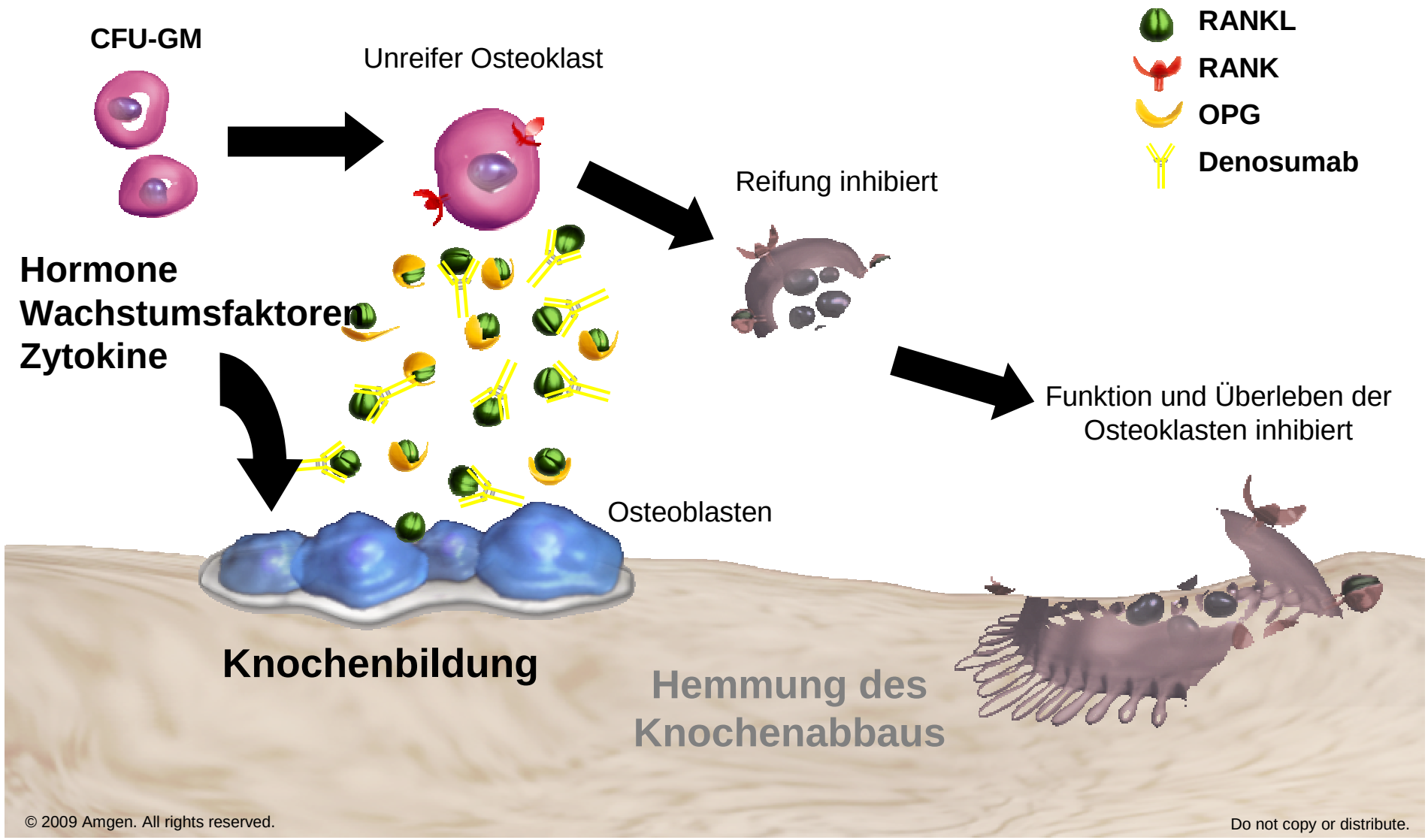
fördert die Aktivität der Osteoklasten

verhindert die Aktivität der Osteoklasten

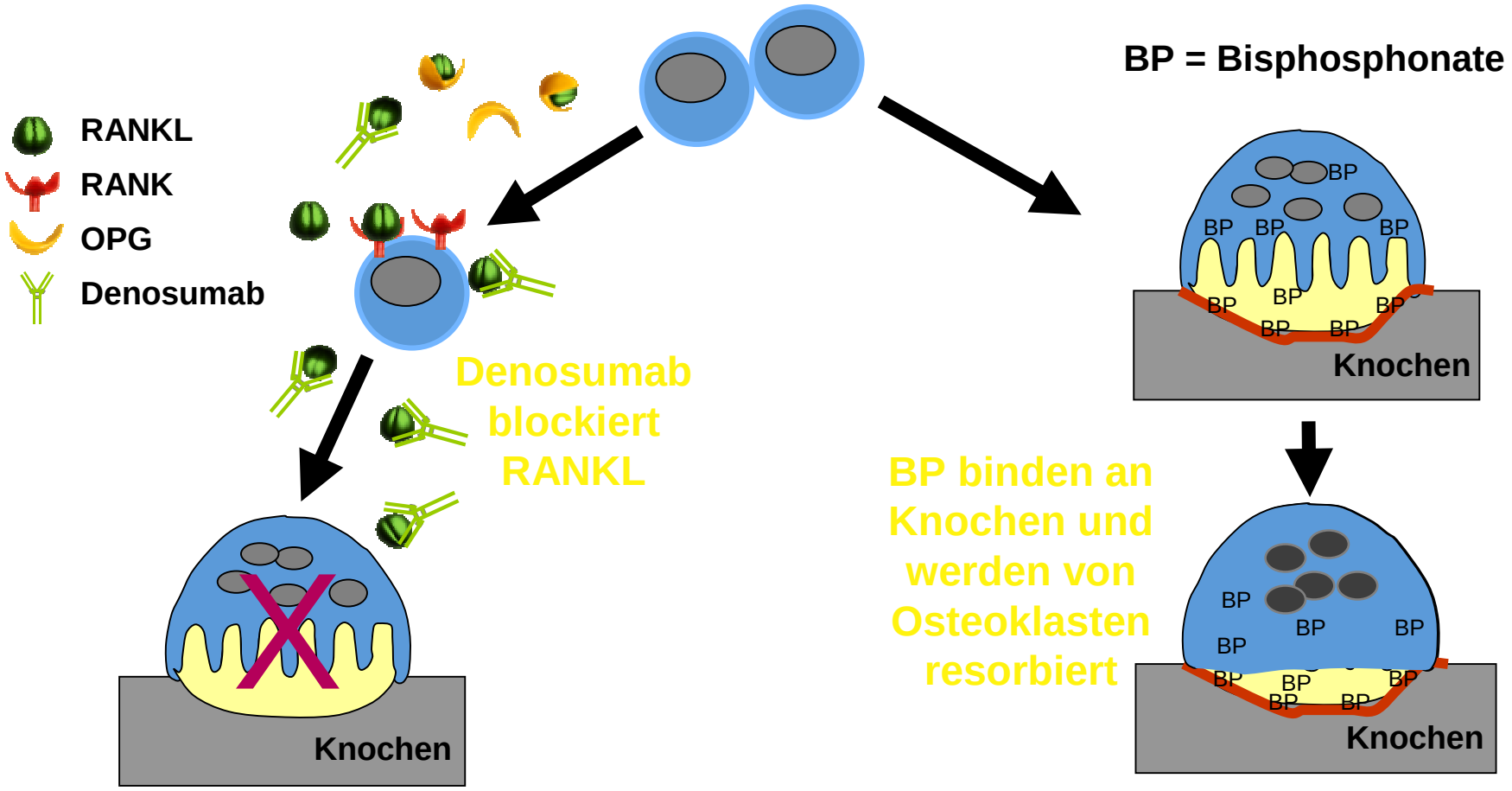
Aktivität der Osteoklasten

Hofbauer L *et al*. *JAMA* 2004; 292: 490-495; Lacey D *et al*. *Cell* 1998; 93: 165-176; Boyle W *et al*. *Nature* 2003; 423: 337-342

