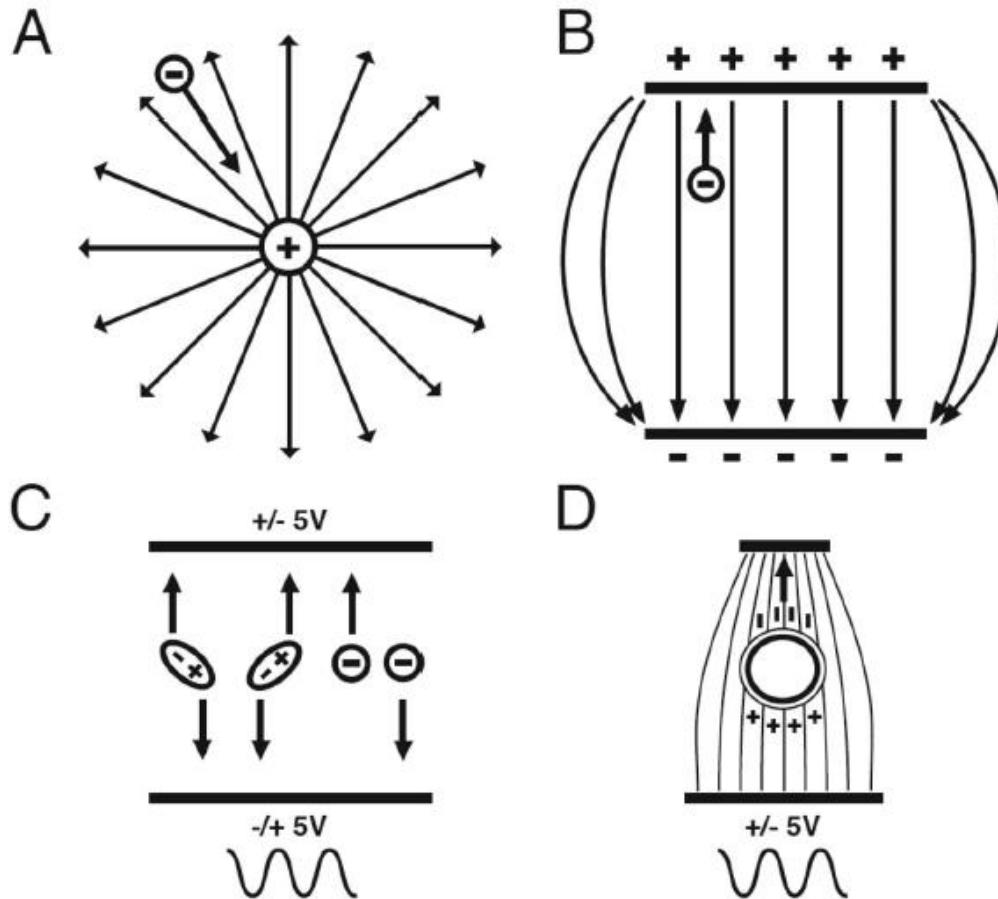


Tumor Treating Fields (TTFields)

