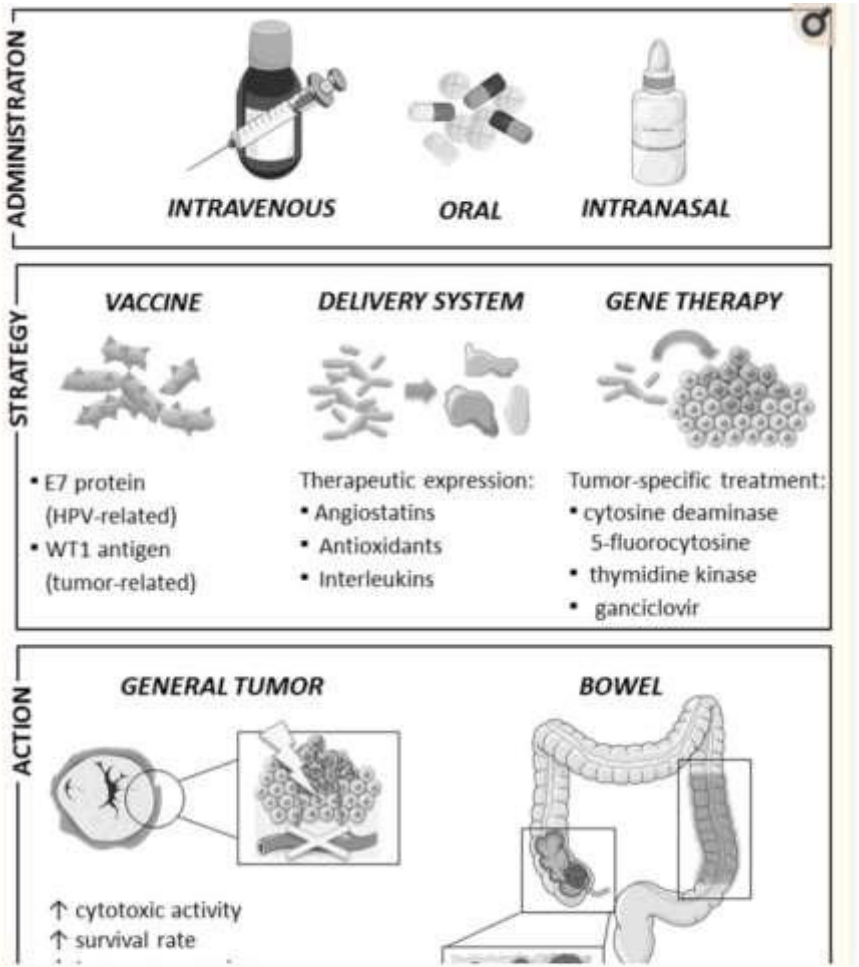
Probiotics



Open in a separate window

Fig. 1

Summary of the possible applications of probiotic bacteria in the treatment and prevention of cancer. Figure summaries most significant findings from studies in vitro and in vivo mentioned in text [89–114]. This figure was prepared using Servier Medical Art, available from www.servier.com/Powerpoint-image-bank. Legend: *downwards arrow* decrease, *upwards arrow* increase *ACF* aberrant crypt foci, *MPL* multiple plaque lesions

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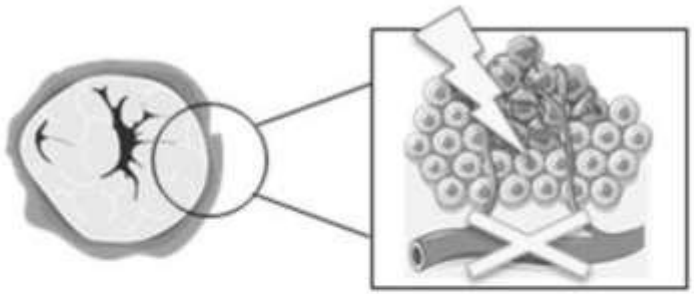
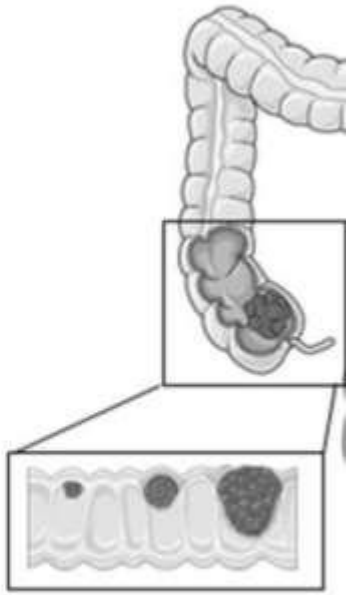
ACTION

GENERAL TUMOR



↑ cytotoxic activity
↑ survival rate
↓ tumor progression
↓ angiogenesis
↑ mitochondrial apoptosis
↑ tumor specific immunoresponse

BO



Tumor:
- prevention
- treatment

Diet and Cancer

- The good and the bad
- Food which triggers and promotes cancer growth
- Food which reduces cancer growth
- Hormones and additives in food
- Weight more important than type of food
- Fasting or not fasting ?
- Extreme Dieting ?

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Minerals and TraceElements

- Some important ones
  - Iodine
  - Selenium
  - Zinc
  - Magnesium

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Bioflavonoids

- Cruciferous Vegetables
- Broccoli Seed Extracts
- Ginger
- Quercetin
- Resveratrol
- Lycopenes

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Avoid Cancer Promoters

- Growth Promoters in food
  - Hormones
  - Others
- Pro-inflammatories
- Excess Sugar
- Carcinogens

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Carcinogens

Acetaldehyde (from consuming alcoholic beverages)
Acheson process, occupational exposure associated with
Acid mists, strong inorganic
Aflatoxins
Alcoholic beverages
Aluminum production
4-Aminobiphenyl
Areca nut
Aristolochic acid (and plants containing it)
Arsenic and inorganic arsenic compounds
Asbestos (all forms) and mineral substances (such as talc or vermiculite) that contain asbestos
Auramine production
Azathioprine
Benzene
Benzidine and dyes metabolized to benzidine
Benzo[a]pyrene
Beryllium and beryllium compounds
Betel quid, with or without tobacco
Bis(chloromethyl)ether and chloromethyl methyl ether (technical-grade)
Busulfan
1,3-Butadiene
Cadmium and cadmium compounds
Chlorambucil
Chlornaphazine
Chromium (VI) compounds
Clonorchis sinensis (infection with), also known as the Chinese liver fluke
Coal, indoor emissions from household combustion
Coal gasification
Coal-tar distillation
Coal-tar pitch
Coke production
Cyclophosphamide
Cyclosporine (ciclosporin)
1,2-Dichloropropane
Diethylstilbestrol (DES)
Engine exhaust, diesel
Epstein-Barr virus (EBV) (infection with)
Erionite
Estrogen-only menopausal therapy
Estrogen-progestogen menopausal therapy (combined)
Estrogen-progestogen oral contraceptives (combined) (Note: There is also convincing evidence in humans that these agents confer a protective effect against cancer in the endometrium and ovary)
Ethanol in alcoholic beverages
Ethylene oxide
Etoposide
Etoposide in combination with cisplatin and bleomycin

Carcinogens in food

Cancer Invest 2007-2009NIH.gov

- Aflatoxins
- Alcohol
- TCDD (Dioxin)
- Salted fish
- Acetaldehyde
- Aromatic hydrocarbons
- Nitrosamines
- Hot Maté
- DDT
- Mold (Aspergillus, Fusarium etc)
- Heterocyclic amines
- Coffee (highest conc of pesticides and insecticides per kg)
- Pickled vegetables
- Acrylamide (drinking water)

