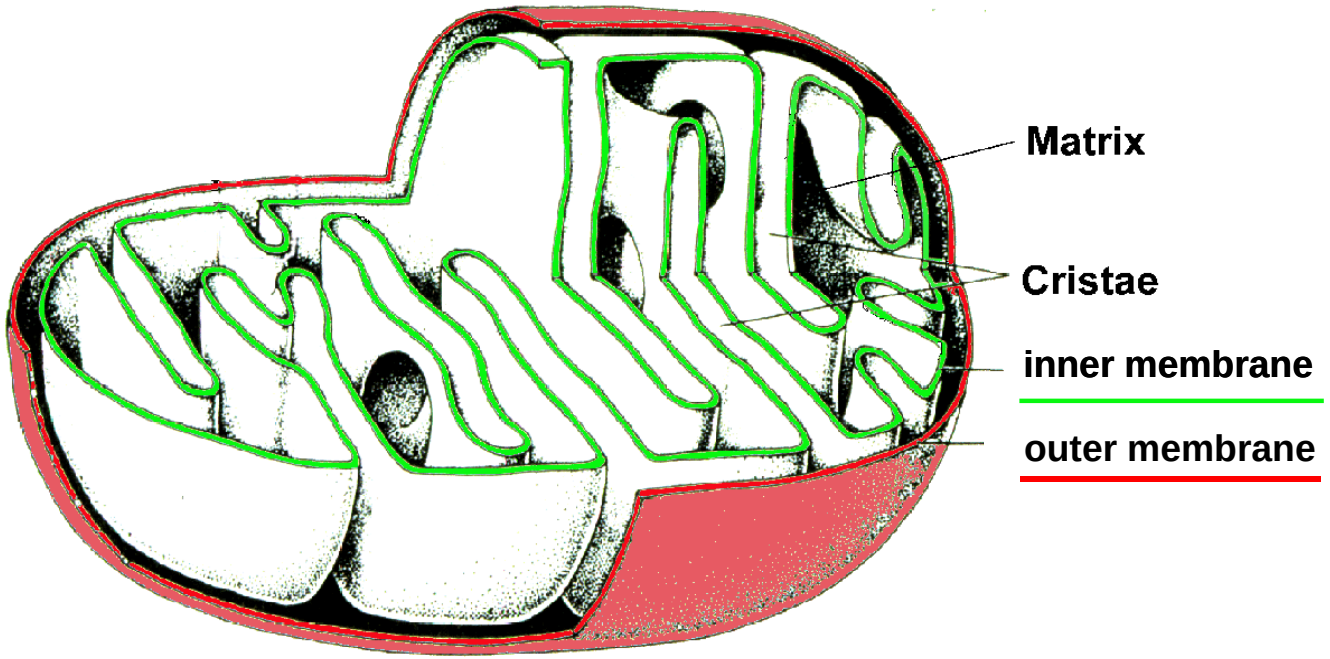
Coenzyme compositum – a Key Remedy in Homotoxicology

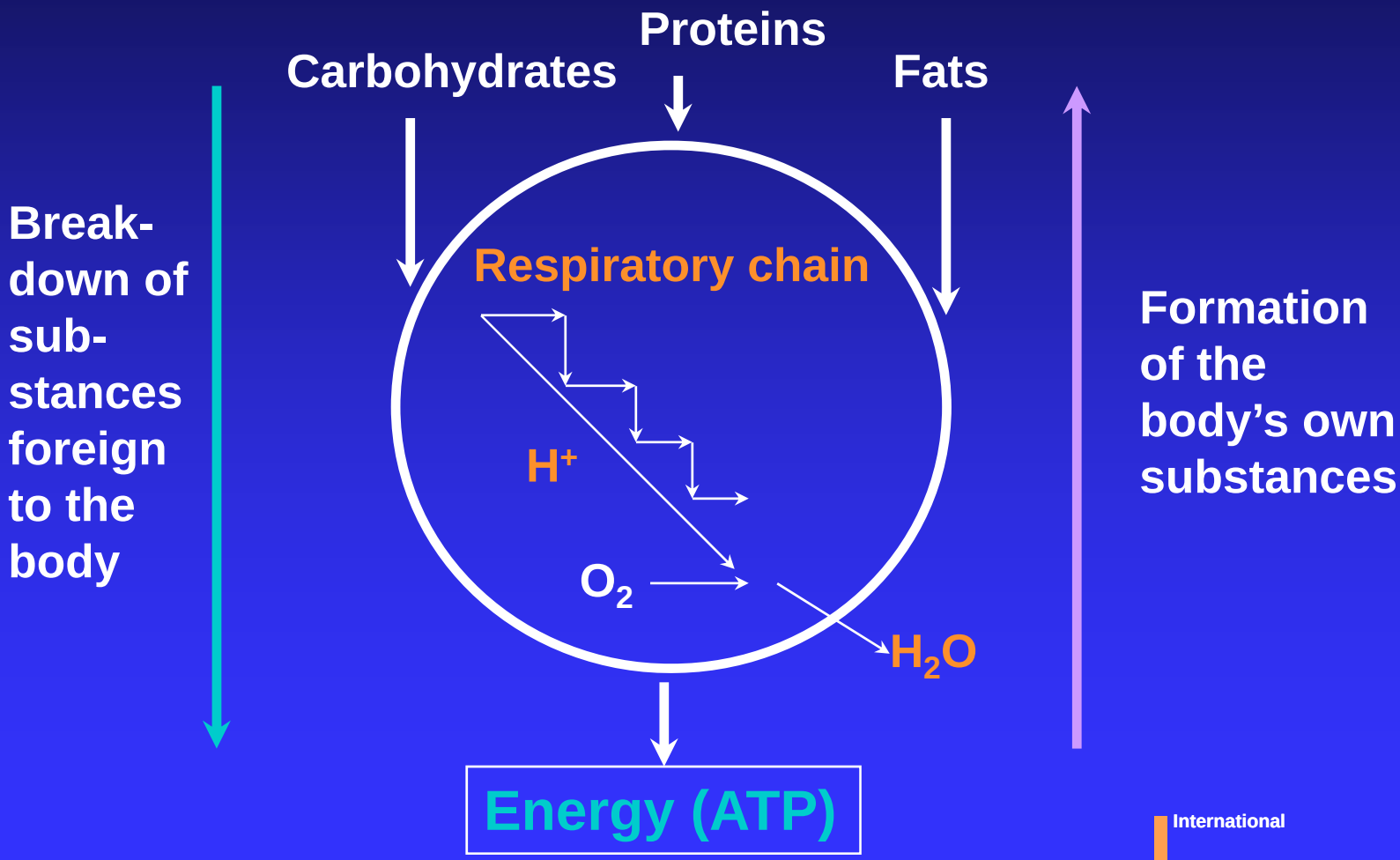
Dr. med. vet. Gunther Löw

Mitochondrion



International
Society
of Homotoxicology

Citric Acid Cycle
(focal point of metabolism)

