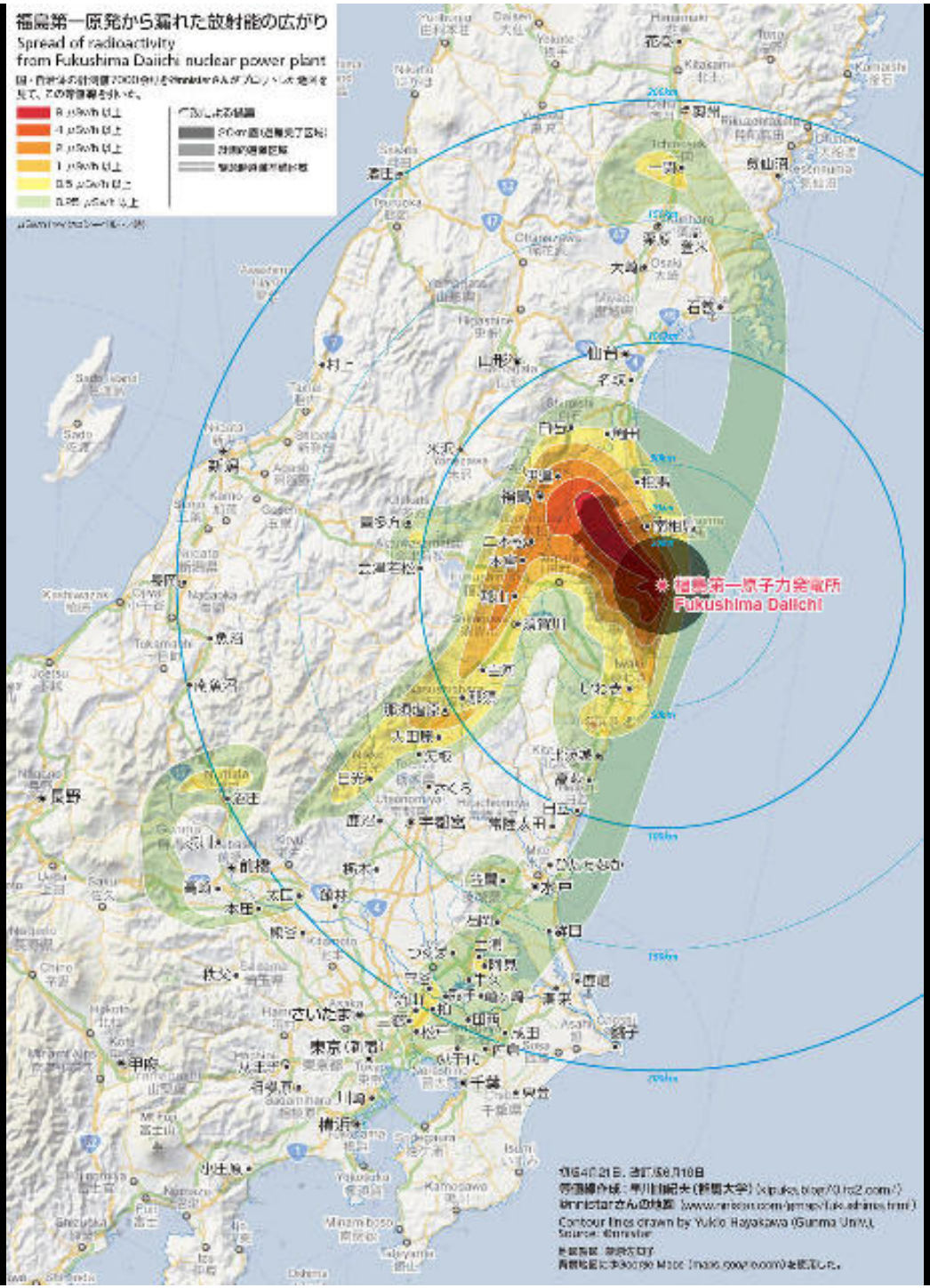
People of Futaba-machi and "Low Dose" Internal Radiation Exposure

Gifu Research Institute for Environmental Medicine

Matsui Eisuke

Radioactive particles flew 3 different directions over 200km apart and deposited in the soil

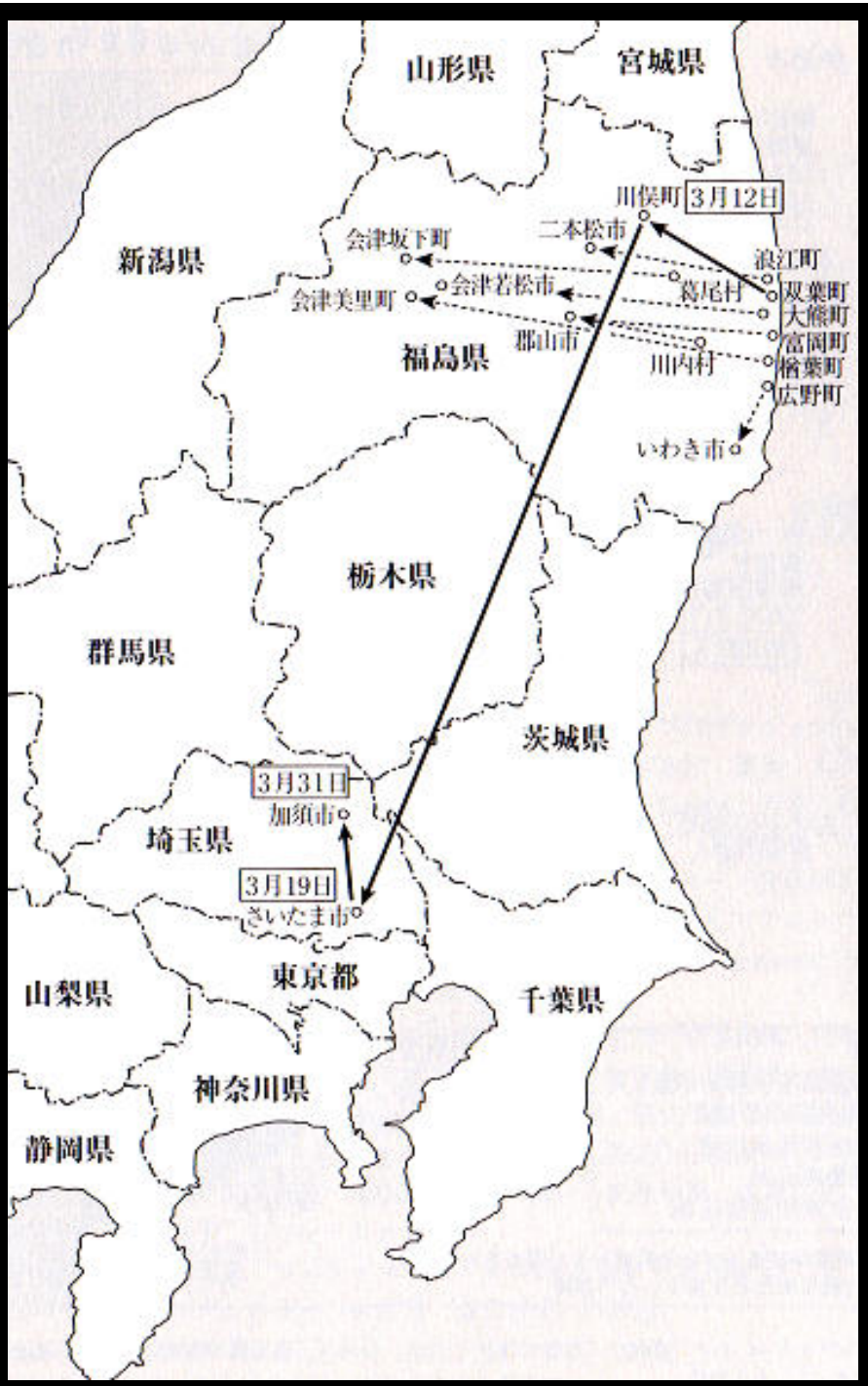
[Yukio Hayakawa, Gunma University]



Evacuation of People and Local Government Futaba-machi

March
2011

[Funahashi Atsushi
Futabakara tooku
hanarete- hinanjo karamita
genpatsu to nihonshakai
(2012)
Iwanamishoten]



Population Futaba-machi ca. 7,000

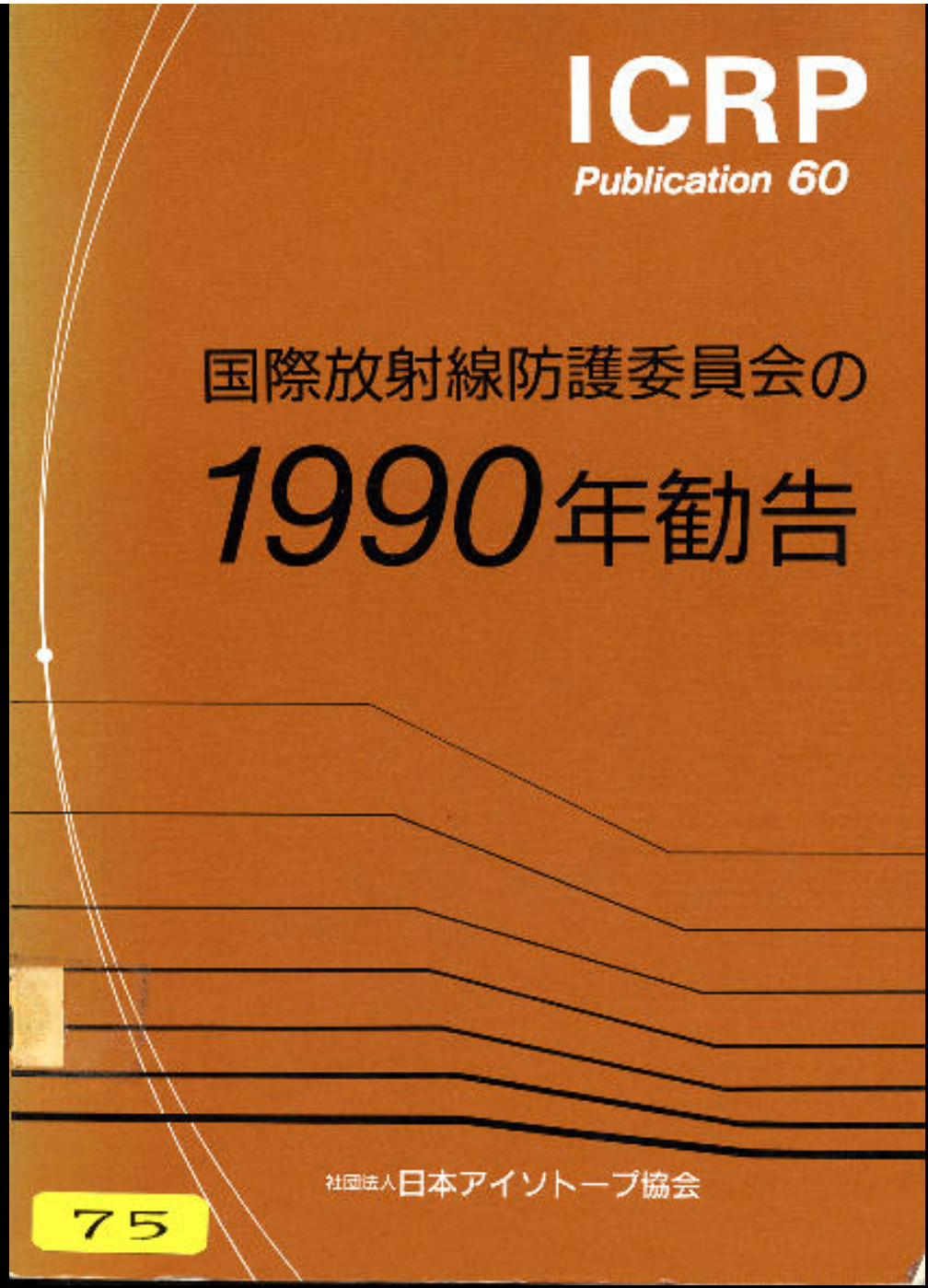
- Population total 6971 (2012.09.18)
- ca. a half in Fukushima,
- another half Saitama prefecture etc.