Filtered water, organic food, avoid plastic

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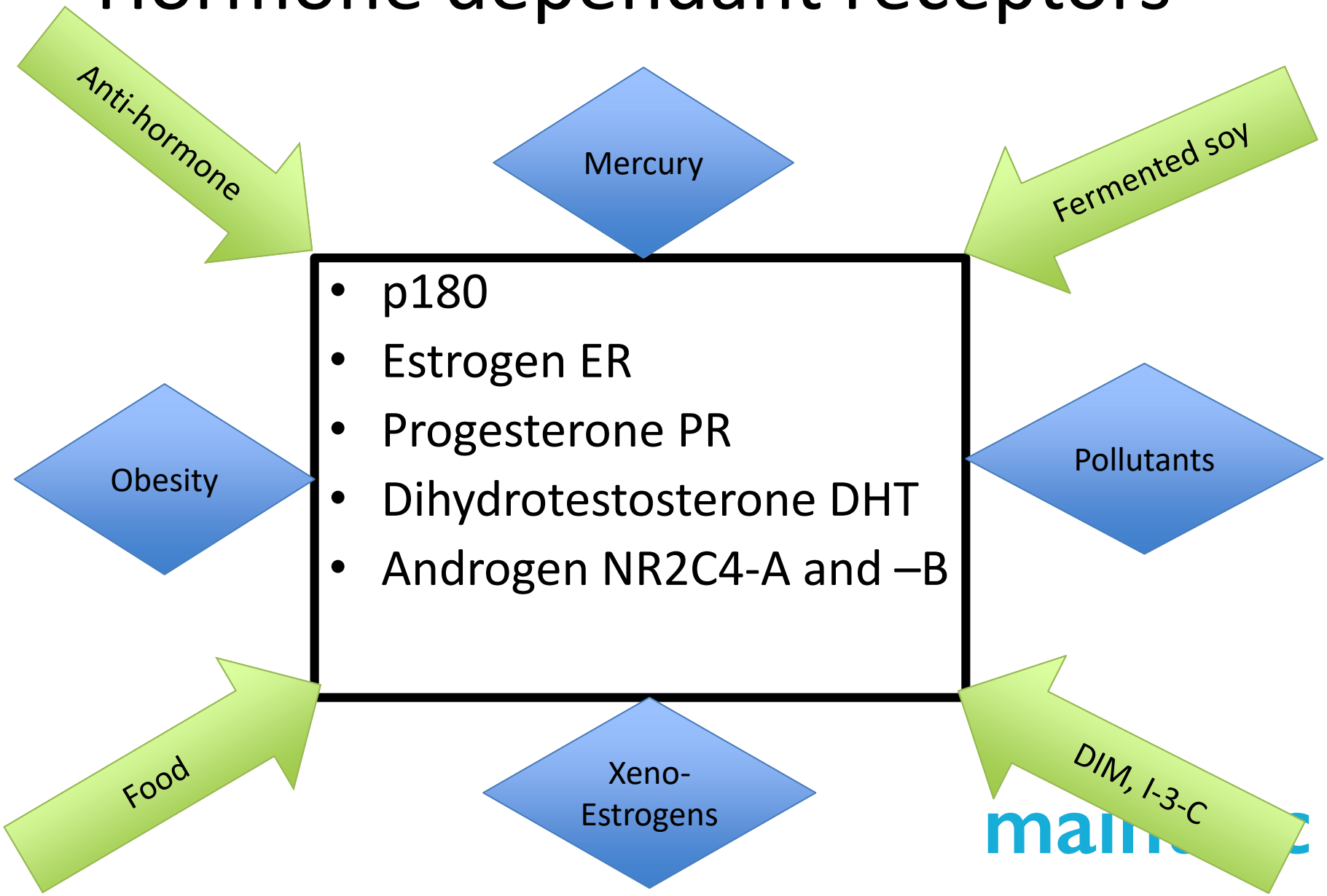
Hormone dependant receptors



“NATURAL” TREATMENTS

- LIFESTYLE
- NUTRITION
- MICRONUTRIENTS
- HERBS (WESTERN HERBS, AYURVEDIC, TCM)
- TABLETS, CAPSULES, INJECTIONS
- BIOPHYSICAL (ACUPUNCTURE, EMF ETC)
- MIND
- SPIRITUAL

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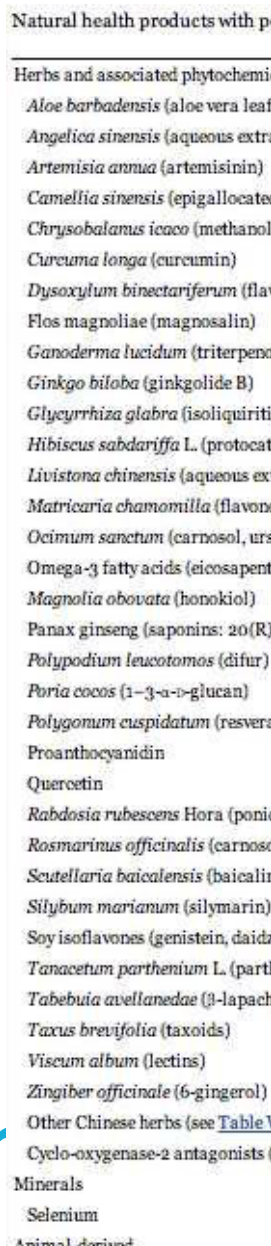
Natural Health Products that inhibit angiogenesis

Curr. Oncol. 2006 February: 13(1): 14-26

Tested by Maintrac

Artemisia annua
Quercetin
Resveratrol
ImmunPlus6-Shogaol
Lektins (Mistletoe)
Vitamin D3
Curcumin
Green Tea
Selenium


Natural health products with p

Herbs and associated phytochemi
Aloe barbadensis (aloe vera leaf
Angelica sinensis (aqueous extr
Artemisia annua (artemisinin)
Camellia sinensis (epigallocate
Chrysobalanus icaco (methanol
Curcuma longa (curcumin)
Dysoxylum binectariferum (fla
Flos magnoliae (magnosalin)
Ganoderma lucidum (triterpen
Ginkgo biloba (ginkgolide B)
Glycyrrhiza glabra (isoliquiriti
Hibiscus sabdariffa L. (protocat
Livistona chinensis (aqueous ex
Matricaria chamomilla (flavon
Ocimum sanctum (carnosol, urs
Omega-3 fatty acids (eicosapent
Magnolia obovata (honokiol)
Panax ginseng (saponins: 20(R)
Polypodium leucotomos (difur)
Poria cocos (1–3-α-D-glucan)
Polygonum cuspidatum (resver
Proanthocyanidin
Quercetin
Rabdosia rubescens Hora (poni
Rosmarinus officinalis (carnos
Scutellaria baicalensis (baicali
Silybum marianum (silymarin)
Soy isoflavones (genistein, daid
Tanacetum parthenium L. (part
Tabebuia avellanedae (β-lapach
Taxus brevifolia (taxoids)
Viscum album (lectins)
Zingiber officinale (6-gingerol)
Other Chinese herbs (see Table
Cyclo-oxygenase-2 antagonists
Minerals
Selenium

VITAMIN C AND CANCER?

Active and Supportive treatments

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What About Cancer?

Controversies?

- Still very common to hear that Vitamin C/antioxidants should not be given with chemo or radiation because they are antagonistic. This is very confusing for patients.

- Animal and human clinical evidence does not support this idea of antagonism. Nothing CLINICAL published to date that shows antagonism.

- Human clinical trials in combination with chemo are rapidly increasing in number every year. Now Vit C in combination with radiation trials are appearing.

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VITAMIN C

- IVC has significant published research in cancer treatment.
- ***Even the National cancer institute, part of the NIH in the USA, says that Vitamin C as an adjunct to cancer treatment***
  - Does not interfere with medical therapies.
  - Improves quality of life and toxicity from medical therapies.

PDQ Cancer Complementary and Alternative Medicine Editorial Board. High-Dose Vitamin C (PDQ): Patient Version. 2015 Apr 8. PDQ Cancer Information Summaries [Internet]. Bethesda (MD): National Cancer Institute (US); 2002-. Available from http://www.ncbi.nlm.nih.gov/books/NBK127724/ PubMed PMID: 26389507.