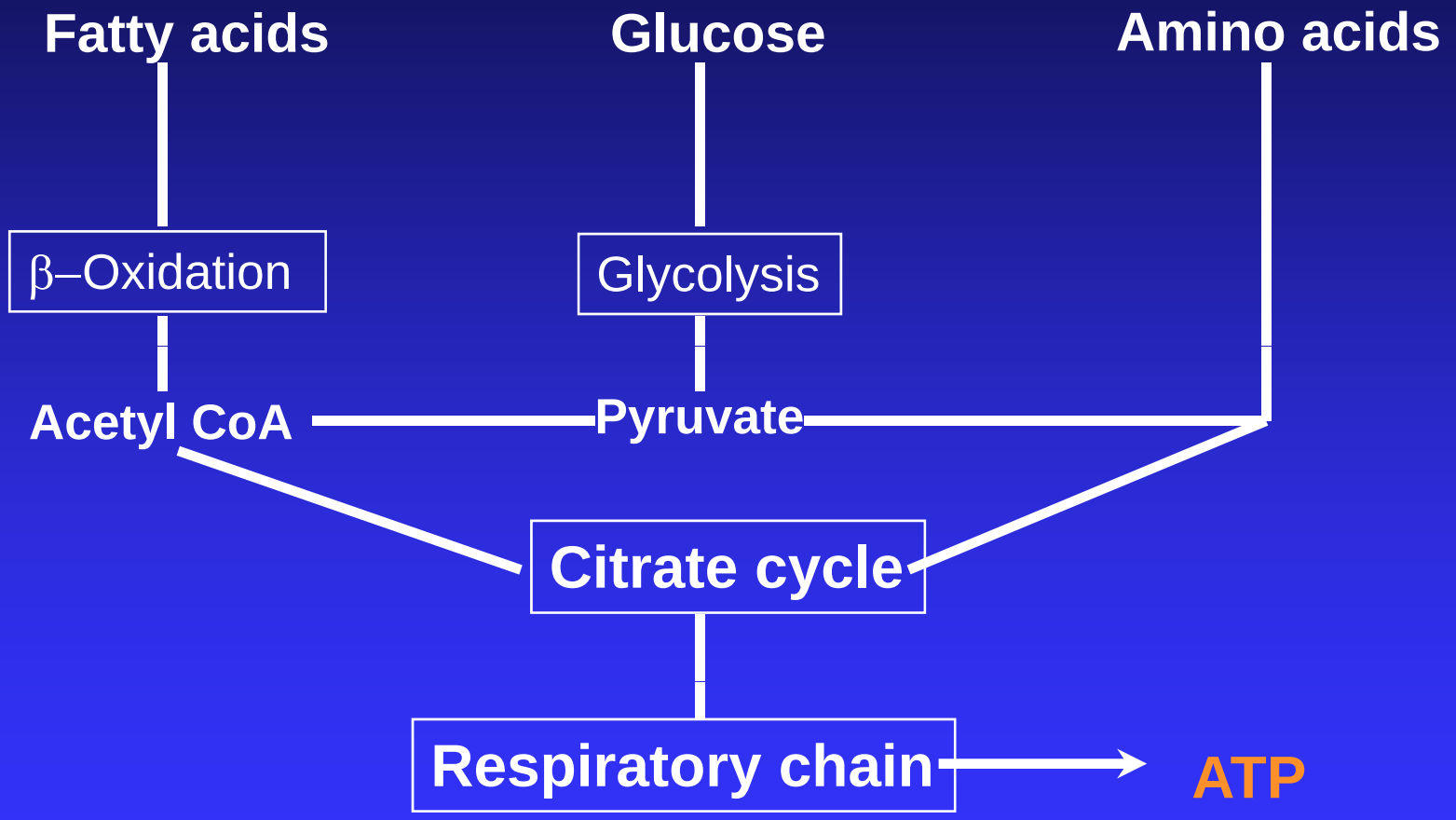


International Society of Homotoxicology

Processes in the Mitochondria

- Citric acid cycle
- Respiratory chain
- ATP synthesis
- β-oxidation
- Urea cycle

Energy Metabolism



International Society of Homotoxicology

Special Features of the Mitochondrial Genome

- Maternal inheritance
- Division possible independently of cell division
- Does not follow the universal code
  (32 tRNA-20 AS → 22 tRNA-20 AS)
- DNA replication shows bidirectional retardation
- No efficient repair mechanism
- 10-20x higher mutation rate
- Replicative segregation

Specific Properties of Mitochondria

- Key organelles which determine how inflammation progresses (apoptosis, necrosis)
  - Control centre for apoptosis
  - Selected target for the protective effect of heat-shock proteins against cytotoxic attack by TNFα and ROS
- Rhythmic synthesis of ATP by the mitochondria of a cell = most important intracellular pacemaker **(Priebe 1980)**

Mitochondria-damaging Noxae

- Physical factors
  - Hypoxaemia, X-rays, UV
- Chemical factors
  - Heavy metals (As, Pb, etc.)
  - Radicals, environmental poisons, toxins
  - Drugs (chlorpromazine, furosemide, aminoglycoside-AB, etc.)
- Physiological factors
  - Inflammation, age

Influence of Hypoxaemia on Mitochondrial Metabolism

- Warburg cultivated embryonic mouse cells under physiological oxygen pressure
- When the oxygen pressure was reduced by 35%, oxygen respiration in the cell was inhibited; after 48 h the metabolism switched to anaerobic glycolysis
- However, when the physiological oxygen pressure was restored, the anaerobic metabolic state persisted and was irreversible

Influence of (Heavy) Metals on Mitochondrial Metabolism

- Decoupling of oxidative phosphorylation (arsenic acid)
- Changes in the structural and functional integrity of the mitochondrial membrane (increased calcium ions in cytoplasm)

Influence of Radicals on Mitochondrial Metabolism

Hypothesis:

Incompletely reduced oxygen radicals

release senDNA

- Cells' own protective systems, enzymatic and nonenzymatic antioxidants initially intercept the radicals
- If there is a strong accumulation of radicals, the protective systems are heavily overloaded and the radicals damage the mtDNA unhindered

Influence of Drugs on Mitochondrial Metabolism

- Substances that attack the DNA (cytostatics)
- Action on protein biosynthesis in the mitochondria by attacking the 55 S and 70 S ribosomes (antibiotics)
- Interaction with enzymes within the organelles
- Change in membrane permeability, or specific inhibition of carriers

Influence by Cytostatics

- Cytostatics which attack the DNA also hit the mitochondrial DNA
  - Mitomycin, bleomycin, daunomycin

Influence of Antibiotics which Inhibit Protein Biosynthesis

- Restriction of protein synthesis by attacks on 55 S and 70 S ribosomes
  - Structural changes in the organelles
    - the inner membrane in particular undergoes changes
  - Obviously the cause of the toxic side effects of certain antibiotics
    - ototoxicity and nephrotoxicity of aminoglycoside AB
    - aplastic anaemia with chloramphenicol
    - etc.

