Personalised Testing of Natural Substances to Support Cancer Cell Apoptosis

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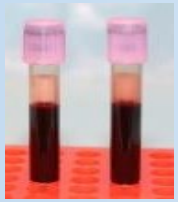
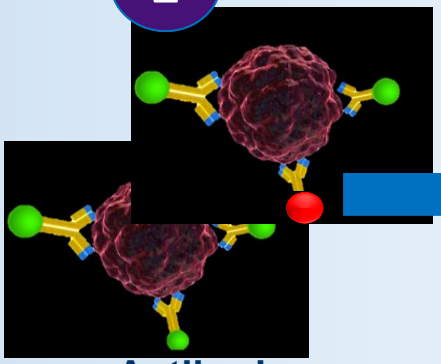
Methodology

1



Blood sample

2



Antibody staining

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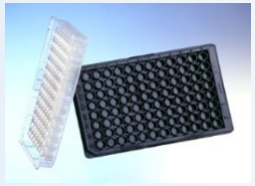
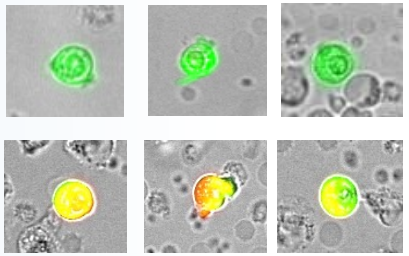


96 well plate

4

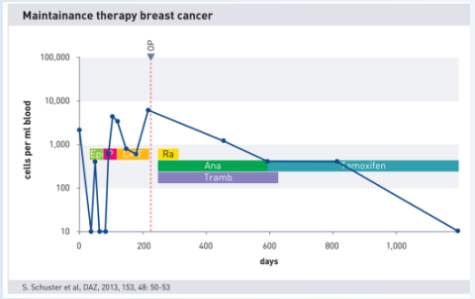
Microscopic identification of living cells

5



Quantitative enumeration of living cells

6



Dynamics of the cell count

Success control:

- Chemotherapy
- Maintenance therapy
- Longtime monitoring

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No other lab has comparable flexibility

- Test natural agents for their cytotoxicity against your patient's own cancer cells
- Send in your own selection of agents (small sample required)
- And/or select from our list of suggestions
- Test the same agent as an infusion and an oral supplement – often very different results
- Test mixtures in one formula – you choose the combination

Chemo-sensitivity

J Cancer Therapy 2013, 4:597-605

Chemosensitivity Testing of Circulating Epithelial tumour Cells (CETC) in Vitro: Correlation to in Vivo Sensitivity and Clinical Outcome.

Journal of Cancer Therapy, 2013, 4, 597-605
doi:10.4236/jct.2013.42077 Published Online April 2013 (http://www.scirp.org/journal/jct)

Scientific Research

Chemosensitivity Testing of Circulating Epithelial Tumor Cells (CETC) *in Vitro*: Correlation to *in Vivo* Sensitivity and Clinical Outcome

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ABSTRACT

Background: Chemotherapy is a mainstay of tumor therapy, however, it is predominantly applied according to empirically developed recommendations derived from statistical relapse rates occurring years after the treatment in the adjuvant situation and from progression-free interval data in the metastatic situation, without any possibility of individually determining the efficacy in the adjuvant situation and with loss of time and quality of life in the metastatic situation if the drugs chosen are not effective. Here, we present a method to determine the efficiency of chemotherapeutic drugs using tumor cells circulating in blood as the part of the tumor actually available in the patient's body for chemosensitivity testing. Methodology/Principal Findings: After only red blood cell lysis, omitting any enrichment (analogous to other blood cell enumeration methods, including rare CD34 cells), the white cells comprising the circulating epithelial tumor cells (CETC) are exposed to the drugs in question in different concentrations and for different periods of time. Staining with a fluorescence-labeled anti-epithelial antibody detects both vital and dying tumor cells, distinguishing vital from dying cells through membrane permeability and nuclear staining with propidium iodide. Increasing percentages of dying tumor cells are observed dependent on time and concentration. The sensitivity can vary during therapy and was correlated with decrease or increase in CETC and clinical outcome. Conclusions/Significance: Thus, we are able to show that chemosensitivity testing of circulating tumor cells provides real-time information about the sensitivity of the tumor present in the patient, even at different times during therapy, and correlates with treatment success.

Keywords: Circulating Epithelial Tumor Cells; Chemosensitivity Testing; Breast Cancer; Ovarian Cancer

1. Introduction

For patients diagnosed with a malignant tumor, cure is presumably only possible if the tumor is completely eradicated. Initially, the main aim is to eliminate the primary tumor, the major tumor burden, preferentially by surgery. However, most cancer patients do not die from their primary tumor but from distant metastases, developing some years after the removal of the primary tumor. During tumor growth, cells from the tumor are disseminated continuously via lymph vessels or directly into blood [1]. These cells are assumed to be the source of metastasis formation. Patients with affected lymph nodes have a less favorable chance of disease-free survival than patients without lymph-node-positive disease, indicating that cells detached from the tumor were able to settle and grow in foreign tissue. Therefore, as the second pillar of tumor therapy, chemotherapy has evolved and is applied after surgery as adjuvant chemotherapy, e.g. in breast and ovarian cancer, to eliminate such early disseminated cells, when no detectable tumor is present. Such therapies have been shown to avert metastasis formation and ultimately save lives in breast cancer patients [2]. In the adjuvant situation, these therapies have been developed in clinical trials using the statistical improvement of relapse-free survival as a measure. This cannot, however, predict for the individual patient whether the

*Corresponding author.

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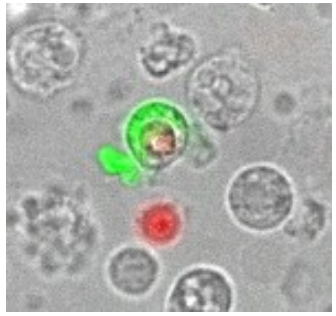
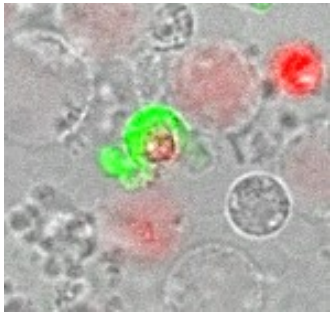
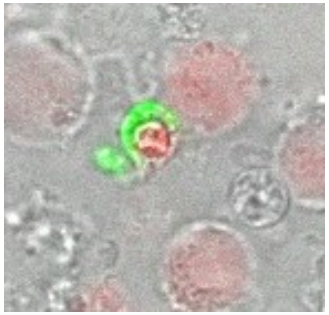
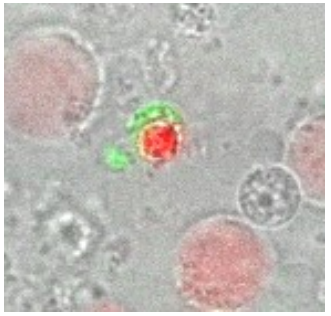
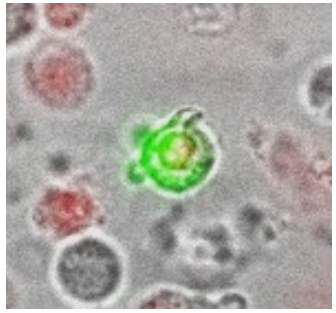
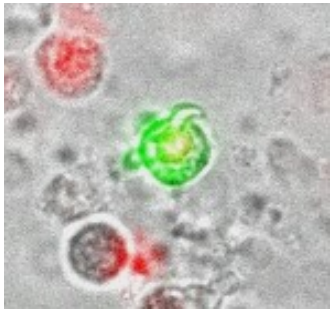
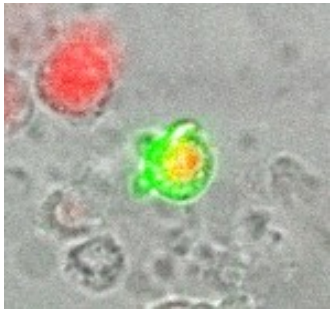
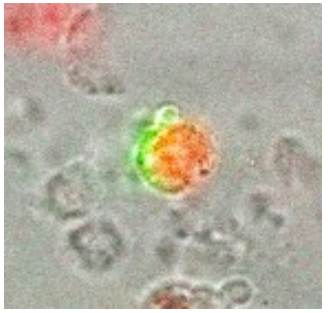
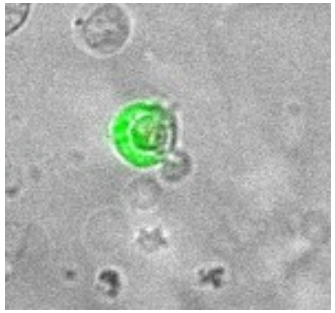
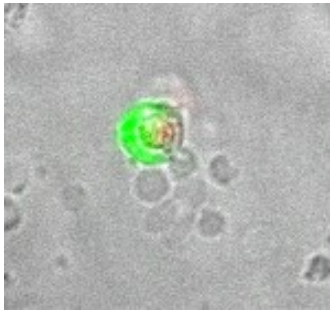
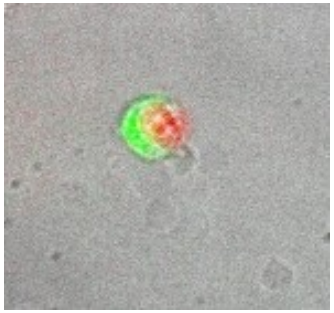
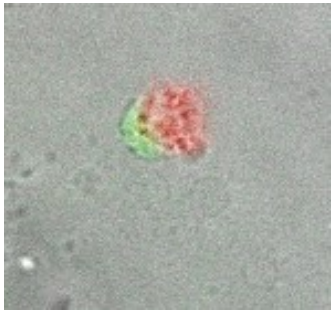
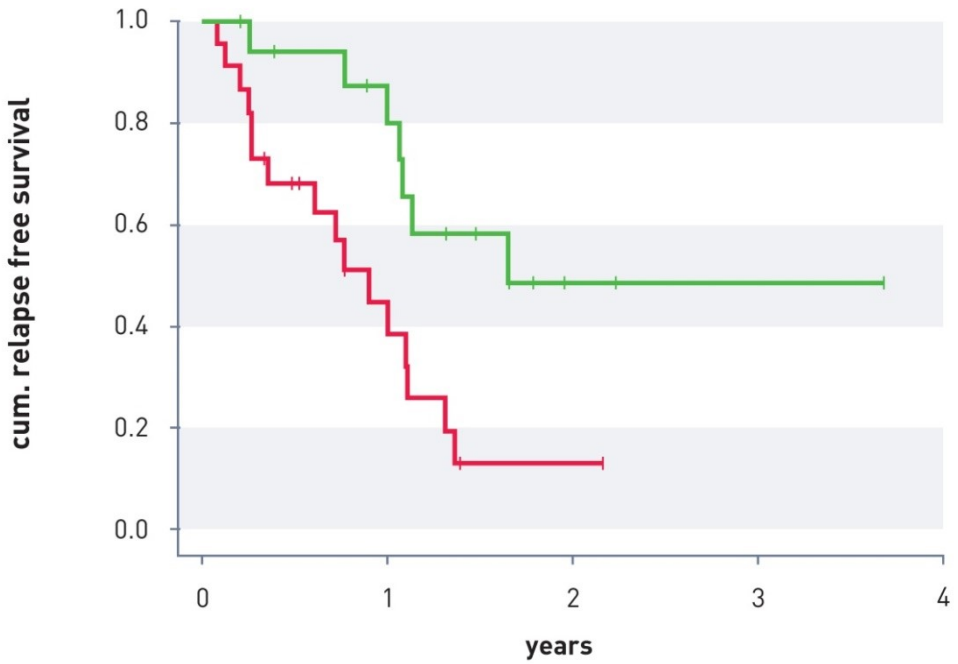
	t=0 Std.	t=3,5 Std.	t=7 Std.	t=10,5 Std.
Docetaxel				
Epirubicin				
Mafosfamid				