October 26, 2015

Tumor Treating Fields

TTFields are fields of forces that act on electrically charged bodies

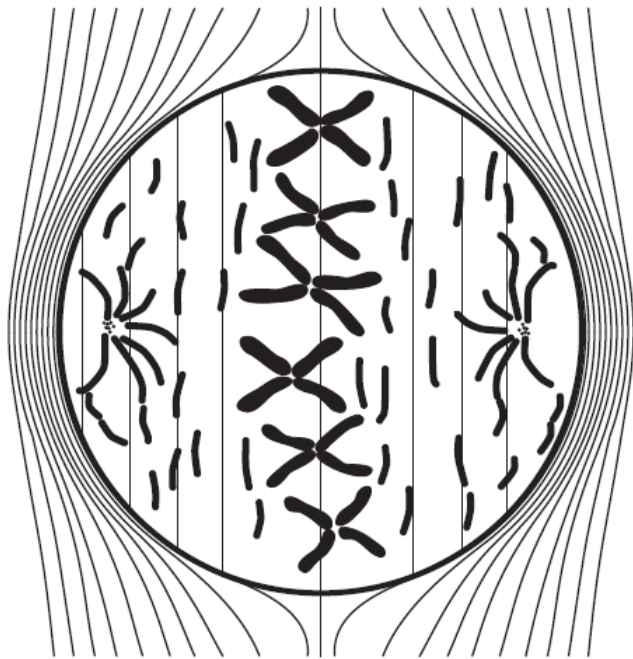


TFields are an Anti-Mitotic Treatment

Target Dividing Cancer Cells and Result in Apoptosis

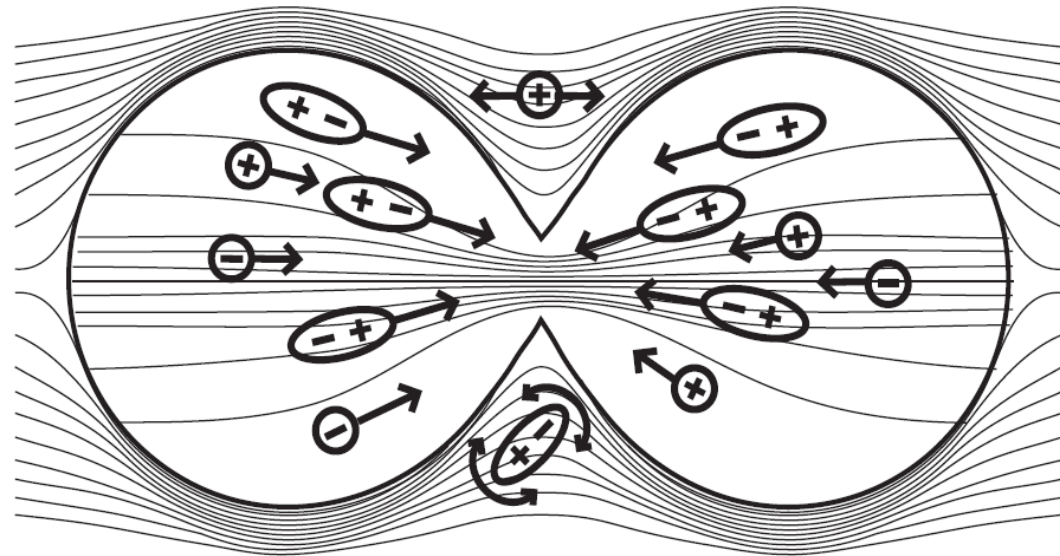
Metaphase:

disrupts formation mitotic spindle



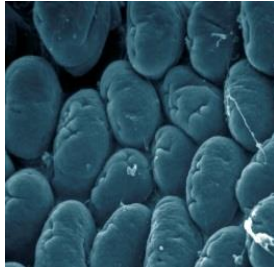
Cytokinesis:

pushes charged subcellular structures towards the cytokinetic furrow



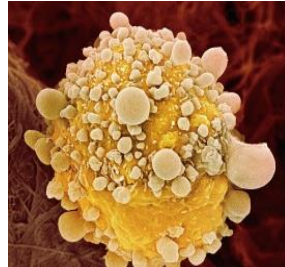
Frequency Tuned to Specific Cell Types

Effects on Cells Are Frequency Specific and Inversely Related to Cell Size



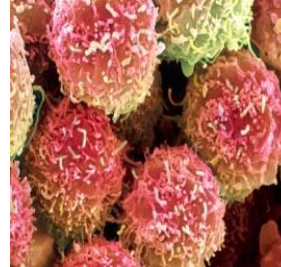
Normal
Intestine

~50 kHz



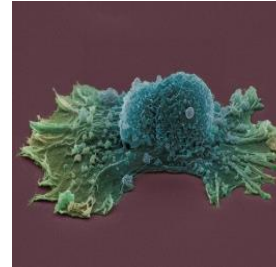
Pancreatic
Cancer

150 kHz



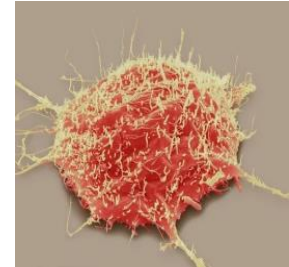
NSCLC

150 kHz



Ovarian
Cancer

200 kHz



GBM

200 kHz

Non-invasive, portable, home use device



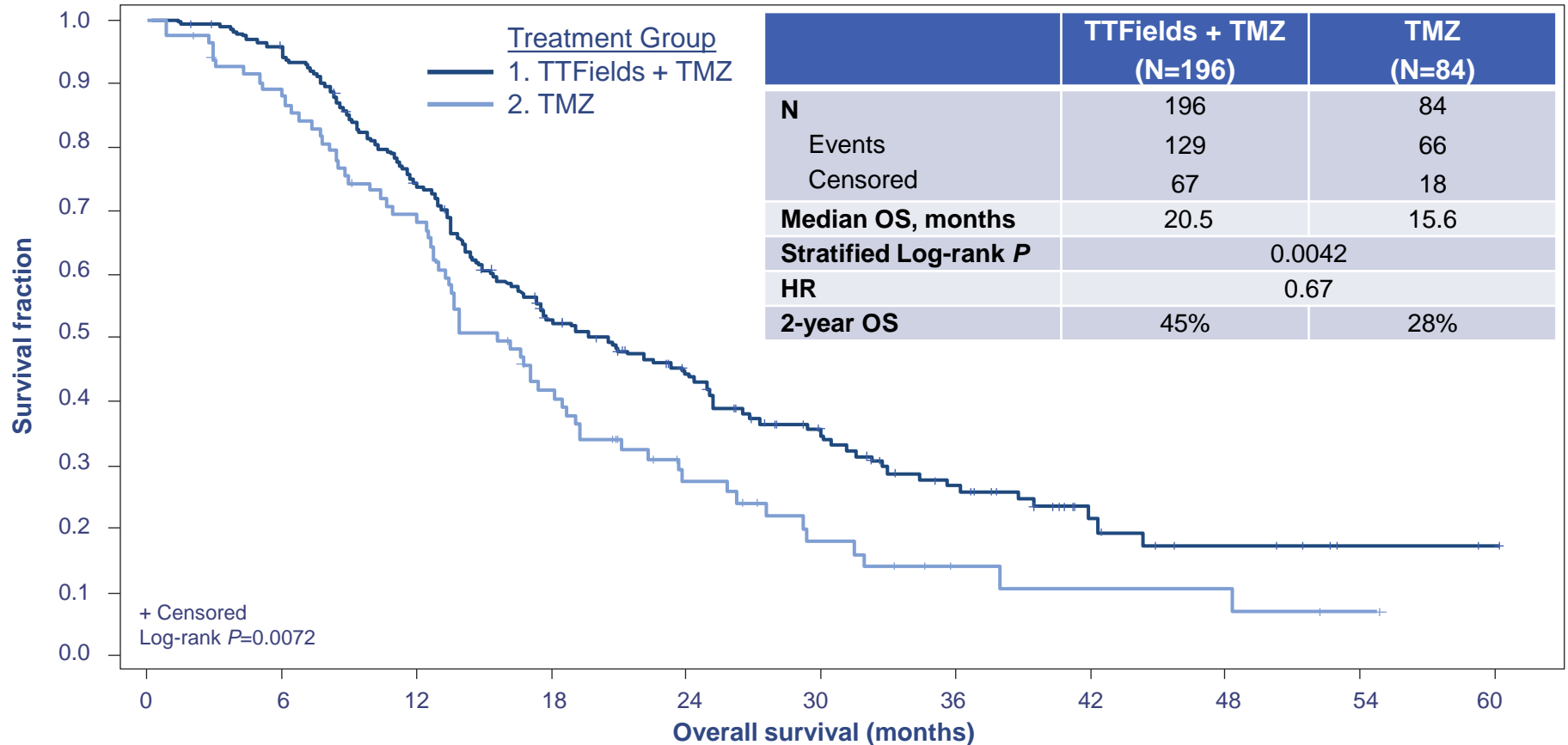
novocure™

Non-invasive, portable, home use device



novocure™

Newly Diagnosed GBM Overall Survival



1	196	185	139	90	63	42	27	11	6	2	1
2	84	72	55	32	16	9	4	3	3	1	0

HR, hazard ratio; OS, overall survival; TMZ, temozolomide.

1. Stupp R, Wong ET, Scott CB, et al. [SNO abstract NT-40]. *Neuro Oncol.* 2014;16(suppl 5):v167.

novocure™

"This information is disseminated for scientific/educational purposes only.