Influence on Mitochondrial Enzymes (1)

- Substances which inhibit electron transport (oxygen consumption)
  - Amobarbital, antimycin A, carbon monoxide, cyanide, H_2S, furosemide, ethacrynic acid, misc. pyrazolone derivatives
- Substances which inhibit ATP formation but leave the oxygen-consuming system intact (respiratory chain decouplers)
  - Dinitrophenol, valinomycin, arsenate

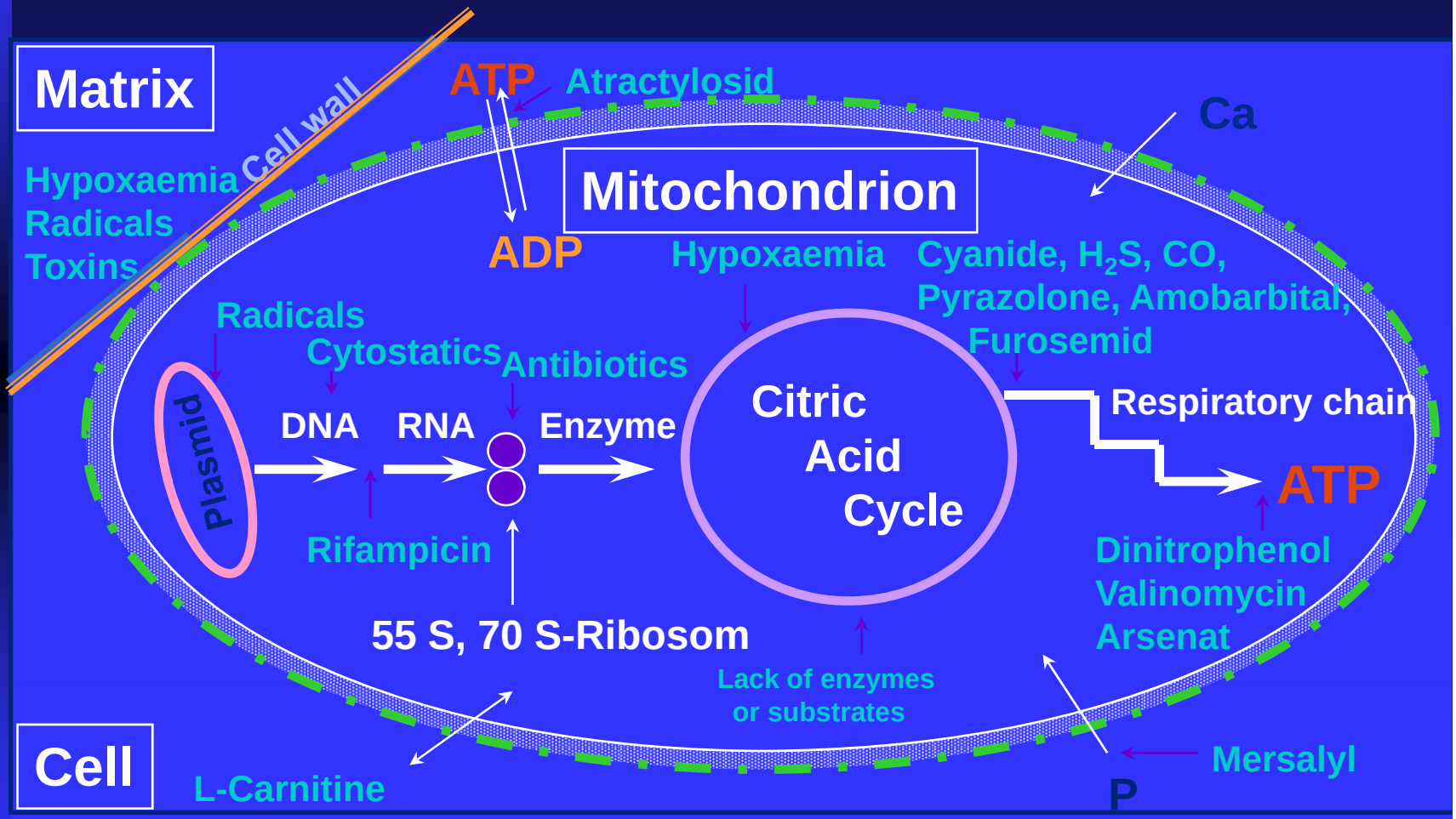
Influence on Mitochondrial Enzymes (2)

- Inhibition of respiration and ATP formation (energy transfer inhibitor)
  - Oligomycin
- Consumption of energy for ion transport processes
  - “Ionophoretic ABs”, e.g. valinomycin

Influence on Carrier Systems

- Prevention of ADP/ATP transport
  - By the toxic “atractyloside” glycoside of the Mediterranean thistle Atractylis gummifera
- Inhibition of the transport of inorganic phosphate
  - By mersalyl (diuretic, Salyrgan)
- Membrane transport of long-chain fatty acids
  - L-Carnitine is the carrier substance for long-chain fatty acids through the inner mitochondrial membrane

Influences on the Mitochondrion



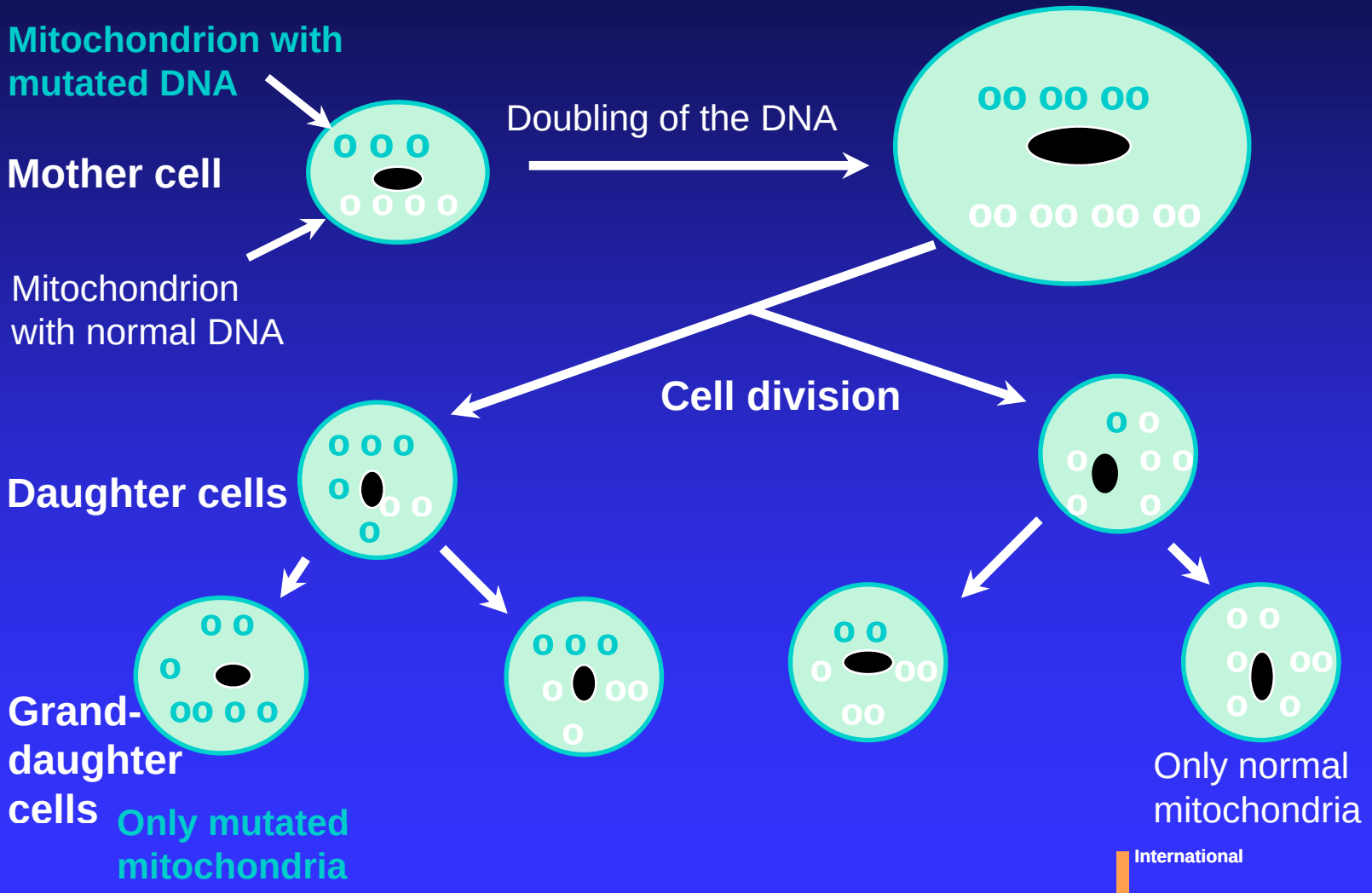
International
Society
of Homotoxicology

Influence of Age on Mitochondrial Metabolism

- Increasing accumulation of toxins
- Accumulation of radicals
- Accumulation of increasingly genetically defective mitochondrial genes (segregation)