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clinicaltrials.gov - IVC in cancer

- **With chemotherapy 20+**
- **Sole treatment 11+**
- **With radiation therapy 4**

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What About Cancer?

- IVC Doses in current trials:
- Chemo – 60g – 100g +
  - Same time as chemo or after chemo.
- Radiation therapy 80g +
  - Before, During and After Radiation.

Effect of Natural Therapies

- Improving effectiveness of anti-cancer treatment
  - Consider timing and possible interactions
- Reducing symptoms
- Increasing QoL
- Improving immune response mechanisms

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Natural “anti-cancer” treatments

- Direct cytotoxic therapies
  - Curcumin as IV
    - Lots of in vitro evidence
    - Lots of practitioner experience
    - Human trials are ongoing
      - Very encouraging results
  - Other bioflavonoids
    - Ginger, Resveratrol, Quercetin,

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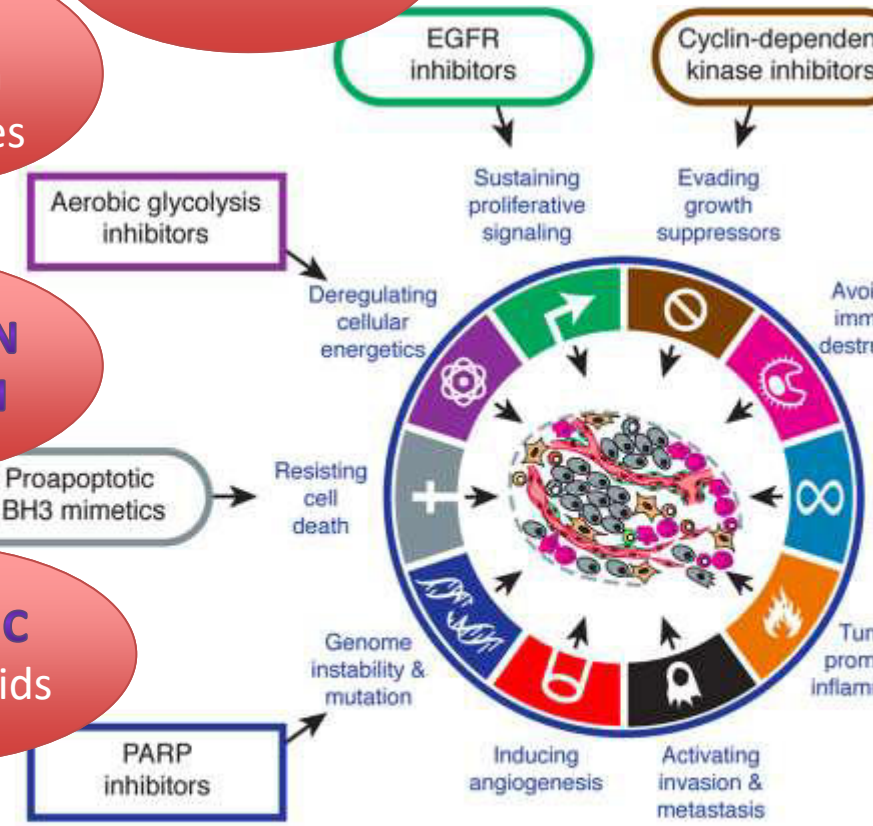
Targets



Quercetin
Curcumin

DCA
Oxygen
Therapies

CURCUMIN
6-
SHOGAOL

AMYGDALIN
CURCUMIN

Thymus
Mistletoe

VITAMIN C
Bioflavonoids

Omega-3

ARTEMISIA
Quercetin

VITAMIN D

GreenTea
CURCUMIN
Cox-2 inh

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Testing for “sensitivity”

- Direct cytotoxic assays
  - Question to the lab: has the substance (with the chosen therapeutic concentration) the ability to kill cancer cells
    - The Maintrac CTC test is the only test which can test the effectiveness of a substance on live tumour cells
    - Other test methods use gene mutations and their statistics or use RNA methods.
      - Not using therapeutic concentration

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Chemo-sensitivity

J Cancer Therapy 2013, 4:597-605

Chemosensitivity Testing of Circulating Epithelial Tumor 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

Nadine Rüdiger[1], Ernst-Ludwig Stein[1], Erika Schiff[2], Gabriele Spitz[3], Carola Rabenstein[1], Martina Stauch[3], Matthias Rongsberger[4], Ingo B. Rinnebaum[1], Ulrich Pachmann[1], Katharina Pachmann[2,3]*

[1]Clinic for Internal Medicine II, University Hospital, Friedrich Schiller University, Jena, Germany; [2]Transfusionsmedizinisches Zentrum, Bayreuth, Germany; [3]Onkologische Schwerpunktpraxis, Kronach, Germany; [4]Women's Hospital, University Hospital, Friedrich Schiller University, Jena, Germany
Email: *kpachmann@labor-pachmann.de

Received February 25th, 2013; revised March 26th, 2013; accepted April 2nd, 2013

ABSTRACT

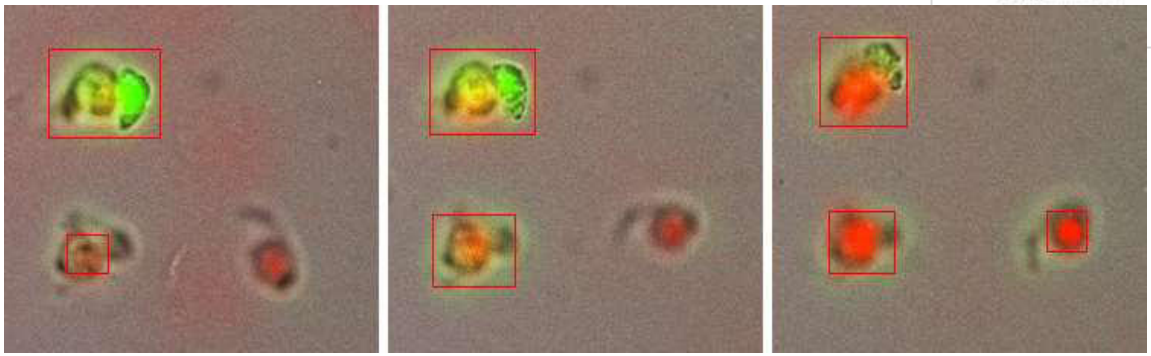
Background: Chemotherapy is a mainstay of tumor therapy, however, it is predominantly applied according to empirically developed recommendations derived from statistical relapse rates occurring years after the treatment in the adjuvant situation and from progression-free interval data in the metastatic 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 efficacy 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 as 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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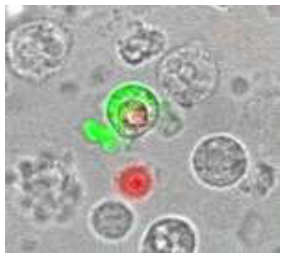
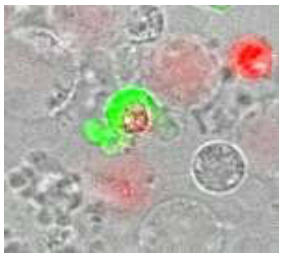
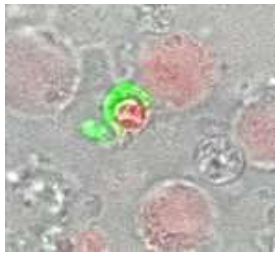
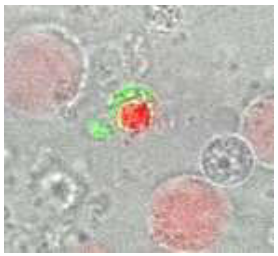
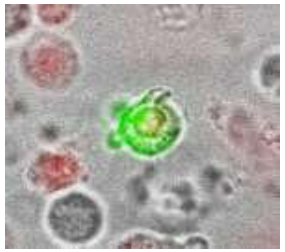
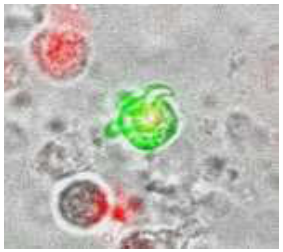
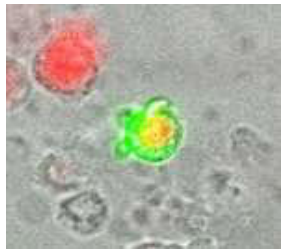
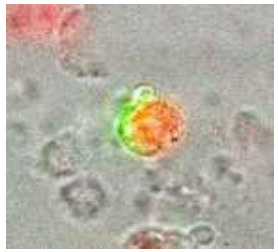
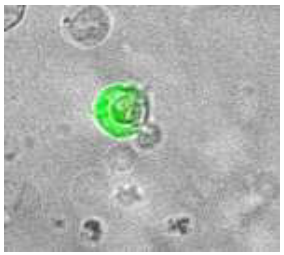
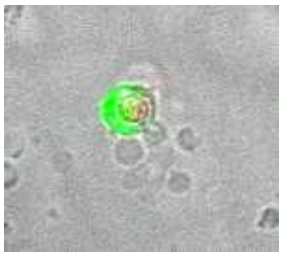
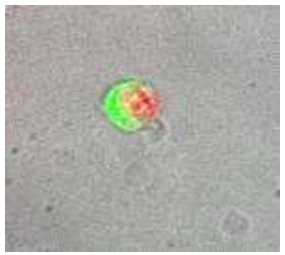
Cell decay of CTCs over time in the presence of a drug

