YEAST Complex Proteins (YCPs)

Antimicrobial Präparaten (AMPs) gegen pathogenische Mikroorganismen

Dr. habil. Anna Salek

Auf Basis eines erprobten Tiermedikamentes lässt sich schnell ein humanmedizinischer Wirkstoff gegen Mikroorganismen entwickeln, sagt Dr. habil. Anna Salek.

Einen vielversprechenden Ansatz zur Entwicklung eines potenten Mittels gegen unterschiedliche Mikroorganismen bieten Erfahrungen aus der Tiermedizin, wo bereits vor über 20 Jahren mit Rota- und Coronaviren infizierte Ferkel und auch mit Dermatophytien (wie *Candida albicans*) bei Pferde erfolgreich behandelt werden konnten.

Unserer YCPs Präparat, wie AMPs Präparat – es besteht aus natürlichen Substanzen, einer auf Pharmakologie basierenden Verbindung, die das Zusammenspiel zwischen der Interaktion mit bakterielle Membrane durch Zell-Wand auf menschliche Haut.

Daher ist unser YCPs, das bestimmte Proteine enthält, am besten für den medizinischen Bedarf geeignet und ermöglicht möglicherweise eine gleichzeitige Immunisierung bei oral benutzen.

Von Kooperation mit der Forschungsabteilung von Universitäten und pharmazeutischen Unternehmen erste praktische Testreihen möglich, meint die Dr. habil. Anna Salek.

Forward veterinary test-application

The properties of our yeast killer toxin have been tested in veterinary praxis on 4000 small pigs with positive results (above 80%).

Population of 2000 sick pigs, infected with Coronavirus and Rotavirus, after 2-3 days got healthy and rid of the infection.

In the same time 2000 control group was lost.

Microbiom

The microbiome refers to the entirety of all microorganisms

(bacteria, fungi and protozoa) that colonize a oorganism (human, animal, plant).

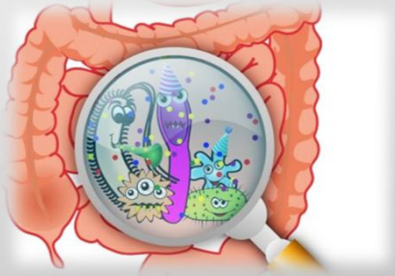
Microbiomes can influence the immune system, metabolism and hormonal system of their host.

A better understanding of the roles and functionalities of these microorganisms

makes it possible to develop new classes of therapeutic preparations,

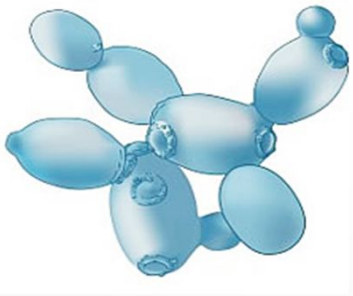
such as live biotherapeutics, probiotics,

which aim to restore the balance of the ecosystem microbiome.