Denosumab hemmt RANKL und Knochenabbau

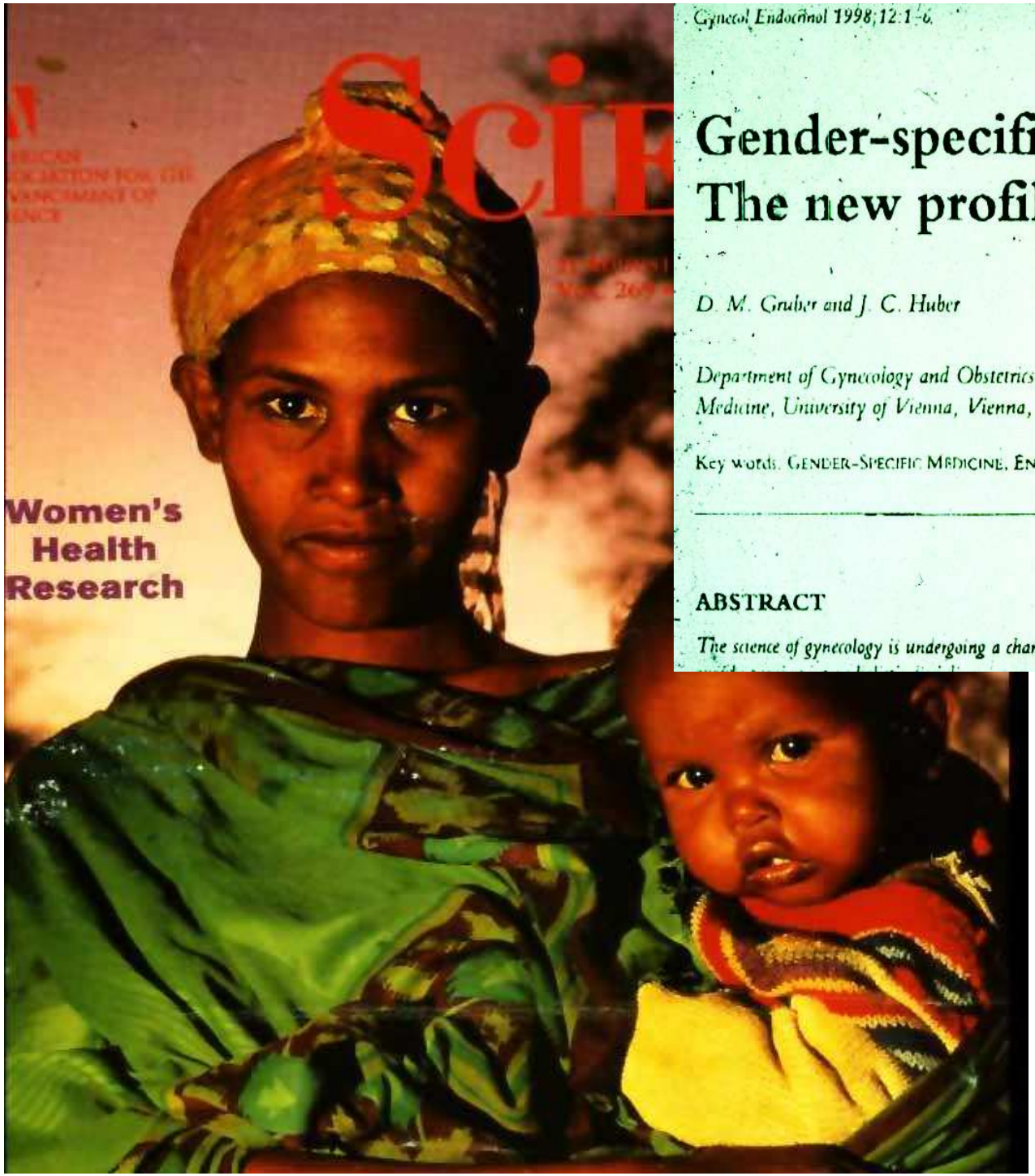


sich grundlegend im Wirkmechanismus



Denosumab hemmt Bildung, Funktion und Überleben der Osteoklasten

BP → Verlust der Resorptionsfähigkeit „Funktionsunfähige“ Osteoklasten leben weiter



Gynecol Endocrinol 1998;12:1-6.

Gender-specific medicine. The new profile of gynecology

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Key words. GENDER-SPECIFIC MEDICINE, ENDOCRINE SYSTEM, REPRODUCTION

ABSTRACT

The science of gynecology is undergoing a change and is

promoted the vaginal radical hysterectomy. Two