

# Review of the Clinical Evidences of Modulated Electro-Hyperthermia (mEHT) Method

Magdolna Dank<sup>1</sup>, Gyonygver Szentmartoni<sup>1</sup>, Gyula Peter Szigeti<sup>3</sup>, Carrie Minnaar<sup>2</sup>, Marcell A. Szasz<sup>1</sup>

<sup>1</sup> Cancer Center, Semmelweis University, Budapest, Hungary

<sup>2</sup> University of the Witwatersrand, Radiobiology, Johannesburg, South Africa

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**Presented at 36<sup>th</sup> ICHS, Budapest, 2018**

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Magdolna Dank<sup>1</sup>, Gyonygver Szentmartoni<sup>1</sup>, Gyula Peter Szigeti<sup>3</sup>, Carrie Minnaar<sup>2</sup>, Marcell A. Szasz<sup>1</sup>

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## Introduction

Modulated electro-hyperthermia (mEHT) is a new kind of hyperthermia in oncology. It is a further development of the conventional heating methods utilizing the capacitive setting. Thus, mEHT heats the malignant cells selectively instead of the complete isothermal heating of the tumor mass. The mEHT is widely accepted and applied, however, traditionally considered clinical indications are still in progress.

## Aim

However, evidence is emerging, the proofs are of various evidence levels. Our overview in this presentation shows the clinical achievements, presenting the results of case presentations and clinical trials utilizing the mEHT method.

## Methods

Our review on data presents the collected experience with capacitive hyperthermia treatments with the EHY-2000+ device (OncoTherm Ltd., Germany). The essence of case reports with primary and metastatic tumors treated with mEHT (grouped into carcinomas of organ systems, and sarcomas of bone and soft tissues), case presentations of immunotherapeutic combinations with mEHT and also clinical trials of various natures were summarized and evidence is provided.

## Results

Based on clinical studies, the method mEHT is a feasible hyperthermia technology for oncological applications. Concomitant utilization of capacitive hyperthermia is now supported by the data from series of case reports up to randomized Phase III clinical trials.

Grant support: NVKP\_16-1-2016-0042



## Review of the Clinical Evidences of Modulated Electro-Hyperthermia (mEHT) Method

Dank M1, Szentmártoni Gy1, Szigeti GP3, Minnaar C2, Szasz AM1

(1) Cancer Center, Semmelweis University, Budapest, Hungary  
(2) University of the Witwatersrand, Radiobiology, Johannesburg, South Africa  
(3) Institute of Human Physiology and Clinical Experimental Research, Semmelweis University, Budapest, Hungary

*Presenter's name: Magdolna Dank MD,  
PhD*

*I have the Relationships with commercial  
interests:*

*Advisory Board: Lilly, Novartis, Pfizer  
Research: Celltrion*

CONFLICT  
OF INTEREST



mEHY treatment – easy to use and safe



# The Stories

Case-reports

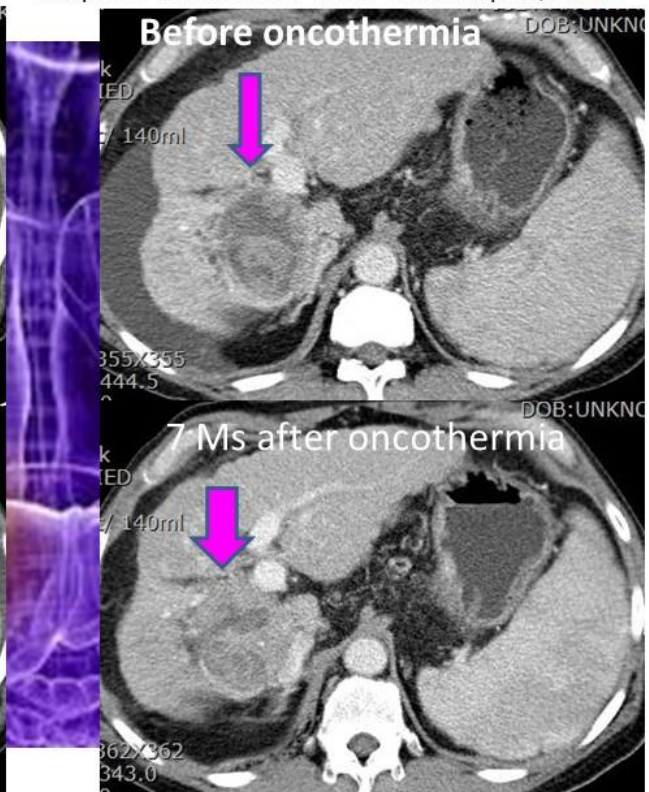
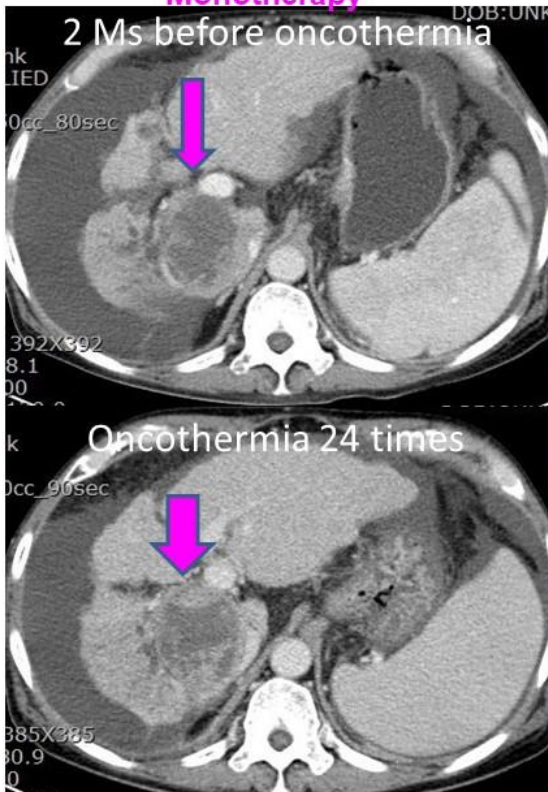
# HCC



# HCC

(61y/M), Feb/2011, oncothermia 24 times, **Monotherapy**

**Investigator:** Prof.Dr.Taesung Jeung  
**Institute:** Department of Radiation Oncology, Kosin University, College of Medicine & Kosin University Gospel Hospital. **Published:** 31<sup>st</sup> ICHO Oct. Budapest; **2012**



## Hepatocellular carcinoma (HCC)

Wang Y-S, Chi K-W, Shih-Kong Hospital, Taipei, Taiwan (11.2017; unpublished yet)



## Hepatocellular carcinoma (HCC)

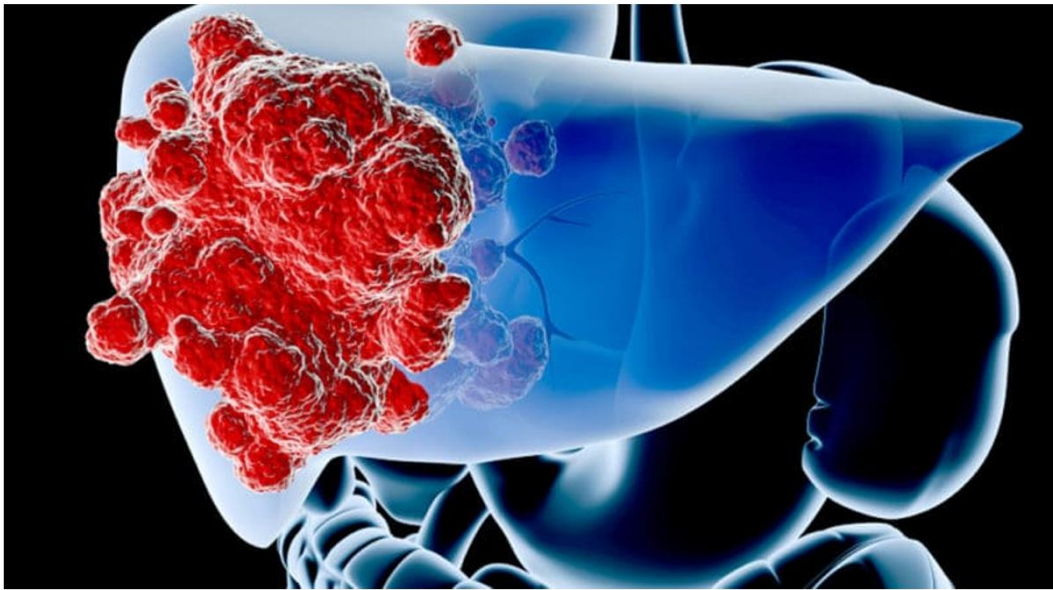
Wang Y-S, Chi K-W, Shih-Kong Hospital, Taipei, Taiwan (11.2017; unpublished yet)



RT 46 Gy/23fx + Oncothermia x 5 (1/week) + Lipodox 20mg x3

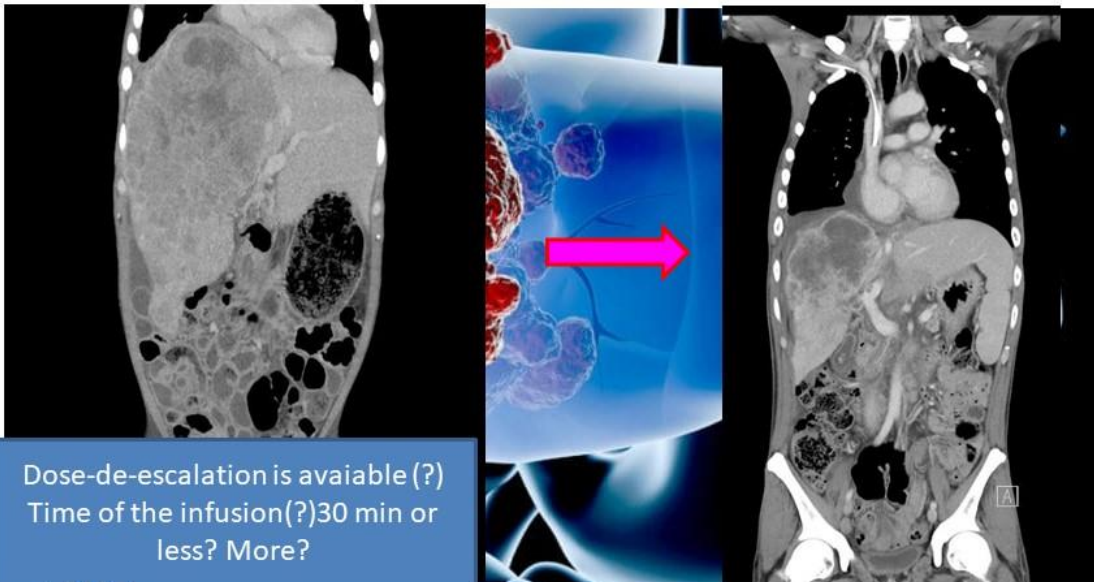
## Advanced hepatoma

Wang Y-S, Chi K-W, Shih-Kong Hospital, Taipei, Taiwan (11.2017; unpublished yet)



## Advanced hepatoma

Wang Y-S, Chi K-W, Shih-Kong Hospital, Taipei, Taiwan (11.2017; unpublished yet)



Dose-de-escalation is available (?)  
Time of the infusion(?)30 min or less? More?

