



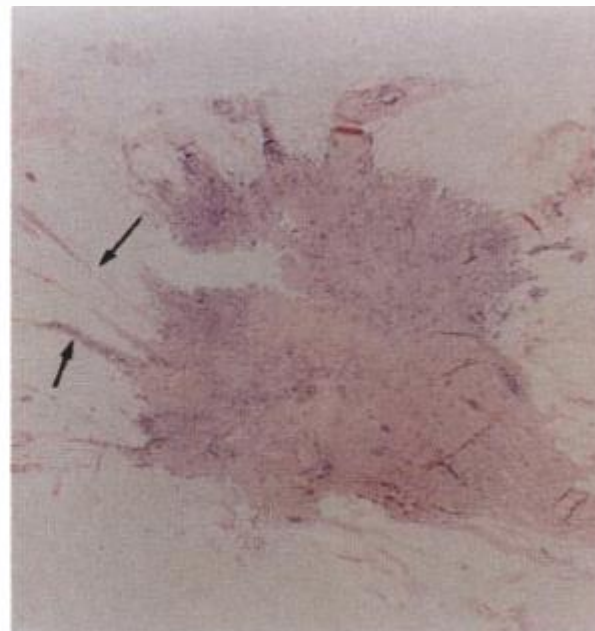
Smog a rozwój nowotworów

Dr Damian Ryszawy

Zakład Biologii Komórki
Wydział Biochemii, Biofizyki i Biotechnologii
Uniwersytet Jagielloński

Odrobina historii

- Pierwsze opisy choroby pochodzą ze starożytnego Egiptu
- 4 000 lat temu – próby leczenia raka maścią arsenową (Indie)
- Hipokrates (460-377 p.n.e.) określenie zmian nowotworowych mianem carcinoma ze względu na podobieństwo wyglądu nowotworów twarzy i piersi do odwłoku i odnóży kraba (podrzęd raków dziesięcionogich)



Odrobina historii

- Celsus (53 p.n.e-7 n.e.) lekarz rzymski używa łacińskiego określenia *cancer*
- Galen (129-201) lekarz rzymski stwierdza częstsze występowanie nowotworów u kobiet melancholijnych, mających nadmiar czarnej żółci (melas chole)

- 1193 H. Mondeville pisze :

*„Nie można wyleczyć żadnego raka, jeśli nie usunie się go radykalnie w całości.
Jeśli pozostawi się nawet niewielką część, złośliwość szerzy się w podłożu”*

- 1775 francuski lekarz B. Peyrilhe - pierwsze próby przeszczepiania nowotworów ludzkich psom
- 1775 angielski chirurg P. Pott wykazuje związek nowotworów z wykonywanym zawodem – powstawanie nowotworów moszny u mężczyzn, którzy jako dzieci zeskrobywali sadzę ze ścian wąskich przewodów kominowych
- 1865 Lissaen stosuje arsenian potasu w leczeniu przewlekłej białaczki
- 1928 K.H. Bauer – mutacyjna teoria powstawania nowotworów

Podział nowotworów

Klasyfikacja nowotworów złośliwych („raków”)
(Na podstawie pochodzenia tkankowego - histogenezy):

Rak (*carcinoma*) – nowotwór złośliwy rozwijający się z komórek nabłonkowych

Mięsak (*sarcoma*)- nowotwór złośliwy rozwijający się z komórek mezenchymalnych

Białaczkę (*leukemia*) - nowotwór złośliwy rozwijający się z komórek krwiotwórczych