➔ low-calorie diet, antioxidants, exercise (oxygen consumption)

Mitochondrial Segregation



International Society of Homotoxicology

Mitochondrial Diseases (1)

- Metabolic diseases
  - Diabetes mellitus (type II)
- Neurometabolic, degenerative diseases
  - Parkinsonian syndrome
    (akinesis or hypokinesis, rigidity, tremor)
  - Alzheimer's disease
    (progressive loss of cognitive abilities)
  - Leber's amaurosis
    (blindness caused by damage to the optic nerve)

Mitochondrial Diseases (2)

- Mycocardial diseases
  - Dilated cardiomyopathy
- Myopathies
  - Mitochondrial myopathy
    (muscle wasting)
  - Dystonia
    (movement disorder with muscular rigidity)

Clinical Aspects of Disturbed Mitochondrial Function

- Specific:
  - insufficiency of metabolically active organs
    CNS, heart, liver, pancreas, kidney
- Nonspecific:
  - feelings of ill-health
  - energy and performance deficits
  - metabolic imbalances
  - degenerative diseases
  - tumours

Therapy Regimen

- Avoidance of ischemia-reperfusion-episods
- Protection through antioxidant
- Reparation of bioenergetic deficits (use of intermediary catalysts)
- Conservation of the physiological function of the Matrix (use of intermediary catalysts)

Antioxidant

- Vitamin E
- Vitamin C
- Selen
- others, like Ubichinon, Melatonin, ...

Catalysts

Definition:

Catalysts are substances which speed up the equilibration of chemical reactions but which are not themselves consumed in the process.

Intermediary Catalysts

- Occur physiologically in the course of cell respiration and energy provision (citric acid cycle, redox systems)
- Some are substances that are formed or which become catalytically active in other enzymatic conversions

Preparation Groups of Catalysts

- Group A
  - Acids of the citric acid cycle and their salts
- Group B
  - Quinones and other intermediary respiratory catalysts
- Group C
  - Other compounds with stimulant action (hormones, biogenic amines, elements, plant extracts)
- Combination preparations

Coenzyme compositum – Constituents (1)

- Catalysts of the citric acid cycle
  - Coenzyme A D8
  - Acidum cis-aconiticum D8
  - Acidum citricum D8
- Substrates of the respiratory chain
  - ATP, disodium salt D10

Coenzyme compositum – Constituents (2)

- Other metabolism-regulating compounds
  - Ascorbic acid D6 (Vit. C)
  - Thiamine hydrochloride D6 (Vit. B1)
  - Riboflavin 5‘-phosphate D6 (Vit. B2)
  - Pyridoxine hydrochloride D6 (Vit. B6)
- Single remedies acting on cell respiration
  - Pulsatilla D6, - Hepar sulfuris D10
  - Sulfur D10, - Manganum phosphoricum D6
  - Beta vulgaris rubra D4

Ubichinon compositum – Constituents (1)

- Coenzymes of the respiratory chain
  - Coenzyme Q_{10} D10
- Substrates of the respiratory chain
  - ATP, disodium salt D10
- Quinones
  - Anthrachinon D10
  - Hydrochinon D8
  - Para-Benzochinon D10
  - 1,4-Naphthochinon

Ubichinon compositum – Constituents (2)

- Other metabolism-regulating compounds
  - Manganum phosphoricum D8
  - Magnesium D-gluconate D10
  - Acidum sarcolacticum (Acidum L(+)-lacticum) D6

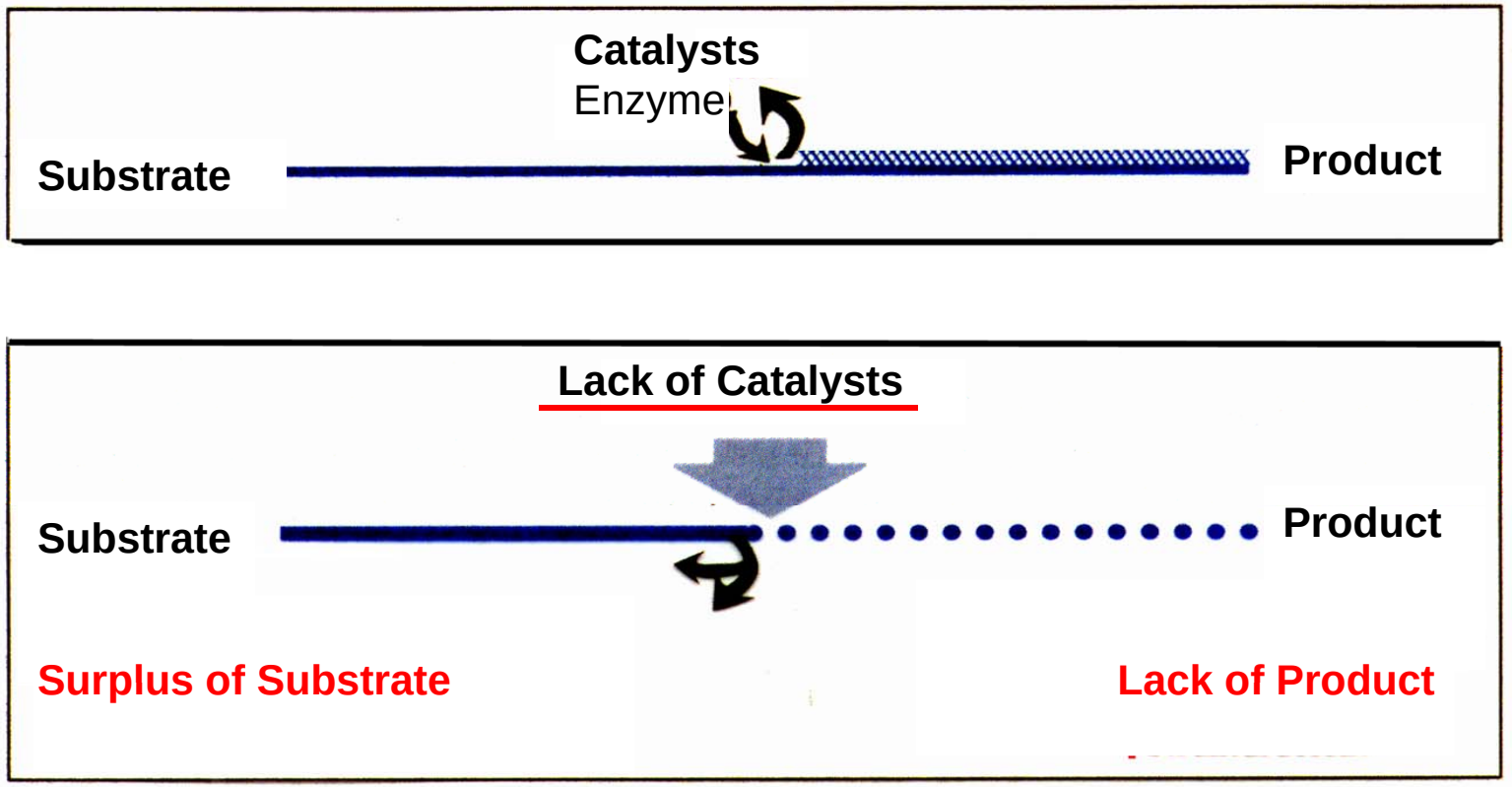
Glyoxal – Constituents

- Methylglyoxal D10
- Glyoxal D10

Combination preparations — Intermediary catalysts

Preparation	Indication
Coenzyme compositum ad us. vet.	**Citric acid cycle** Stimulation of blocked enzyme systems in degenerative diseases and in enzyme dysfunction (cellular phases)
Ubichinon compositum Contraindication: Do not use during pregnancy or lactation	**Respiratory chain** Stimulation of toxin defence mechanisms to reactivate blocked enzymes in enzyme dysfunction and degenerative diseases (cellular phases)
Glyoxal compositum	**Tumours and viral diseases** Stimulation of toxin defence mechanisms of blocked enzyme systems in enzyme dysfunction, disturbed glandular function and degenerative diseases (cellular phases)