TTFields: Clinical Development Plan

Proposed Indications

TTFields at 150 kHz for Mesothelioma

STELLAR

TTFields at 150 kHz for Squamous Lung Cancer

LUNAR

TTFields at 200 kHz for Ovarian Cancer

INNOVATE

TTFields at 150 kHz for Pancreatic Cancer

PANOVA

TTFields at 150 kHz for Brain Metastases

EF-21, METIS

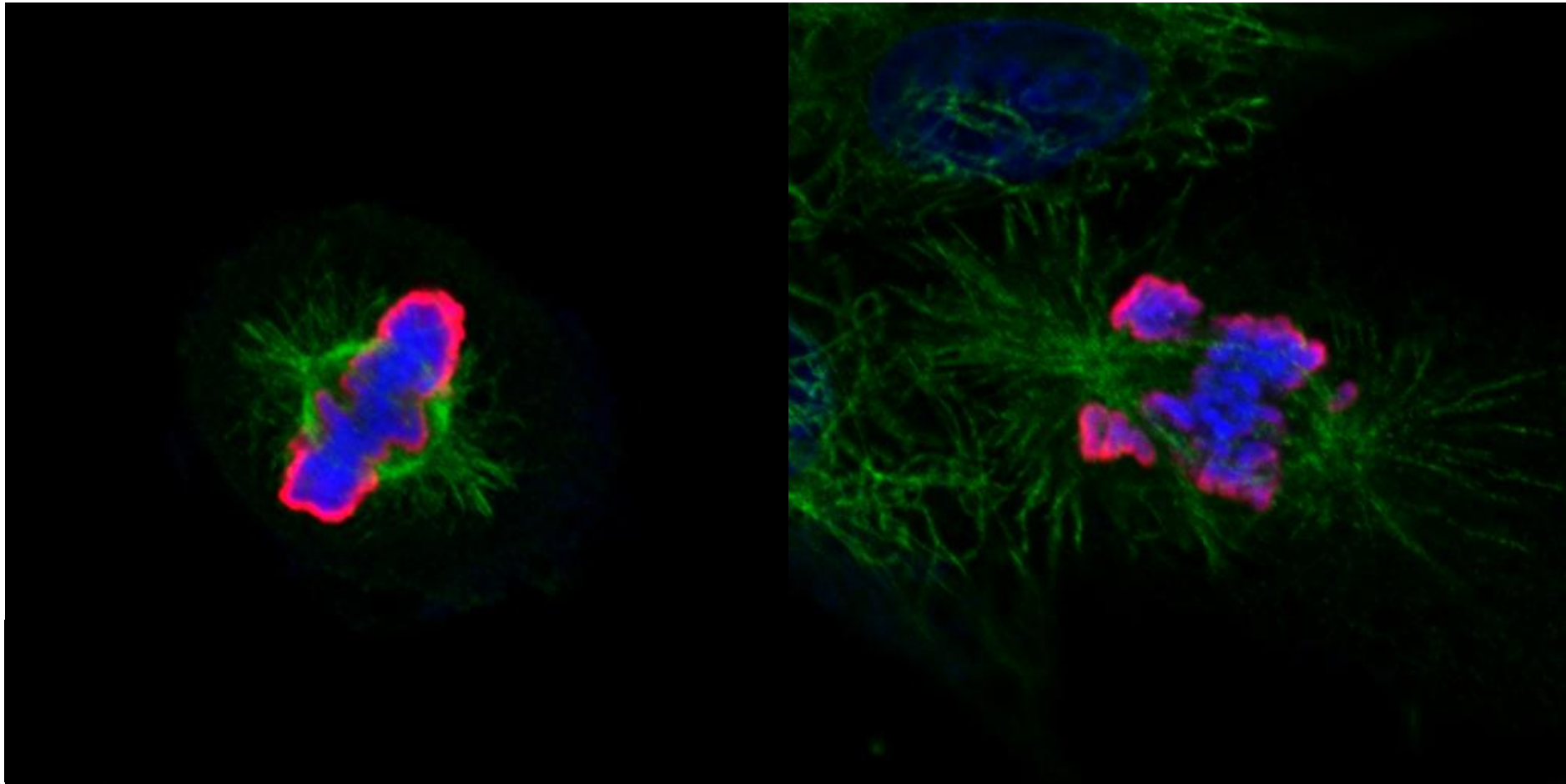
Current Indication

TTFields at 200 kHz for GBM

GBM, glioblastoma multiforme.

TTFields are not approved for brain metastases, lung cancer, pancreatic cancer, ovarian cancer, or mesothelioma. The safety and effectiveness of TTFields for brain metastases, squamous lung cancer, pancreatic cancer, ovarian cancer, or mesothelioma has not been established..