Nowotwory złośliwe pochodzące z komórek układu nerwowego

Co odpowiada za powstanie nowotworu

Percival Pott
Scrotal cancer



Co odpowiada za powstanie nowotworu



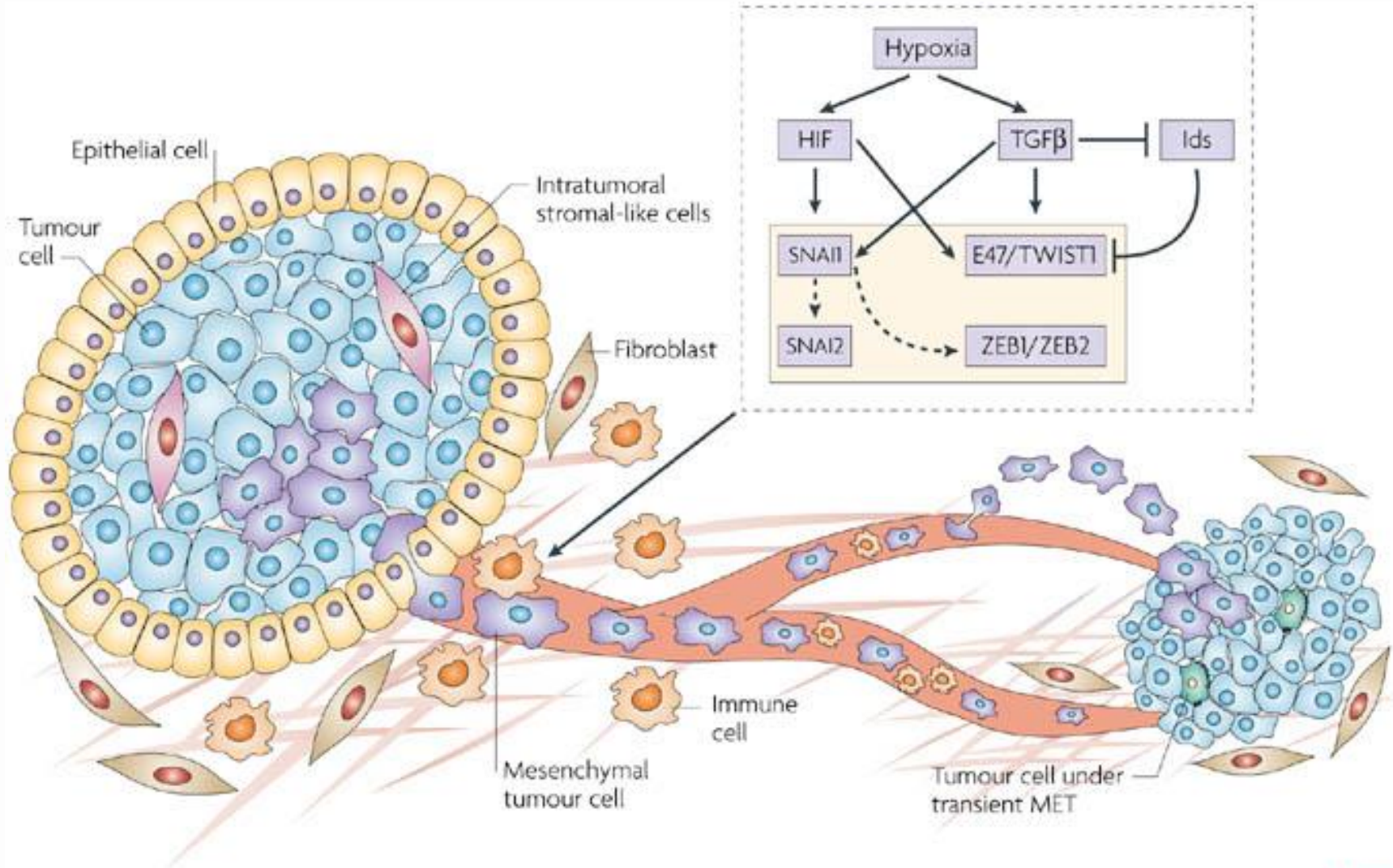
Yamagiwa Katsusaburō
23.02.1863 – 2.03.1930