External and Internal Radiation

- External: high dose
  far
  γ -ray
  short time
- Internal: low dose
  near
  α -ray, β -ray
  repeat, long time

ICRP estimates radiation effects from the data of External γ-ray exposure of Hibakusha in Hiroshima and Nagasaki

It calculates radiation risks as if human body homogenous



Radiation Effects: Lymphocyte and Erythrocyte

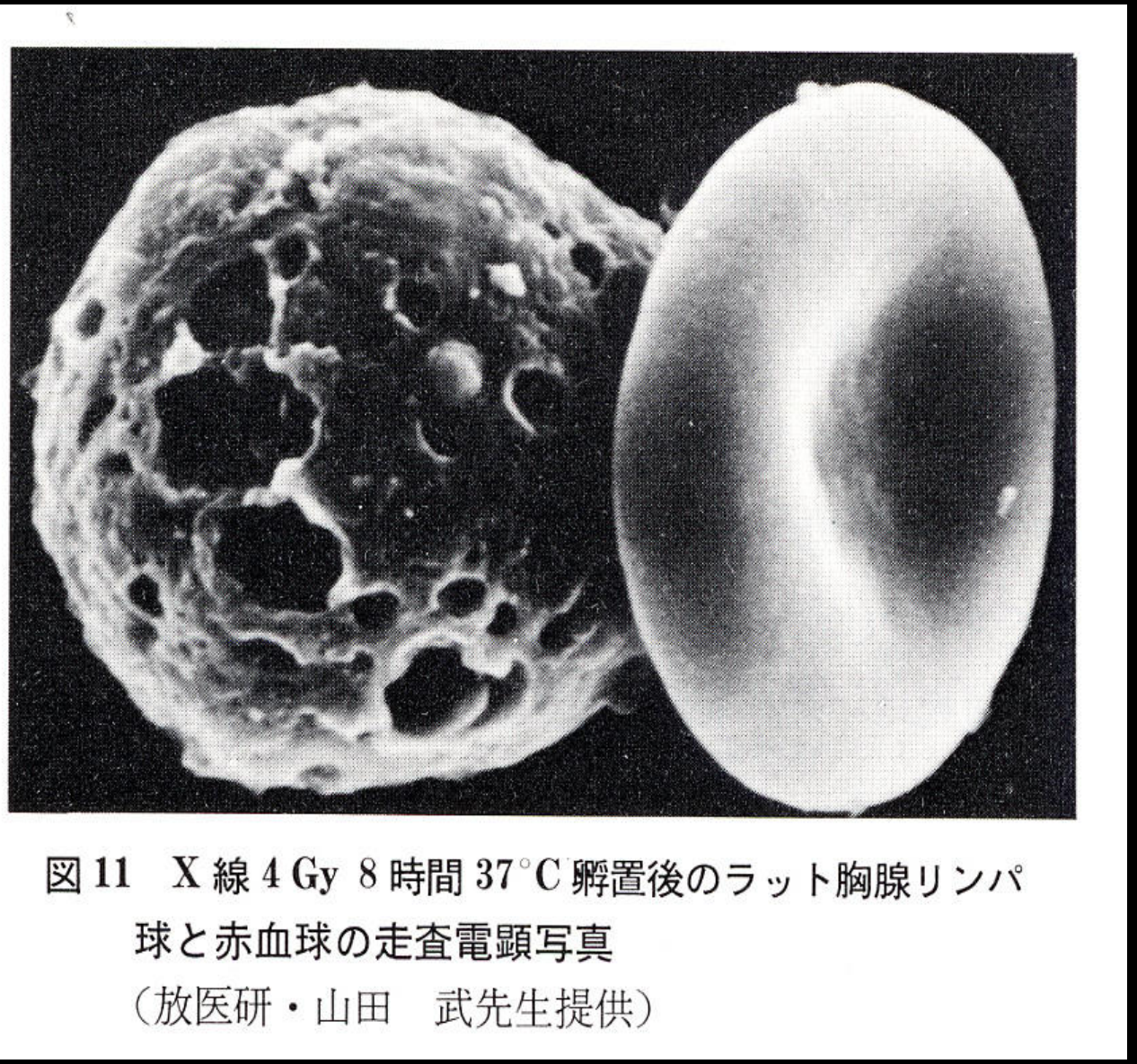
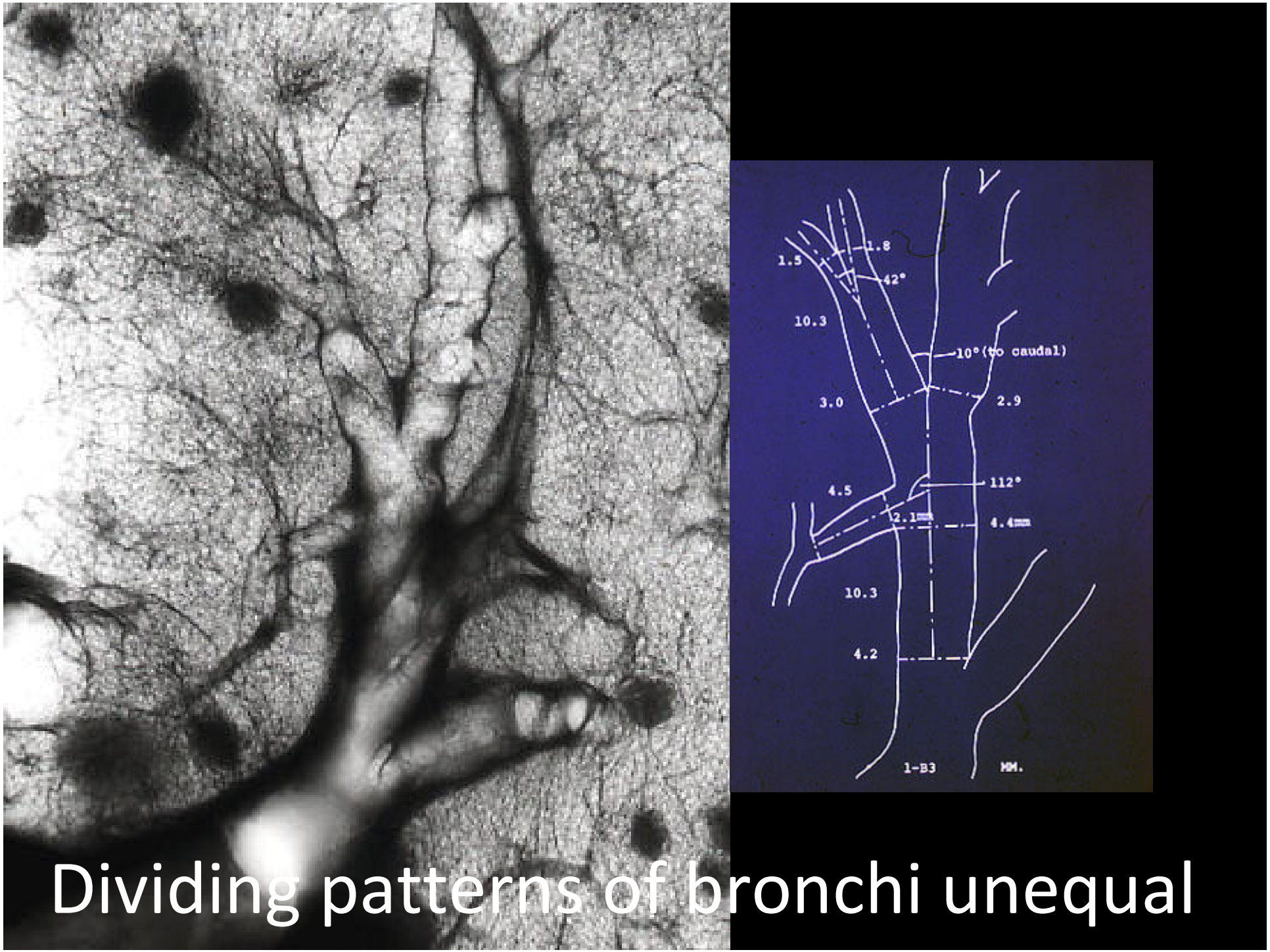
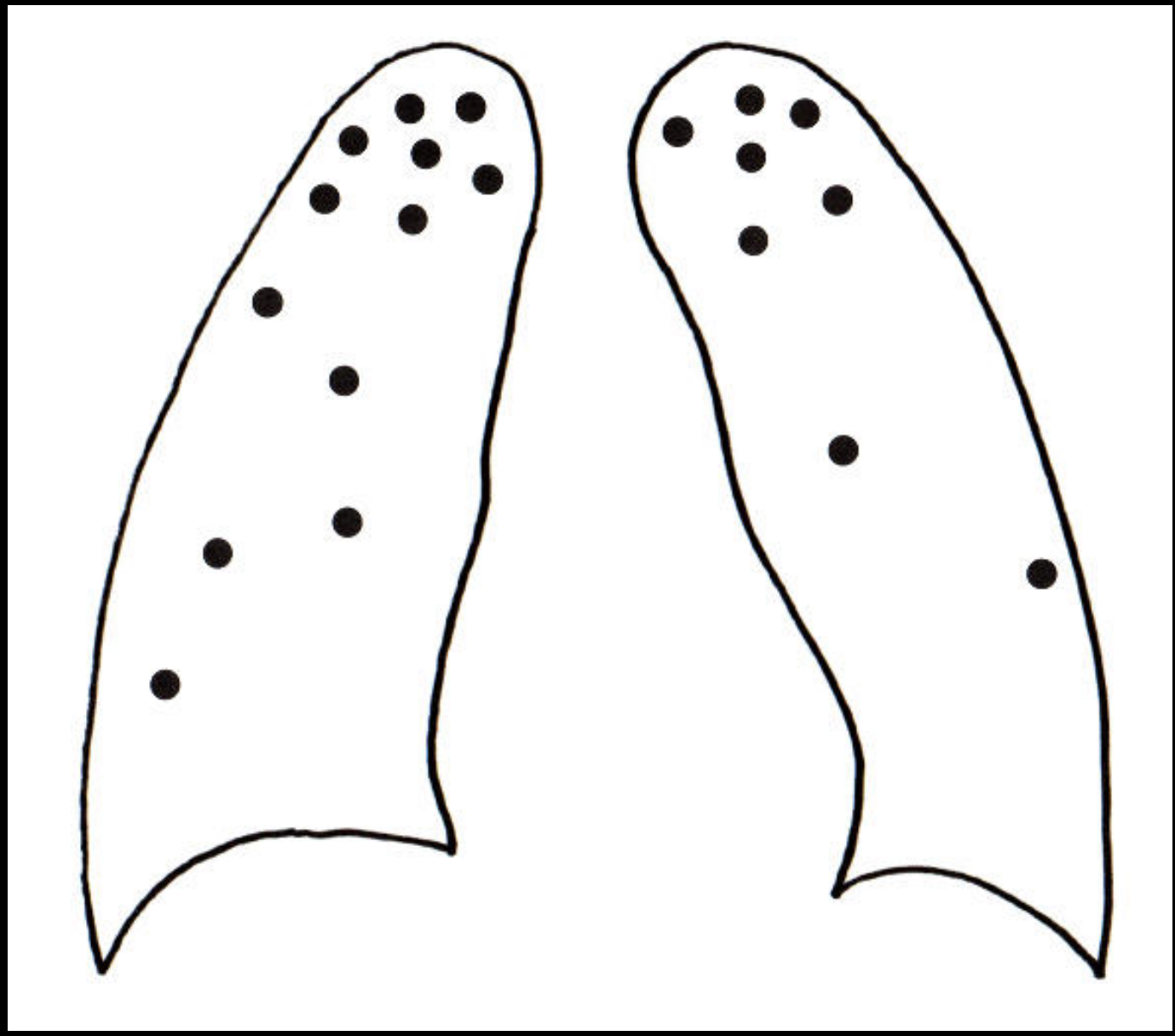