200 mg

10/16/2016 CT

05/25/2017 CT

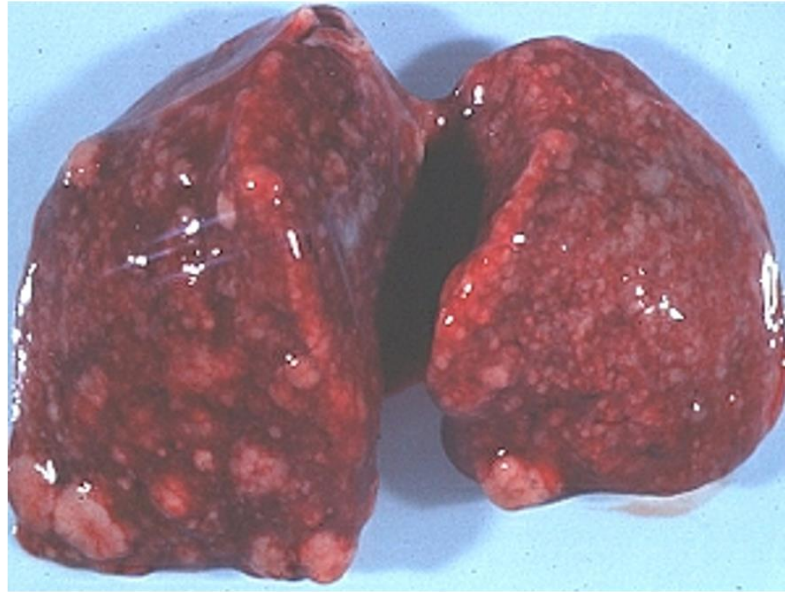
Keytruda 50mg Q3W +  
Lipodox 20mg Q2W  
+ liver RT



Oncothermia for liver 15 times

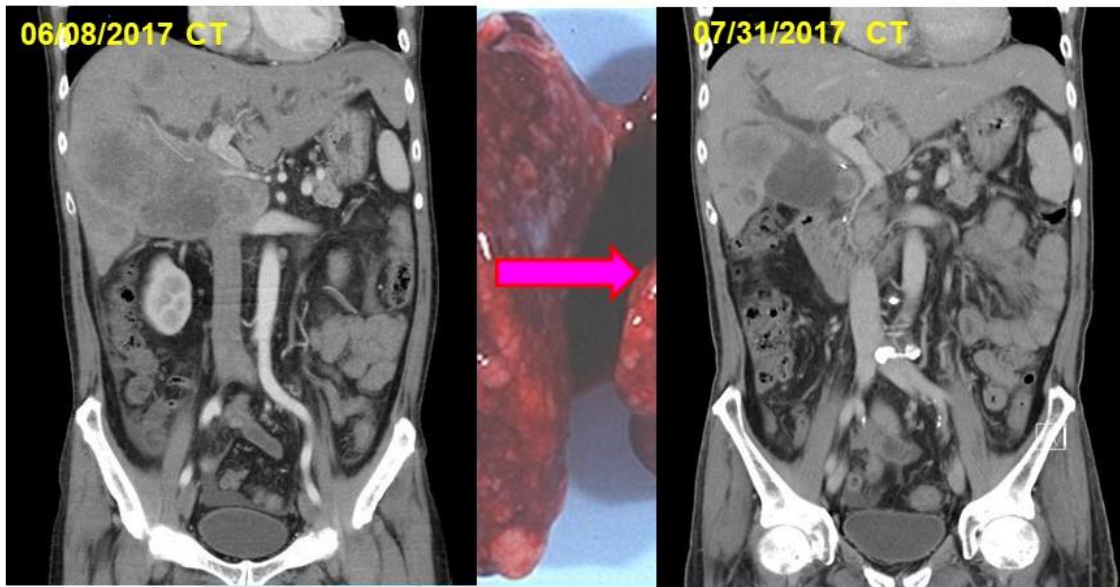
## Cholangiocarcinoma

Wang Y-S, Chi K-W, Shih-Kong Hospital, Taipei, Taiwan (11.2017; unpublished yet)



## Cholangiocarcinoma

Wang Y-S, Chi K-W, Shih-Kong Hospital, Taipei, Taiwan (11.2017; unpublished yet)



D1: Avastin 200MG  
D2: Gemzar 500MG/M2 , D2~D4: 5-FU 500MG/M2  
D5: Keytruda 150mg  
RT (Cholangiocarcinoma): from 6/15 to 7/5, total 30Gy/15Fx.  
**Oncothermia** : from 6/28 to 7/31, total 10 times

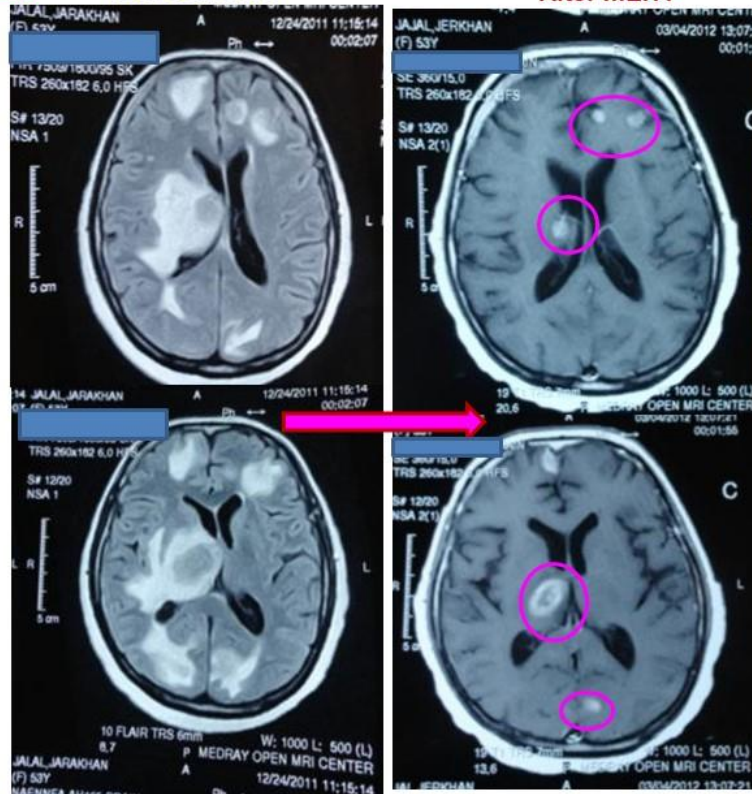
## Brain metastasis from breast cancer

**Investigator:** Dr. Marwan Akasheh; **Institute:** Dar Alshefa' Tumors Treatment Center, Amman, Jordan, **Patient:** female 53 y.

**mEHT Monotherapy**

**Before mEHT**

**After mEHT**

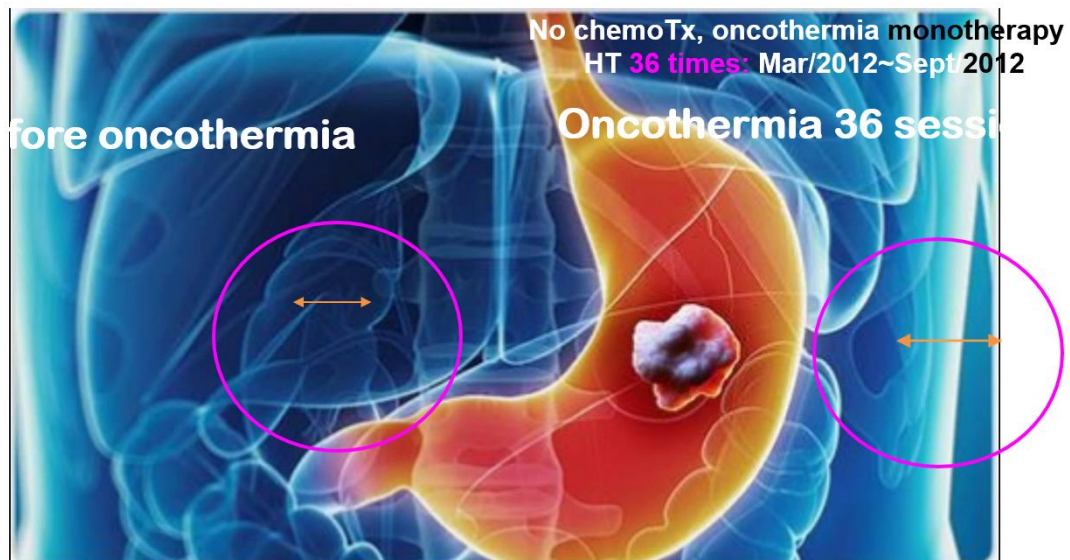


## Stomach Carcinoma, Stage IV; pts' preference

**Investigator:** Prof.Dr.Taesung Jeung

**Institute:** Department of Radiation Oncology, Kosin University, College of Medicine & Kosin University Gospel Hospital. Patient: (54y/F)

**Published:** 31<sup>st</sup> ICHO Oct. Budapest; 2012

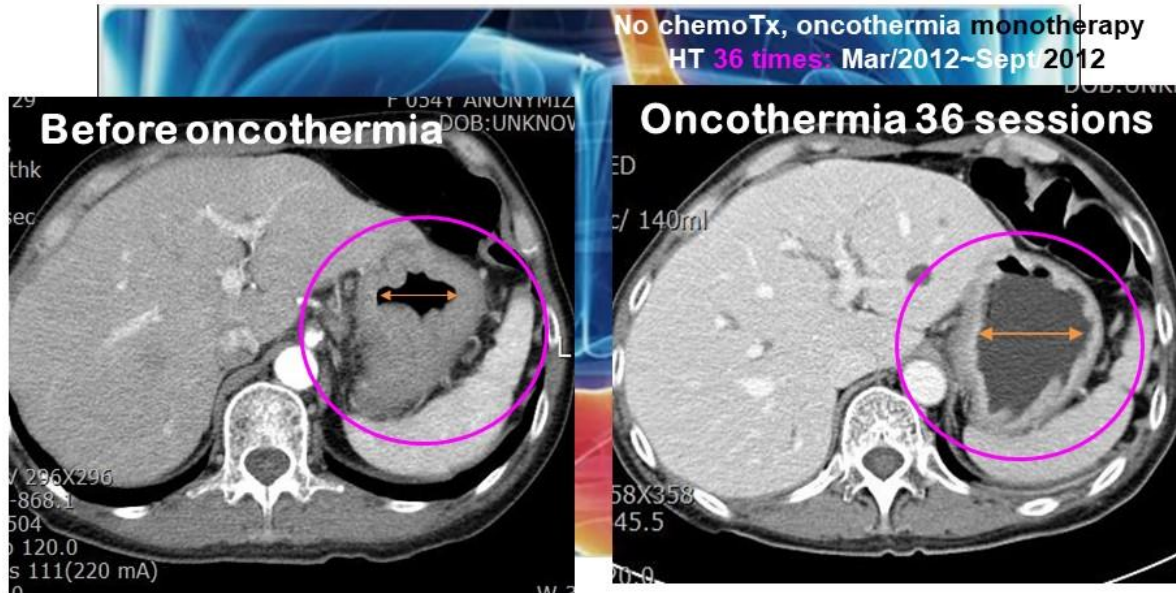


## Stomach Carcinoma, Stage IV; pts' preference

**Investigator:** Prof.Dr.Taesing Jeung

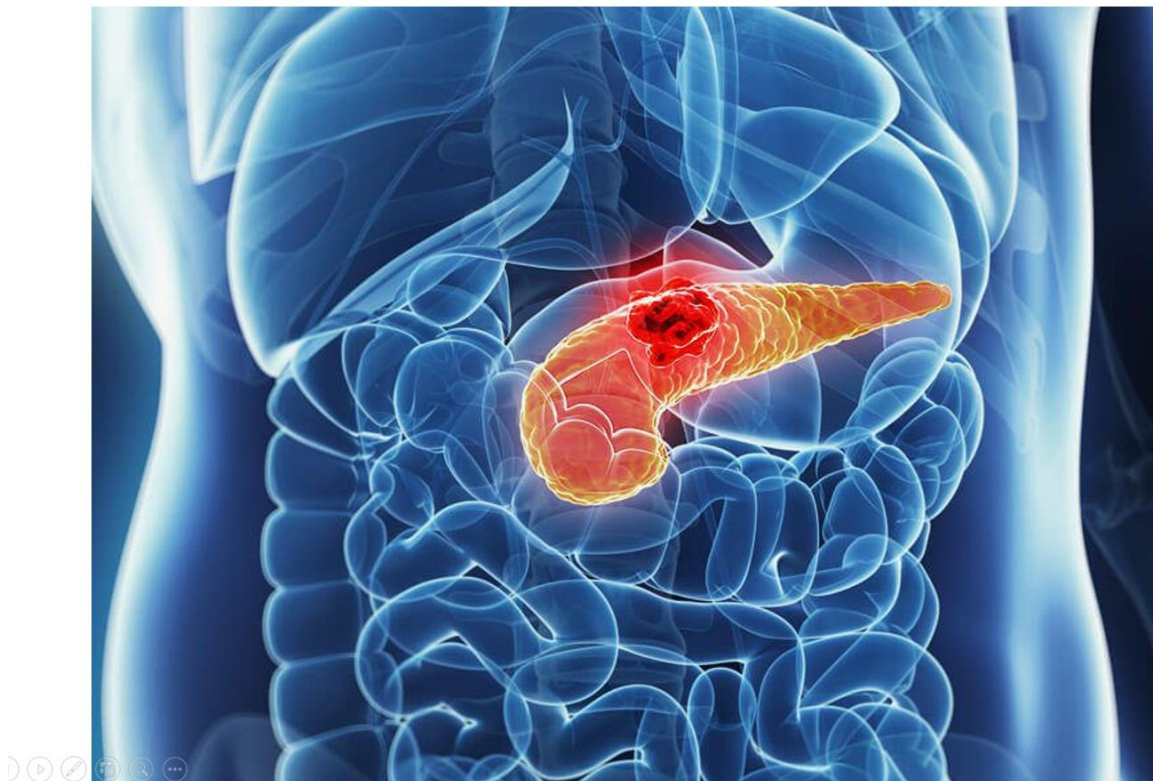
**Institute:** Department of Radiation Oncology, Kosin University, College of Medicine & Kosin University Gospel Hospital. Patient: (54y/F)