Pilot Study: Relapse free survival of patients with ovarian carcinoma patients with sensitive vs. resistant CETCs

Chemosensitivity ovarian cancer: sensitive vs. resistant tumor cells



sensitive
resistant
sensitive-censored
resistant-censored

log rank p ≤ 0.007

39 Patients were included in this study

N. Rüdiger et al, J Cancer Therapy, 2013, 4, 597-605

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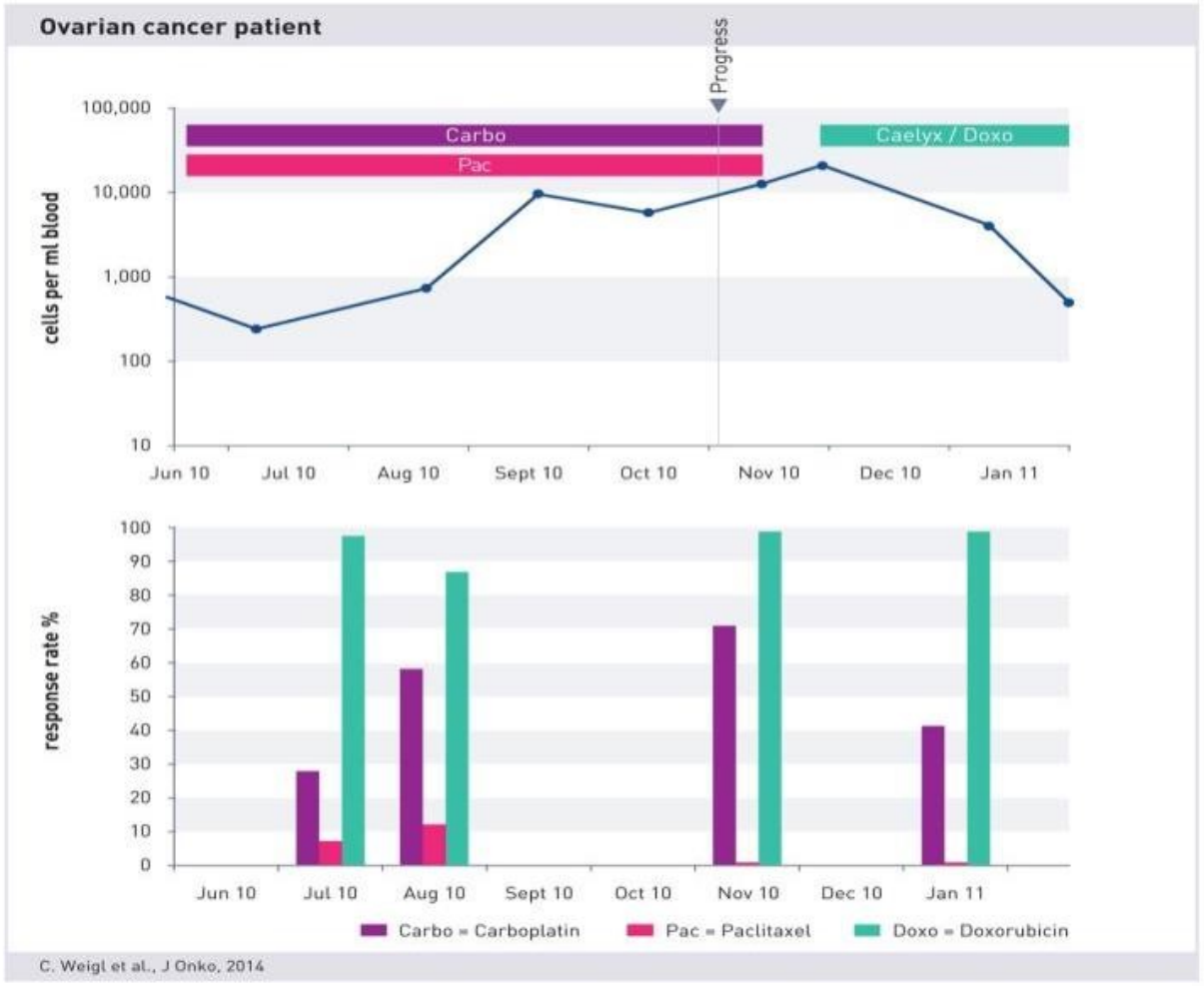
Case report: Ovarian carcinoma