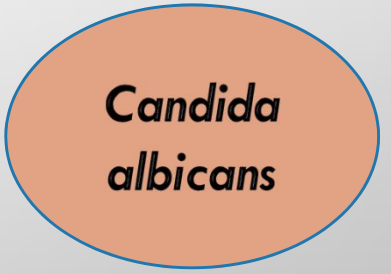


Moreover, products based on living microorganisms generally do not act directly,

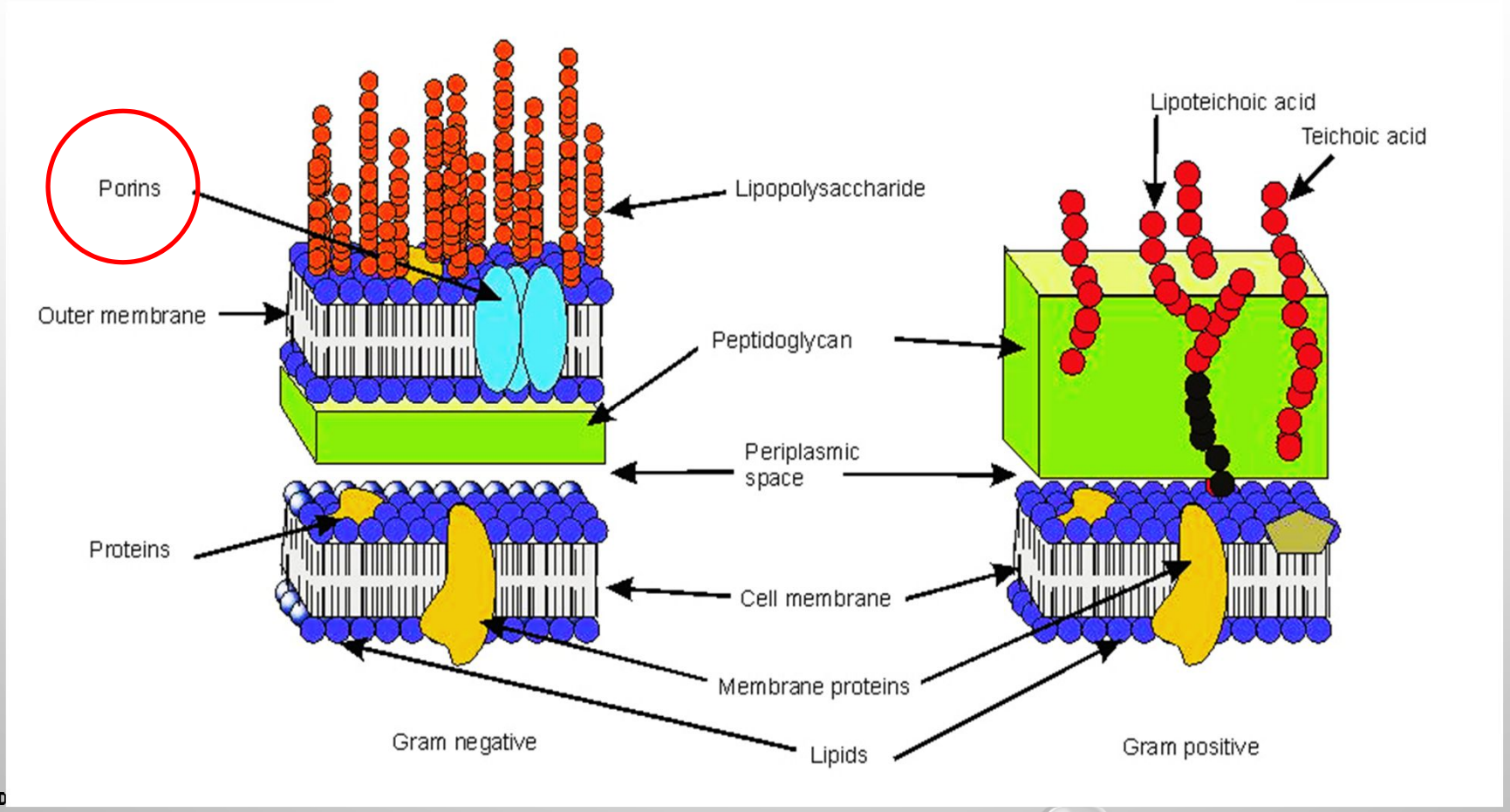
i.e. on specific organs or tissues, but interact through a multifactorial mechanism of action.