**Published:** 31<sup>st</sup> ICHO Oct. Budapest; 2012



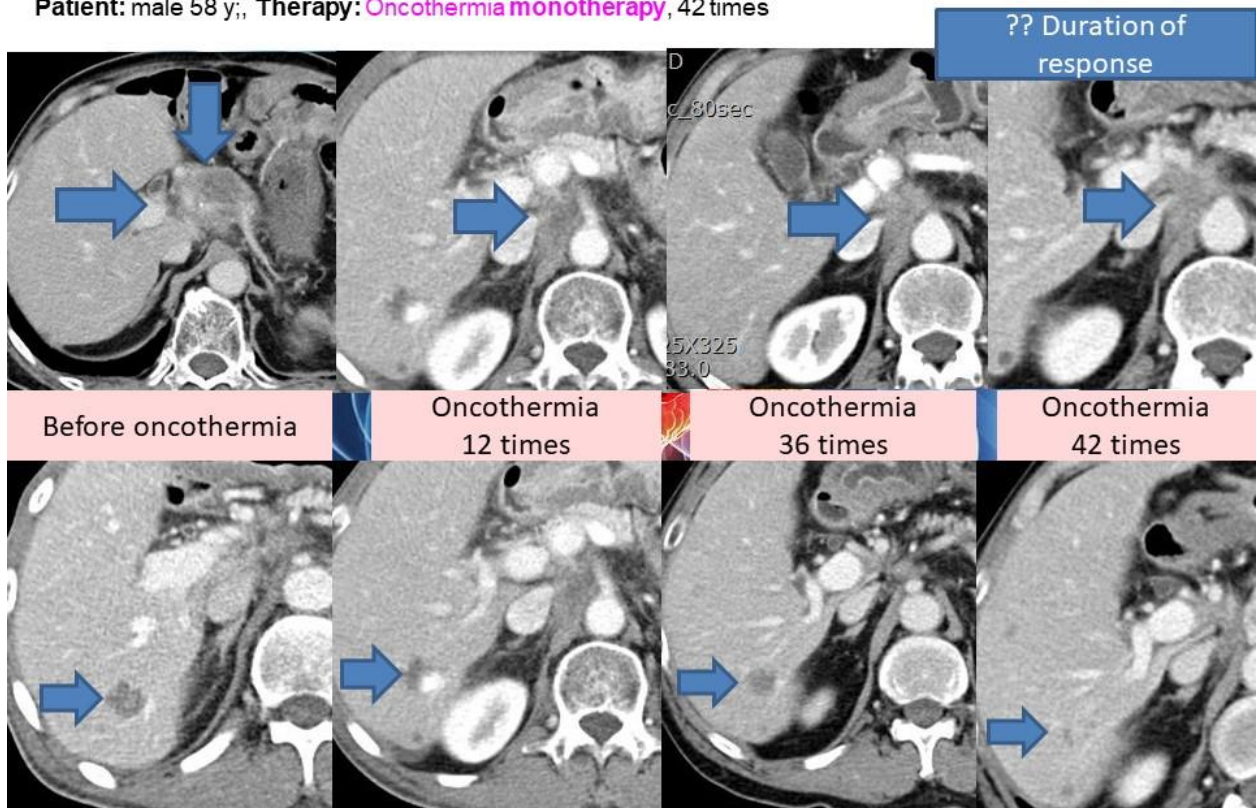
## Pancreatic cancer and liver metastasis

**Investigator:** Prof.Dr. Taesing Jeung; **Institute:** Department of Radiation Oncology, Kosin University,  
**Patient:** male 58 y., **Therapy:** Oncothermia monotherapy, 42 times



## Pancreatic cancer and liver metastasis

Investigator: Prof. Dr. Taesung Jeung; Institute: Department of Radiation Oncology, Kosin University,  
 Patient: male 58 y.; Therapy: **Oncothermia monotherapy**, 42 times



## Recurrent uterine sarcoma with peritoneal seedings

Investigator: Prof. Chi K-W, Shih-Kong Hospital, Taipei, Taiwan  
 Presented on 35<sup>th</sup> ICCHS Conference, Guangzhou, China; Nov. 2017)

refractory to chemotherapy and salvage  
 with combined radiotherapy (45Gy/30fx)



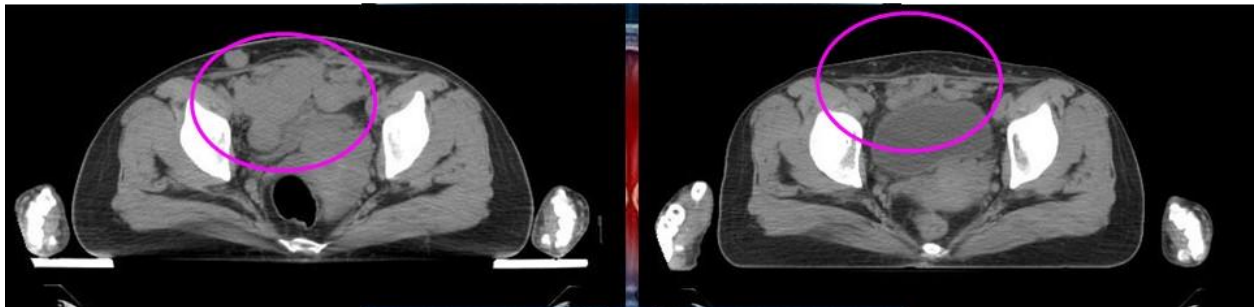
Evolution of partners in the  
 combo



## Recurrent uterine sarcoma with peritoneal seedings

Investigator: Prof. Chi K-W, Shih-Kong Hospital, Taipei, Taiwan  
Presented on 35<sup>th</sup> ICCH Conference, Guangzhou, China; Nov.2017)

refractory to chemotherapy and salvage  
with combined radiotherapy (45Gy/30fx)



Before treatment

After treatment

Evolution of partners in the  
combo

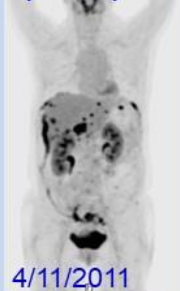
Intratumoral ipilimumab 2.5 mg, i.v. nivolumab  
50 mg and complementary with oncothermia 6  
times (1 time/week)

## Abscopal effect

Investigator: YH Kim; Ewha Womans University Mokdong Hospital, Seoul, Korea

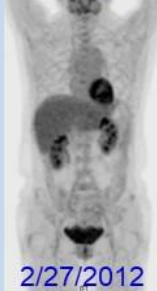
Recurrent refracter progressive  
ovarian cancer. (55y).

Op + multiple  
CTx



4/11/2011

CTx + mEHT



2/27/2012

Invasive adenocarcinoma of ovary  
(grade 2) (33 y). Vaginal bleeding; G5P2

Op + multiple  
CTx



4/20/2010

CTx +  
mEHT

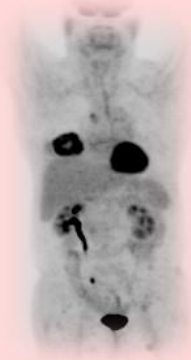
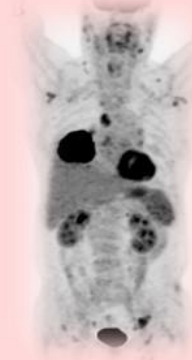


2/21/2011

Metastatic non-small-cell lung cancer (55y).

Investigator: Prof. Dr. Seong Min Yoon,  
Division of Hematology-Oncology, Department of Internal  
Medicine, Samsung Changwon Hospital, Sungkyunkwan University,  
Korea

Patient: 72 y, male, Primer-tumor: NSCLC; Size: 9.5 cm right middle  
lobe; Metastases: in sentinel and distant lymph-nodes; Tumor-  
classification: cT2 cN2 Mx, stage IIIB  
Treatment: 28x1.7 Gy; support: 250 microgram Leukine and  
Oncothermia 6x



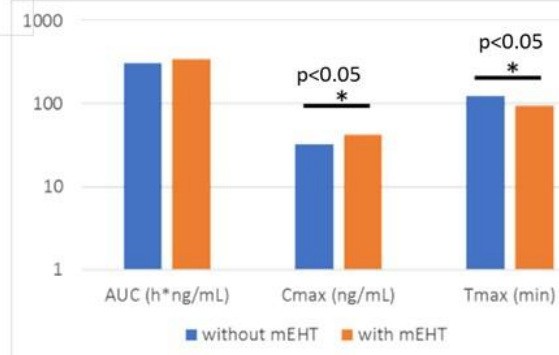
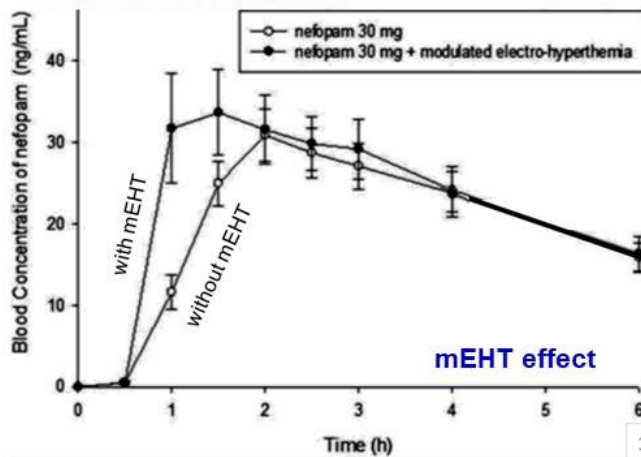
# Clinical studies



## Randomized study (n=6+6) for pharmacokinetics

**mEHT (with Nefopam)**

Lee SY, Kim M-G (2015); Int J Hyp, 31:869; 2015



# Oncothermia is safe in heavily escalated dose too

Institute: Neurology Clinic, Regensburg University, Germany,

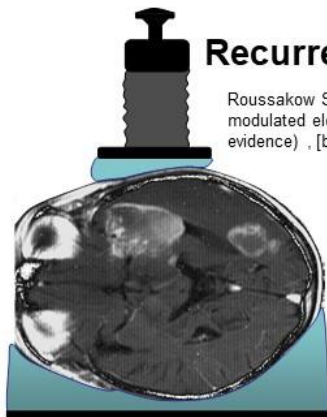
Investigators: Prof. Dr. U. Bogdahn & PD.Dr. P.Hau

Group	Number of Patients	Chemotherapy (single close of a 6 week cycle)	Oncothermia (4 of 6 week cycle)
1	3 (6)	ACNU 90 mg/m <sup>2</sup>	Oncothermia 2x /week
2	3 (6)	ACNU 90 mg/m <sup>2</sup>	Oncothermia 3x /week
3	3 (6)	ACNU 90 mg/m <sup>2</sup>	Oncothermia 4x /week
4	3 (6)	ACNU 90 mg/m <sup>2</sup>	Oncothermia 5x /week

Advanced glioma (3<sup>rd</sup> & 4<sup>th</sup> line)  
Dose escalation study (PhI)  
Number of patients: 24

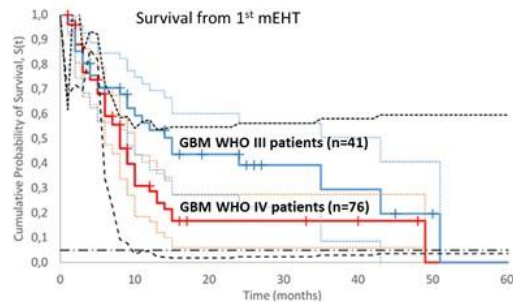
No additional side effect of oncothermia was observed. (Side effects were not more than with Nimustine alone!)