Resistance to guideline drugs with progress, sensitivity to second line drug

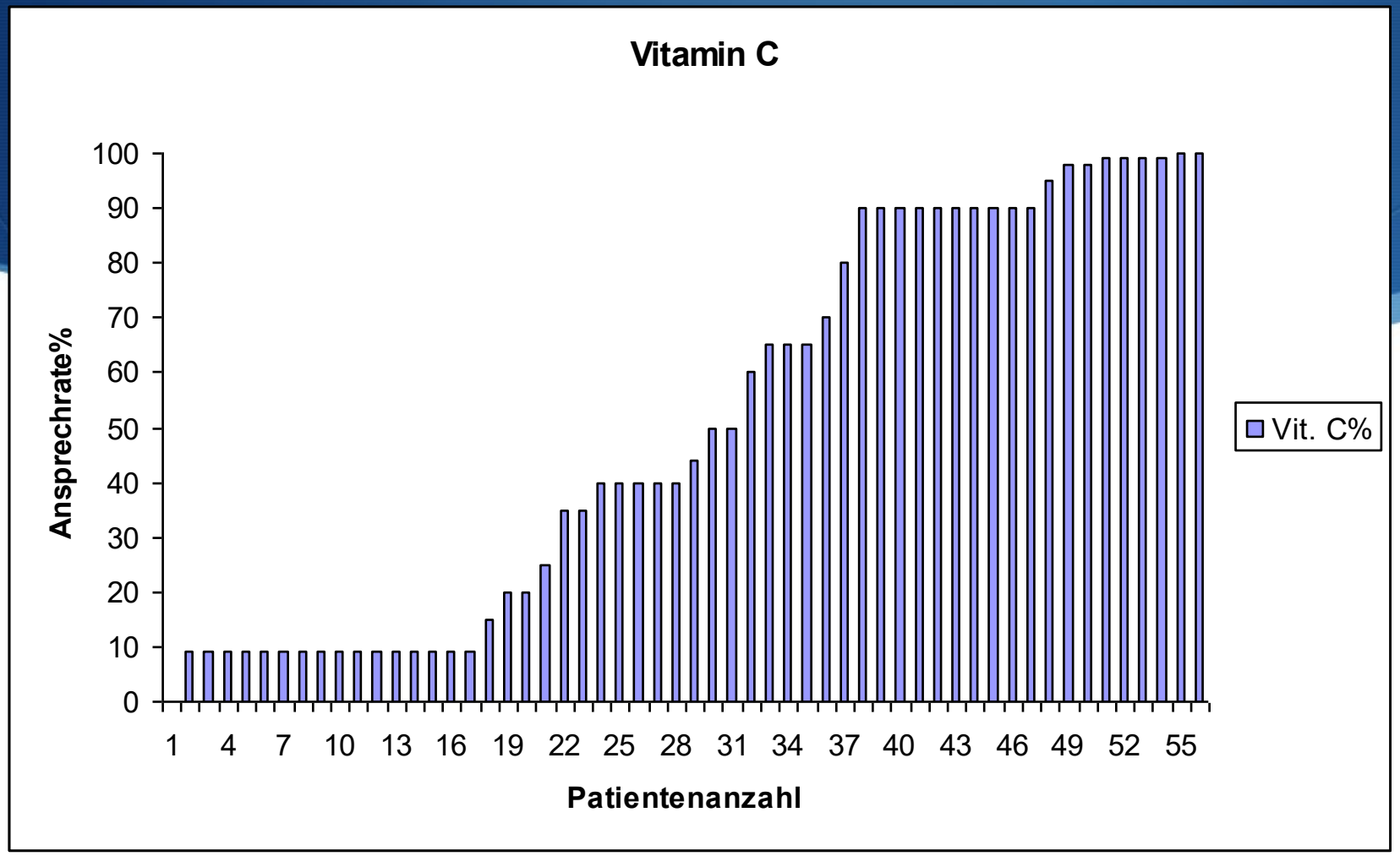


Case report breast cancer

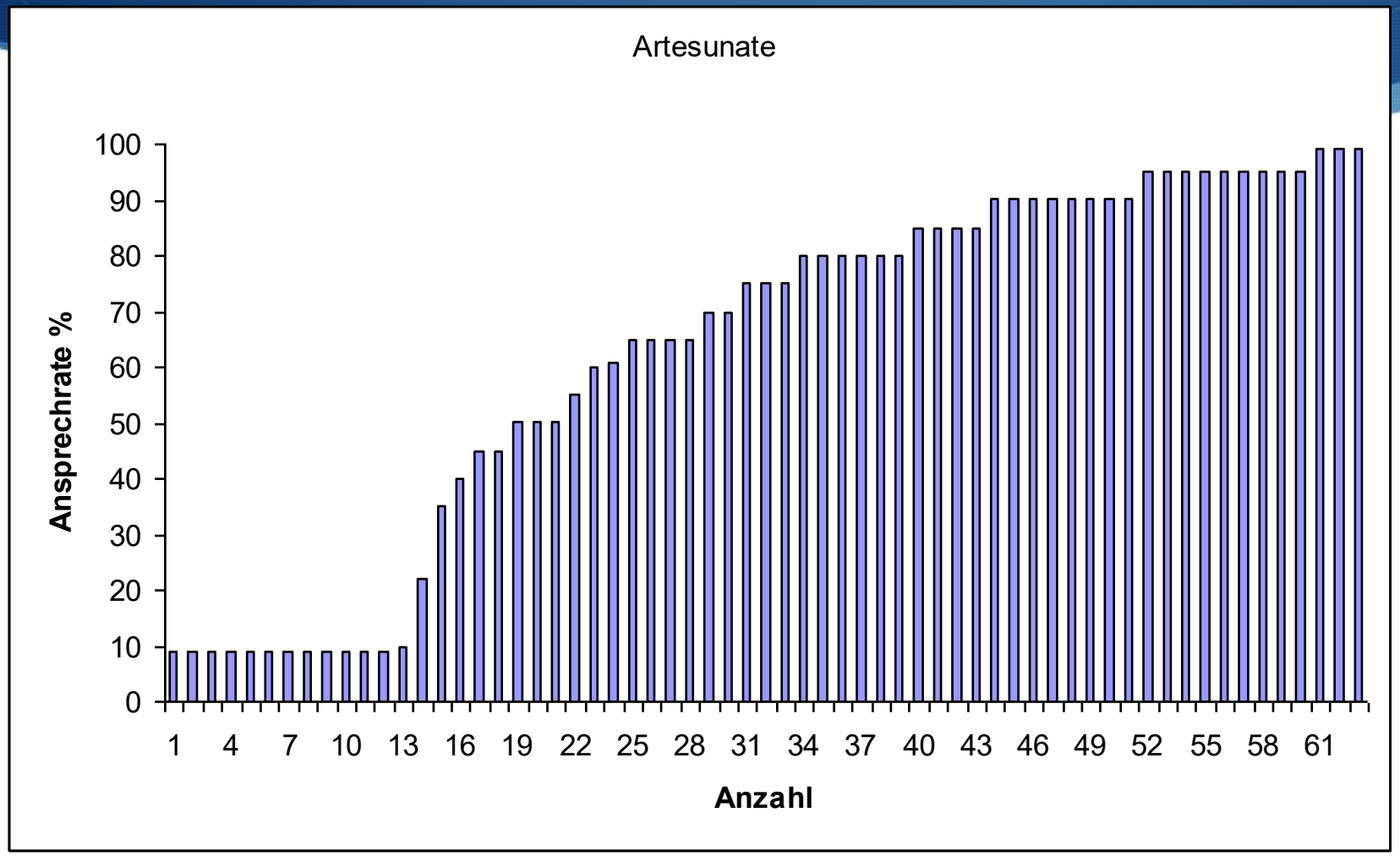
increasing resistance to drugs

N. Rüdiger et al., J Cancer Therapy, 2013, 4, 597-605

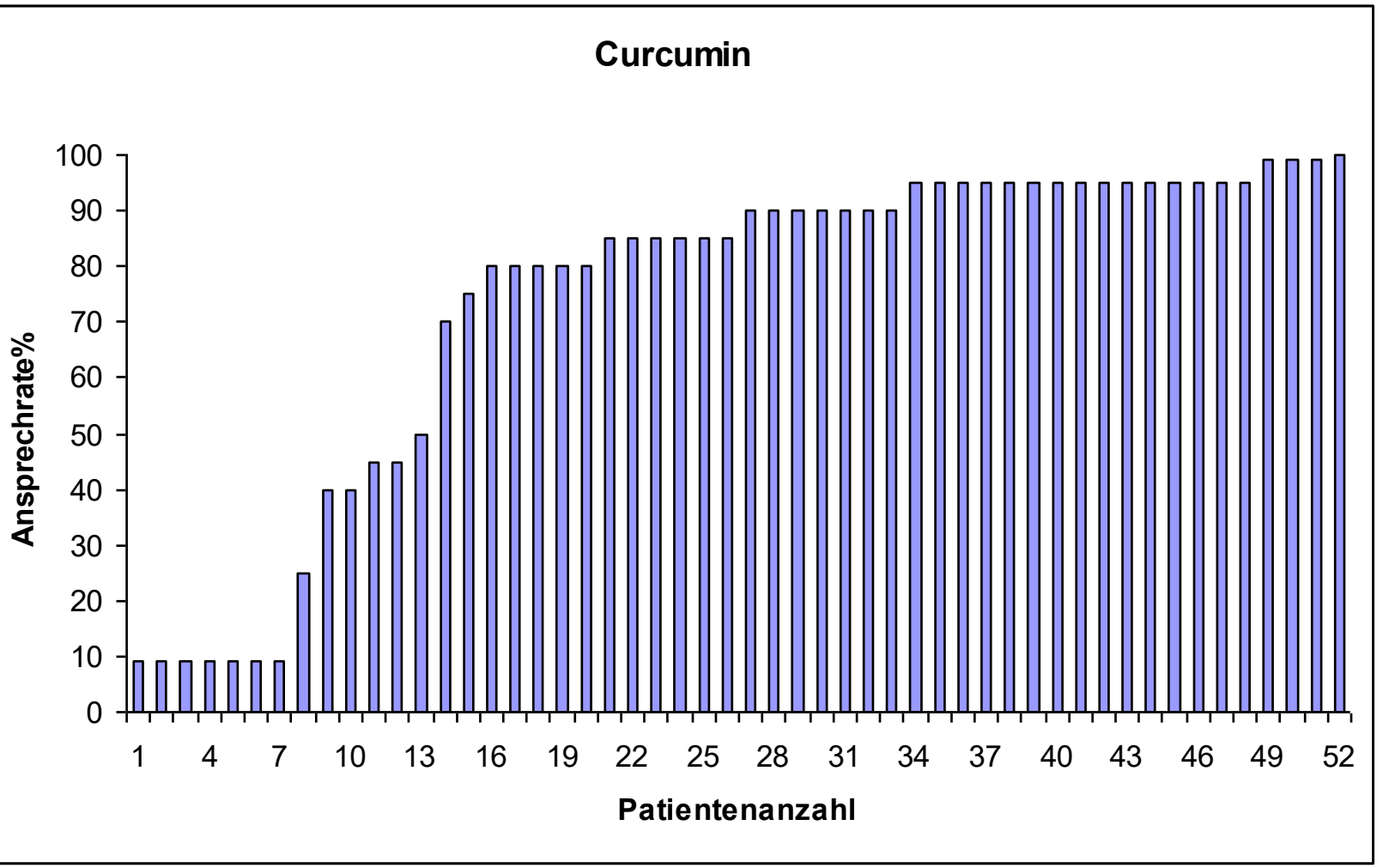
Adjuvant therapy using natural agents



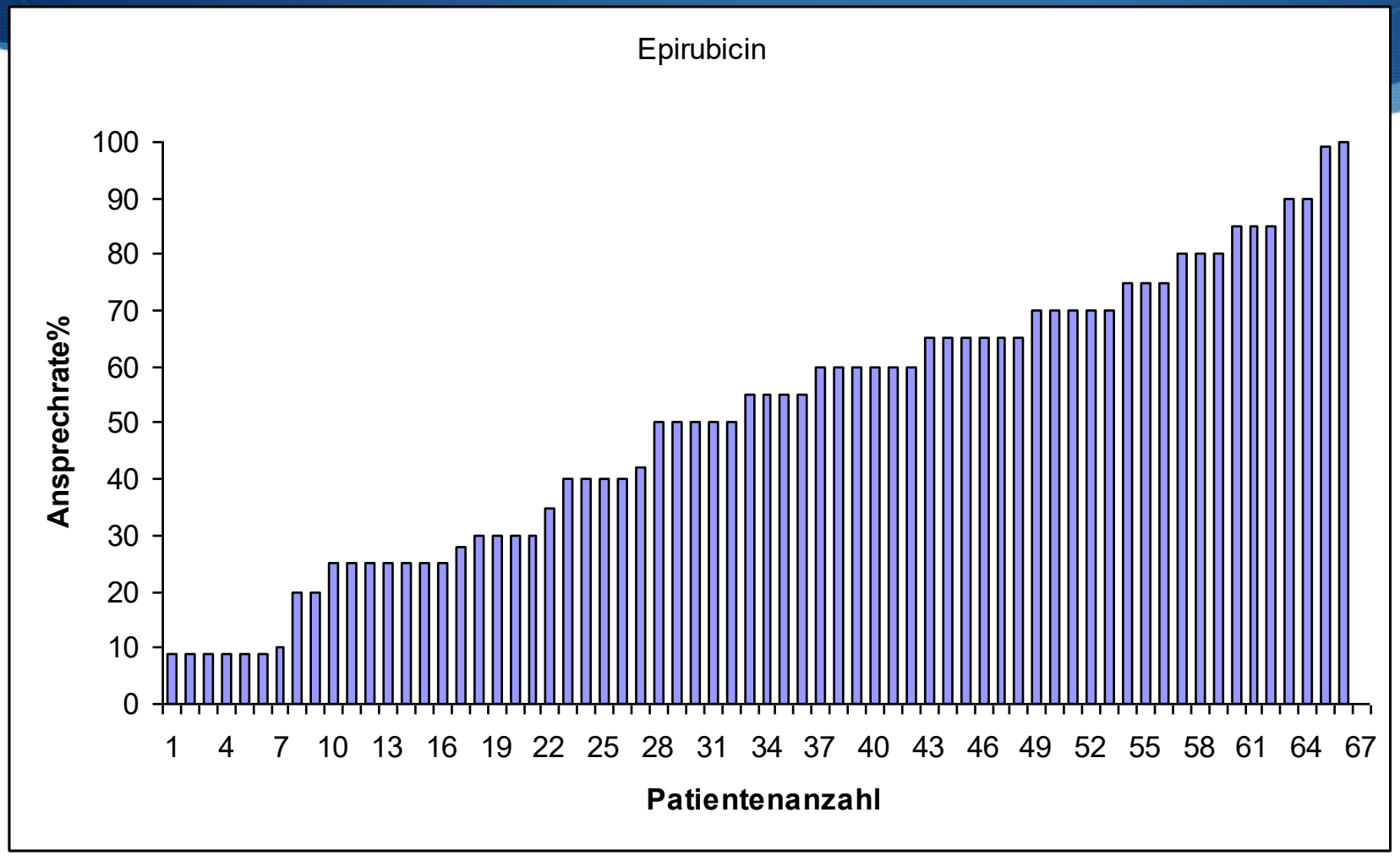
Patients total: 56		
Sensitivity > 50%	25 Patients	45%
Sensitivity < 50%	31 Patients	55%



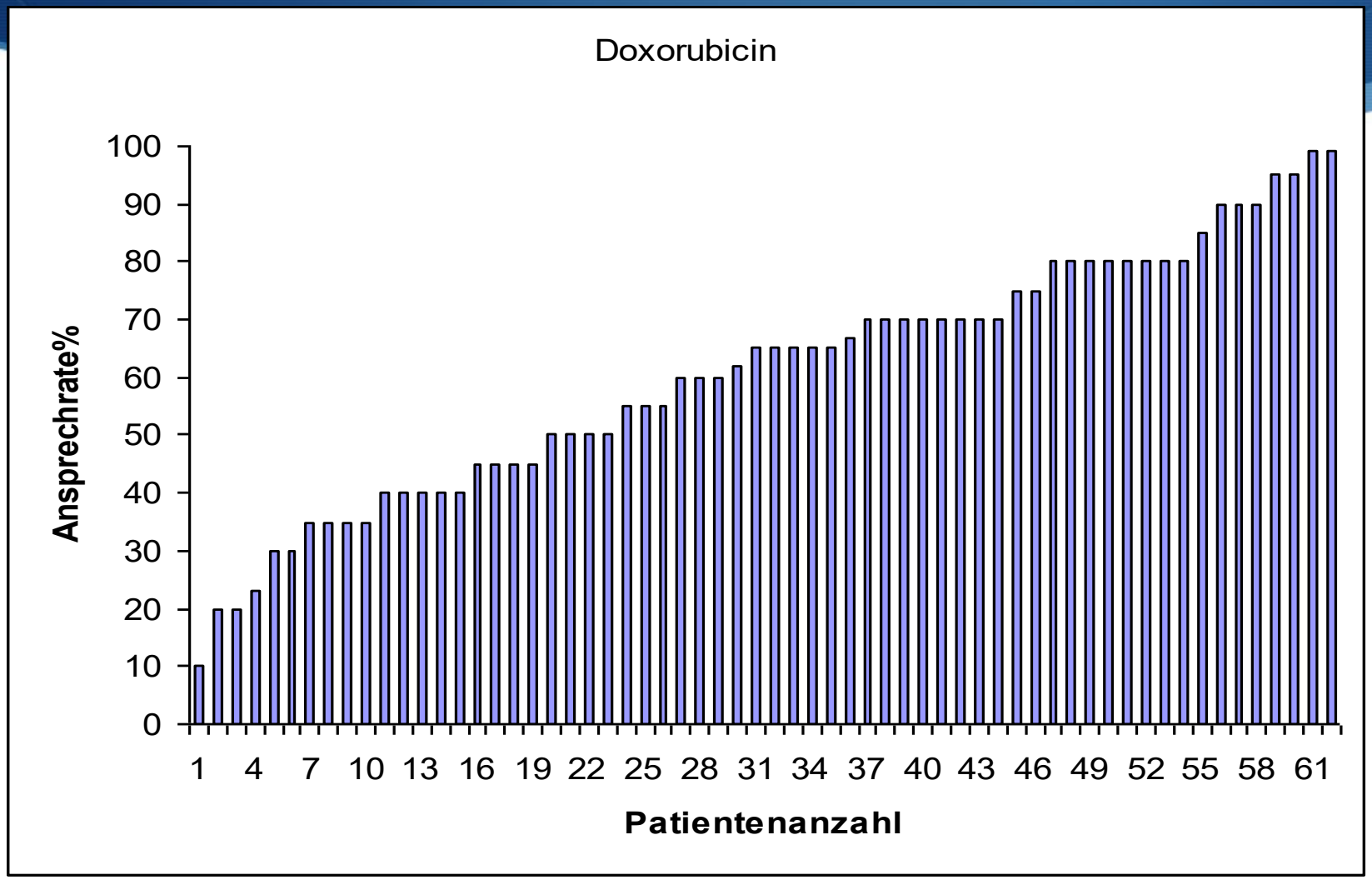
Patients total: 63		
Sensitivity > 50%	42 Patients	67%
Sensitivity < 50%	21 Patients	33%