CatalystsTransformation: Substrate - Product



Antihomotoxische Medizin, Bd. I

General Use of Coenzyme compositum

- Stimuation of blocked enzymes in degenerative diseases
- Enzyme disorders
- Improvement of the oxygen utilization
- Metabolic disorders
- Cachexia
- Chronic eczema
- Geriatrics

Therapy with Intermediary Catalysts in a Small-animal Practice (1)

- Dermatoses
  eczema, allergic dermatitis, hair loss, itching, possibly together with Cutis compositum
- Tumours
  e.g. breast cancers, leucosis: Para-Benzochinon-Injeel, Coenzyme comp., Ubichinon comp. together with Lymphomyosot and Galium-Heel

Therapy with Intermediary Catalysts in a Small-animal Practice (2)

- Geriatrics, with degenerative organ diseases
  e.g. liver, kidney, Coenzyme comp. with Hepar comp., Solidago comp.
- Metabolic disturbances
  e.g. diabetes, Coenzyme comp., together with Syzygium compositum
- Adjuvant in any chronic disease

Therapy with Intermediary Catalysts in an Equine Practice (1)

- Skin diseases, eczema
- Metabolic disturbances
  together with Carduus compositum
- Stabilization of performance
  e.g. in training and racing
- Tumour treatment
  e.g. equine sarcoid, Coenzyme compositum, Glyoxal compositum and Ubichinon compositum together with Lymphomyosot

Therapy with Intermediary Catalysts in an Equine Practice (2)

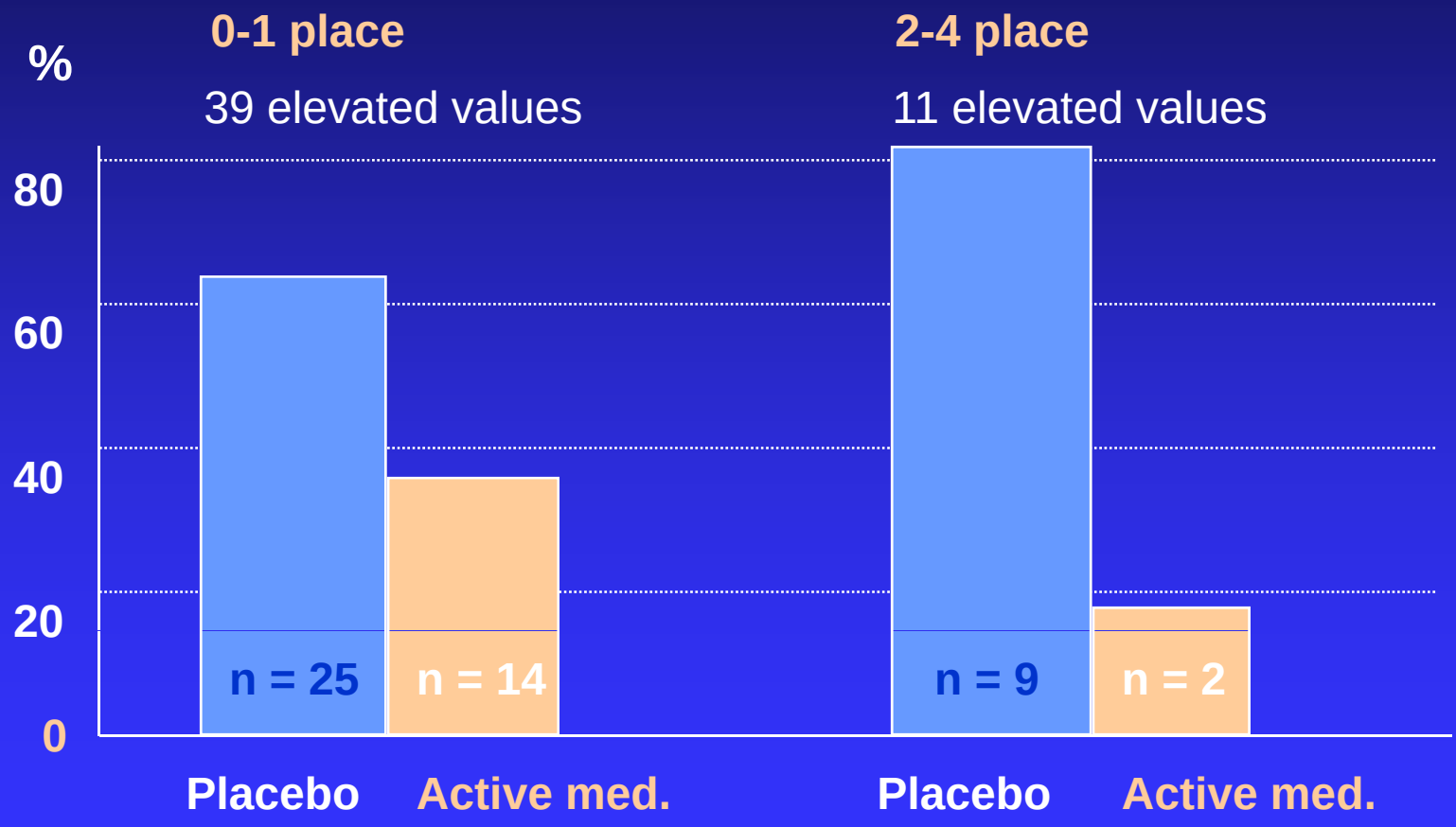
- Convalescence
  e.g. after colic and bone spavin
- Adjuvant in chronic degenerative diseases

Study Report on the Influence of Coenzyme comp. ad us. vet. on the Performance of Racehorses

- Study design
  - Double-blind study
  - 32 racehorses
  - Blood samples: about every 4 weeks (AST, CK, γ-GT)
  - Division into 3 performance classes
  - Assessment: liver values, racing success, performance
- Dosage
  - 10 ml s.c., 2x/week for 18 weeks
    - Active medication: Coenzyme compositum ad us. vet.
    - Placebo: physiological saline