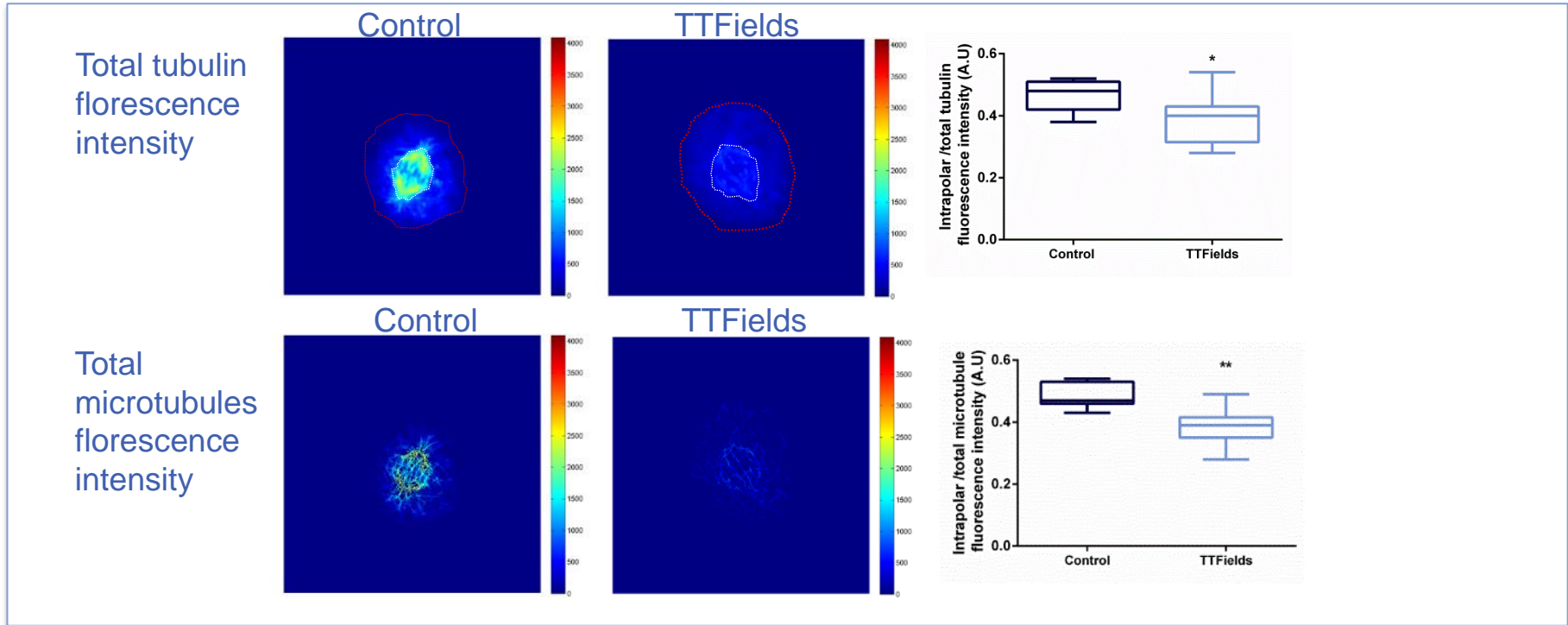
TFields Interfere with Microtubule Polymerization and Leads to Abnormal Chromosomes Segregation



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A549 control cells (left image) exhibit normal chromosome arrangement along the metaphase plate and normal spindle formation. Cells treated with TFields (right image) exhibit abnormal chromosome arrangement along the mitotic plate.

TTFields Treatment Induce Severe Spindle Damage in Cancer Cell Lines – Image Analysis