1. Wismeth C et al (2008) Loco-regional hyperthermia in patients with progressive astrocytoma WHO III or glioblastoma WHO IV (RNOP-10) – a prospective single arm phase I/II study; EANO
2. Wismeth C et al (2009) Transcranial electro-hyperthermia combined with alkylating chemotherapy in patients with relapsed high-grade gliomas – Phase I clinical results. Expanding the Frontiers of Thermal Biology, Medicine and Physics Annual Meeting of Society of Thermal Medicine, Tucson, USA, 3-7 April 2009
3. Hau P. (2010) Transcranial EHT & alkylating chemotherapy in relapsed high-grade gliomas: phase I clinical results, 1st International Oncothermia Symposium, Cologne, Germany
4. Wismeth C, Dudel C, Pascher C, Ramm P, Pietsch T, Hirschmann B, Reinert C, Proescholdt M, Rümmele P, Schuierer G, Bogdahn U, Hau P. (2010) Transcranial electro-hyperthermia combined with alkylating chemotherapy in patients with relapsed high-grade gliomas - Phase I clinical results, accepted Journal of Neuro-Oncology 98: 395-405, 2010



## Recurrent glioblastoma multiforme meta-analysis

Roussakow S Clinical and economic evaluation of dose-dense temozolomide 21/28d regimen with and without concurrent modulated electro-hyperthermia in the treatment of recurrent glioblastoma: a retrospective comparison of cohort trials (2a level evidence) , [based on Publications of Gronemeyer et al. (2004)]; BMJ Open, 7:e017387.doi.1136/BMJ-open-2017-017387; (2017).



No Study, cohort	Single-arm		Weight (%)	p-value						
	M/No	Mean survival time		1	2	3	4	5	6	7
1 Jungk (2016), BCNU	9,0/34	9,00 (7,49 – 10,51)	10,6%	1,00	0,00	0,00	0,87	0,98	0,61	0,07
2 Reithmeier (2010), BCNU	5,1/35	5,10 (4,48 – 5,72)	62,6%	0,00	1,00	0,14	0,03	0,00	0,00	0,05
3 Glas (2009), ACNU + VM26	6,0/35	6,00 (5,01 – 6,99)	24,4%	0,00	0,14	1,00	0,12	0,02	0,00	0,37
4 Heiland (2016), BEV + CCNU	8,7/18	8,70 (5,51 – 11,89)	2,4%	0,87	0,03	0,12	1,00	0,90	0,62	0,33
5 Hau (2010), ACNU+mEHT, salvage	9,0/15	8,96 (6,69 – 11,23)	4,7%	0,98	0,00	0,02	0,90	1,00	0,65	0,16
6 Douwes (2005), ACNU+mEHT	9,7/19	9,68 (7,61 – 11,75)	5,6%	0,61	0,00	0,00	0,62	0,65	1,00	0,04
<b>7 Pooled (1 - 4)</b>	<b>7,20/122</b>	<b>6,90 (5,19 – 8,61)</b>	<b>110%</b>	<b>0,07</b>	<b>0,05</b>	<b>0,37</b>	<b>0,33</b>	<b>0,16</b>	<b>0,04</b>	<b>1,00</b>

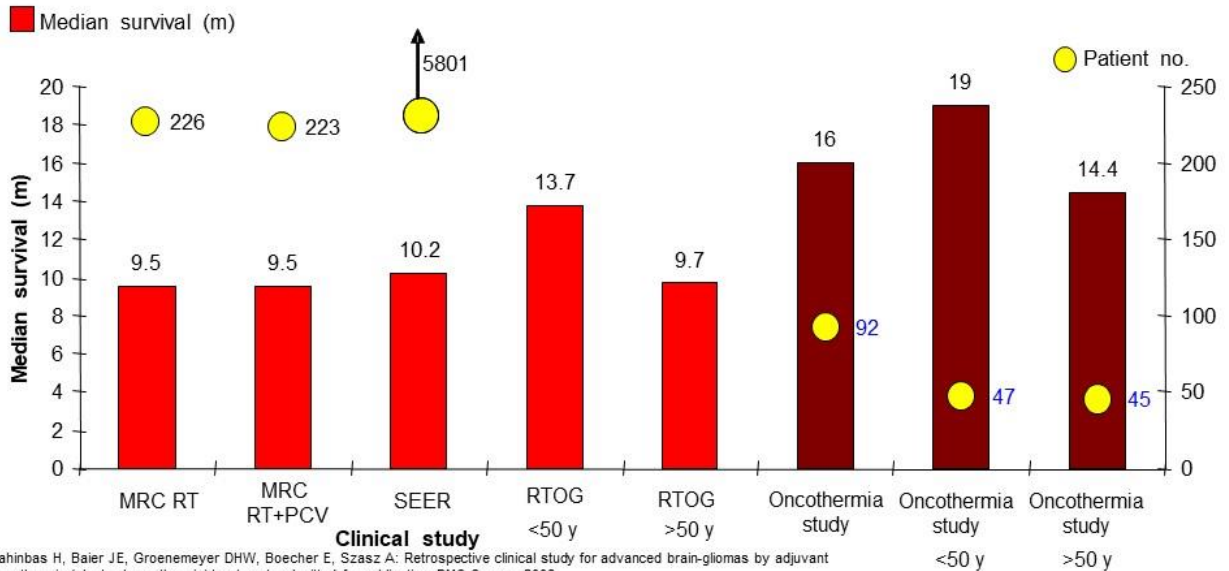
Random effect model (I<sup>2</sup>=0,0%, p=0,59)

Mean ST, months  
worst ← → better

## Comparison by international trials

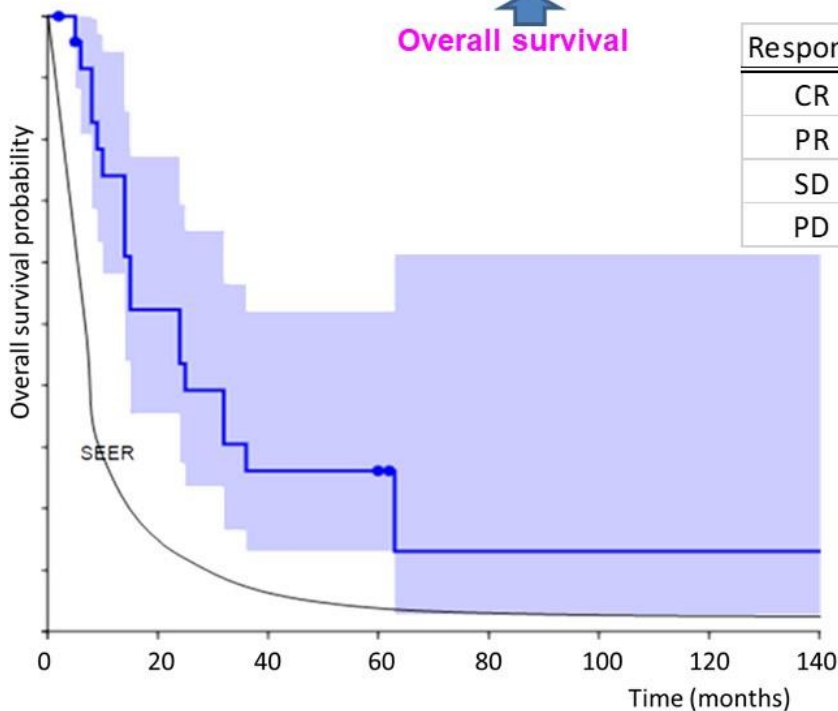
SEER (Surveillance, Epidemiology, and End Results) by the National Cancer Institute USA, April 2000  
 MRC (Medical Research Council, Brain Tumor Working Party)  
 RTOG (Radiation therapy Oncology Group)  
 EORTC (European Organisation for Research and Treatment of Cancer)  
 RT = Radiotherapy, PCV = Procarbazine+CCNU(Lomustine)+Vincristine, TMZ = Temizolomide

### Glioblastoma multiforme (WHO IV) clinical trial-results



### Relapsed gliomas survival (n=24)

**Investigator:** Prof. Dr. Fiorentini G.; **Department** of Onco-hematology, Azienda Ospedaliera Marche Nord, Pesaro, Italy. **Patients:** n=25, 19 glioblastoma, 6 astrocytoma, **Pretreatments:** all: temozolomide & radiotherapy, 22/24 surgery; **Published:** Fiorentini G. Oncothermia in brain tumors, Invited lecture on 35<sup>th</sup> annual conference of the International Clinical Hyperthermia Society (ICHS), November 25-26, 2017, Guangzhou, China



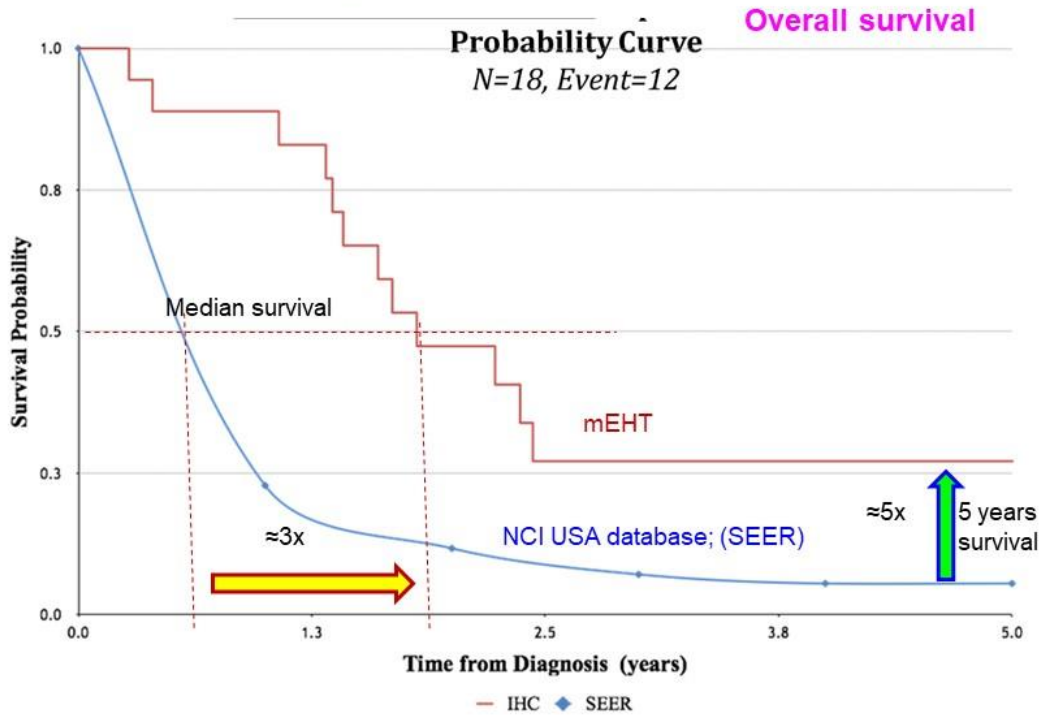
Clinical benefit in pretreated pts.