Prof. Sommer 1999

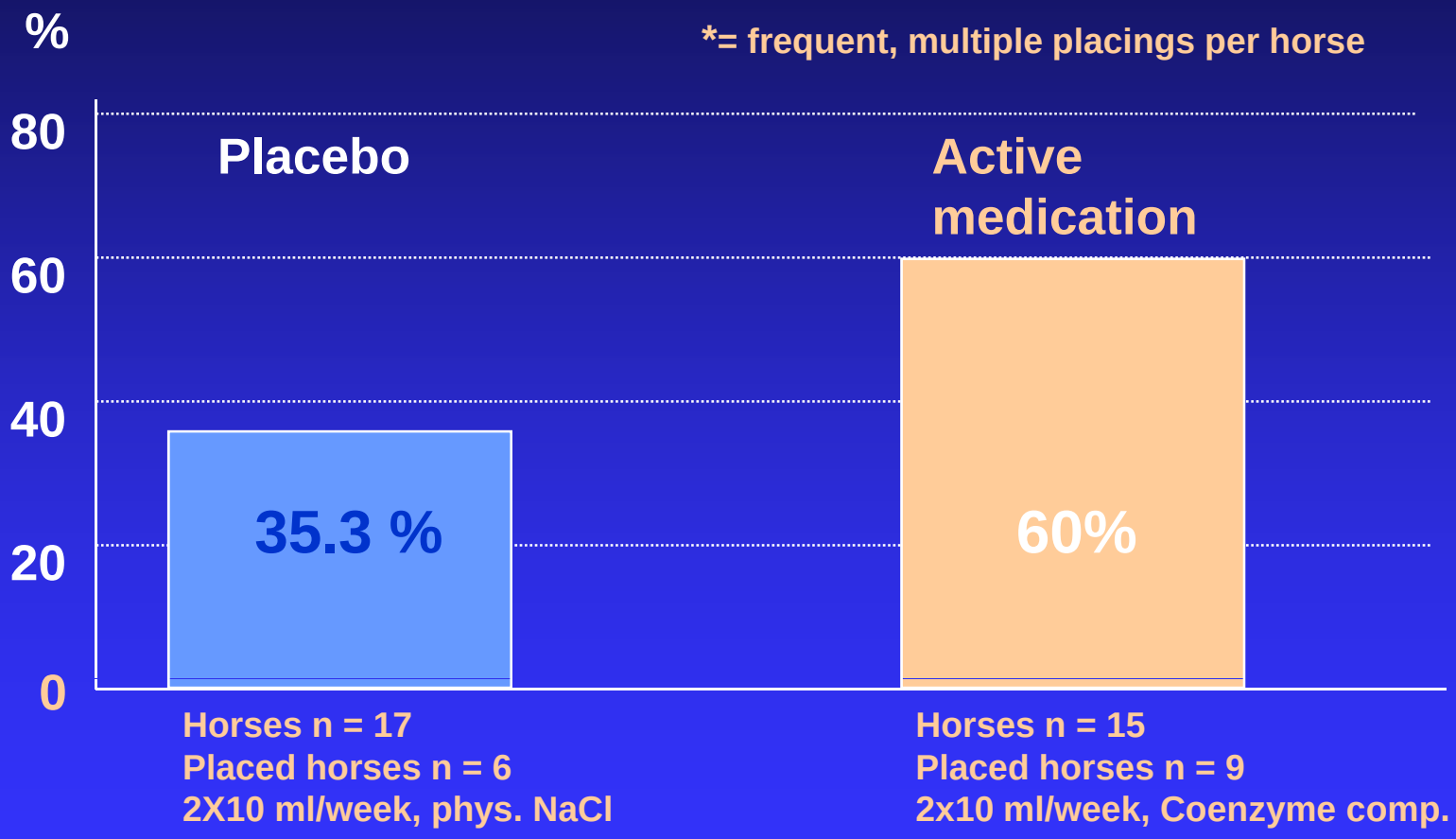
Percentage of Elevated Enzyme Levels (AST, γ-GT, CK) in Different Performance Groups Under the Influence of Coenzyme compositum



Prof. Sommer 1999

International Society of Homotoxicology

Percentage of Placed Horses "in the Money"* and Wins for 32 Horses with and without Coenzyme compositum



Prof. Sommer 1999

International Society of Homotoxicology

Biological Follow-up Treatment as Postoperative Supportive Therapy in Canine Breast Cancers (1)

- Study design
  - Bitches, n = 34, age 6-17 years, Ø =11.1 years
  - 31 histologically investigated, of which 83% malignant
  - Therapy following partial or radical mastectomy
  - Assessment by comparison with literature data

Biological Follow-up Treatment as Postoperative Supportive Therapy in Canine Breast Cancers (2)

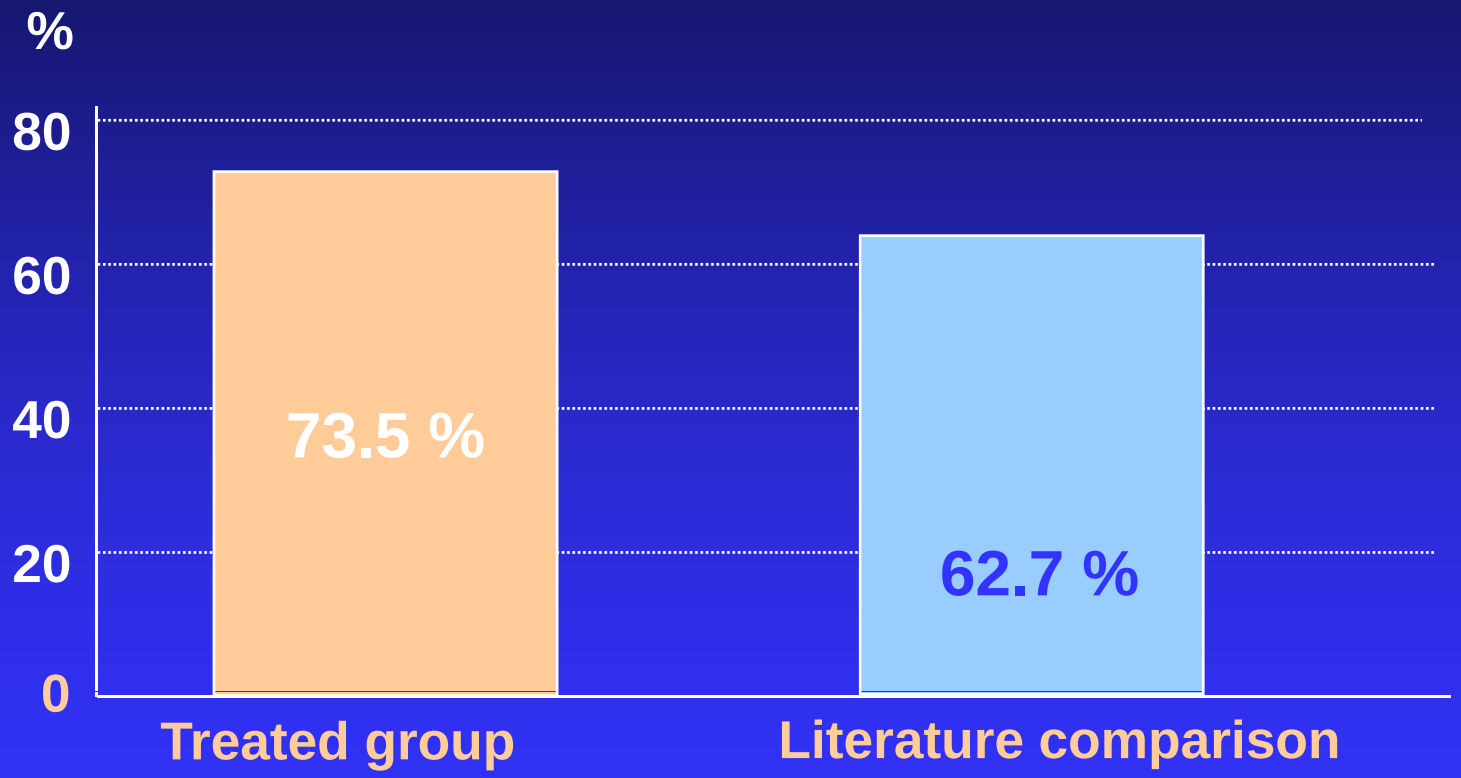
- Dosage
  - 4 weeks' therapy with:
    - Coenzyme compositum + Ubichinon compositum 2x/week s.c.
    - Para-Benzochinon Injeel forte 1x/week s.c.
    - Lymphomyosot 1x daily, orally