Patients total: 52		
Sensitivity > 50%	39 Patients	75%
Sensitivity < 50%	13 Patients	25%



Patients total: 66		
Sensitivity > 50%	34 Patients	52%
Sensitivity < 50%	32 Patients	48%



Patients total: 62		
Sensitivity > 50%	39 Patients	63%
Sensitivity < 50%	23 Patients	37%

Natural agents suggested by maintrac

○ Helixor A ; M ; P	○ Further substances:
Please name manufacturer:	
daily dose	
○ Vitamin C	
○ Graviola	
○ Iscador M; Q; U; P	
○ DCA (Dichloracetat)	
○ Amygdalin	○ Combination testing:
○ Sulforaphan	
○ Hypericin	
○ Curcumin	
○ Artesunat	

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DAkkS Deutsche Akkreditierungsstelle D-ML-13345-01-00

Labor Dr. med. Ulrich Pachmann · Kutzenreuthe 2 · 95448 Bayreuth

Therapist

mail:

Bayreuth, 14.03.2017

Your patient:
Born:

Your request from: 08.03.2017
Our Lab number: T731890

Report on diagnostic findings on Circulating Tumor Cells (MAINTRAC)

Dear Dr.

Many thanks for sending your examination request regarding the detection of circulating tumor cells. After Therapy.

Diagnosis:
Colon Cancer, Initial diagnosis: 08/15

- 1.Therapy: Mexico, Oasis of Hope 3 visits
  Therapy: B17, Prosanalin, Xeloda, Curcumin
- 10/15-07/16: DCA, Vitamin C
- until: 10/16: Ozone, Boswellia, Hyperhtermia
- 11/16: Surgery (Removal of remaining tumor 5mm)

The automated microfluorimetric image analysis of the **epithelial cell adhesion molecule (EpCAM)**-positive cells with visual control (MAINTRAC) from **1 ml EDTA blood** resulted in following findings (detection limit is at 10 cells/ml):

	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**500**	**2,5**		numerous

in-vitro-vitality reduction in relation to concentration and time (in%) with eutherapeutic concentrations of				
Vitamin C	**70**	DCA	**60**	The ideal is a reduction by 100% in short-term cell culture
Amygdalin	**70**	Curcuma*	**40**	
Artesunat	**95**	Prosanalin*	**85**	
Boswellia*	**60**			

*provided by the patient

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Prioritisation of natural agents suggested by the results

The automated microfluorimetric image analysis of the **epithelial cell adhesion molecule (EpCAM)**-positive cells with visual control (MAINTRAC) from **1 ml EDTA blood** resulted in following findings (detection limit is at 10 cells/ml):

	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**500**	**2,5**		numerous

in-vitro-vitality reduction in relation to concentration and time (in %) with eutherapeutic concentrations of				
Vitamin C	**70**	DCA	**60**	The ideal is a reduction by 100% in short-term cell culture
Amygdalin	**70**	Curcuma*	**40**	
Artesunat	**95**	Prosanalin*	**85**	
Boswellia*	**60**			

*provided by the patient

Curcumin and artemisia better than chemotherapeutic agents for this PX

Diagnosis:
Lung Cancer, initial diagnosis: 26.06.2017
TNM: T4 N3 M1b, Stage IV
- no Surgery
- no Radiation therapy
- post Complementary therapy
- no current therapy
- Medication: Herbal supplements

The automated microfluorimetric image analysis of the **epithelial cell adhesion molecule (EpCAM)**-positive cells with visual control (MAINTRAC) from **1 ml EDTA blood** resulted in following findings (detection limit is at 10 cells/ml):

	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**150**	**0,75**		numerous

in-vitro-vitality reduction in relation to concentration and time (in%) with eutherapeutic concentrations of				
Avastin	**20**	Alimta	**60**	The ideal is a reduction by 100% in short-term cell culture
Cisplatin	**65**	Vitamin C	**40**	
Curcumin	**90**	Artemisia	**80**	

The material for examination could be thoroughly evaluated.
Under Therapy with herbal supplements we found only **a slightly increased number of live, potentially malignant tumor cells circulating in the blood.**
In addition, there were numerous specific cell fragments detected.
Specific cell fragments occur, for example, after chemotherapy or radiation, or as part of an immune response and indicate damaged cells.

Combination of curcumin and hypericin come out at 85% in this case

The automated microfluorimetric image analysis of the **epithelial cell adhesion molecule (EpCAM)**-positive cells with visual control (MAINTRAC) from **1 ml EDTA blood** resulted in following findings (detection limit is at 10 cells/ml):

	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**450**	**2,25**		numerous

in-vitro-vitality reduction in relation to concentration and time (in%) with eutherapeutic concentrations of			
Curcumin/ Hypericin	**85**		The ideal is a reduction by 100% in short-term cell culture

The material for examination could be thoroughly evaluated.
After the recent surgery we found **a slightly to moderately increased number of live, potentially malignant tumor cells circulating in the blood.**
In addition, there were numerous specific cell fragments detected.
Specific cell fragments occur, for example, as part of an immune response and indicate damaged cells.

In vitro vitality reduction occurred at **Curcumin/Hypericin.**

In connection with a detected tumor the cells are most probably cells from this tumor.

The current cell numbers present a basic value, only an increase in cell numbers is relevant for disease progress.

TZB

Maintrac sensitivity to natural agents is available in three levels of concentration

in-vitro-vitality reduction in relation to concentration and time (in%) with eutherapeutic concentrations of The ideal is a reduction by 100% in short-term cell culture					
Quercetin 0,1-fold	**85**	Quercetin 1-fold	**90**	Quercetin 10-fold	**99**
Vitamin C 30g 0,1-fold	**55**	Vitamin C 30g 1-fold	**75**	Vitamin C 30g 10-fold	**90**
Artesmisinin 250mg 0,1-fold	**25**	Artesmisinin 250mg 1-fold	**90**	Artesmisinin 250mg 10-fold	**98**
Curcumin 450mg 0,1-fold	**n.a.**	Curcumin 450mg 1-fold	**90**	Curcumin 450mg 10-fold	**n.a.**

This is how the circulating epithelial cancer count presented

Diagnosis:
Adenocarcinoma of the caecum (initial diagnosis: 12/2015)

TNM:	T3 N2 M1, KRAS Exon 2 Codon 12 Mutation (Gly12Val)
-	Liver, lung and omental metastases
-12/15:	right hemicolectomy
- 03-08/16:	Chemotherapy with Capecitabine and Avastin
- 13.09.16:	left lung ablation
- 28.11.16:	left and right hemihepatectomy and non anatomical liver resection in S6 right hemihepatectomy
- current :	ProCurcumin, ProSirtusan, Supplements (Tisso)

The automated microfluorimetric image analysis of the **epithelial cell adhesion molecule (EpCAM)**-positive cells with visual control (MAINTRAC) from **1 ml EDTA blood** resulted in following findings (detection limit is at 10 cells/ml):

	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**250**	**1,25**		some

The material for examination could be thoroughly evaluated.
Under current therapy we found only **a slightly increased number of live tumor suspected cells circulating in the blood.**
In addition, there were some specific cell fragments detected. Specific cell fragments occur, for example, after chemotherapy or radiation, or as part of an immune response and indicate damaged cells.

Arbeitsgemeinschaft TZB

Testing the sensitivity of chemotherapy vs. natural agents

	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**200**	**1**		some

in-vitro-vitality reduction in relation to concentration and time (in%) with eutherapeutic concentrations of				
Vitamin C	**<10**	Capecitabine	**80**	The ideal is a reduction by 100% in short-term cell culture
Artesunat	**50**			

The material for examination could be thoroughly evaluated.
Under current therapy we found only **a slightly increased number of live tumor suspected cells circulating in the blood.**
In comparison to the previous findings from March 2017 the number of potential tumor cells has decreased somewhat.
In addition, there were some specific cell fragments detected.

Curcumin in three levels of concentration

	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**1 250**	**6,25**		numerous

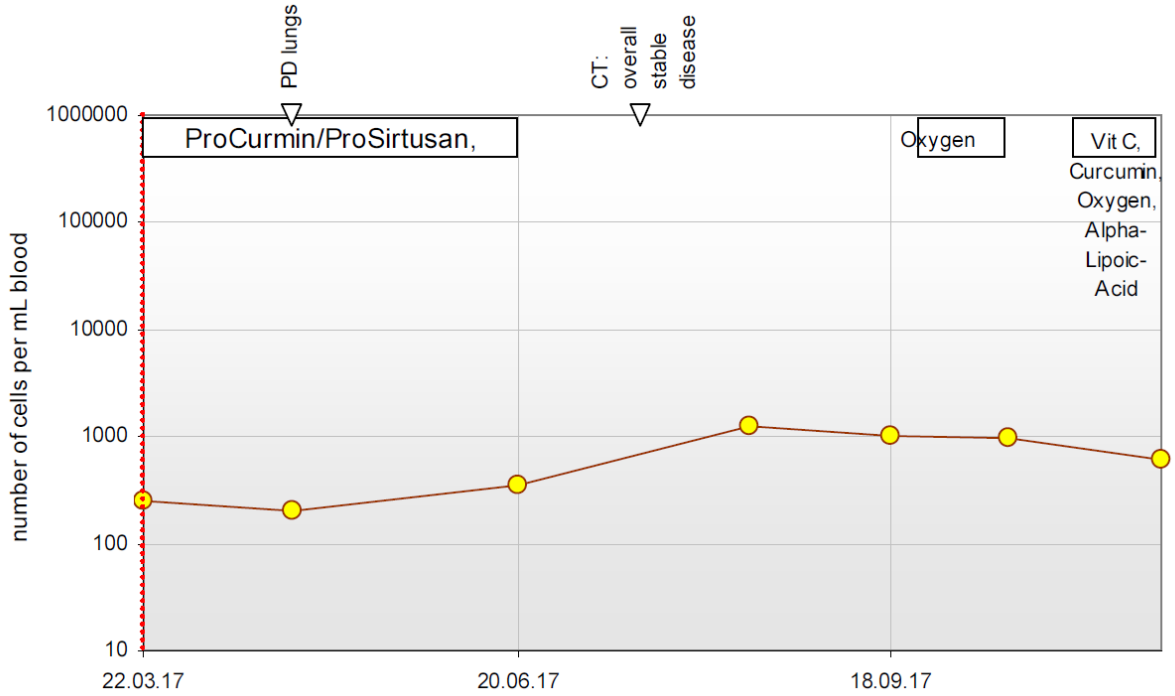
in-vitro-vitality reduction in relation to concentration and time (in%) with eutherapeutic concentrations of The ideal is a reduction by 100% in short-term cell culture							
Curcumin 450mg 0,1-fold	**70**		Curcumin 450mg 1-fold	**90**		Curcumin 450mg 10-fold	**95**