# Glioblastoma multiform

**Investigator:** Dr. Gurdev Parmar

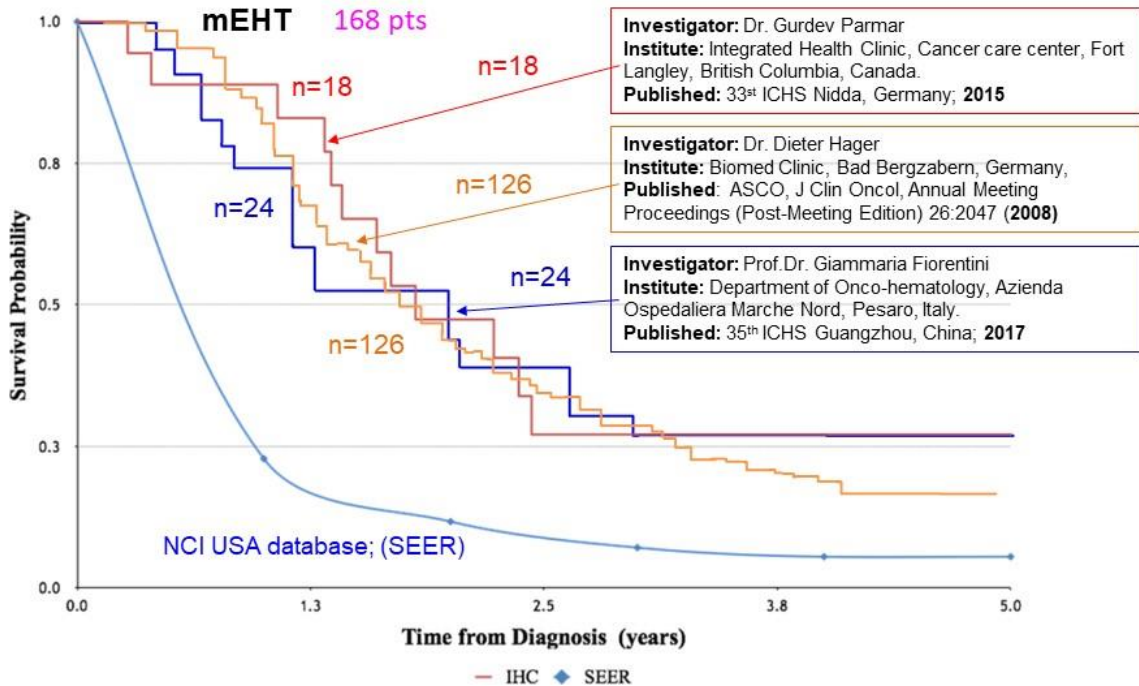
**Institute:** Integrated Health Clinic, Cancer care center, Fort Langley, British Columbia, Canada.

**Published:** 33<sup>rd</sup> ICCHS Nidda, Germany; 2015



## Glioblastoma multiform – comparison of three survival results

### Overall survivals



## Small-cell-lung-cancer (n=9+10) double arm prospective study 2L

**Investigator:** Professor DY Lee, Kagnam Severance Hospital, Yonsei University, Seoul, S.Korea

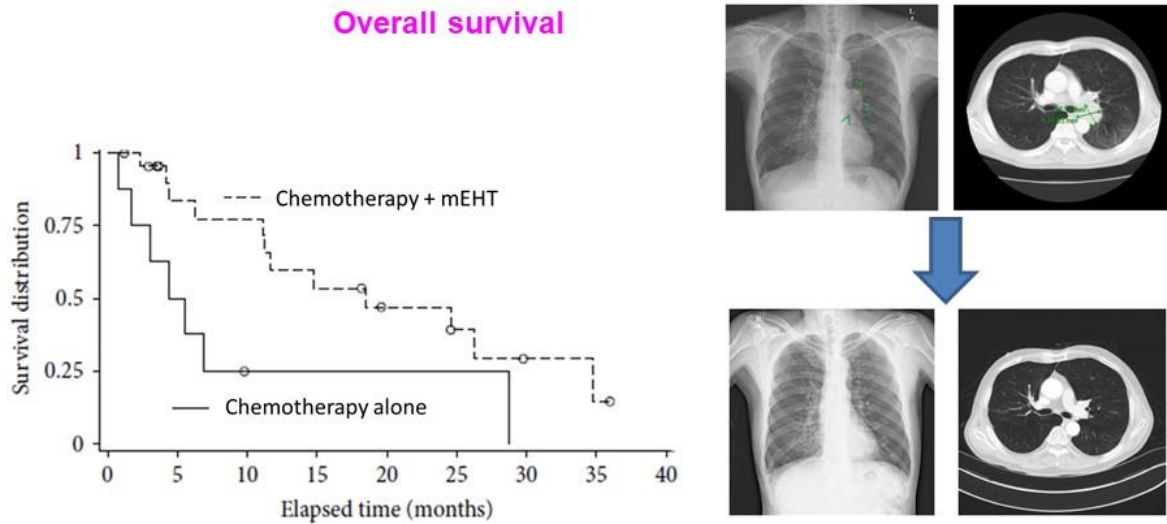
**Published:** Lee DY, et al. (2013) Conference Papers in Medicine, Vol.2013, Article ID 910363, pp.1-7

Prospective, monocenter, cohort double-arm study of chemotherapy with and without complementary oncothermia

**Chemotherapy 1<sup>st</sup> line (n=28):** Irinotecan (60 mg/m<sup>2</sup>), Cisplatin (60 mg/m<sup>2</sup>) three times.

**Chemotherapy 2<sup>nd</sup> line (n=19):** Etoposide, (110 mg/m<sup>2</sup>) Cisplatin (70 mg/m<sup>2</sup>)

**Additional oncothermia in 2<sup>nd</sup> line combination (n=9):** 150 Watt, 1,490.5 kJ, 60 min, every second day, with rise in temperature to 38.5°C–42.5°C. Electrode 30 cm diameter at least 12 sessions were in 1 cycle.

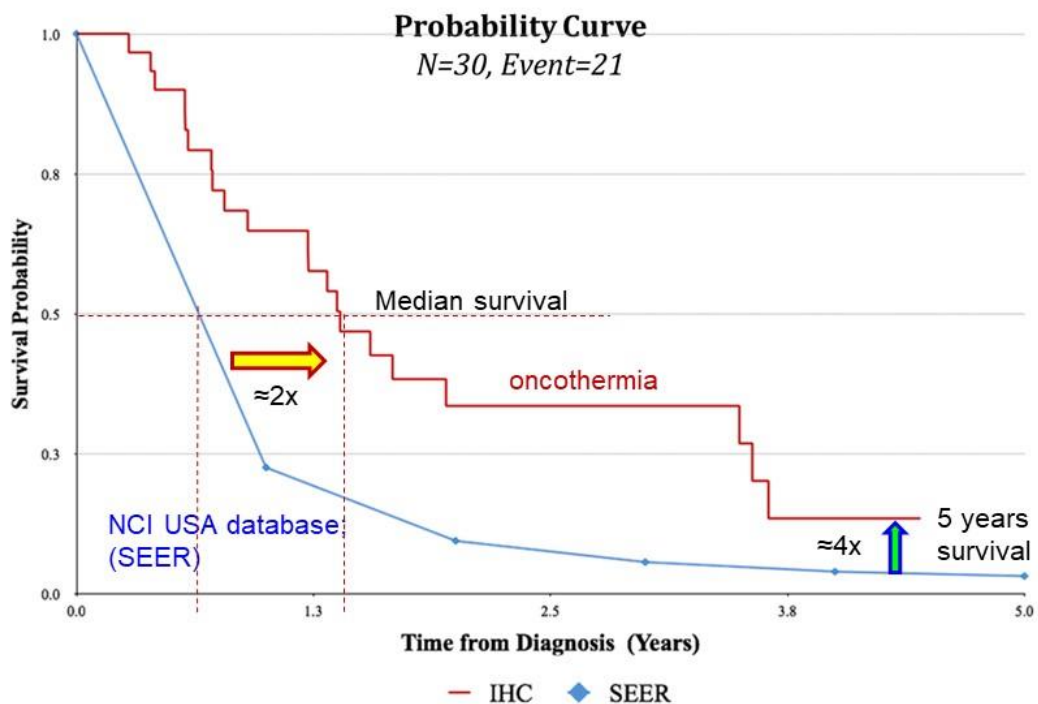


## Metastatic lung

**Investigator:** Dr. Gurdev Parmar

**Institute:** Integrated Health Clinic, Cancer care center, Fort Langley, British Columbia, Canada.

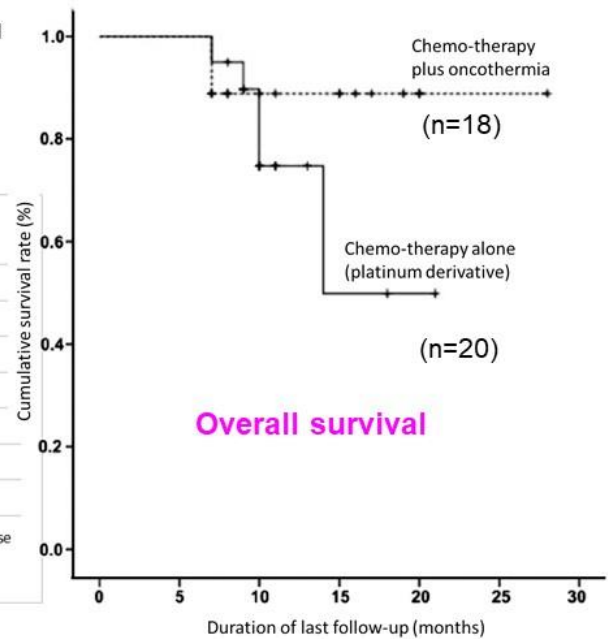
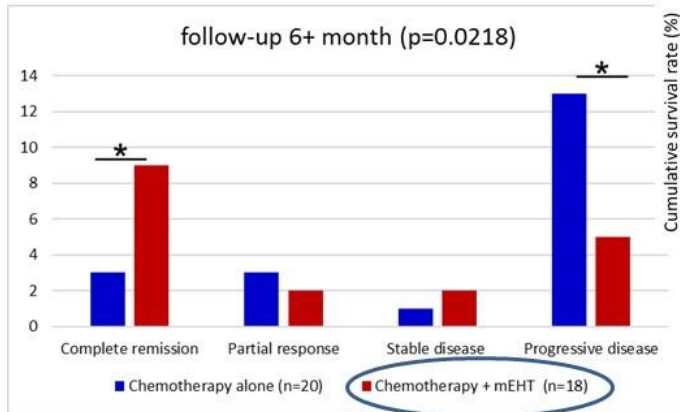
**Published:** 33<sup>rd</sup> ICHS Nidda, Germany; 2015



## Recurrent cervix double arm (n=20+18), randomized study

Lee SY, Lee NR, Cho D-H, Kim JS; Oncology Letters, <https://doi.org/10.3892/ol.2017.6117>, (2017)

Patients received *conventional chemotherapy alone* (n=20) compared to the combination to mEHT (n=18). Every patient had chemotherapy [paclitaxel + cisplatin (n=14), paclitaxel + carboplatin (n=10), cisplatin + 5-fluorouracil (n=12), cisplatin alone (n=2)]. *Radiotherapy was not permitted* in this cohort.