Wzrost nowotworu



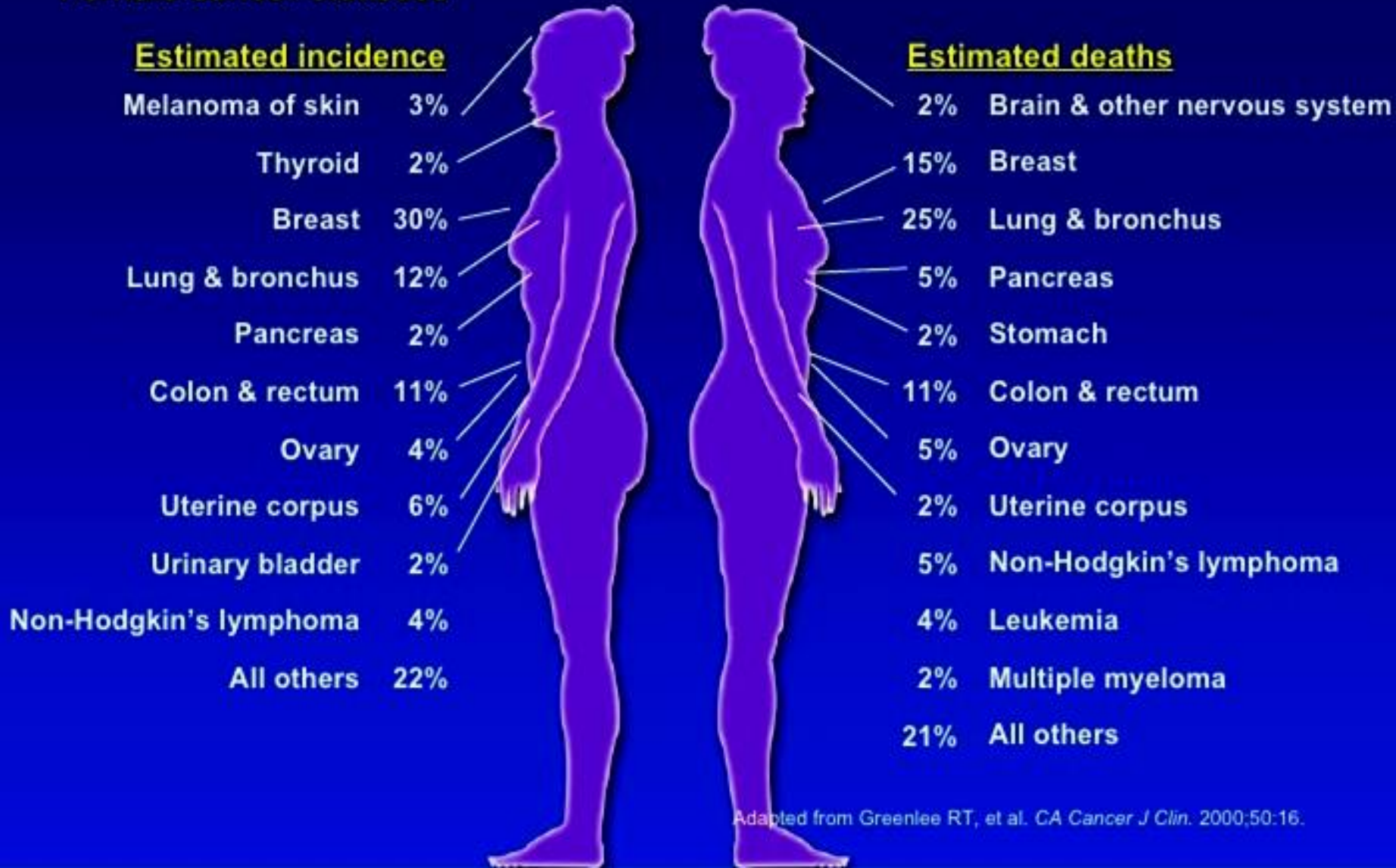
Etapy rozwoju nowotworu



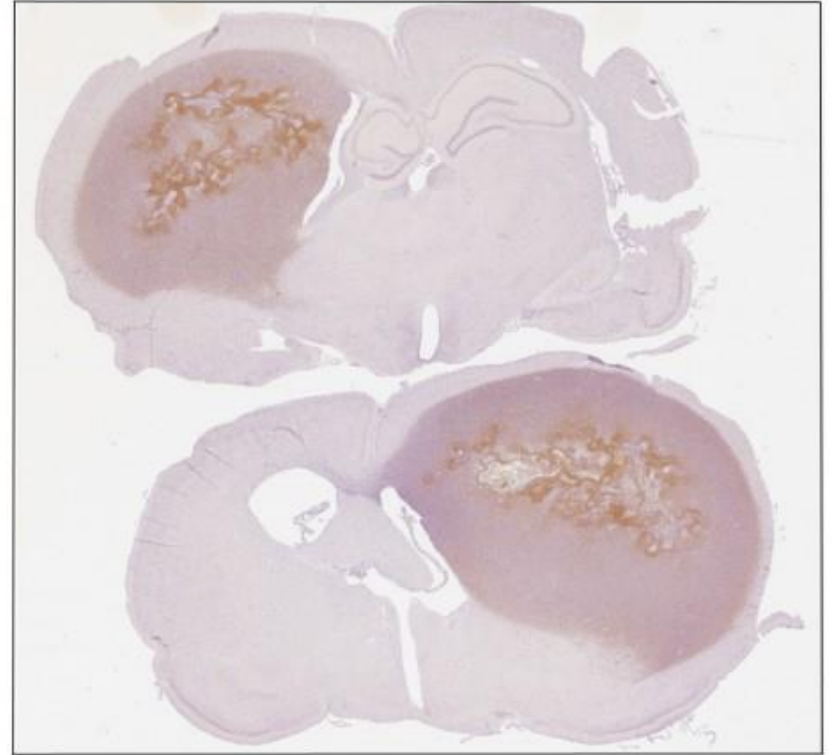
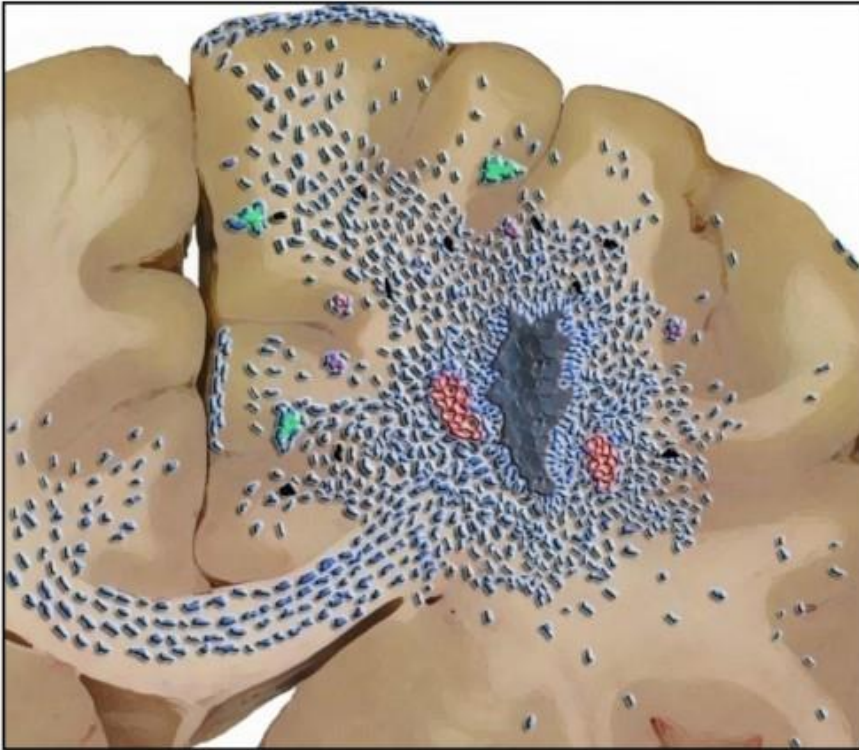
ONCOLOGY

Epidemiology

Female cancer statistics



Inwazyjność GBM



Skylla



Smog a nowotwory

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Gene expression profiling of A549 cells exposed to Milan PM2.5

Maurizio Gualtieri^{a,*}, Eleonora Longhin^a, Michela Mattioli^{b,1}, Paride Mantecca^a, Valentina Tinaglia^b, Eleonora Mangano^c, Maria Carla Proverbio^b, Giuseppina Bestetti^a, Marina Camatini^a, Cristina Battaglia^b