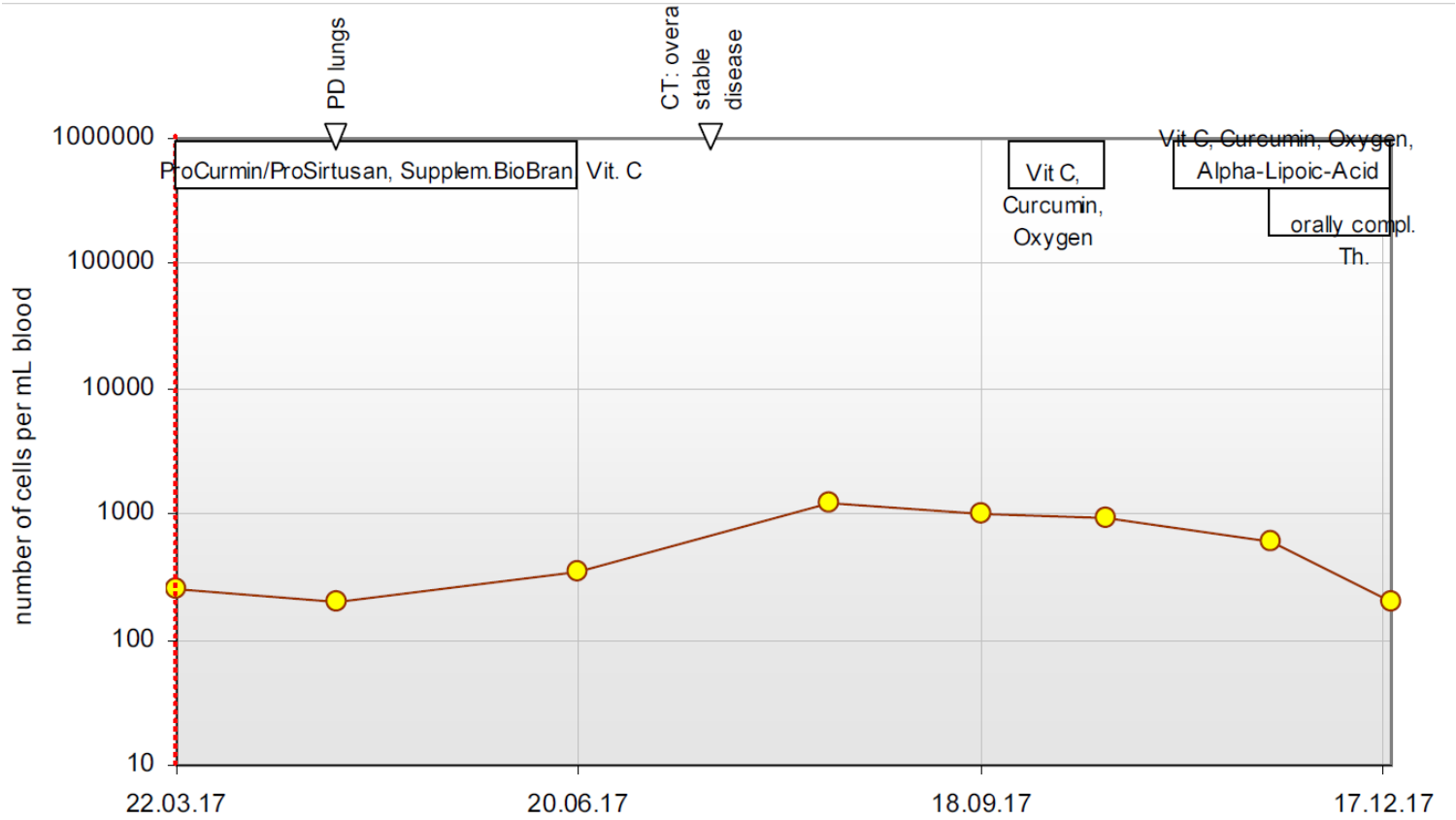
Vitamin C in three levels of concentration

	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**1 000**	**5**		numerous

in-vitro-vitality reduction in relation to concentration and time (in%) with eutherapeutic concentrations of The ideal is a reduction by 100% in short-term cell culture							
Vitamin C 0,1-fold 3g	**30**		Vitamin C 1-fold 30g	**45**		Vitamin C 10-fold 300g	**45**

Trajectories





Strength of different combinations

- 06/17: Therapy with ProCurcumin, ProSirtusan, Supplements (Tisso), Biobran, Vit.C
- 20.07.17: CT-Scan: number of small lesions in the lungs including the right upper lobe (6mm) and right lower lobe (9mm). The liver remains clear. Overall her disease has been classed as stable
- 25.09.-16.10.17: Therapy with 3 x Vitamin C Infusions (25g), 2 x Curcumin Infusions (150mg), 3 x Oxygen Therapy
- 01.11.-21.11.17: Therapy with 3 x Vitamin C Infusions (25g), 2 x Curcumin Infusions (150mg), 3 x Oxygen Therapy, Alpha-Lipoic-Acid
- since 21.11.17: Therapy with 2x Vitamin C Infusions (25g), 2x Curcumin Infusions (200mg), 2x Alpha Lipoic, Gluthation, Oxgen therapy, daily ProSirtusan, Curcumin longvida, orally Vitamin C and Vitamin D Tisso

	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**550**	**2,75**		numerous

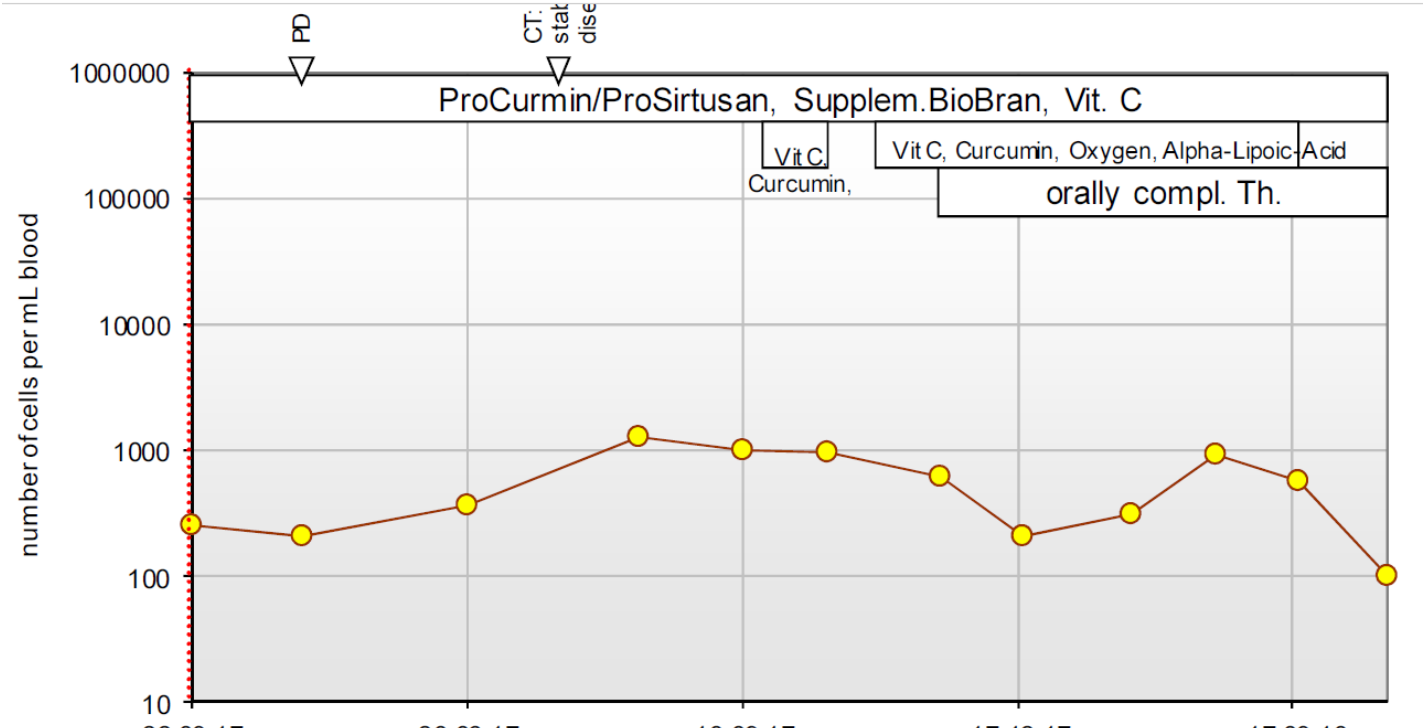
in-vitro-vitality reduction in relation to concentration and time (in%) with eutherapeutic concentrations of				
Quercetin +Artesunate	**85**	Vitamin C +Curcumin	**60**	The ideal is a reduction by 100% in short-term cell culture

Following the recommendations produces a decline in cell count

- 21.11.17-03/18: Therapy with 2x Vitamin C Infusions (25g), 2x Curcumin Infusions (200mg),
- since 21.11.17: Alpha Lipoic, Gluthation, Oxgen therapy, daily ProSirtusan, Curcumin longvida, orally Vitamin C and Vitamin D Tisso, Artesimin, Quercetin, Astaxanthin, Selenium, Biobran, Faty acids

The automated microfluorimetric image analysis of the **epithelial cell adhesion molecule (EpCAM)**-positive cells with visual control (MAINTRAC) from **1 ml EDTA blood** resulted in following findings (detection limit is at 10 cells/ml):

	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**100**	**0,5**		numerous



Evidencing the effectiveness of curcumin

	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**200**	**1**		numerous

in-vitro-vitality reduction in relation to concentration and time (in%) with eutherapeutic concentrations of The ideal is a reduction by 100% in short-term cell culture					
Curcumin 450mg 0,1-fold	**30**	Curcumin 450mg 1-fold	**80**	Curcumin 450mg 10-fold	**95**

The material for examination could be thoroughly evaluated.
Under ongoing complementary therapies we again found **a slightly increased number of live, potentially malignant tumor cells circulating in the blood. In comparison to the previous findings from September 2018 the number of potential tumor cells has not changed.**