図 11　X 線 4 Gy 8 時間 37°C 孵置後のラット胸腺リンパ球と赤血球の走査電顕写真
（放医研・山田　武先生提供）



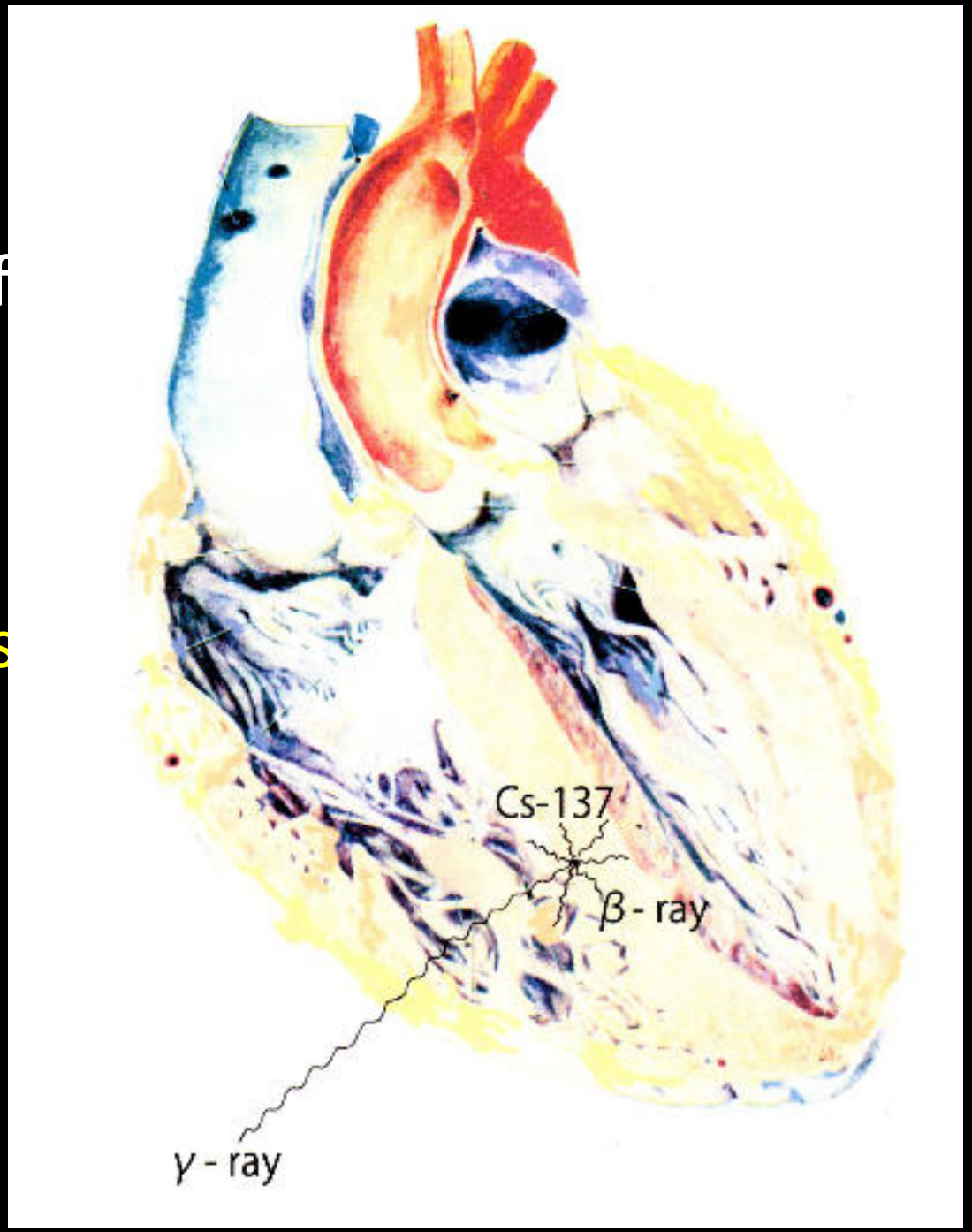
Dividing patterns of bronchi unequal



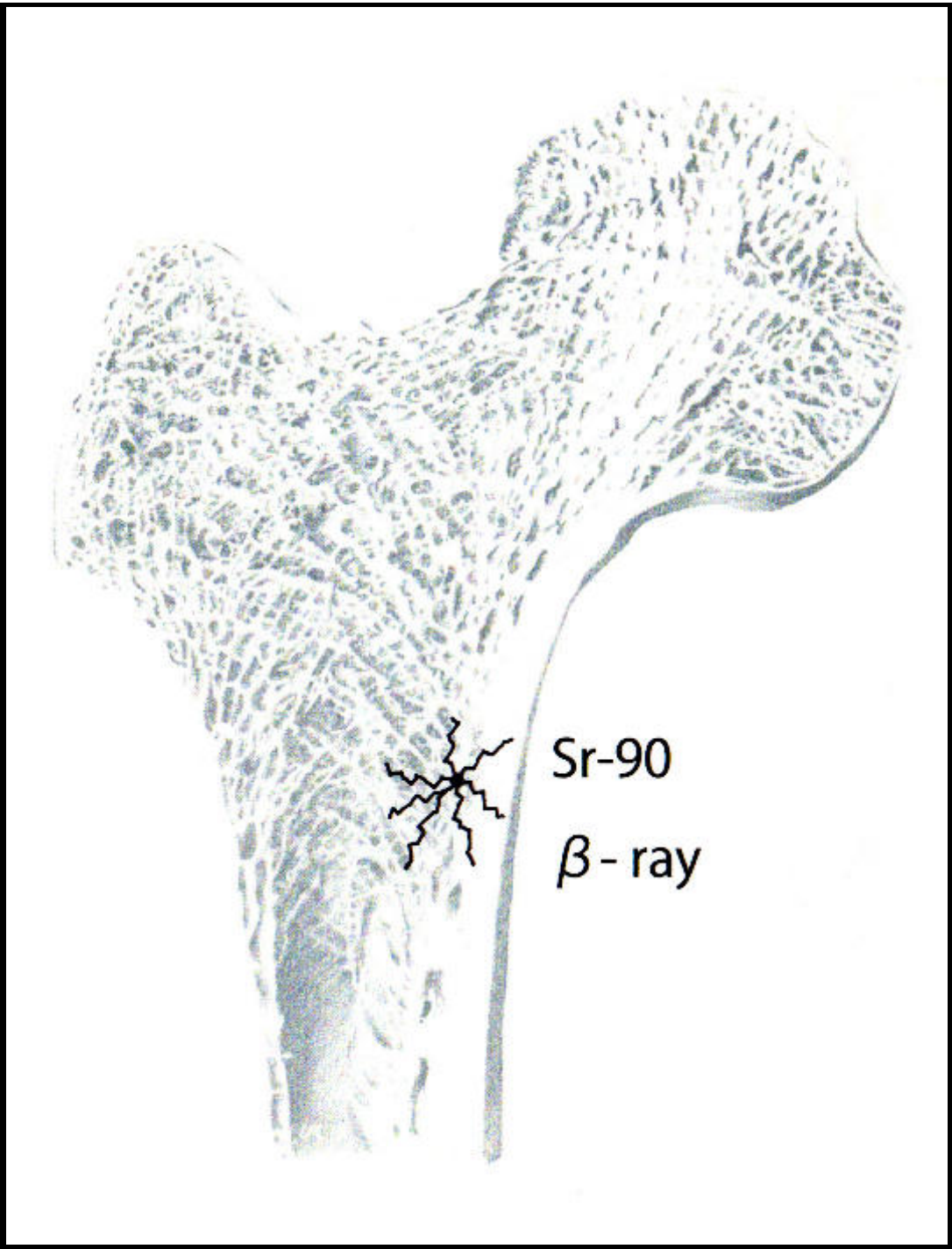
Hot spots in the Lung

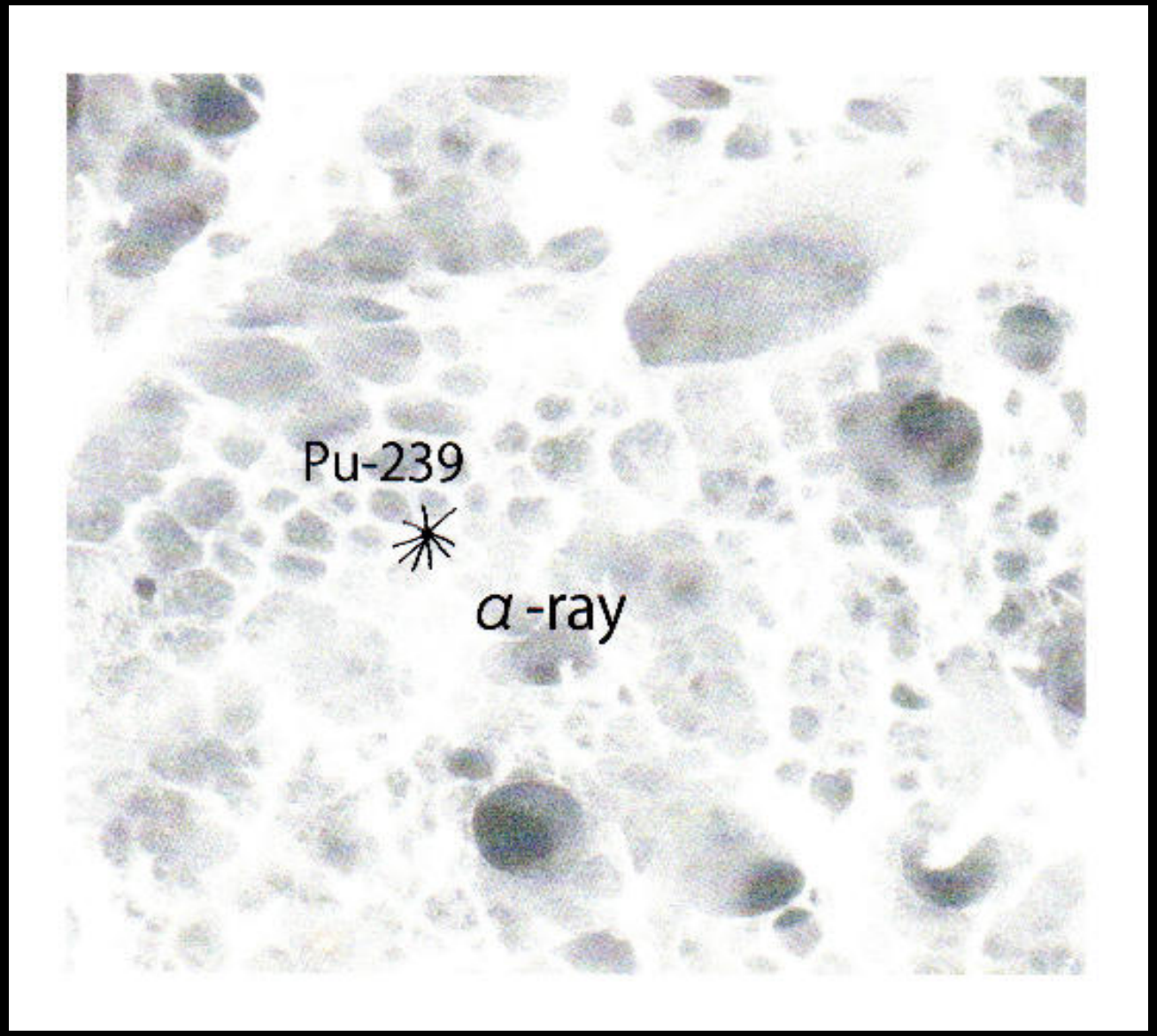
Structure of the Organ are not Homogenous