	t=1 hr.	t=3,5 hrs.	t=7 hrs.	t=10,5 hrs.
Docetaxel				
Epirubicin				
Mafosfamid				

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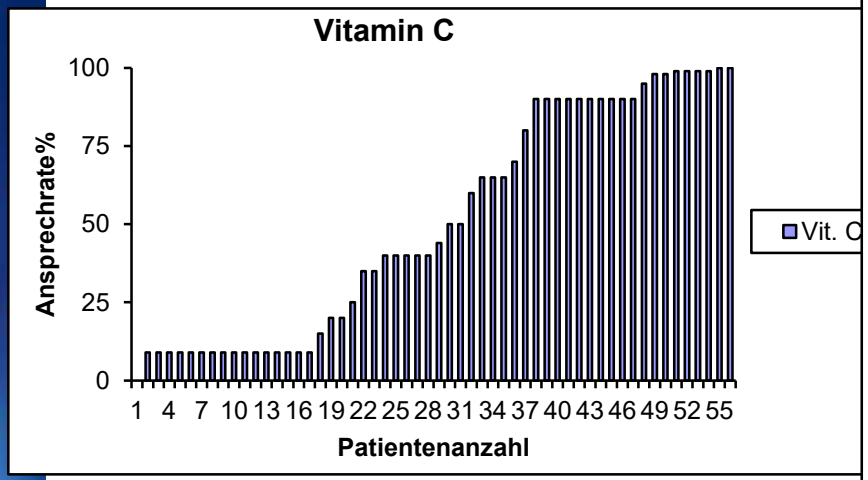
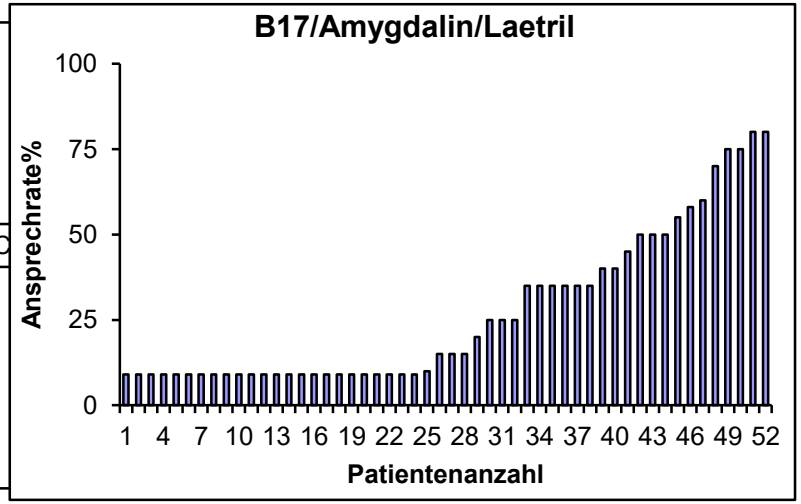
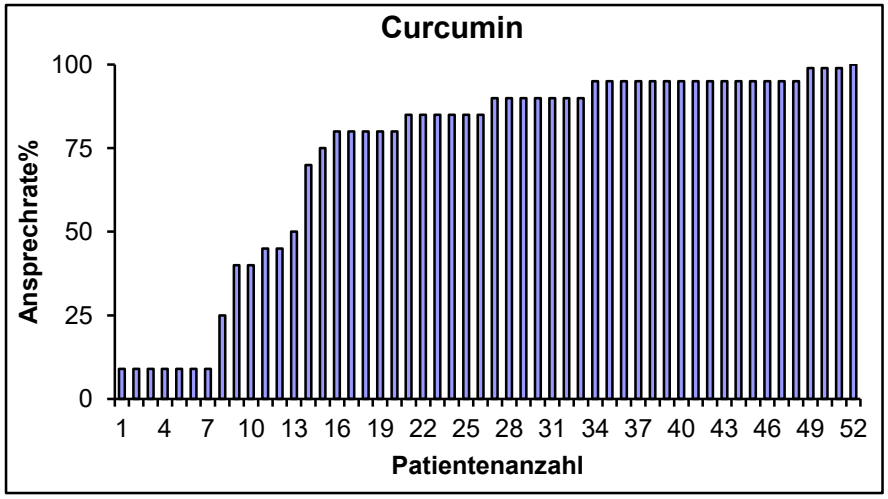
Cytotoxicity Assays (Chemosensitivity)
To BOTANICAL MEDICINES







Dr. med. Ulrich Pachmann
Tel: +49 921 / 85 02 00 Fax +49 921 / 85 02 03
Email: mail@laborpachmann.de

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

Labor Dr. med. Ulrich Pachmann Kopernikusstraße 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