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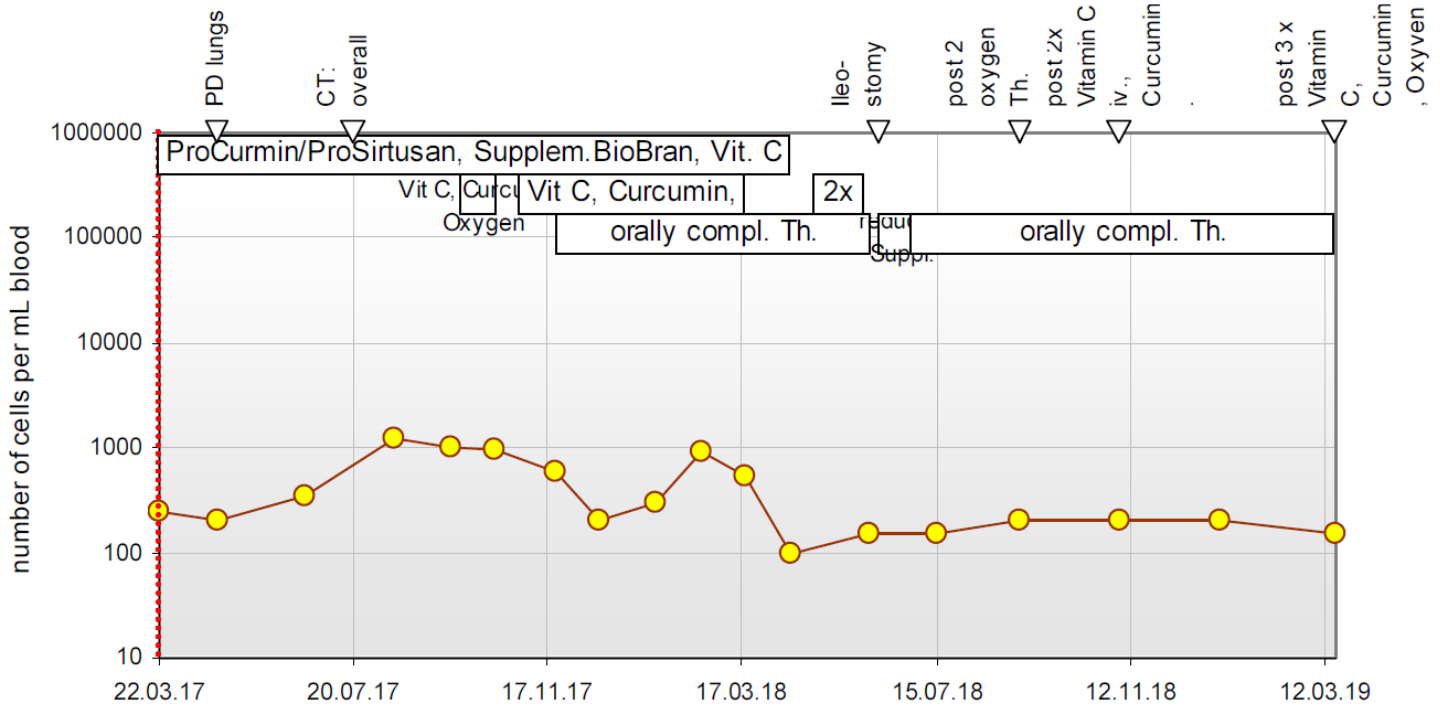
Therapy effectiveness evidenced in patient stability

repeated re-decrease and in June 2018, cells remained relatively stable. After reversal ileostomy on June 11th and under ongoing complementary therapies, cells numbers remained relatively stable.

We recommend a control in 3 months.



Effectiveness of Hypericin in a specific case

	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**300**	**1,5**		numerous

in-vitro-vitality reduction in relation to concentration and time (in%) with eutherapeutic concentrations of The ideal is a reduction by 100% in short-term cell culture					
Hypericin 0,1-fold	**15**	Hypericin 1-fold	**80**	Hypericin 10-fold	**90**

The material for examination could be thoroughly evaluated.
Under ongoing complementary therapies, we found **a slightly increased number of live, potentially malignant tumor cells circulating in the blood.**
In comparison to the previous findings from March 2019, the number of potential tumor cells has doubled.

Capecitabine declines in effectiveness over time ...

	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**200**	**1**		some

2017

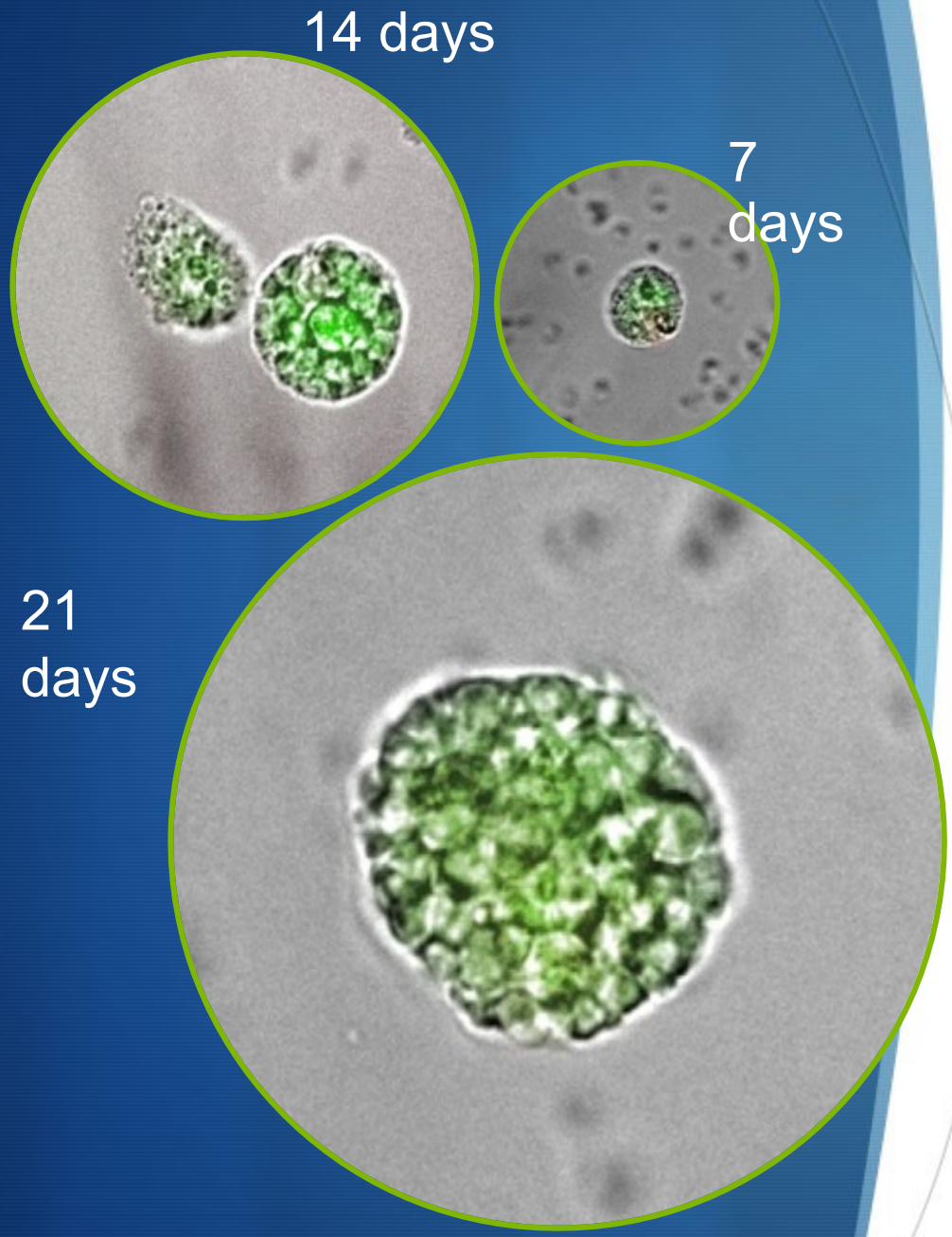
in-vitro-vitality reduction in relation to concentration and time (in%) with eutherapeutic concentrations of				
Vitamin C	**<10**	Capecitabine	**80**	The ideal is a reduction by 100% in short-term cell culture
Artesunat	**50**			

2019

in-vitro-vitality reduction in relation to concentration and time (in%) with eutherapeutic concentrations of				
5FU	**20**	5FU/ Honokiol	**25**	The ideal is a reduction by 100% in short-term cell culture
5FU/ Curcumin	**80**			

Honokiol = Magnolia

Clonal expansion of circulating tumour cells

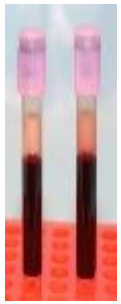


Tumour spheres from CETC

Spheres were detected in 86 out of 109 patients **(78.9%)**;

Number of spheres varied between 50 and 1700/ml (median 200)

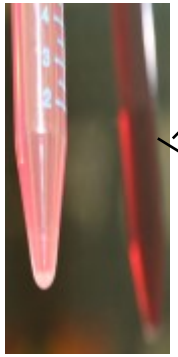
All spheres detected **are positive for EpCAM**.



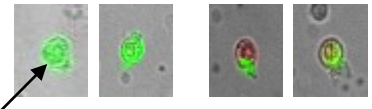
1 ml EDTA Blood

Lysis of red blood cells

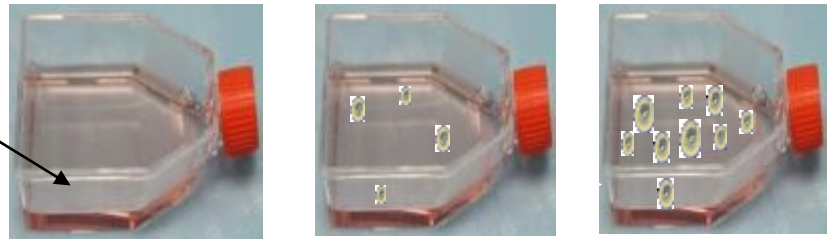
One centri-fugation step



+ Anti-EpCAM

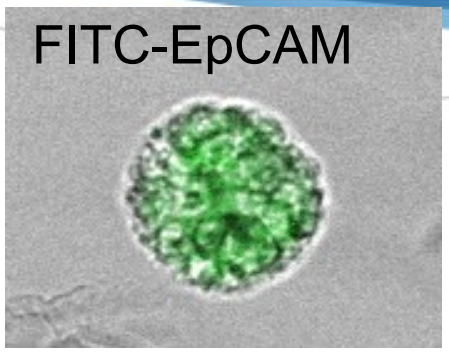


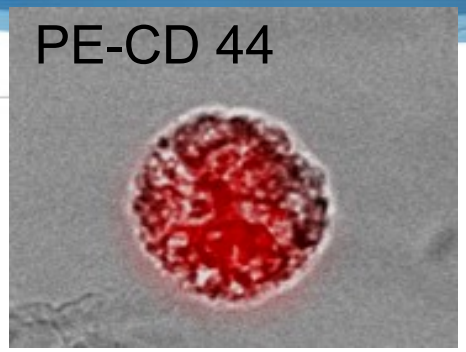
Determination of vital and dead EpCAM positive cells among the white blood cells

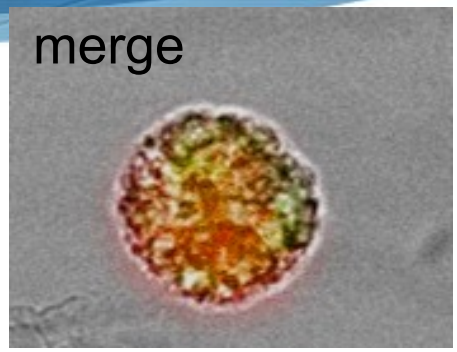


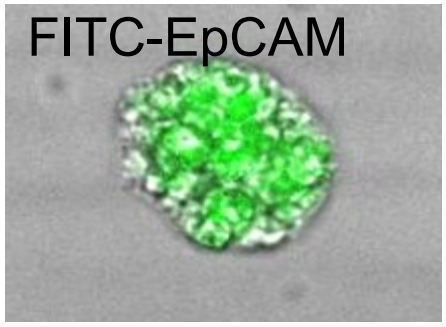
Culture of all white blood cells under conditions favouring growth of epithelial cells and determination of sphere formation at different times of culture

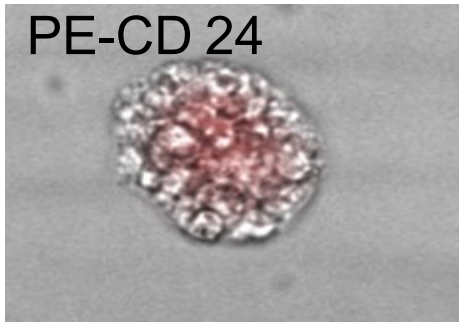
Stem cell marker expression in tumour spheres