Both the local control and the overall survival are improved

## Phase III randomised cervix trial (n=236) of mEHT with CHRT (interim results (n=160), follow-up is ongoing)

**Investigators:** Minnaar CA; Kotzen JA; Baeyens A. Charlotte Maxeke Johannesburg Academic Hospital, S.Afrika. **Aim:** to enrol 236 participants with FIGO stage IIB (initial distal parametrium involvement) to IIIB *cervical cancer*

Statistics	n	%
HIV positive	120	51%
Stage III	157	66.6%

**Radiation:** 25x2Gy external and 3x8Gy brachytherapy

**Chemotherapy:** 3x 80mg/m2 Cisplatin

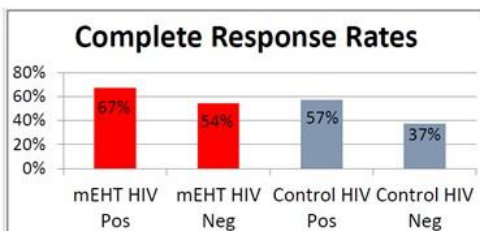
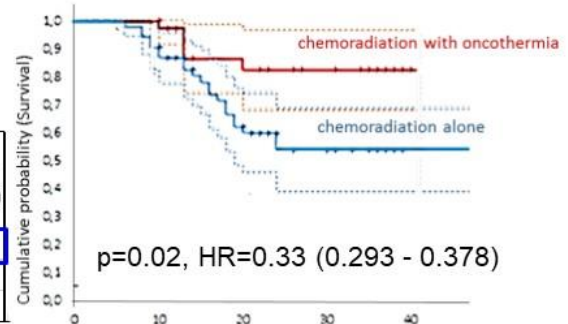
**mEHT (oncothermia):** 2x 55min/week (4 weeks)

### Local control

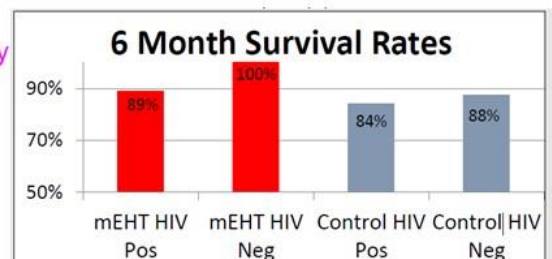
Until now: 6 month Local Disease Control  
160 patients completed 6 month PET scan.

Measured	Radio-chemotherapy				Gain by mEHT (%)
	with mEHT		without mEHT		
	n	%	n	%	
Complete response	33	47%	27	32%	15%
6 months survival (n=160)	70	91%	90	81%	10%
24 months survival (n=114)	55	78%	59	65%	13%

### Survival time control



Interim report by HIV infection (subgroups)



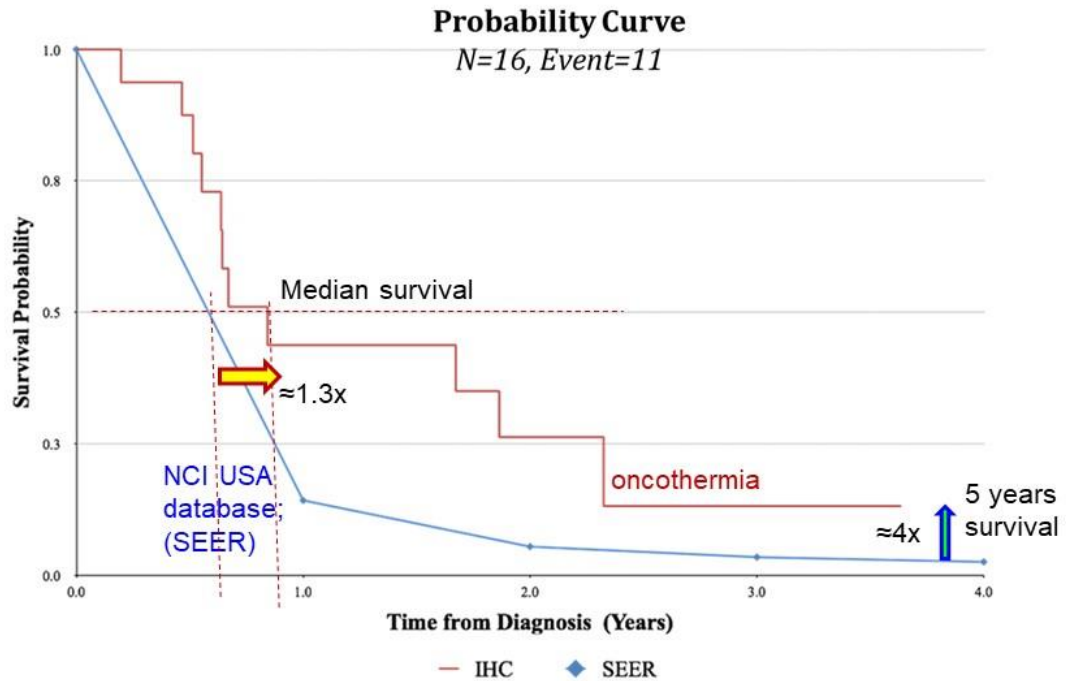
Until now, both the local control and the overall survival are improved

# Non-resectable pancreatic adenocarcinoma

Investigator: Dr. Gurdev Parmar

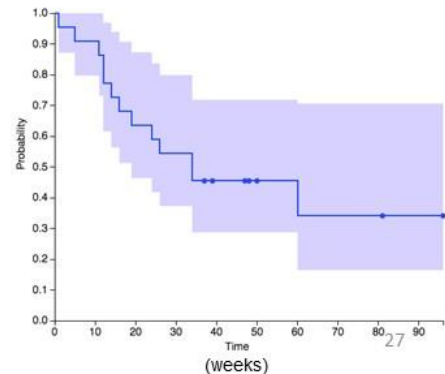
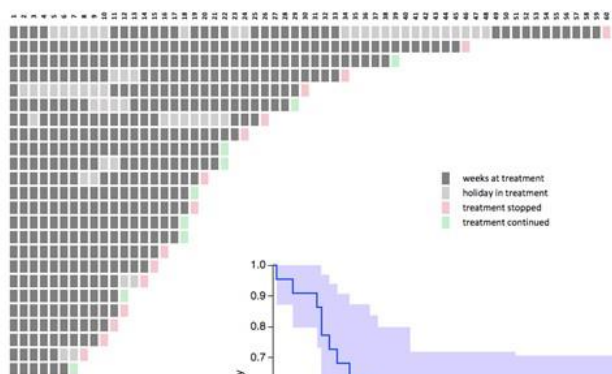
Institute: Integrated Health Clinic, Cancer care center, Fort Langley, British Columbia, Canada.

Published: 33<sup>rd</sup> ICCHS Nidda, Germany; 2015

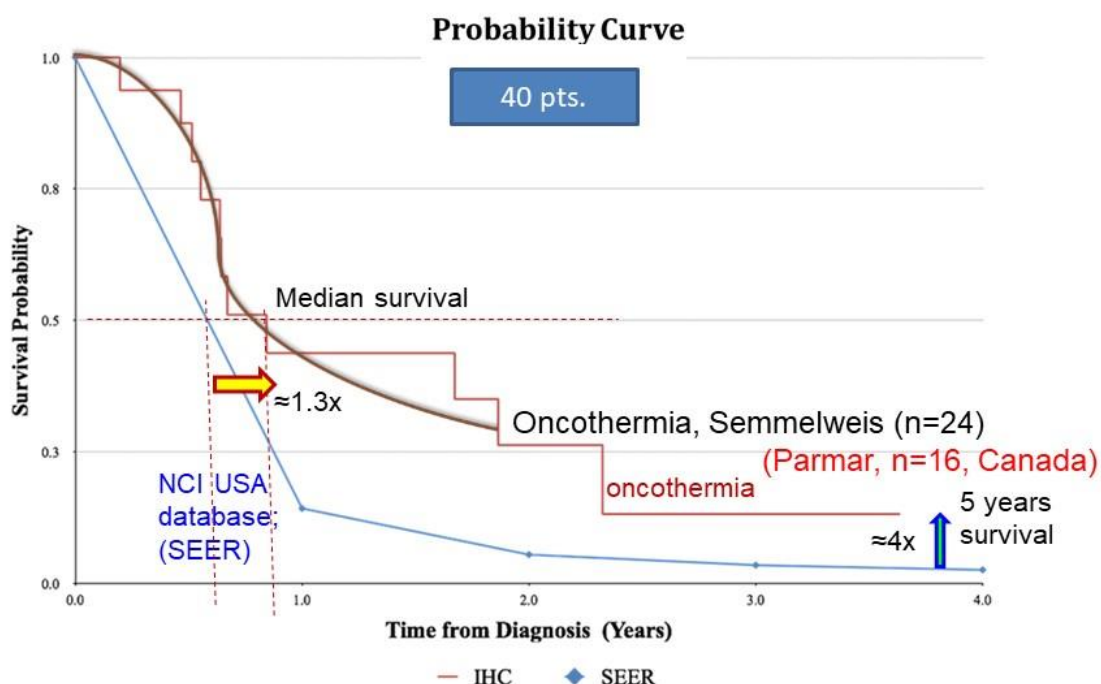


Own study – real life data at Cancer Center, Semmelweis University (poster at ESHO 2018)

1	gender/age	session	weeks	adjuvant t/a	reason for stopping/break
2	F68	85	60	GEM/B, Folfirinox	fever
3	M68	86	46	wek.Gemzar/B	intolerance
4	M71	79	39		
5	M58	82	34	Folfirinox	
6	F63	22	30	Gemzar3FU+LV	neutropenia
7	M71	54	29	weekly CDDP+Gemzar	pneumonia
8	M26	42	26	10xrad	fever
9	F69	52	24	CI GEM+CDDP	progression, ileus
10	F67	41	22	GEM+CDDP	
11	M64	39	22	GEM-Tax.	urticaria
12	F57	24	20	Gemzar	intolerance
13	F76	34	19	Tegafur	
14	M72	8	19	GEM+CDDP	pain
15	M63	29	18	GEM+CDDP	
16	F72	33	18	gemzar	
17	M61	51	16	Folfirinox	progression, ascites
18	F62	28	15	Folfirinox	cholangitis, jaundice, ascites
19	M56	30	14	GEM+CDDP	progression, ascites
20	F66	42	12	GEMox, majd GEM mono	
21	M68	16	12	Folfirinox	progression
22	M48	23	11	wek. Gemzar	jaundice, hyperkalaemia
23	F65	12	10	Folfirinox	
24	M56	14	8	Folfirinox	pain
25	F75	15	7	GEM/B	pain, ascites



## Non-resectable pancreatic adenocarcinoma



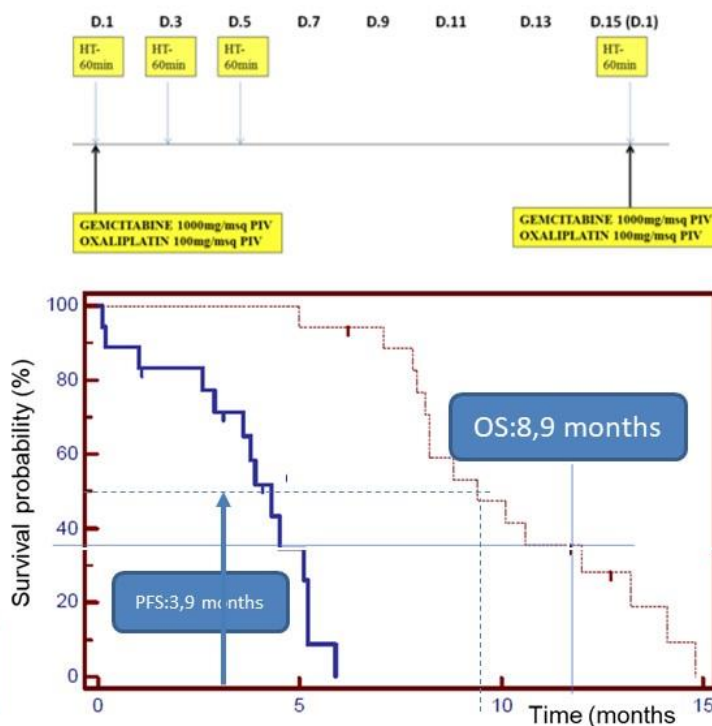
### Preliminary results of an prospective trial with 2L GEMOX+mEHY (n=26)

Metastatic pancreatic cancer after 1L gemcitabine treatment. In the 2<sup>nd</sup> line the patients received gemcitabine 1000mg/m<sup>2</sup> IV and oxaliplatin 100mg/m<sup>2</sup> IV day 1 (GEMOX) combined with mEHT days 1, 3 and 5 all repeated at 14 days

Characteristics	Enrolled (n=17)
Male	9
Female	8
ECOG Performance status	
ECOG 1	5
ECOG2	12
Stage at study entry	
Liver metastasis	6
Lung metastasis	4
Lymph node metastasis	6
Peritoneal carcinosis	4
Bone metastasis	6
Ascites/pleural effusion	8
Nr. of prior chemotherapy cycles (GEM) - median	5.4
Histopathologic types	
Duct cell carcinoma	11
Acinar cell carcinoma	1
Papillary mucinous carcinoma	2
Signet ring carcinoma	1
Adenosquamous carcinoma	1
Undifferentiated carcinoma	1
Prior regional therapy	
Surgery	6
Radiotherapy	3