Voloshin Sela T. Giladi M, Schneiderman RS. et al. AACR 2015

GBM Responses

T1-Weighted MRI scans of recurrent GBM patients

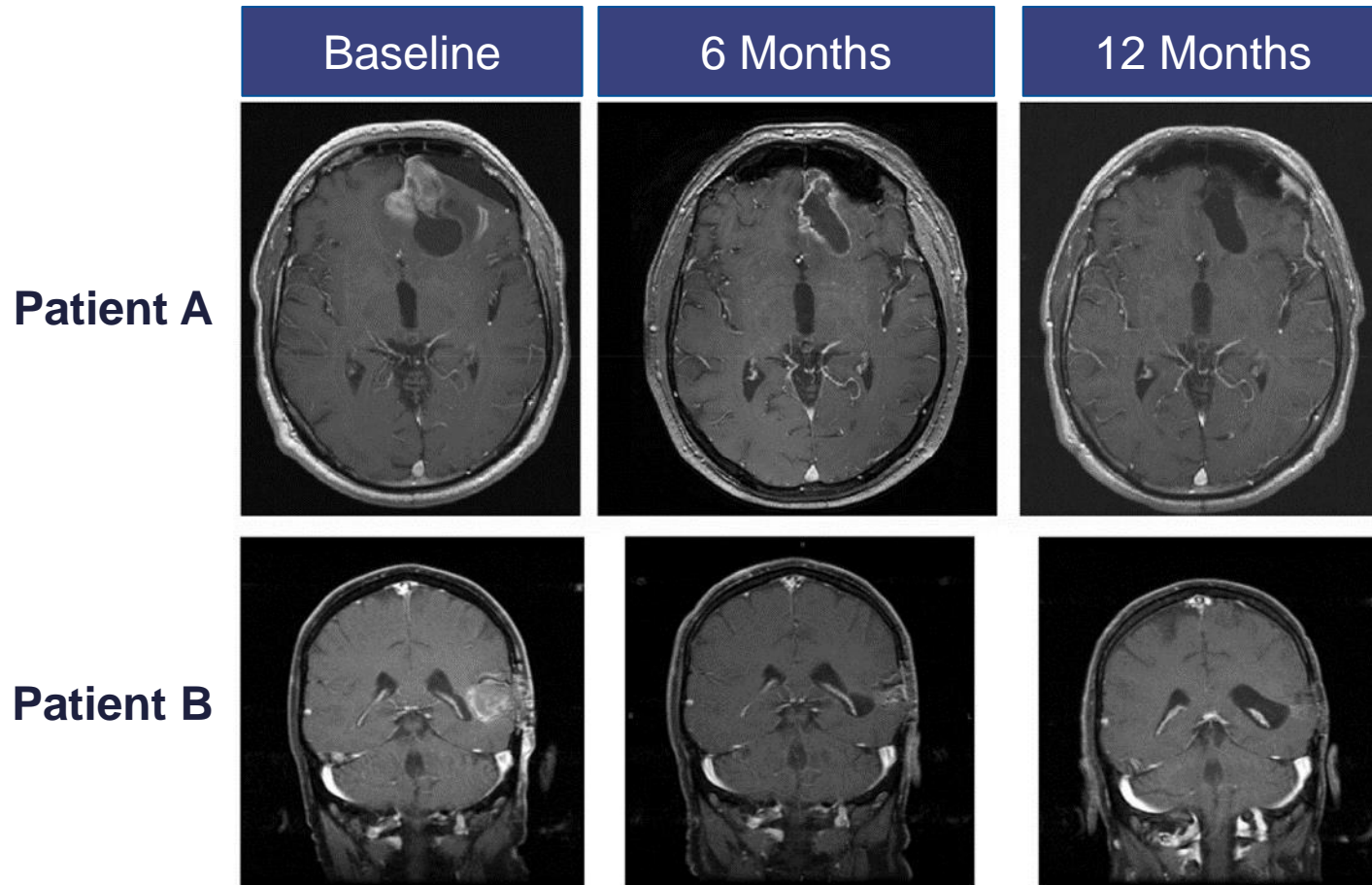


Figure reprinted with permission from Elsevier.

1. Stupp R, Wong ET, Kanner AA, et al. *Eur J Cancer*. 2012;48(14):2192-2202.

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TTFIELDS: an Antimitotic Therapy¹