Entrez Gene	Gene Symbol	Description	Cellular Localization	Functional Classification	PM2.5 win	PM2.5 sum
1543	CYP1A1	cytochrome P450, family 1, subfamily A, polypeptide 1	intracellular	response to xenobiotic stimulus	↑0.59	↑0.89
1545	CYP1B1	cytochrome P450, family 1, subfamily B, polypeptide 1	membrane	response to organic substance	↑3.24	↑1.95
25976	TPARP	TG2-inducible poly(ADP-ribose) polymerase	intracellular	protein metabolic process	↓2.77	↓1.33
220	ALDH1A3	aldehyde dehydrogenase 1 family, member A3	intracellular, cytoplasm	metabolic process, vitamin nucleobase	↓1.89	↓0.90
57491	AHR	aryl-hydrocarbon receptor	intracellular	nucleoside, nucleotide	↑0.89	↑0.03
26595	GREM1	gremlin 1, cysteine knot superfamily	extracellular	cell-cell signaling	↑1.63	↑1.79
6347	CCL2	chemokine (C-C motif) ligand 2	extracellular	inflammatory response	↑1.80	↑0.61
57568	SFPA1L2	serpin peptidase inhibitor, associated 1 like 2	intracellular	signal transduction	↓1.07	↑0.48
9518	GDF15	growth differentiation factor 15	extracellular	cell signaling	↑1.00	↑0.27
8870	IER3	immediate early response 3	membrane	apoptosis	↓0.96	↑0.59
6775	STAT4	signal transducer and activator of transcription 4	intracellular, cytoplasm	nucleobase, nucleotide	↑0.85	↑0.55
2099	EREG	epiregulin	extracellular	cell-cell signaling	↑0.69	↑1.10
8001	FOSL1	FOS-like antigen 1	intracellular	transcription, signal transduction	↑0.47	↑1.10
6857	SYT1	synaptotagmin 1	intracellular, cytoplasm	nucleoside, nucleotide	↑0.14	↓0.76
1E+05	CPNE4	copine IV		cell-cell signaling	↓0.75	↑0.46
182	JAG1	Jagged 1	plasma membrane	cell motility	↓0.75	↑0.23
57210	SLC45A4	solute carrier family 45, member 4			↓0.76	↑0.25
2296	FG3	fibrogen gamma chain	extracellular	protein metabolic process	↓0.78	↑0.50
727	CPACKLE	complement component 5	extracellular	inflammatory response	↓0.79	↑0.35
2E+05	PPARGC2	peroxisome proliferator-activated receptor gamma, member 2	intracellular	response to xenobiotic stimulus, maintenance of protein metabolic process	↓0.80	↑0.17
10891	1A	activated receptor gamma, member 1	intracellular	process	↓0.85	↑0.20
22943	DKK1	dickkopf homolog 1	plasma membrane	regulation of biological process	↓0.86	↑0.34
4884	NPTX1	neuronal pentraxin 1	intracellular, cytoplasm	cell-cell signaling	↓0.86	↑0.56
7494	XBP1	X-box binding protein 1	intracellular	nucleoside, nucleotide	↓0.86	↑0.42
5274	SERPIN1	serpin peptidase inhibitor, clade I (neuroserpin), member 1	intracellular	nucleoside, nucleotide	↓0.87	↓0.10
80323	CCDC68	coiled-coil domain containing 68		system development	↓0.88	↑0.40
2114	ETS2	v-ets erythroblastosis virus E26 oncogene homolog 2	intracellular	nucleobase, nucleotide	↓0.89	↑0.35
6374	CXCL5	chemokine (C-X-C motif) ligand 5	extracellular	inflammatory response	↓0.90	↓0.95
10468	FST	folistatin		nucleoside, nucleotide	↓0.90	↑0.30
654	BMP6	bone morphogenetic protein 6	extracellular	nucleobase, nucleotide	↓0.92	↑0.43
4929	NR4A2	nuclear receptor subfamily 4, group A, member 2	intracellular	nucleoside, nucleotide	↓0.93	↑0.62
3399	ID3	interleukin 3, inducible dominant negative helix-loop-helix protein 3	intracellular, organelle	nucleoside, nucleotide	↓0.94	↑0.41
5732	PTGER2	prostaglandin E receptor 2 (subtype EP2), 53kDa	plasma membrane	nucleoside, nucleotide	↓0.99	↑0.65
7103	TSPAN8	tetraspanin 8	intracellular, cytoplasm	signal transduction	↓0.99	↑0.39
84620	ST6GAL2	ST6 beta-galactosaminidase alpha-2,6-sialyltransferase 2	intracellular	protein metabolic process	↓1.00	↑0.42
6446	SGK1	serum glucocorticoid induced kinase	intracellular	protein transport, signal transduction	↓1.02	↓0.76
1373	CPS1	carbamoyl-phosphate synthetase 1, mitochondrial	intracellular, cytoplasm	nucleoside, nucleotide	↓1.03	↑0.50
56521	DNAJC12	DNAJ (Hsp40) homolog, subfamily C, member 12	membrane	nucleoside, nucleotide	↓1.05	↑0.74
2861	GPR37	G protein-coupled receptor 37	intracellular, nuclear	signal transduction	↓1.07	↑0.87
2E+05	RHOV	ras homolog gene family, member V	intracellular, membrane	signal transduction	↓1.13	↓0.85
6616	SNAP25	synaptosomal-associated protein, 25kDa	plasma membrane	cell-cell signaling	↓1.17	↓0.83
3641	INSL4	insulin-like 4	extracellular	cell-cell signaling	↓1.36	↑0.73
3400	ID4	inhibitor of DNA binding 4, dominant negative helix-loop-helix protein 4 (sex determining region Y)	intracellular, organelle membrane	nucleoside, nucleotide	↓1.48	↑0.42
6682	SOX9	sox box 9	intracellular	nucleoside, nucleotide	↓1.77	↓0.29

Smog a nowotwory

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PLOS ONE

Environmental Particulate (PM_{2.5}) Augments Stiffness-Induced Alveolar Epithelial Cell Mechanoactivation of Transforming Growth Factor Beta