Volovat et al.; (2014); *Romanian Reports in Physics*, 66:166–174

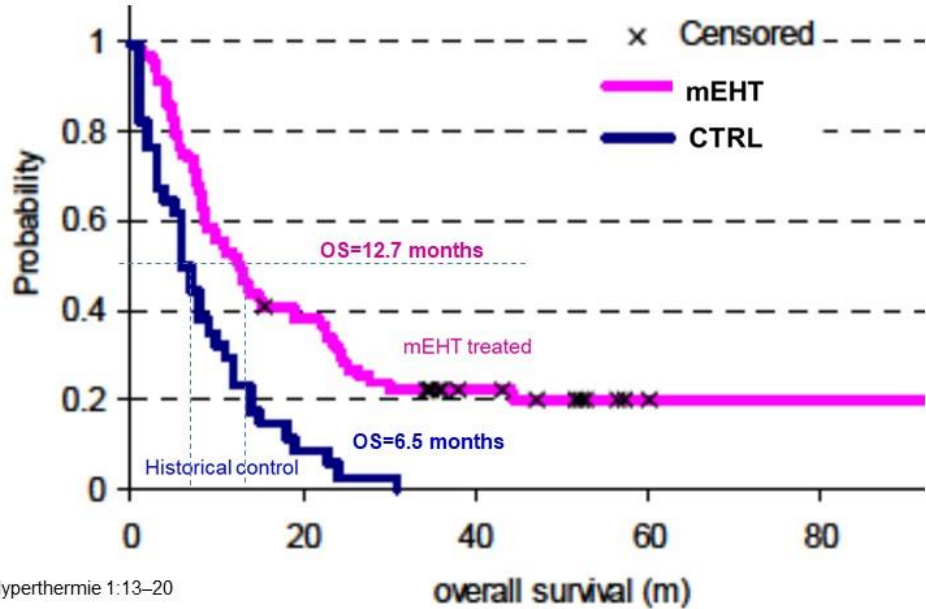
SEER: median survival for all the pancreatic patients is 7.5 months



## Advanced, metastatic pancreas study (n=99)

Retrospective, 2centers (A & B), single-arm clinical trial (n=99) for advanced pancreas cancer treated by oncothermia [1]. Most of the patients had **distant mets** (77, 77.8%; A:23,88.7%, B:54,74%) and more than 40% had **multiple mets**. The trial includes a cohort of **heavily pretreated patients** (3+ lines), and due to the refractory or another fail of the conventional therapies, in this study **mEHT was applied as monotherapy**. The first and subsequent year survivals were: 1st:50.5%, 2nd: 27.3%, 3rd:15.2%, 4th:8.1%, 5th:3%. These values are significantly higher than the values from the large databases (SEER and Eurocare). The center B had the historical arm of conventional therapies (and palliation) of the cohort, with **median overall survival 6.5 m**, while the **median in study arm was 12.7 m**.

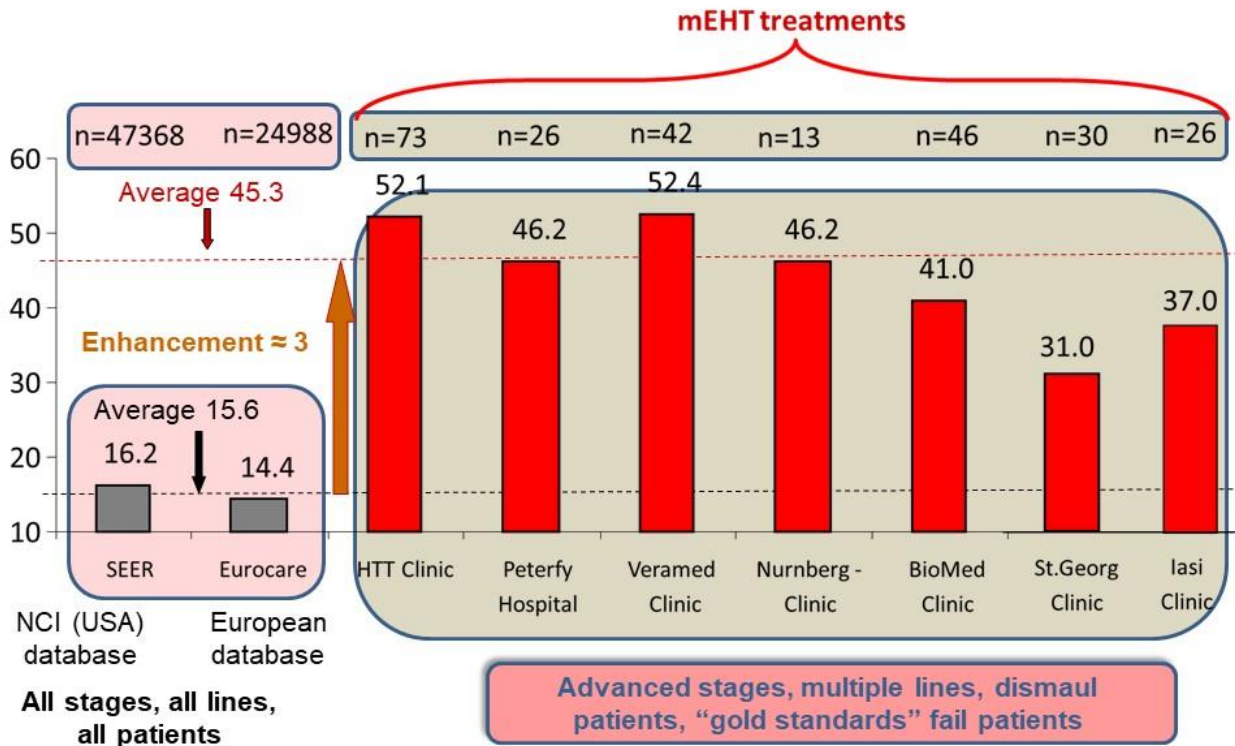
### Overall survival



Dani A, et al. (2008) Forum Hyperthermie 1:13-20

## Comparison of pancreas studies

### Metastatic pancreas CA 1y survival [%]



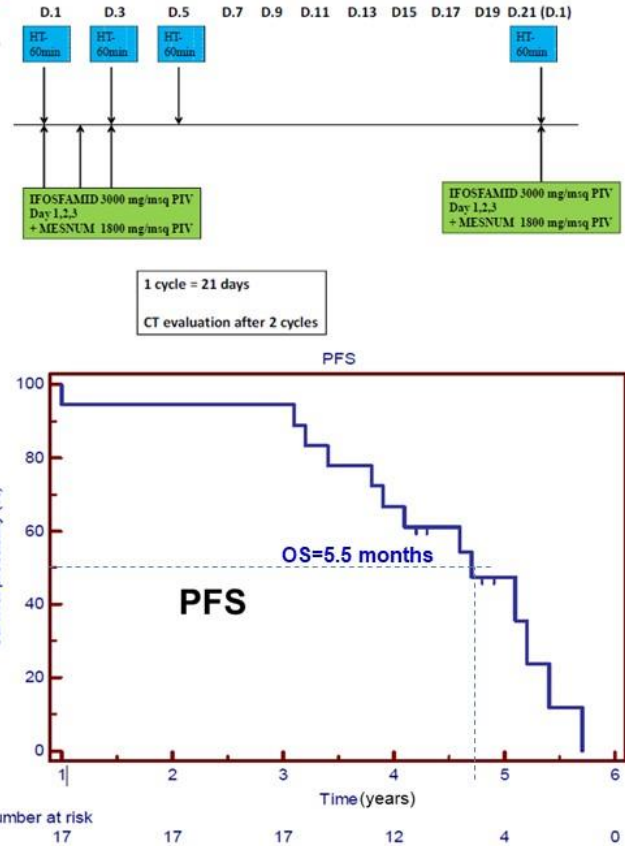
## Advanced, high risk recurrent sarcoma (n=24)

After recurrence of 1L CHT with doxorubicin 2L CHT (ifosfamide 3000mg/m<sup>2</sup>, day 1–3) and mEHT (1 hour application with temperature between 41.5°C and 42°C, 3 days/week).

The response 88% (partial response 44% patients for 4 m; stable disease 44% patients for 4 m and 5% only 1 m).

Characteristic	Nr. of patients
Performance status	
ECOG 2	4
ECOG 3	14
Site of metastasis	
Lung	8
Liver	11
Bone	7
Histopathologic Type	
Fibrosarcoma	5
Mixofibrosarcoma	2
Synovial sarcoma	3
Leiomyosarcoma	3
Epithelioid Sarcoma	2
Angiosarcoma	3

Volovat et al.; (2014) The results of combination of ifosfamide and locoregional hyperthermia (ehy 2000) in patients with advanced abdominal soft-tissue sarcoma after relapse of first line chemotherapy, *Romanian Reports in Physics*, 66:175–181

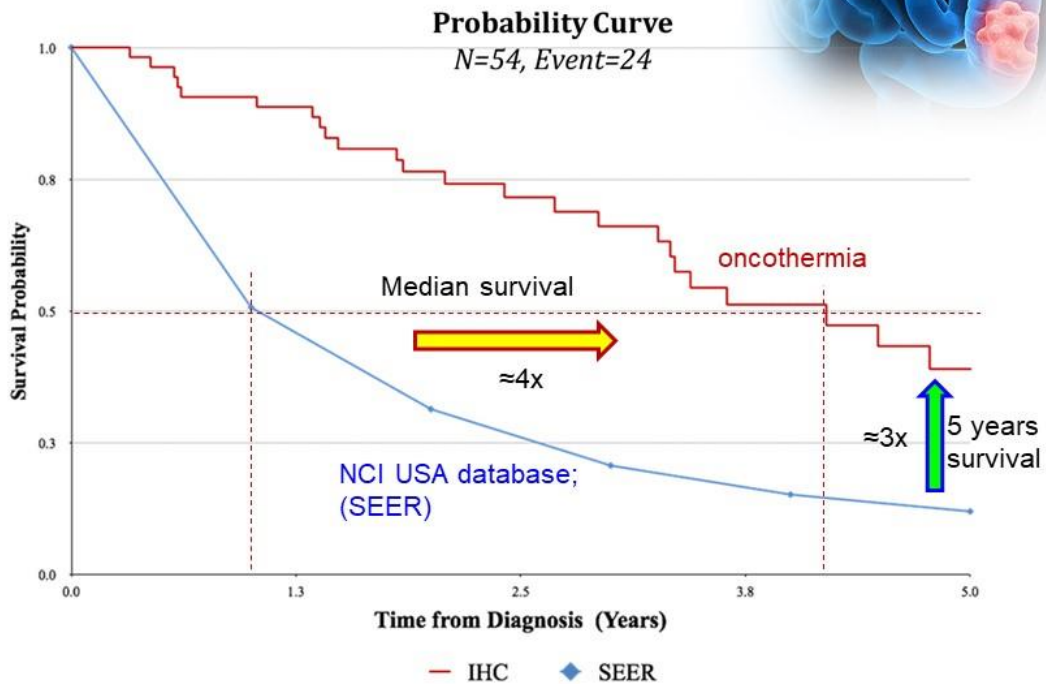


## Metastatic colorectal cancer

Investigator: Dr. Gurdev Parmar

Institute: Integrated Health Clinic, Cancer care center, Fort Langley, British Columbia, Canada.