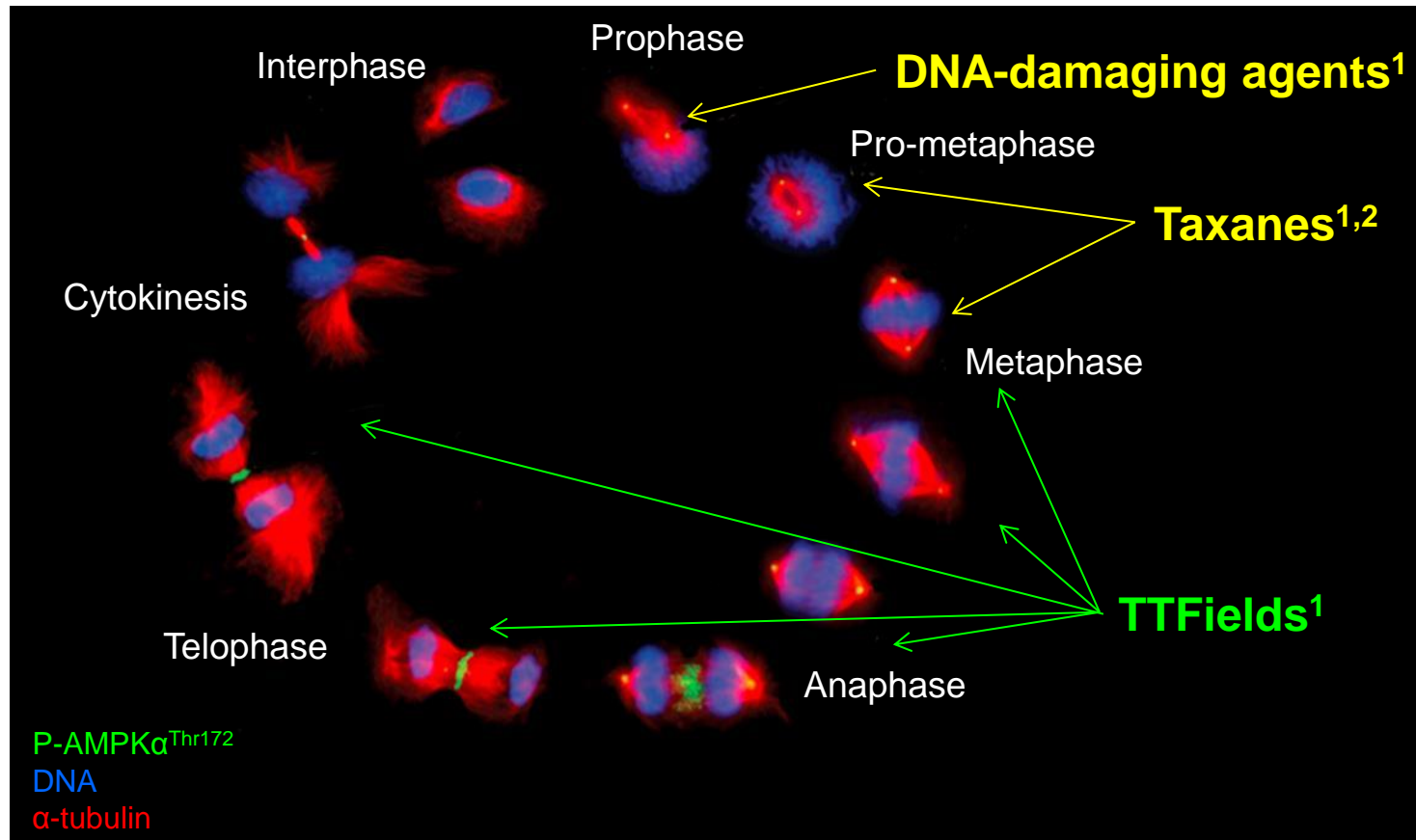


Image modified from Vazquez-Martin A, Oliveras-Ferraros C, Mendeendez JA. *Cell Cycle*. 2009;8(15):2385-2398.*

DNA, deoxyribonucleic acid; P-AMPK, phospho-AMP-activated protein kinase.

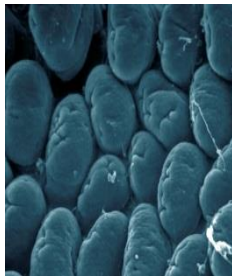
**Cell Cycle*, Landes Bioscience, 2009. Copyright and all rights reserved. Material from this publication has been used with the permission of Landes Bioscience.

1. Lee SX, Wong ET, Swanson KD. [SNO abstract CB-013]. *Neuro Oncol*. 2012;14(suppl 6):vi7-vi20. 2. Jordan MA, Wendell K, Gardiner S, et al. *Cancer Res*. 1996;56:816-825.

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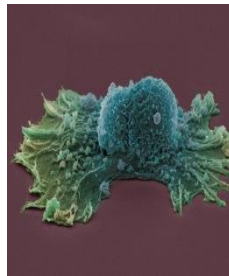
Pancreatic Cancer

150 kHz



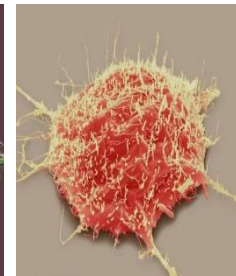
NSCLC

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Ovarian Cancer

200 kHz



GBM

200 kHz