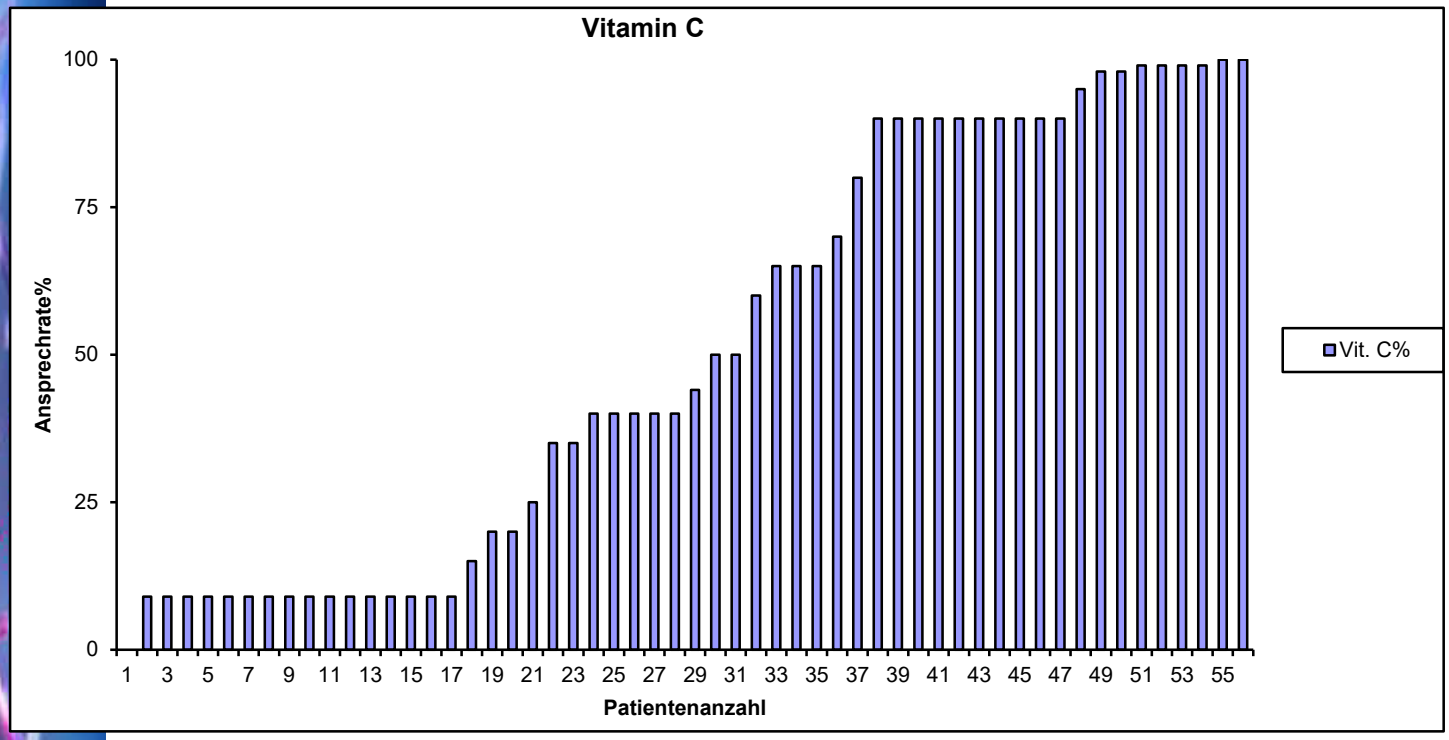
- 1.Therapy: Mexico, Oasis of Hope 3 visits
  Therapy: B17, Prosanalin, Xeloda, Curcumin
- 10/15-07/16: DCA, Vitamin C
- until: 10/16: Ozone, Boswellia, Hyperhtermia
- 11/16: Surgery (Removal of remaining tumor 5mm)

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):

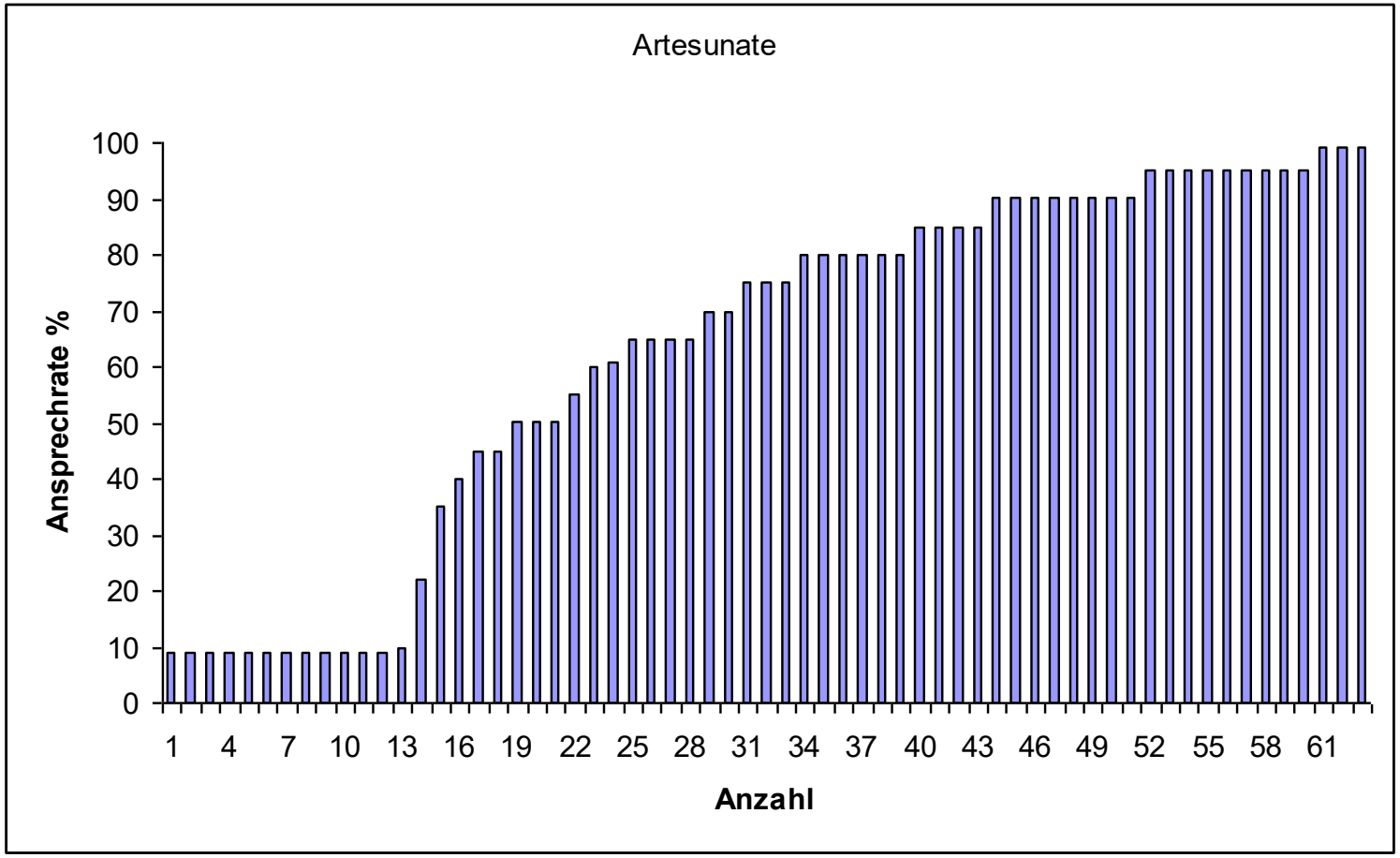
	Number of potential tumor cells			
Examination parameter	In the sample (1ml)	In circulation (5l) (in millions)	In addit. examination: % of EpCAM-pos. cells	Cell fragments
EpCAM	**500**	**2,5**		numerous