    Break after 4-6 weeks, repeat the treatment regimen

- Follow-up
  - Over 2 years, 3 months regularly, then every 1/4 to 1/2 years

T. Kurth 1999

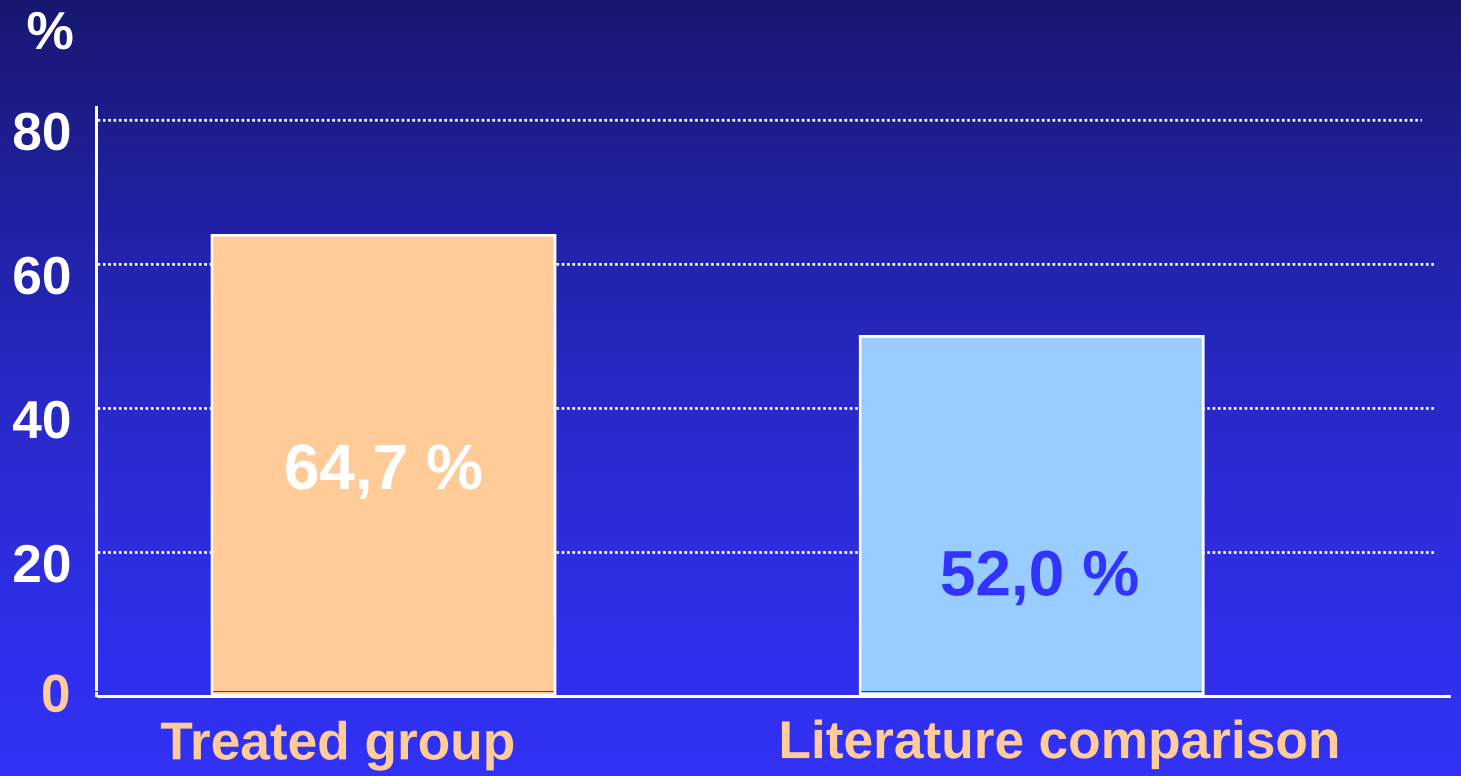
Survival Rate for Treated Bitches after One Year by Comparison with Literature Data



T. Kurth 1999

International Society of Homotoxicology

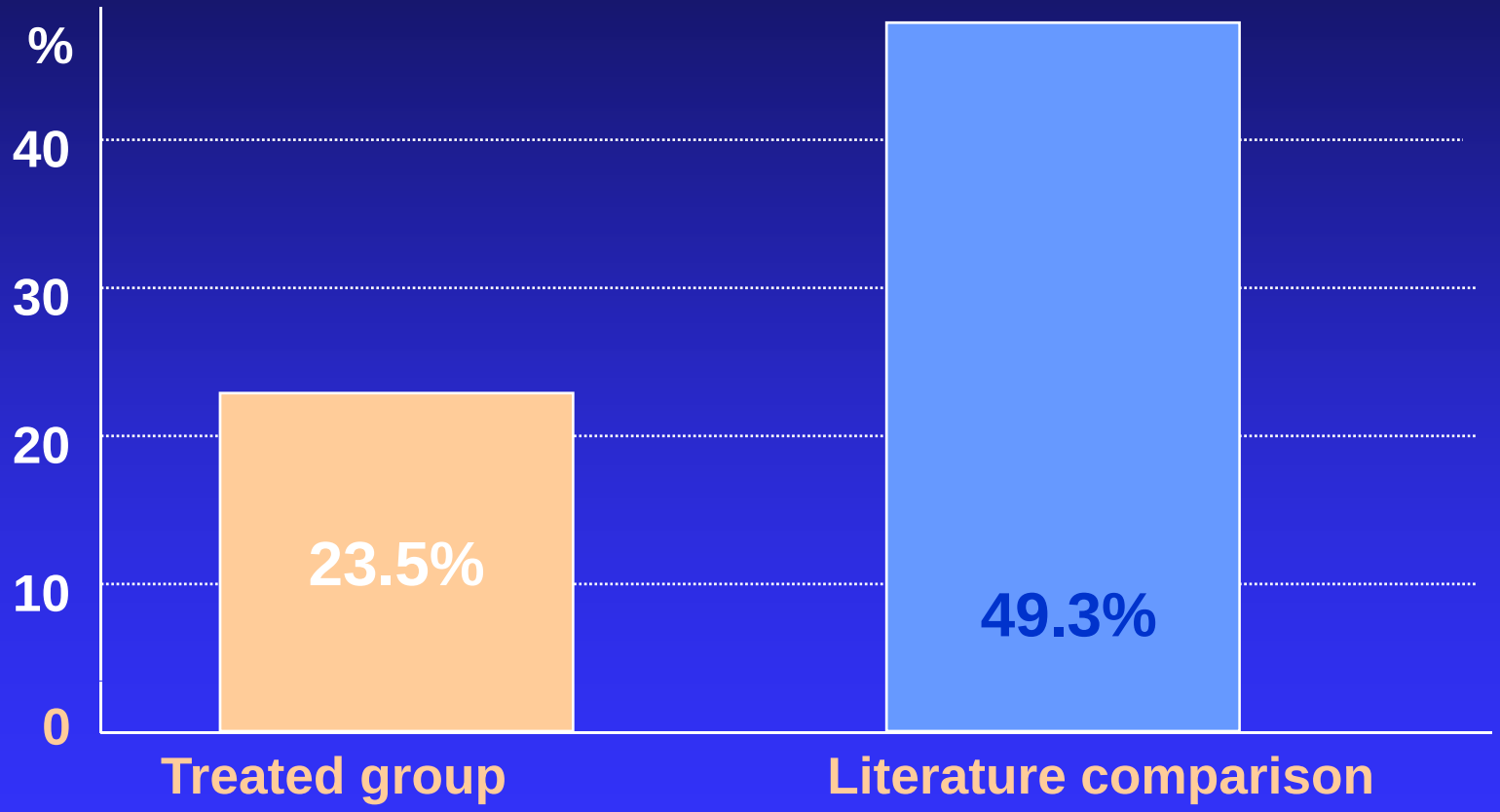
Survival Rate for Treated Bitches after Two Years by Comparison with Literature Data