Published: 33<sup>rd</sup> ICHS Nidda, Germany; 2015

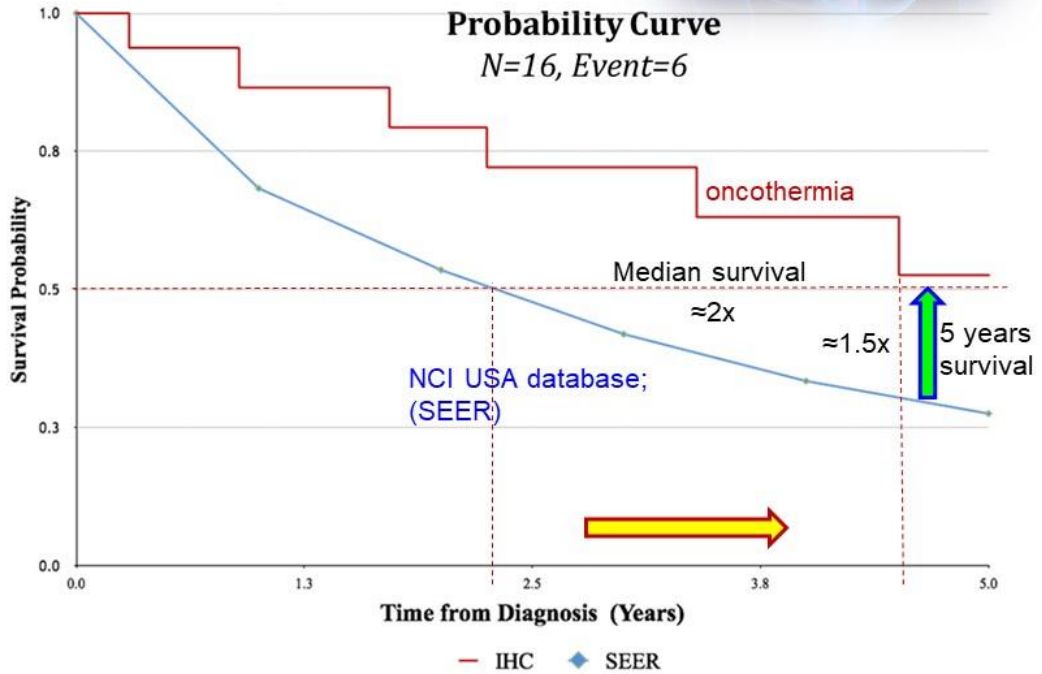


## Advanced ovarian cancer

Investigator: Dr. Gurdev Parmar

Institute: Integrated Health Clinic, Cancer care center, Fort Langley, British Columbia, Canada.

Published: 33<sup>st</sup> ICHS Nidda, Germany; 2015

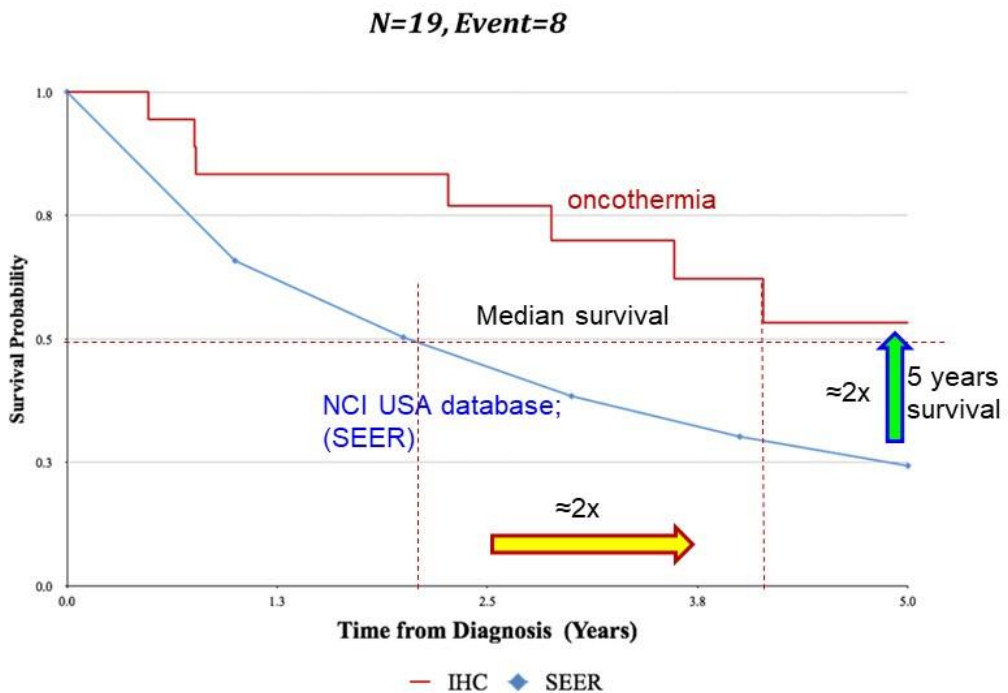


## Metastatic breast cancer

Investigator: Dr. Gurdev Parmar

Institute: Integrated Health Clinic, Cancer care center, Fort Langley, British Columbia, Canada.

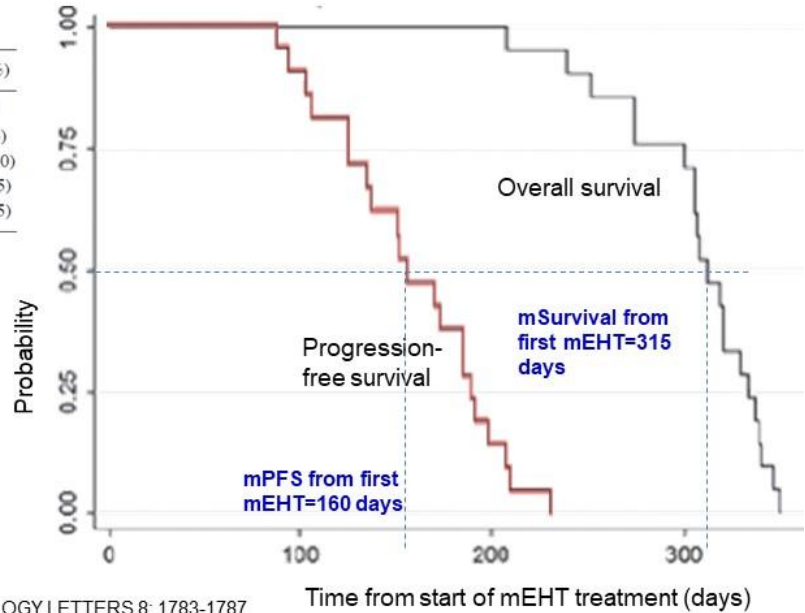
Published: 33<sup>st</sup> ICHS Nidda, Germany; 2015



## Hepatocellular carcinoma Phase II study (n=21)

A mono-institutional uncontrolled phase II trial was conducted on advanced HCC patients. Treatment was continued until disease progression (PD) or unacceptable drug-related toxicities. Sorafenib treatment interruptions and dose reductions (initially 200 mg twice daily, then reduced to 200 mg once daily) were allowed for drug-related toxicity.

Response	n (%)
Complete response	0
Partial response	1 (5)
Stable disease	11 (50)
Progressive disease	9 (45)
Disease control rate	9 (45)



Gadaleta-Cardarola G. et al.; (2014); ONCOLOGY LETTERS 8: 1783-1787

## TCM + oncothermia for intraperitoneal chemoinfusion (IPCI)

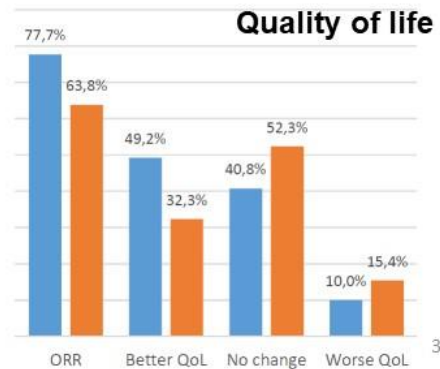
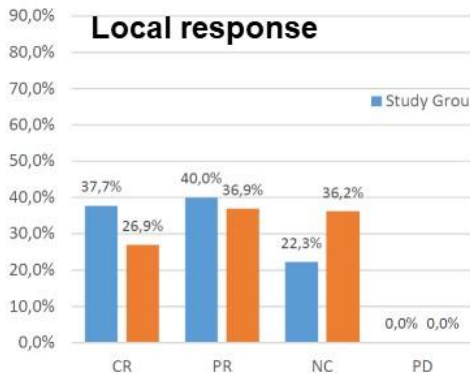
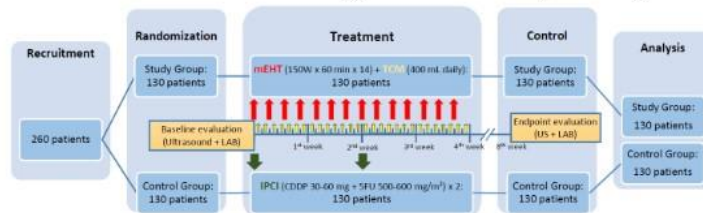
Investigator: Prof. Dr. Clifford LK Pang

Institute: Clifford Hospital, Panyu, Guangzhou, China

Published: CLK Pang et al (2017) **Local modulated electro-hyperthermia** in combination with traditional Chinese medicine vs. intraperitoneal chemoinfusion for the treatment of peritoneal carcinomatosis with malignant ascites: A phase II randomized trial, MOLECULAR AND CLINICAL ONCOLOGY 6: 723-732, 2017

Patient: 260 patients in two randomized groups: IPCI control and IPCI+TCM+mEHT

Diagnosis: peritoneal carcinomatosis with malignant ascites (PCMA)



# TCM + oncothermia for intraperitoneal chemoinfusion (IPCI)

**Investigator:** Prof. Dr. Clifford LK Pang

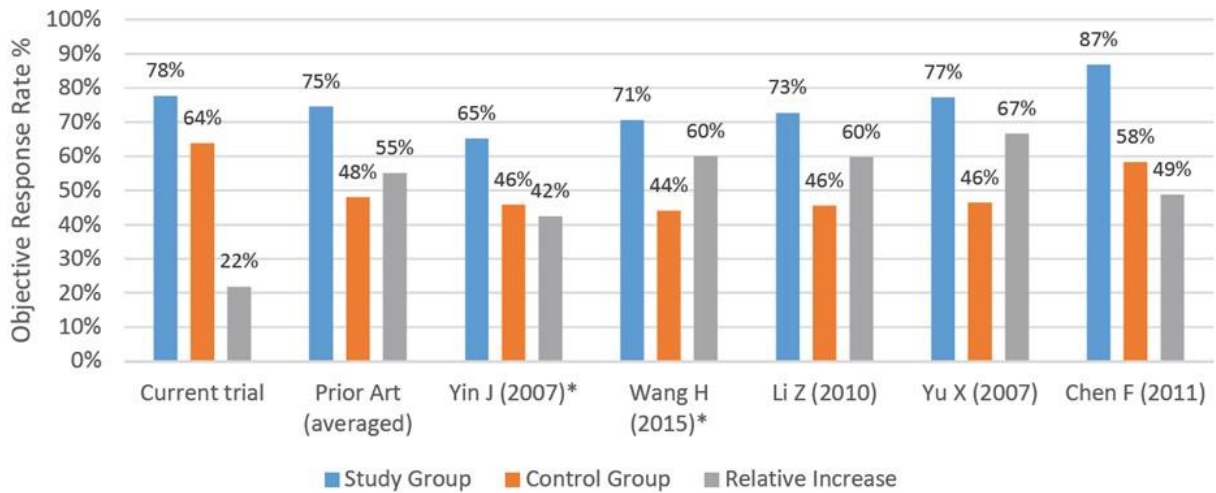
**Institute:** Clifford Hospital, Panyu, Guangzhou, China

**Published:** CLK Pang et al (2017) Local modulated electro-hyperthermia in combination with traditional Chinese medicine vs. intraperitoneal chemoinfusion for the treatment of peritoneal carcinomatosis with malignant ascites: A phase II randomized trial, *MOLECULAR AND CLINICAL ONCOLOGY* 6: 723-732, 2017

**Patient:** 260 patients in two randomized groups: IPCI control and IPCI+TCM+mEHT

**Diagnosis:** peritoneal carcinomatosis with malignant ascites (PCMA)

## Comparison of efficacy



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a penny for your thoughts

Immuncells  
 Imflammation- hot and cold tumours  
 CHT, targeted therapy and RT induces tumor-  
 antigens  
 Neangiogenesis

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