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



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%

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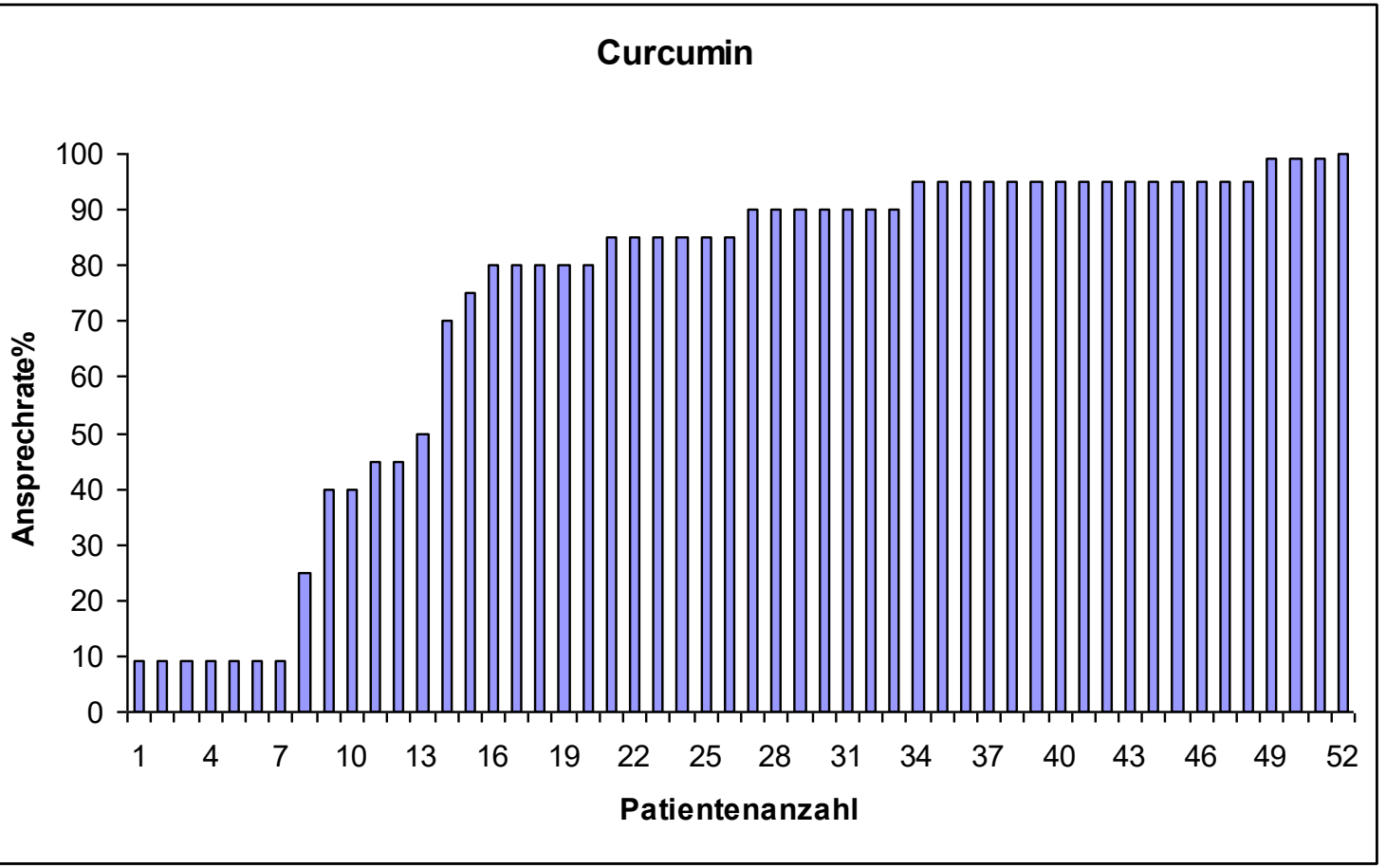

Patients total: 52		
Sensitivity > 50%	39 Patients	75%
Sensitivity < 50%	13 Patients	25%

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Tumour Spheres - Culture

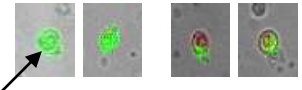
San Antonio Breast Cancer Symposium - Cancer Therapy and Research Center at UT Health Science Center – December 10-14, 2013

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

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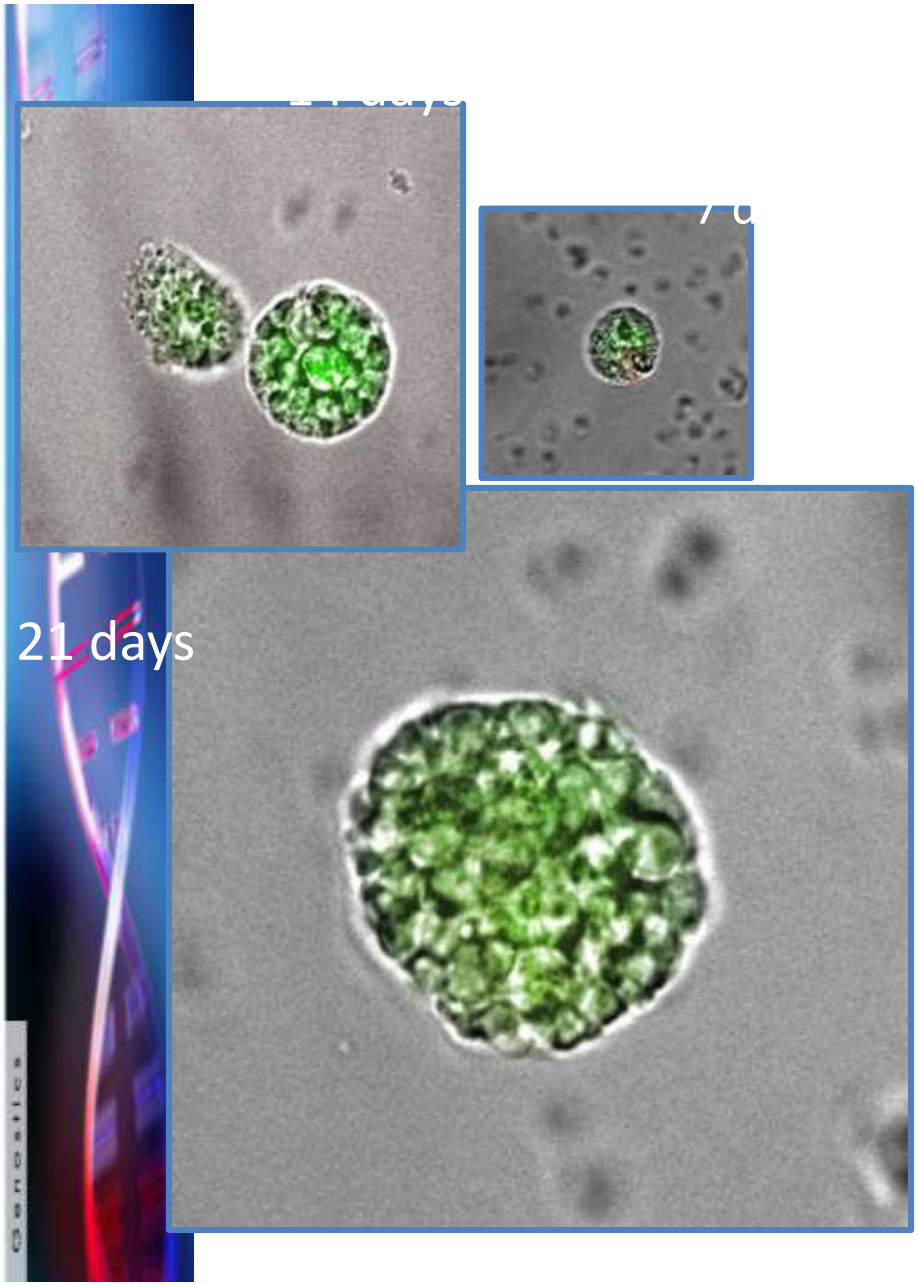