T. Kurth 1999

International Society of Homotoxicology

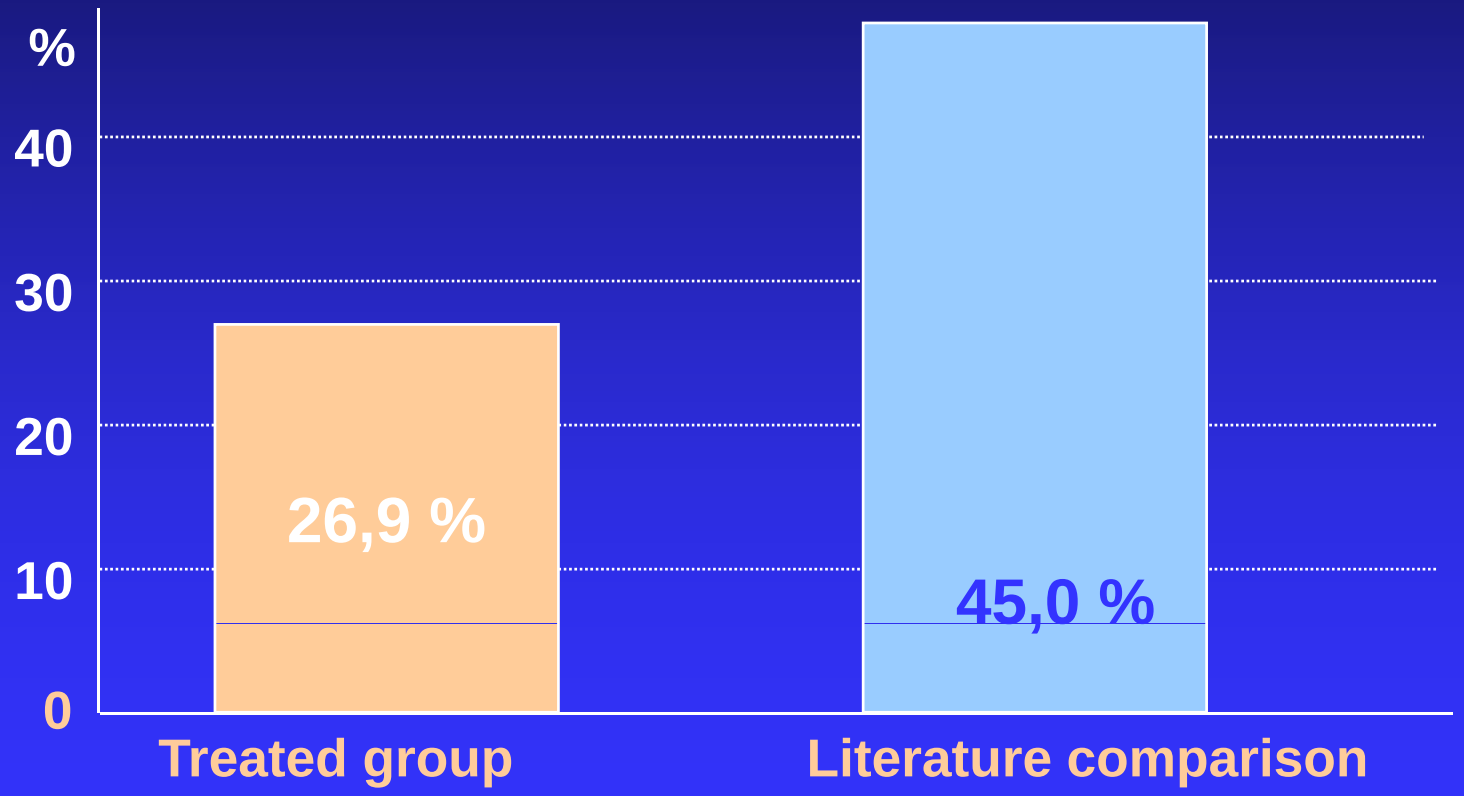
Recurrence Rate and/or Metastases after One Year by Comparison with Literature Data



T. Kurth 1999

International Society of Homotoxicology

Recurrence Rate and/or Metastases after One Year by Comparison with Literature Data (malign cases only)



T. Kurth 1999

International Society of Homotoxicology

Therapy-Regimen of Equine Sarcoid

Day	Remedy (1 Ampoule each, i.m.)
1, 4, 6, 9, 11, 14	Coenzyme compositum
2, 5, 7, 10, 12, 15	Ubichinon compositum
3 8 13	Glyoxal compositum

2 weeks break, than repetition like above

To avoid recidivation:
Lymphomyosot 3 - 1 x 30 drops, every second day

International Society of Homotoxicology

Panostitis Eosinophilica

s.c. 2x / week

Echinacea compositum + Placenta compositum

in exchange with

Coenzyme compositum + Tonsilla compositum

additional:

per os

Cruroheel (5x / day) + Osteoheel (3x / day)

(Späth, BTM 4/86)

Diabetes Mellitus

Therapy:

s.c. 2x / week (4-6 weeks)

- **Pankreas suis-Injeel**
- **+ Coenzyme compositum**
- **+ Ubichinon compositum**

additional:

per os

- **Syzygium compositum (3x / day)**

FeLV-Leukemia of the Cat

- **Coenzyme compositum** 1 ml / day, s.c.
  later 2x / day 10 drops per os

(Grammel, Rochell, BTM 3/92)

- **Coenzyme compositum + Ubichinon compositum + Para-Benzochinon-Injeel forte**
  together once a week (2-3x, s.c.)

  additional, per os:
  for weeks 3 x 5 drops / day or 3 x 1 tablet / day:
  Traumeel, Galium-Heel, Lymphomyosot

(Gratz, BTM 4/95)

Coronavirus Infection of the Cat

- 2 - 3x s.c. every 2. or 3.day (1-2 ml each):

  Coenzyme compositum

  + Ubichinon compositum

  + Nux vomica-Homaccord

- additioinal depending on the symptomes:

  Spascupreel, Solidago comp., Galium-Heel, Gripp-Heel, Echinacea comp., ...

  (Gratz, BTM 2/94)

Chronic Renal Insufficiency of the Cat

- **Solidago compositum**
  + Coenzyme compositum
  + Ubichinon compositum
  2 x 1-2ml (1. - 2. day), later 1 x / day – 2 - 1 x / week

- **Hepar compositum**

(Ulrich 1999)