Small particles of Cs-137 in the heart irradiate γ -rays & β -rays

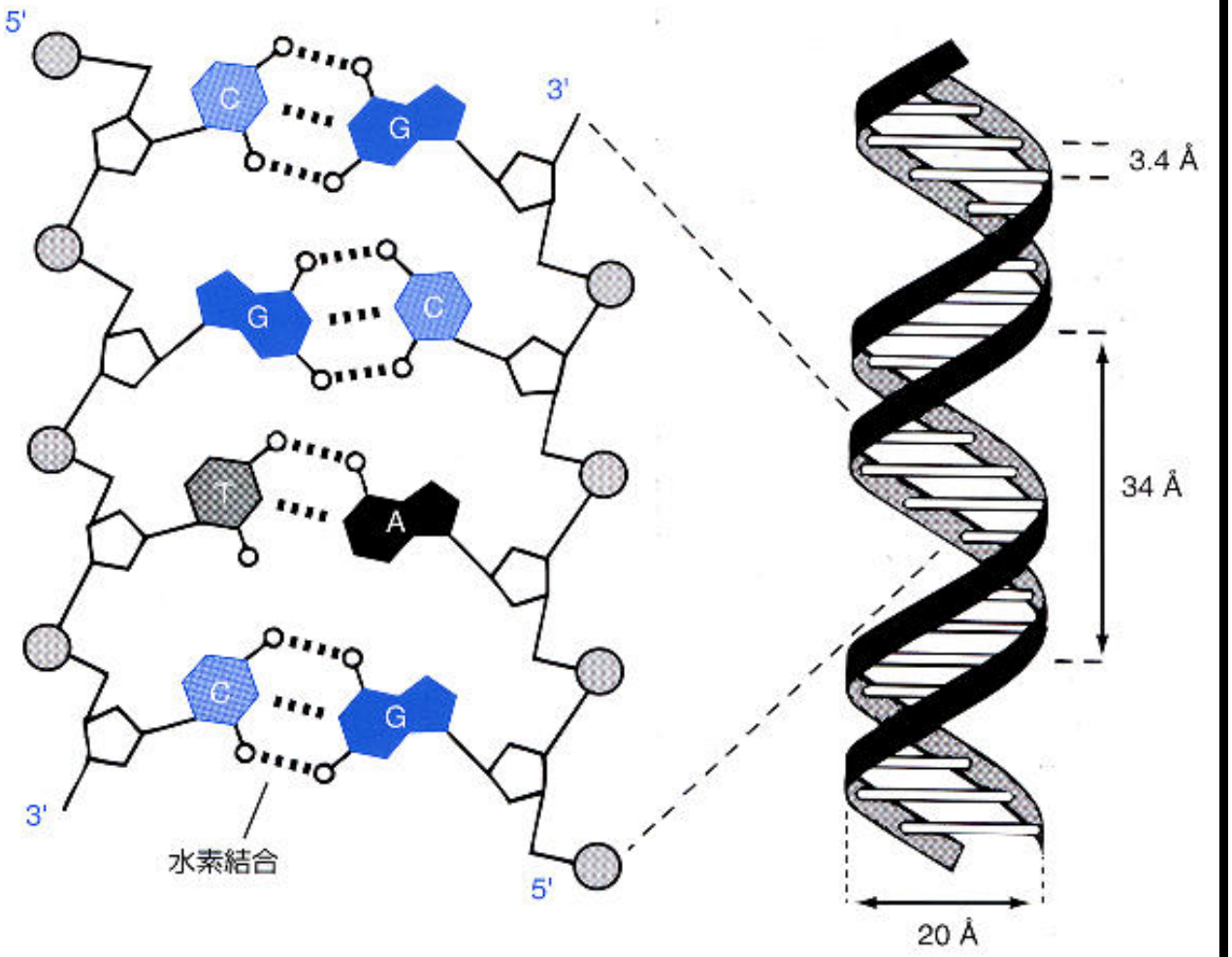


Small particles of Sr-90 in the bone irradiate β -rays



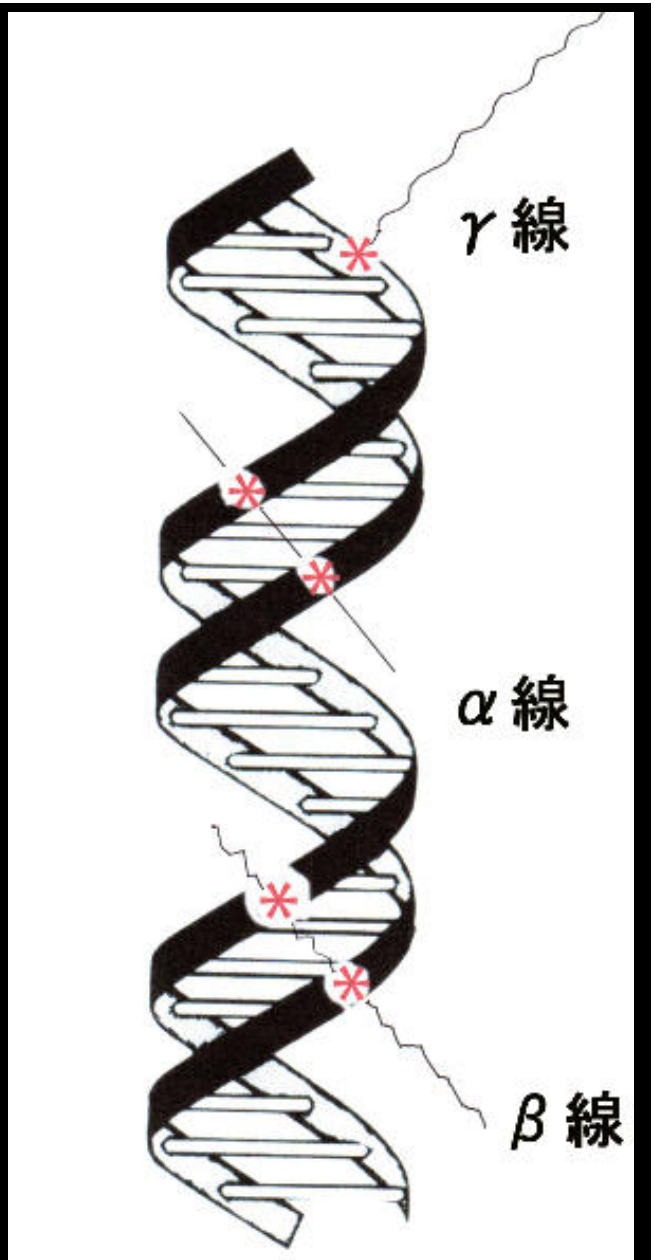


Small particles of Pu-239 in the lung irradiate α-rays

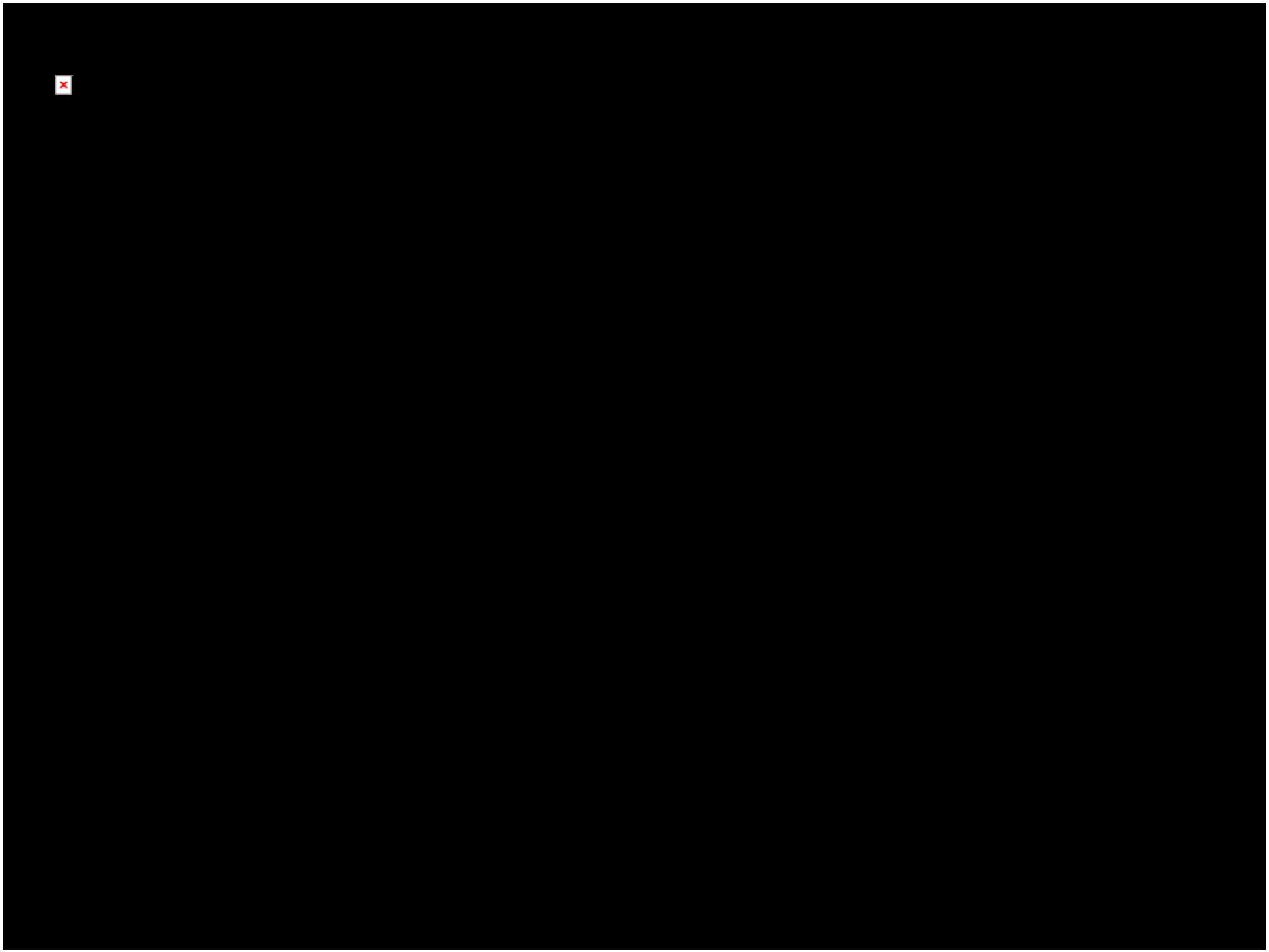


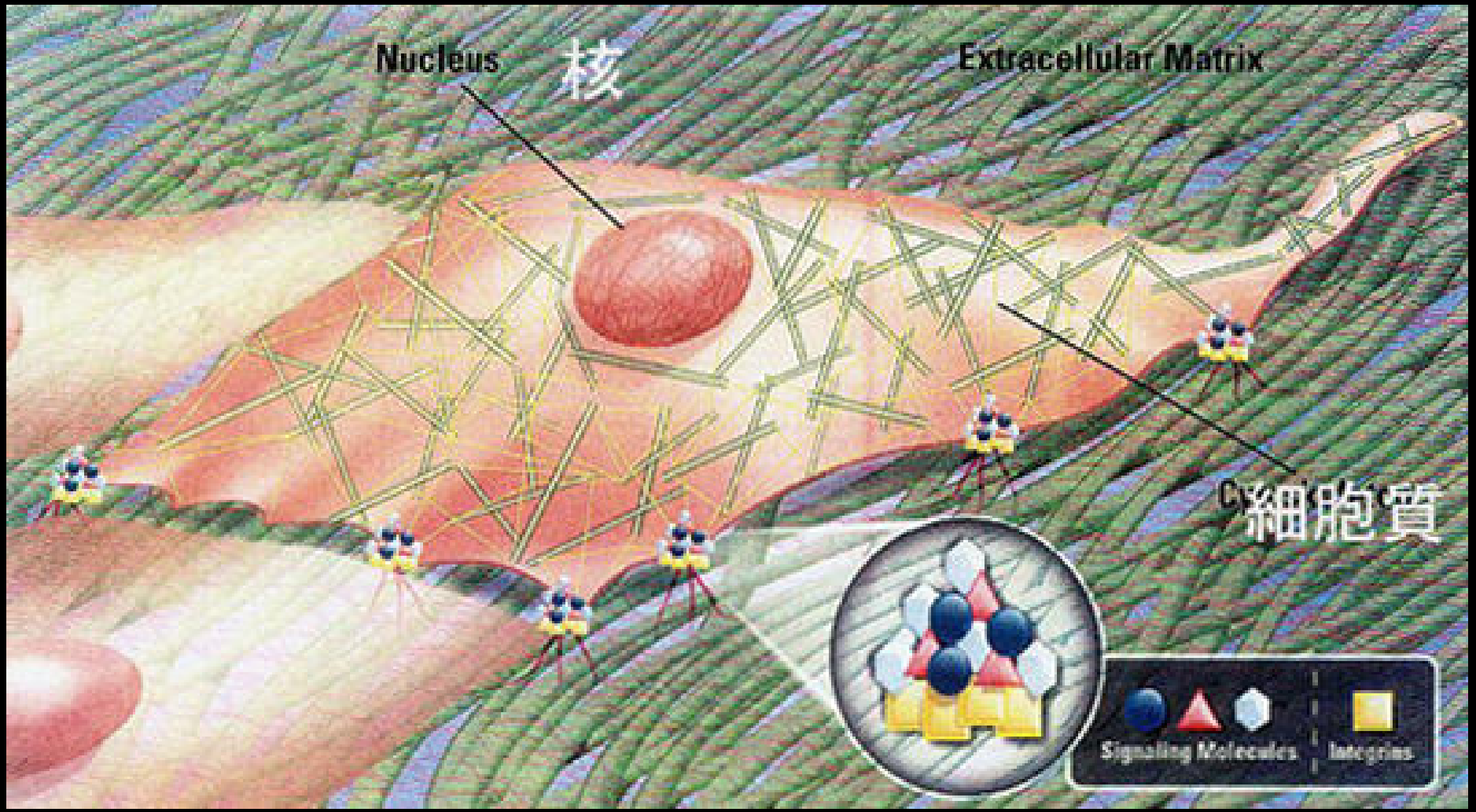
Structure of DNA: Double Strands

Thompson＆Thompson: Genetics in Medicine