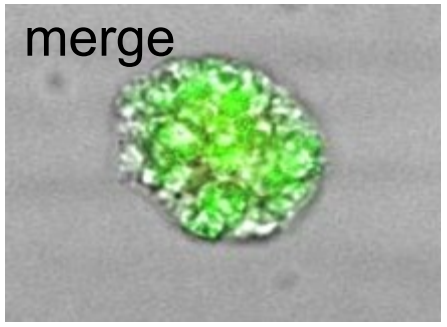


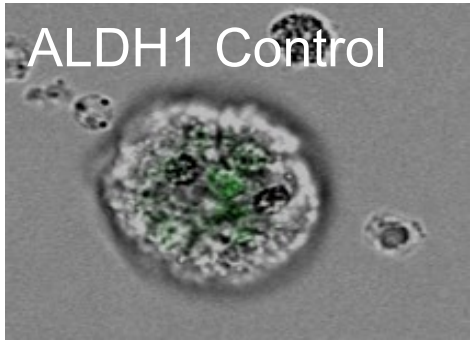


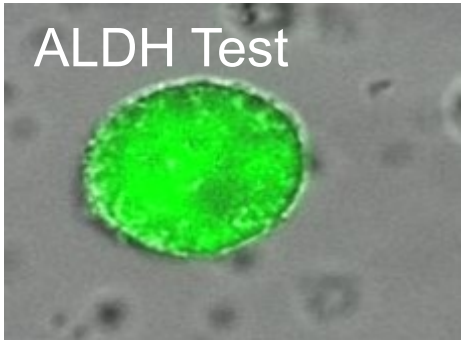






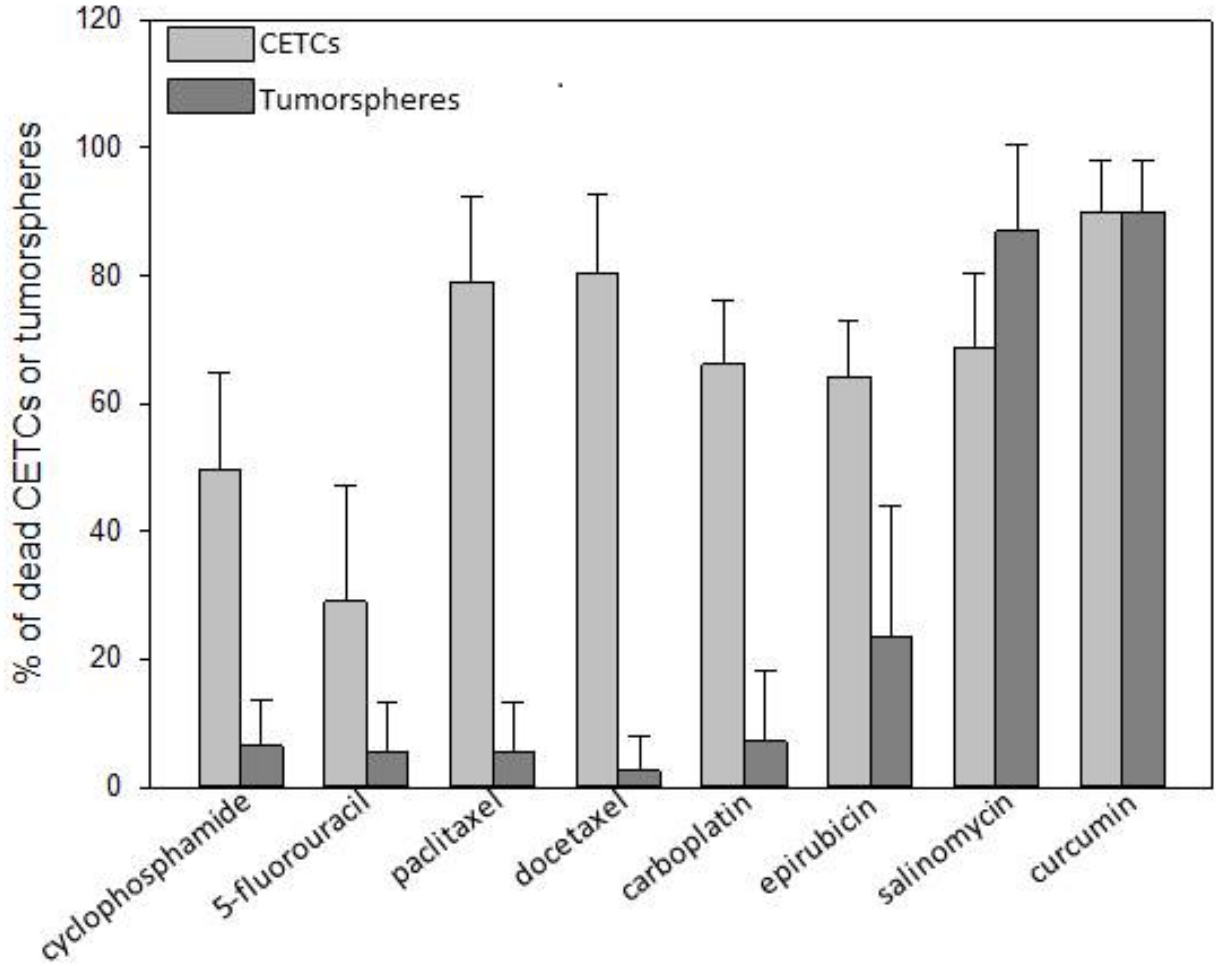






Chemo-sensitivity of tumour spheroids

Chemosensitivity of tumour spheroids vs. CETC



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Selected agents not so effective against circulating stem cells

	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**100**	**0,5**		some
Circulating Cancer Stem Cells	**250**			

in-vitro-vitality reduction in relation to concentration and time (in%) with eutherapeutic concentrations of				
Salinomycin Acid	**40**	Shogaol	**60**	The ideal is a reduction by 100% in short-term cell culture

in-vitro-vitality reduction on Circulating Cancer Stem Cells in relation to concentration and time (in%) with eutherapeutic concentrations of				
Salinomycin acid	**<10**	Shogaol	**<10**	The ideal is a reduction by 100% in short-term cell culture

The material for examination could be thoroughly evaluated.
We now found **a minimally to slightly increased number of live, potentially malignant tumor cells circulating in the blood.**
In comparison to the previous findings from August 27th, 2019 the number of potential tumor cells has doubled.
In addition, there were some specific cell fragments detected.
Specific cell fragments occur, for example as part of an immune response and indicate damaged cells.

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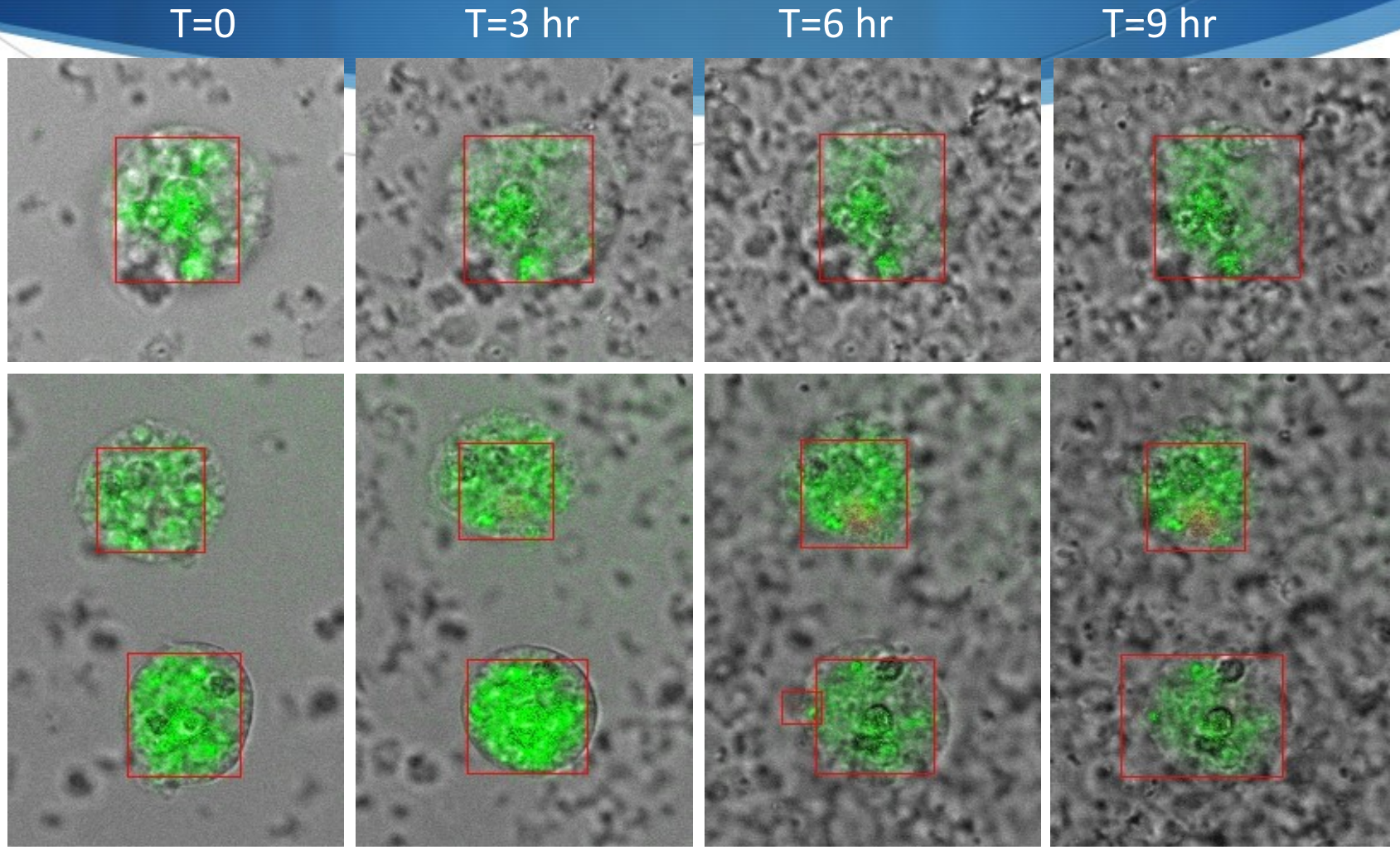
Cancer stem cells are particularly sensitive to curcumin



Tumour spheres

Cancer Res 2013;73(24 Suppl): Abstract nr PD6-1

Tumour spheres growing from peripherally circulating tumour cells exhibit stem cell features

Abstract

Background: Among the cells that are disseminated from a malignant tumour only very few are capable to resettle in distant organs and grow into life-threatening metastases. Therefore, the question arises how and whether such cells which have the potential to grow into metastases can be detected. It has been shown that a subpopulation of cells from breast cancer tissue can form so-called mammospheres with stem cell features. Here we show that such tumour spheres can also be grown from peripherally circulating tumour cells from breast cancer patients in different stages of disease

Materials and Methods: Using a nondissipative approach with only one enrichment step of red blood cell lysis, the cells from the pellet, containing the white blood cells together with the putative tumour cells were cultured under conditions favoring the growth of epithelial cells. At 7, 14 and 21days the cell cultures were inspected for the appearance of spheroids staining with anti-EpCAM, anti-CD24 and anti-CD44 antibody and.expressing ALDH1.