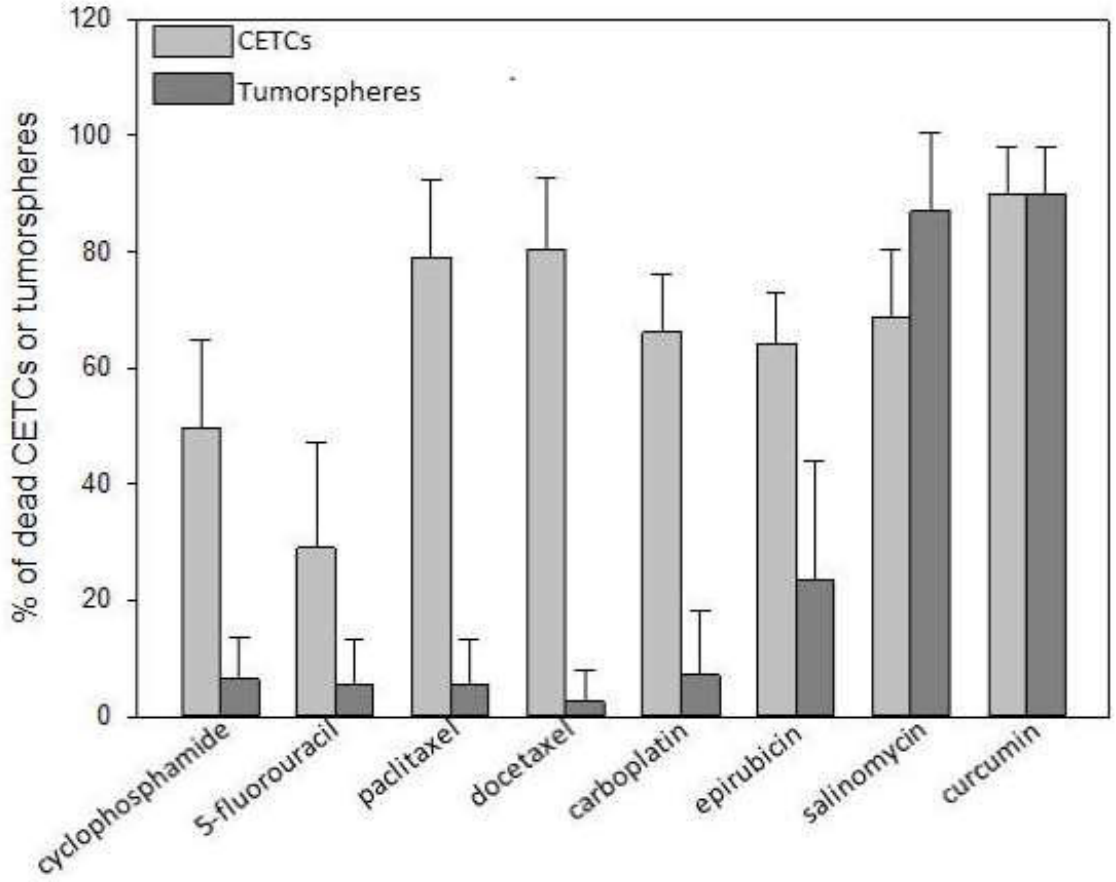
Tumorspheres from CTCs

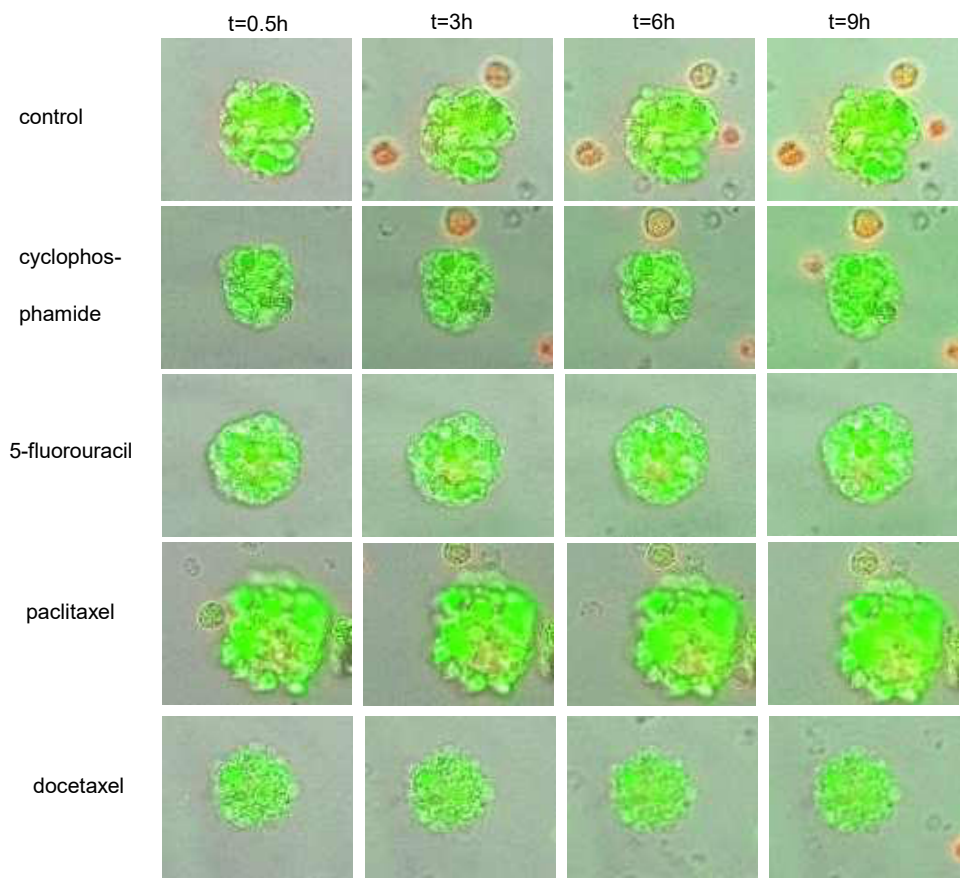
Spheres were detected in 86 of 109 patients **(78.9%)**;

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

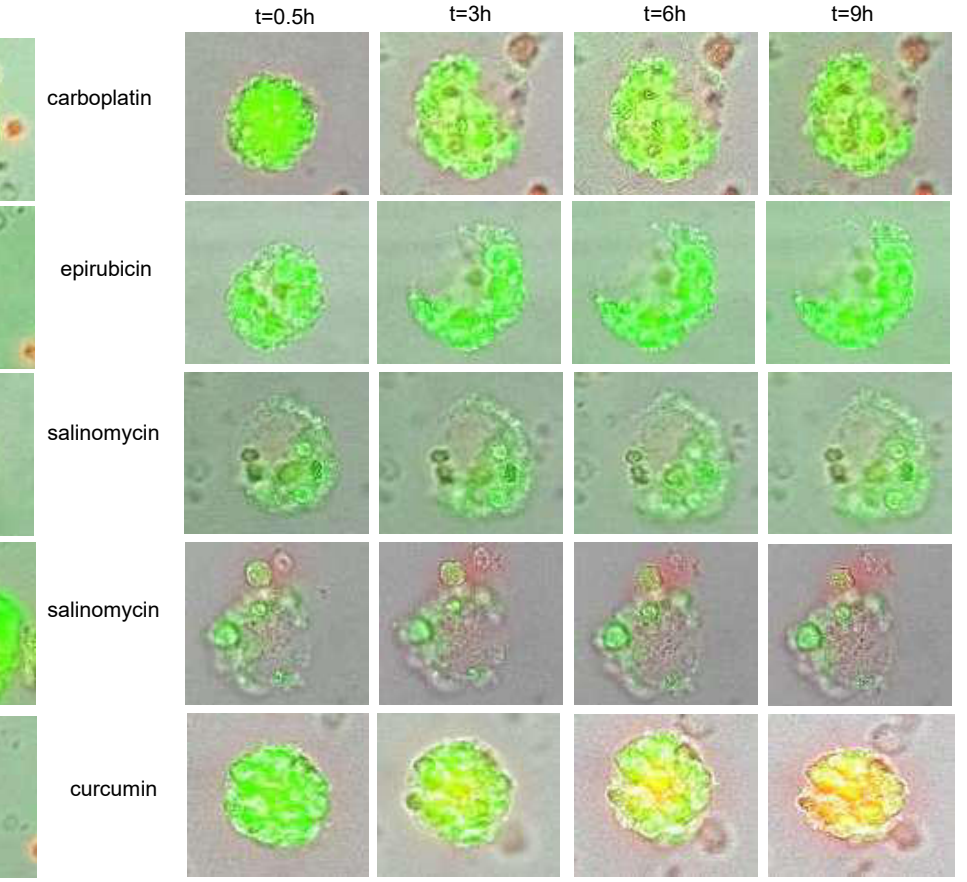
All spheres detected **are positive for EpCAM**.

Chemosensitivity of tumour spheroids vs. CETC





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.

Maintrac CTC Testing

for

Early Detection (Screening?)