Cut off DNA





Bystandar Effects

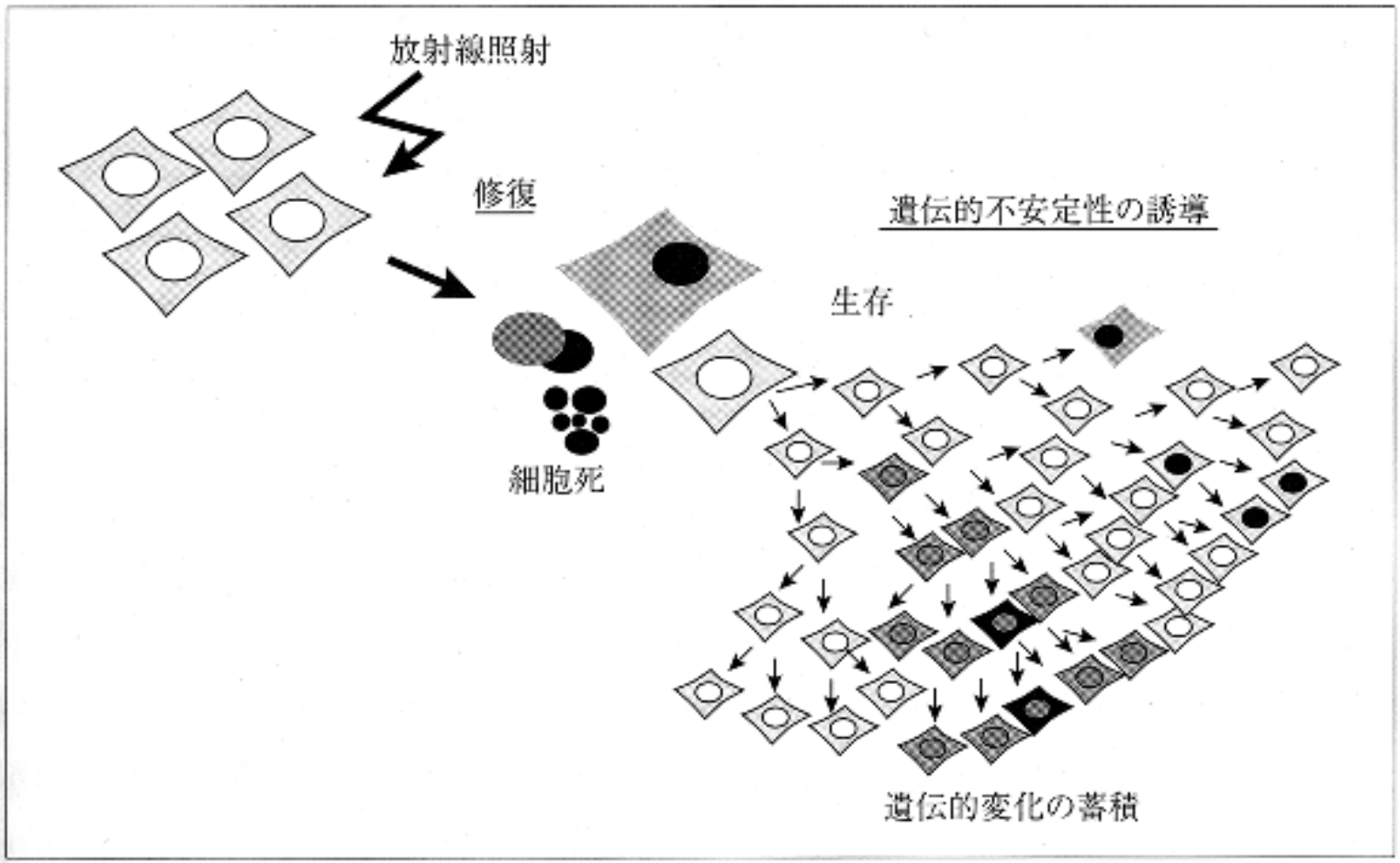


図８．６　遺伝的不安定性の誘導の模式図
放射線被ばくで生じた損傷が修復され生き残った細胞に細胞分裂に伴って新しい変異が次々と生ずる現象で，細胞は放射線被ばくをなんらかの仕組みで記憶していることを示唆する．

Genomic Instability

佐渡敏彦、福島昭治、甲斐倫明著「放射線および環境化学物質による発がん
―本当に微量でも危険なのか？」医療科学社、(2005）

Karl Ziegler **Morgan**

(September 27, 1907 – June 8, 1999)
American physicist, one of the founders of the field of radiation health physics.