Results: Peripherally circulating cells from patients with malignant tumours in different stages of disease were analyzed for the presence of circulating epithelial tumour suspect cells and the frequencies of tumourspheres. tumourspheres could so far be grown from 79% of 36 patients in whom more than 1700/ml epithelial tumour suspect cells were detected. Numbers of tumourspheres varied from 1 to 29 /ml and correlated with the aggressiveness of the tumour. Surprsingly the numbers were highest in patients after surgery who had not yet received any systemic therapy. The size of the spheres increased from day 7 to day 21. The spheres were negative for CD24 and positive for CD44. They highly express ALDH1 and thus exhibite typical features of stem cells.

Conclusion: Here, we demonstrate that the circulating tumour cells, detected in our approach contain a subpopulation with stem cell-like properties capable of growing into tumourspheres. The frequency and growth potential of cells capable of forming spheres seems to be dependent from the properties of the primary tumour. The possibility to grow tumourspheres from peripherally circulating tumour cells may open up a new field, where the relevant cells with stem cell properties from individual patients can now be specifically analysed further for genetic endowment, transcriptional activity, heterogeneity and stem cell markers.

http://cancerres.aacrjournals.org/content/73/24_Supplement/PD6-1.short

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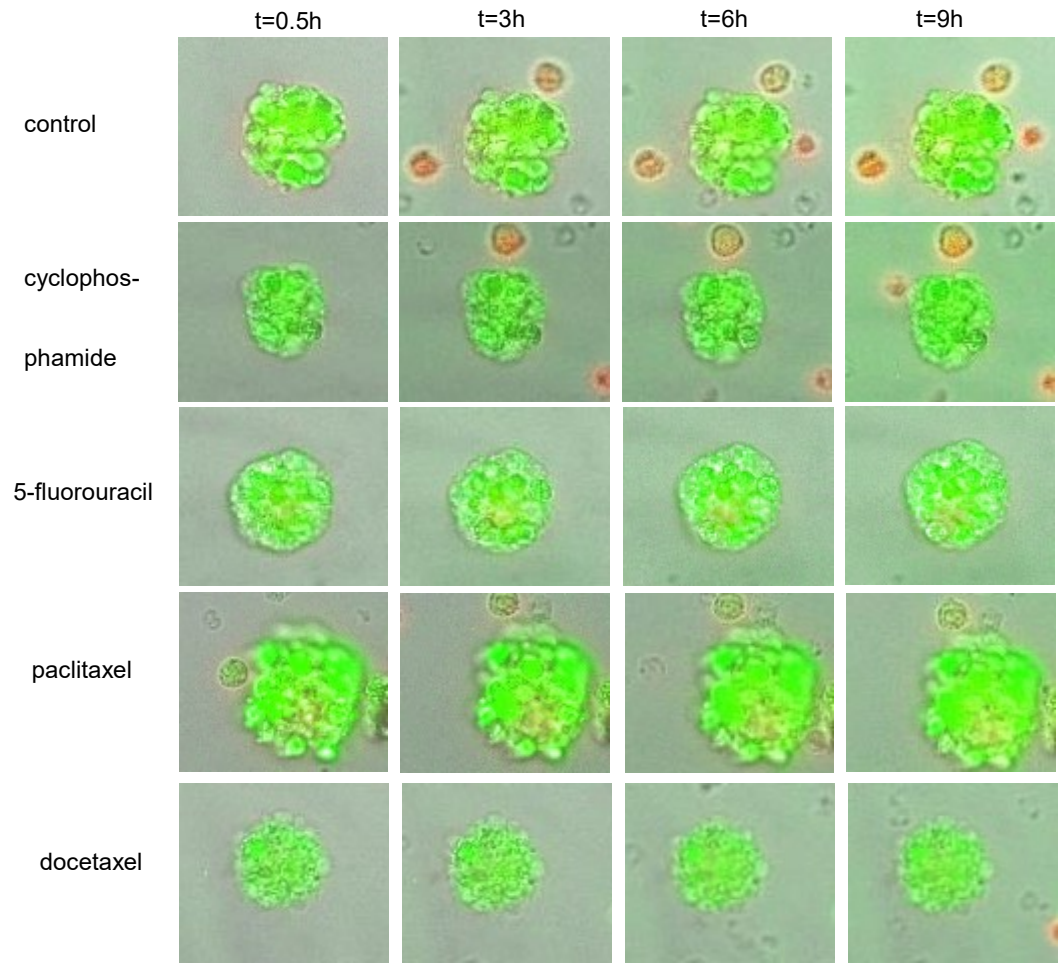
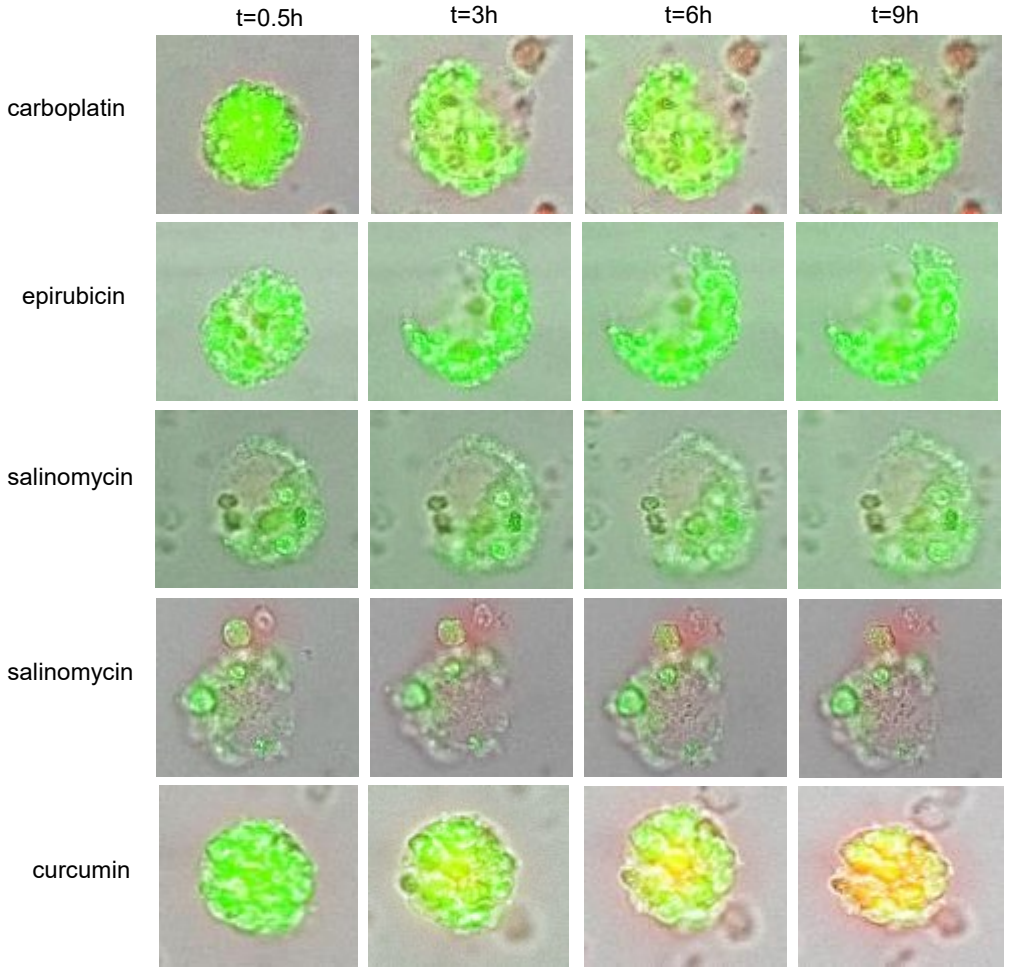
Fascinating to see the effectiveness of salinomycin and curcumin



Examples of tumourspheres with chemoresistance to cyclophosphamide, 5-fluorouracil, paclitaxel and docetaxel. tumourspheres remain alive during short time culture (0-9h).



tumourspheres sensitive to carobplatin, epirubicin, salinomycin and curcumin. Carboplatin and epirubicin lead to disintegration of tumourspheres with destruction of part of the cells in the spheroids. The strong cytotoxic effect of salinomycin is already observed at the first point of measurement with almost total destruction of all cells. Curcumin works by inducing cell death in all cells of the tumourspheres leading to nuclear staining with propidium iodide.

TZB

Conclusion

Dynamics of CETC as a **parameter**
for personalised therapy decisions

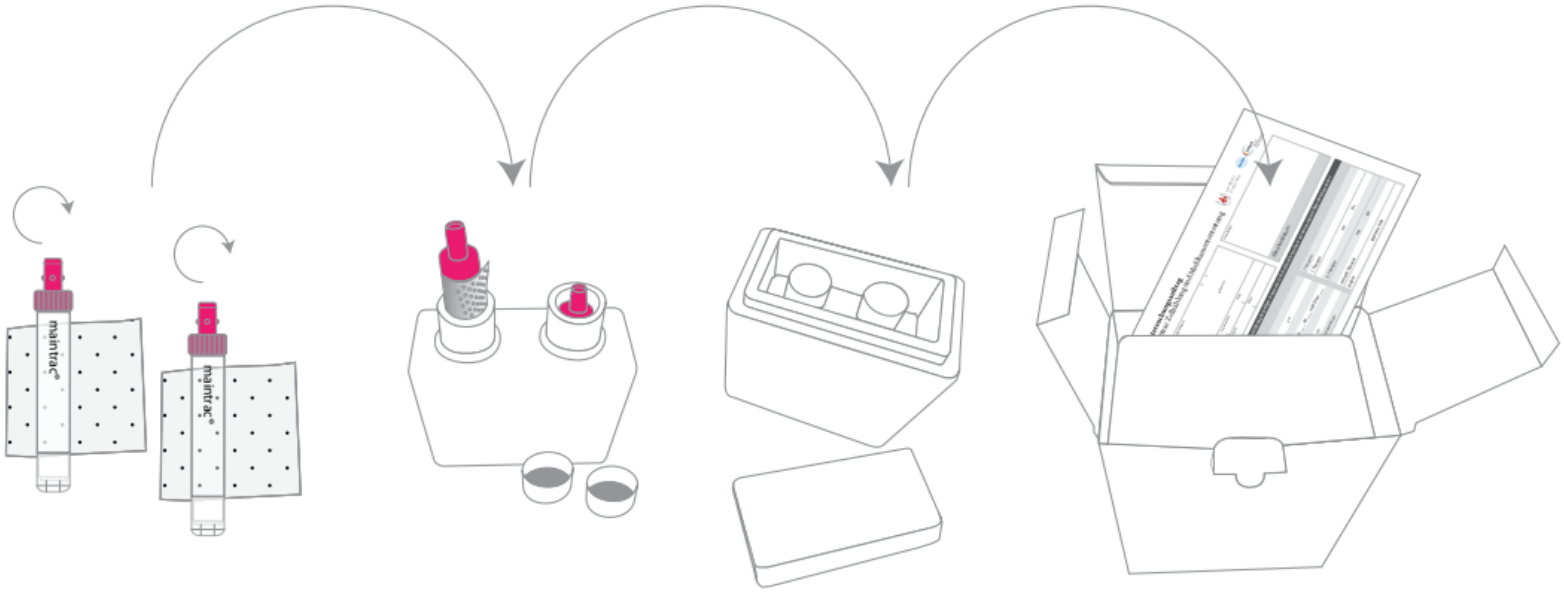
- CETCs can be **identified** and **characterized** already in primary diagnosed cancer patients
- Maintrac is **quantitative**
- **Efficacy of medication** can be measured

→ Treatment decisions can be made with maintrac

Fully accredited laboratory

Blood collection kit

Sample packaging



Shipping and results

Within 48 to max. 72 h at room temperature

to our lab in Bayreuth, Germany

Results will be sent usually 5 days after receiving the sample.

Thank you
for your attention