Marilyn M. Dysart¹, Boris R. Galvis², Armistead G. Russell², Thomas H. Barker^{1,3*}

¹ The Wallace H. Coulter Department of Biomedical Engineering, Georgia Institute of Technology and Emory University, Atlanta, Georgia, United States of America, ² The School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, Georgia, United States of America, ³ The Parker H. Petit Institute for Bioengineering and Biosciences, Georgia Institute of Technology, Atlanta, Georgia, United States of America

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Traffic Air Pollution and Risk of Death from Breast Cancer in Taiwan: Fine Particulate Matter (PM_{2.5}) as a Proxy Marker

Li-Ju Hung^{1,2}, Shang-Shyue Tsai³, Pei-Shih Chen⁴, Ya-Hui Yang⁵, Saou-Hsing Liou⁶, Trong-Neng Wu^{6,7}, Chun-Yuh Yang^{4,6*}

¹ Graduate Institute of Occupational Safety and Health, Kaohsiung Medical University, Kaohsiung, Taiwan

² Department of Family Medicine, Kaohsiung Veterans General Hospital, Kaohsiung, Taiwan

³ Department of Healthcare Administration, I-Shou University, Kaohsiung, Taiwan

⁴ Department of Public Health, Kaohsiung Medical University, Kaohsiung, Taiwan

⁵ Department of Occupational Safety and Hygiene, Fooyin University, Kaohsiung, Taiwan

⁶ Division of Environmental Health and Occupational Medicine, National Health Research Institute, Miaoli, Taiwan

⁷ Graduate Institute of Public Health, China Medical University, Taichung, Taiwan

Autofagia

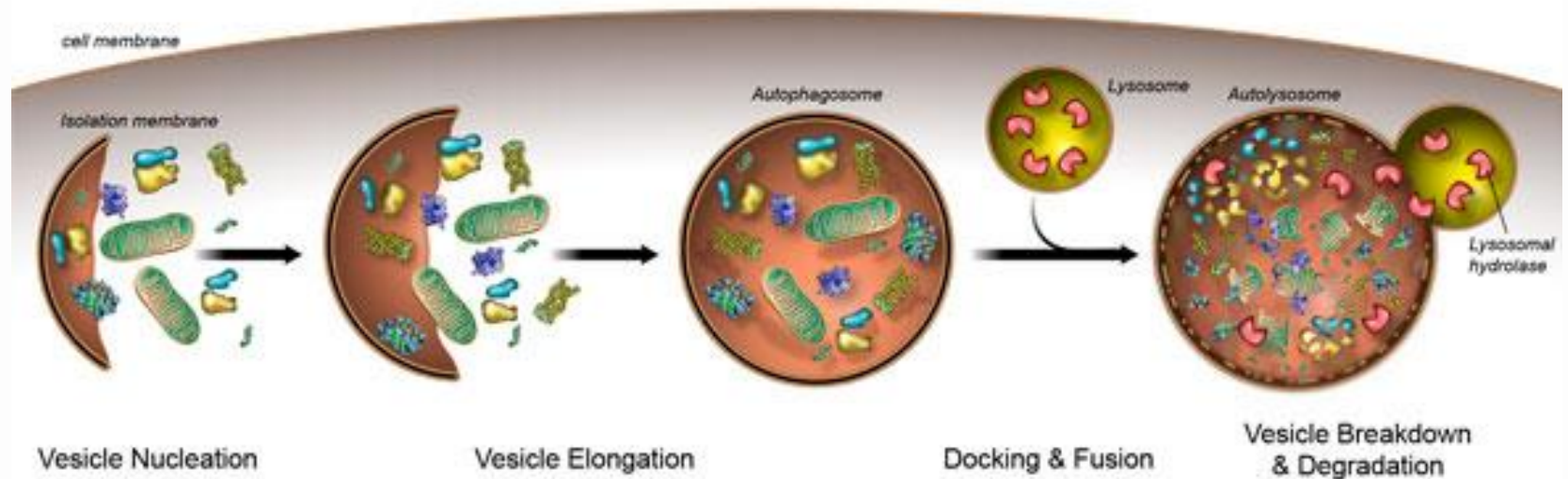


Figure 1: Model summarizing the (macro) autophagy process.

Different steps of the autophagy process are highlighted. In brief, cytosolic components are sequestered into double-membrane containing vesicles, called autophagosomes. When completed, autophagosomes fuse with acidic lysosomes containing enzymes important for degradation, and degraded material can finally be recycled.

Z nadzieją spoglądamy w przyszłość