Late in life, after a long career in the Manhattan project
1950 the first chairman of the Internal Radiation Committee ICRP

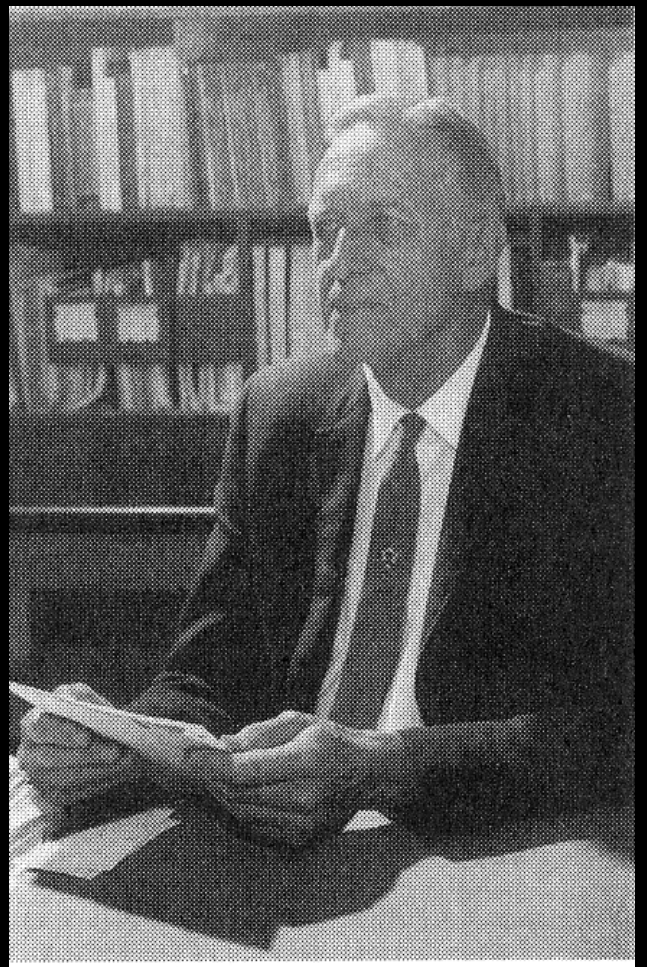


図49　1979年のカール・Z・モーガン。シルクウッド裁判の年。（写真：ORNLの好意による）

"ICRP not independent from nuclear companies"

ABCC and Unit 731

- ABCC: Atomic Bomb Casualty Commission
- Radiation Effects Research Foundation

- Unit 731: A covert biological and chemical warfare research and development unit of the Imperial Japanese Army(1937–1945)

To Save the Children

1） The Risk of Internal Radiation Exposure for Fetuses and Infants

2） Real Facts of Health Disorders Already Observed in the Contaminated Areas

3） Migration of Local Communities from Contaminated Areas

Ultrasonography of Thyroid Gland

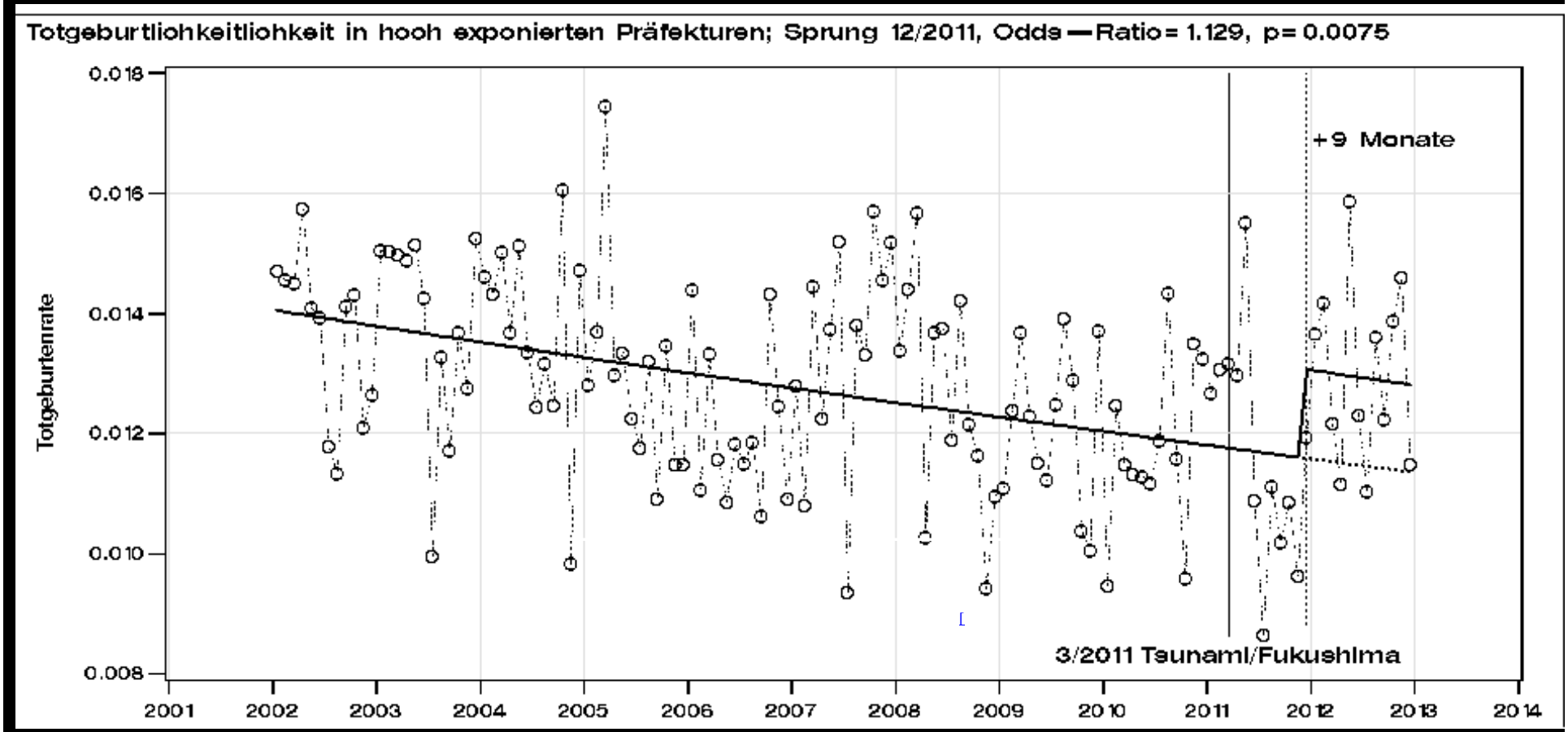
Children under 18yo in Fukushima Prefecture 2011-2013

	2011	2012	2013	Total
Tyroid Cancer*	10	22	1	33
Cytology **	4	28	9	41
Total	14	50	10	74
Examinee	41,561	139,239	88,554	269,354

* pathological diagnosis after surgery

** ultrasonography guided fine needle biopsy

data until 2013.11.15.

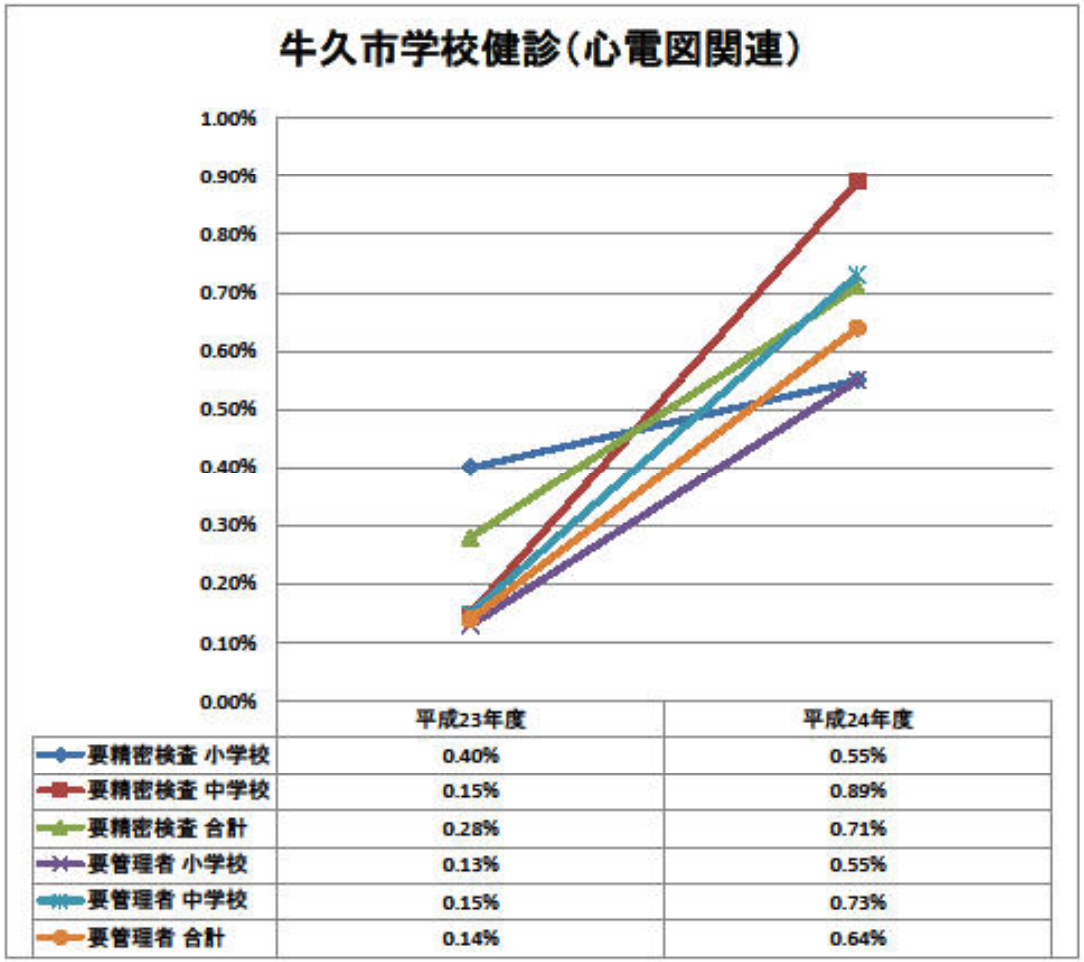


Totgeburtlichkeit in den hoch exponierten japanischen Präfekturen Ibaraki, Fukushima, Miyagi und Iwate