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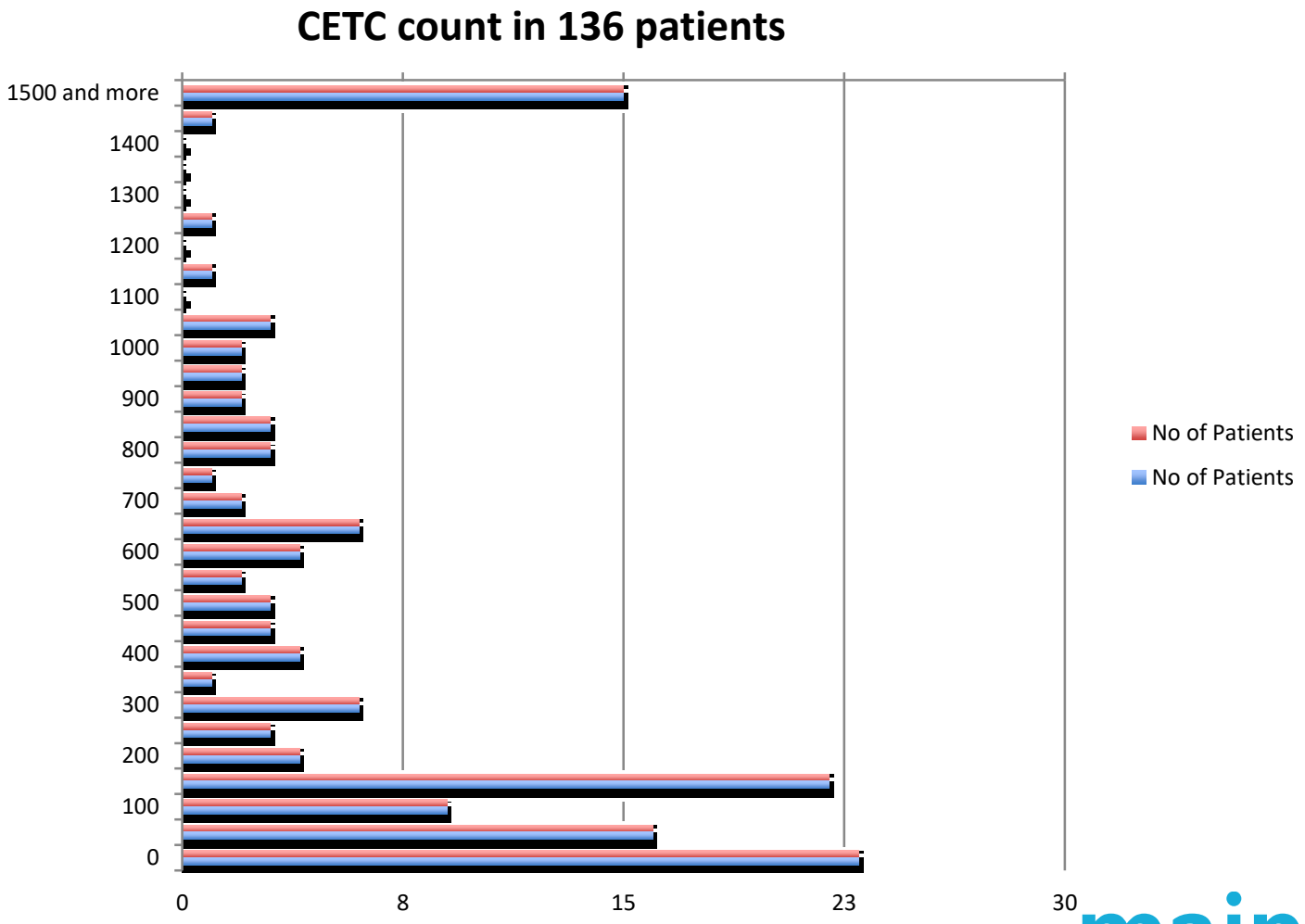
136 Patients without Diagnosis significant risk factors



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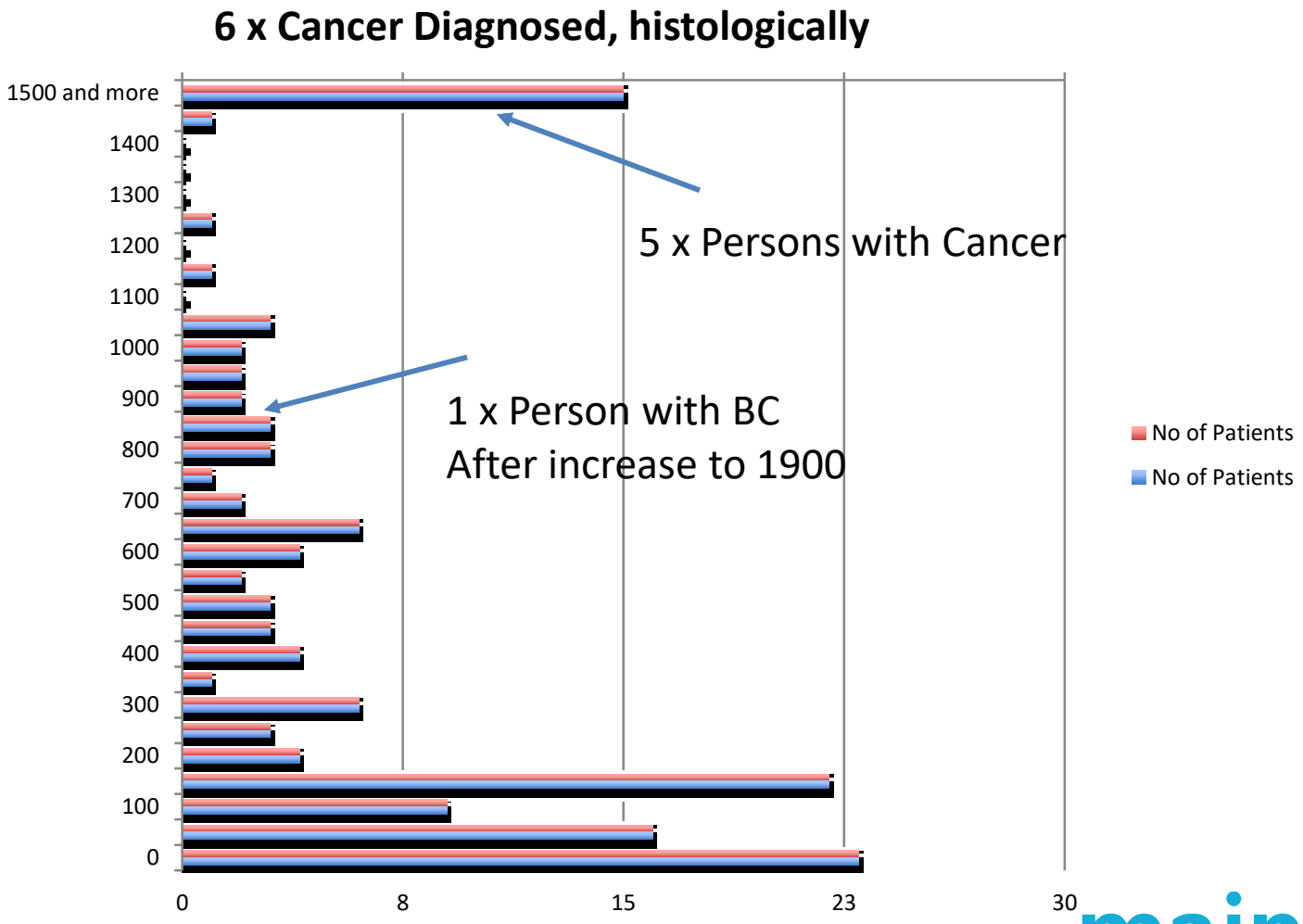
136 Patients without Diagnosis significant risk factors

87 Patients CETC < 450
49 Patients CETC > 500
6 Diagnoses



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Results of CTC	Repeat CTC Test

CTC Count

Results of CTC		Repeat CTC Test
0	No known risk	12 months
	Known risk	3 months
0 - 500	Prevention Rx	6 months
500 – 1500	Intensive Prevention Rx	3 months
> 1500		Ix & Rx → 2-3 month

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Results of CTC	Treatment

CTC Count

Results of CTC		Treatment
0	No known risk	Prevention Strategies
	Known risk	
0 - 500	Prevention Rx	Prevention Program Level 1
500 – 1500	Intensive Prevention Rx	Prevention Program Level 2
> 1500		Investigation Scans, Tests
		Active Intervention Program

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The Effect of Natural Therapies and CTC Testing on Patients with Cancer

Dr. Joachim Fluhrer MBBS (UniSyd)
FACNEM, FSAARMM

AONM Webinar Aug 2020

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