Von Masao Fukumoto, Kristina Voigt, Ralf Kusmierz, Hagen Scherb

Strahlentelex Nr. 650-651 / 28.Jahrgang, 6. Februar 2014

Abnomal ECG
Ushiku-city,
Ibaraki
Prefecture

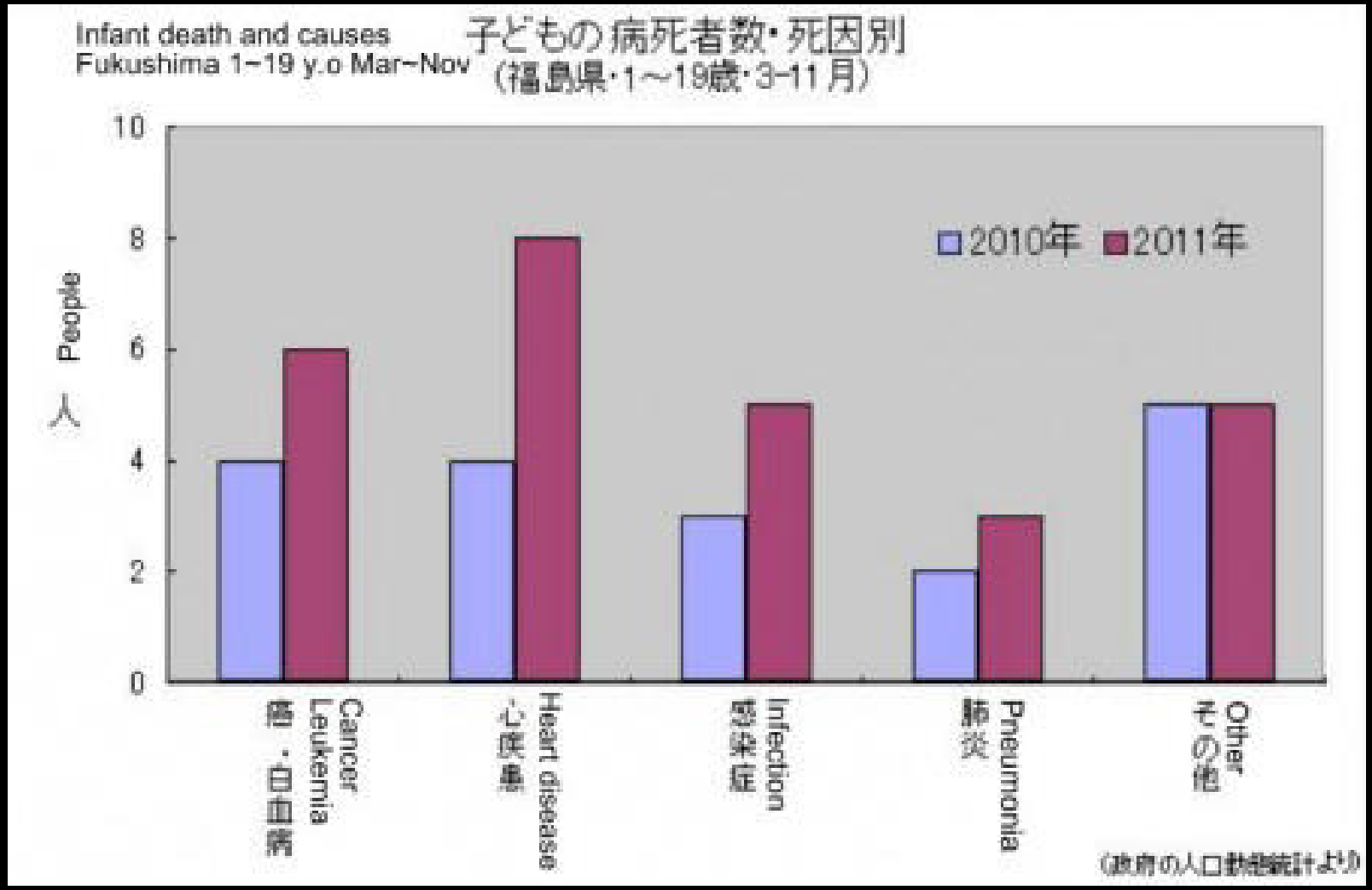


	平成23年度	平成24年度
要精密検査 小学校	0.40%	0.55%
要精密検査 中学校	0.15%	0.89%
要精密検査 合計	0.28%	0.71%
要管理者 小学校	0.13%	0.55%
要管理者 中学校	0.15%	0.73%
要管理者 合計	0.14%	0.64%

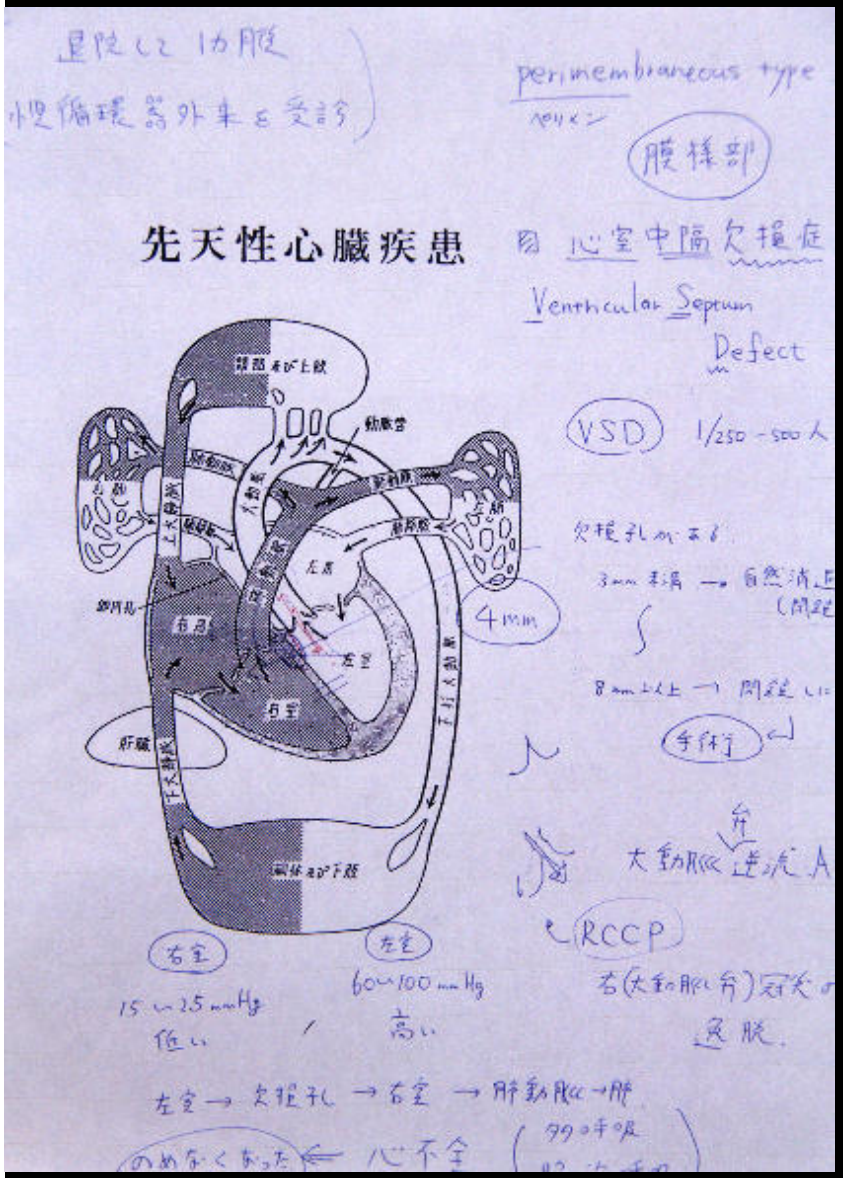
＜コメント＞

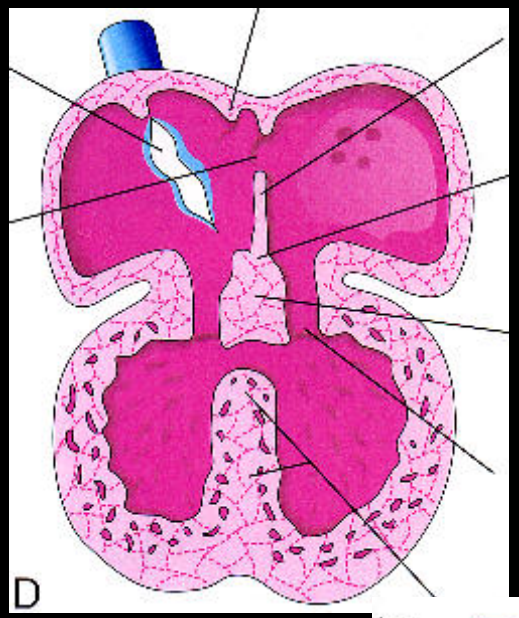
牛久市は震災前のデータは破棄してしまったため、震災後の2年分のみ。牛久市教育委員会は2年で個票を除くデータは破棄してしまうとのことです。 データは「茨城学校保健会」に送られています。

この「茨城学校保健会」とは、学校保健に関する調査研究事業を行っている組織です。 2012年12月19日の朝に「牛久市が震災前のデータを破棄してしまったそうなので、そちらでもらってくださいと言われたのですが」との問合せに、最初「ではこちらから牛久市の方にデータを送り返すとか、ちょっと相談させてください」との回答でした。その後、19日の市議会を傍聴するため、牛久市役所へ行ったついでに教育委員会へ行き、茨城学校保健会へ問い合わせたので、送り返してもらえるな



Todesursachen bei Kindern bis zu 19 Jahren in Fukushima
März-November





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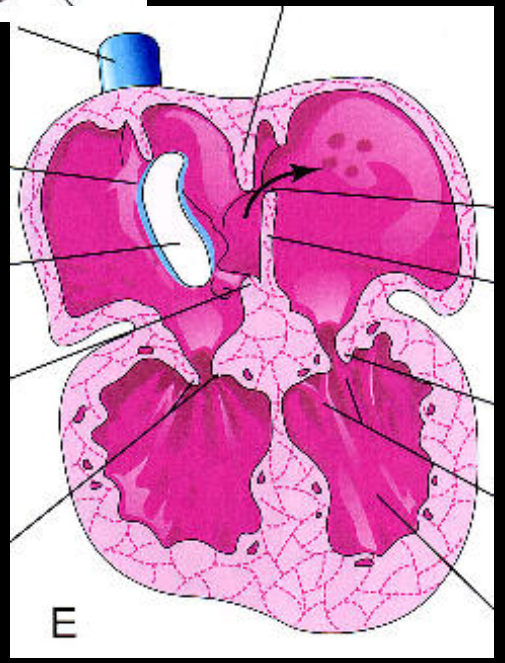
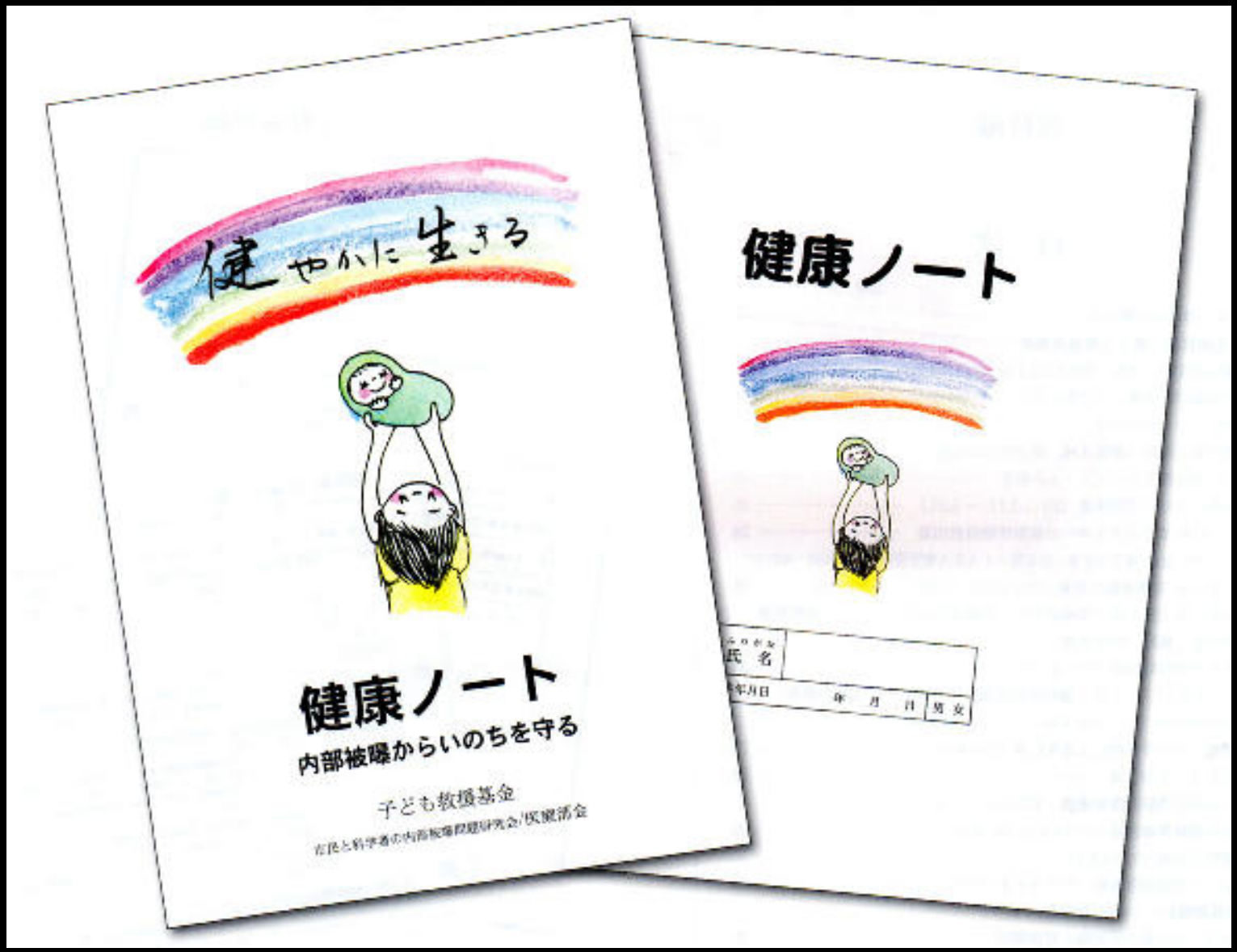


8w

Moore and Persaud: The Developing Human, 2008

Record children's health damages

- It is important to record such children's health damages and conduct survey on relationship with their exposed dose.
- In order to do that, examining and recording radionuclides and radiation level included in soil and foods in details is important and such survey should be carried out by the government and local municipalities.



Health Notebook
"live your own life in good health“
"Protecting your life from internal radiation"

Temporary houses for the evacuees from Futaba-machi
& deposits of decontaminated mud waste in Koriyama city
3.8mSv/y in a room

2014-01-22 Koriyma-city Asumi General Community Center

On the street in front of the building 0.72 μ Sv/hr (6.31mSv/yr)

In the room 0.27 μ Sv/hr (2.37mSv/yr)

Sample
Sediment in school swimming pool

Sample „Sediment in school swimming pool“

		Cs137 (Bq/kg)	Cs134 (Bq/kg)	Sr90 (Bq/kg)	Pu238 (Bq/kg)	Pu239/240 (Bq/kg)
CRMS (Fukushima)	sieved sediment	78697 ± 67.0	40764 ± 46.3			
Senate department for urban development (Berlin)"	sieved sediment	79000 ± 4400	38000 ± 2200	76 ± 8	< 0,017	0,19 ± 0,09
	remaining sediment in s	97000 ± 5500	48000± 2800			

2013.11.19　Iitate village　Decontamination of rice fields

食品の許容線量限度値の比較　単位：ベクレル　Bq/l　Bq/kg

	ウクライナ　2006年		ベラルーシ　2006年		日本　2011年～2012年3月		日本　2012年4月～	
	セシウム137	ストロンチウム90	セシウム137	ストロンチウム90	セシウム137	ストロンチウム90	セシウム137	ストロンチウム90
飲料水	2	2	10	0.37	200	–	10	–
牛乳	100	20	100	3.7	200	–	50	–
粉ミルク	500	100	100	–	500	–	50	–
乳幼児食品	40	5	37	1.85	–	–	50	–
米	–	–	–	–	500	–	100	–
パン	20	5	40	3.7	500	–	100	–
ジャガイモ	60	20	80	3.7	500	–	100	–
野菜	40	20	100	–	500	–	100	–
果物	70	10	40	–	500	–	100	–
肉・肉製品	200	20	–	–	500	–	100	–
魚・魚製品	150	35	–	–	500	–	100	–
卵	100	30	–	–	500	–	100	–
キノコ（生）	500	50	370	–	500	–	100	–

但し、米、牛肉は9月まで、500Bq/kg
大豆は年内、500Bq/kg

Comparative data of Ukraine, Belarus and Japan on intolerance dose limits of radioactive materials in foods and drinks

Temporary housing; Former Kisai High School Kazo-city Saitama Prefecture

In the temporary house Fukushima city 1.7mSv/yr

2013.03.14　Yamada’s house　ca.4km from TEPCO

88 μ Sv/h (771mSv/y, air)

2013.11.05　250 μ Sv/h (2190mSv/y, surface)

2013.11.05　well　250 μ Sv/h(2190mSv/y, surface)

2013.11.05 Ishikawa clinic

2013.11.05 Kindergarden Futaba 58 μ Sv/h（ 51.0mSv/y ）

Athletic Center Futaba

“ Nuclear power, rich life with clear comprehension”

Healthcare Center Futaba　105 μ Sv/h (920mSv/y)

2012.11. Dr. Anand Grover (UN Human Rights Committee special reporter) was hearing from more than 50 persons

Rights for Health

- 20mSv/y, dose limits for evacuation too high : Heath effect of low dose radiation estimated too small
- Human rights of pregnant and children are the most important task
- Return to contaminated area not recommended
- 1mSv/y, dose limits should be for the public
- Heath risk of low dose radiation should be taught in school

Statement by IPPNW Board -1-

- We would comment that the highest immediate health priority for the affected population should be reducing radiation exposure as much as possible, especially for those more sensitive to its dangers – young children and pregnant women.

Statement by IPPNW Board -2-

- This includes substantial areas of the cities of Fukushima and Koriyama, which have a combined population of about 600,000. We find it unacceptable that people are currently even being encouraged to return to some areas where they can be expected to receive up to 20 mSv in additional annual radiation exposure.

“radiophobia”

- We need to pay special attention to the fact that, in Fukushima, “radiophobia” is now cunningly used in ETHOS project, which had mislead the citizens and hampered their movement to protect children in Belarus.

Criteria for identifying the zones of radioactive contamination

No	Zones	Soil Contamination, kBq/m² (Ci/km²)			Annual dose mSv/yr
		Cesium 137	Strontium 90	Plutonium 239	
1	Exclusion	n.d.	n.d.	n.d.	n.d.
2	Obligatory resettlement	>555 (>15)	>111 (>3)	>3.7 (>0.1)	>5
3	Guaranteed voluntary	185～555 (5～15)	5.55～111 (0.15～3)	0.37～3.7 (0.01～0.1)	>1
4	Enhanced radioecological control	37～185 (1～5)	0.74～5.55 (0.02～0.15)	0.185～0.37 (0.005～0.01)	>0.5

Exclusion zone : Territories residents evacuated in 1986 n.d. : No Definition, bold letters by the author

Definition of Ukraine radiological contamination and annual dose and dose rate per hour were cited from p.48 "Legal Measures against the Consequences of the Accident in Ukraine" by Oleg Nasvit and Tetsuji Imanaka in "*Radioactive Disaster by Chernobyl Accident-International Cooperative Studies" edited by Tetsuji Imanaka,* P.47-8 "Legal Measures against the Accident in Ukraine"

Chernobyl law（1991）

- Zone of Resettlement Rights

  ≧ 1mSv/y

  ≧ 185kBq/m^2

Proposal to Enact “Collective Resettlement Right Law”

- In order to prevent further health hazards, what is most urgently needed now is to enact “Collective Resettlement Right Law.”