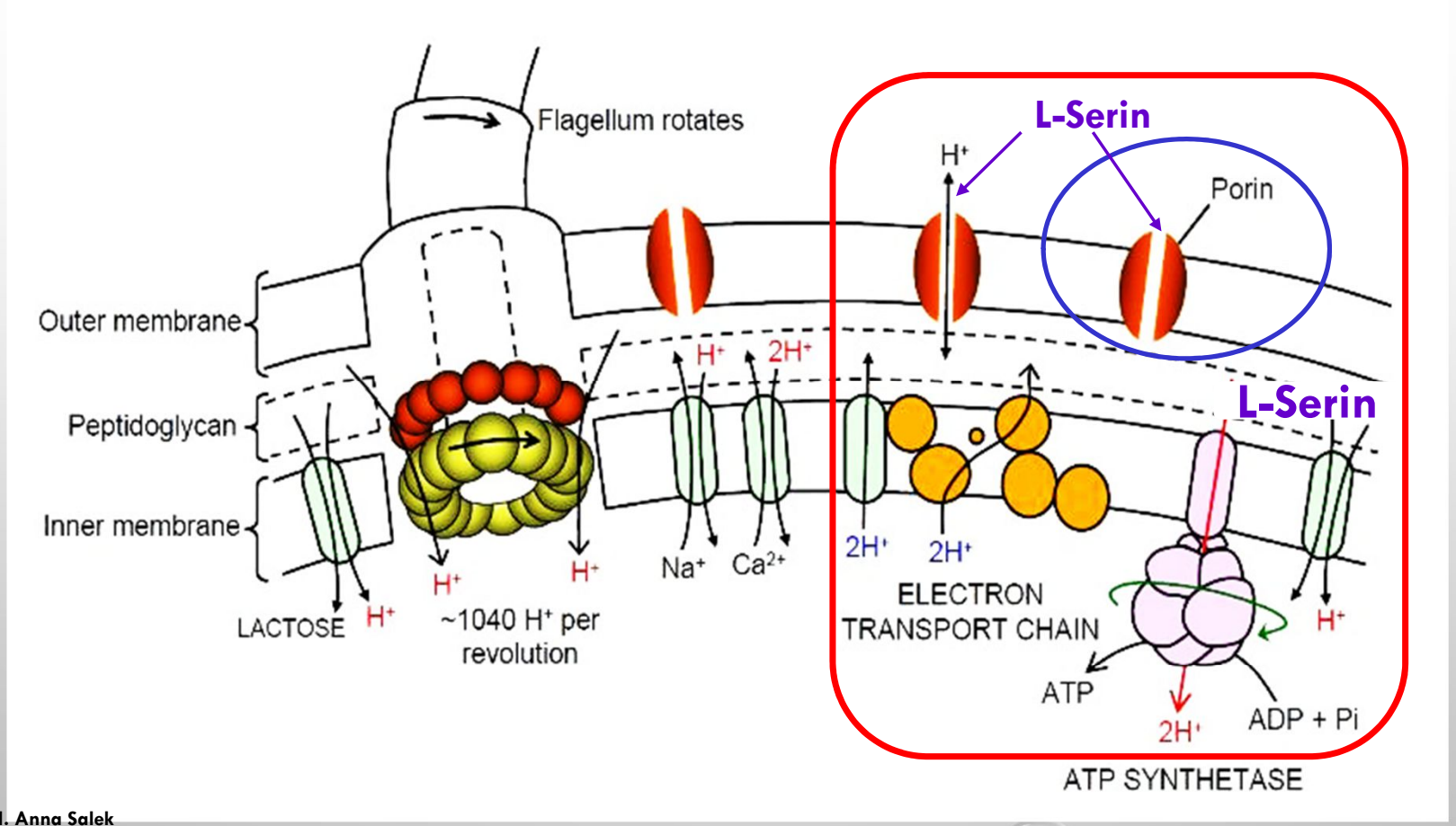
Yeast Antimicrobial Proteins (research)

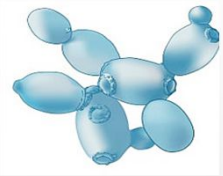


STRUKTUR DER MEMBRANEN VON GRAM-NEGATIVEN UND GRAM-POSITIVEN BAKTERIEN

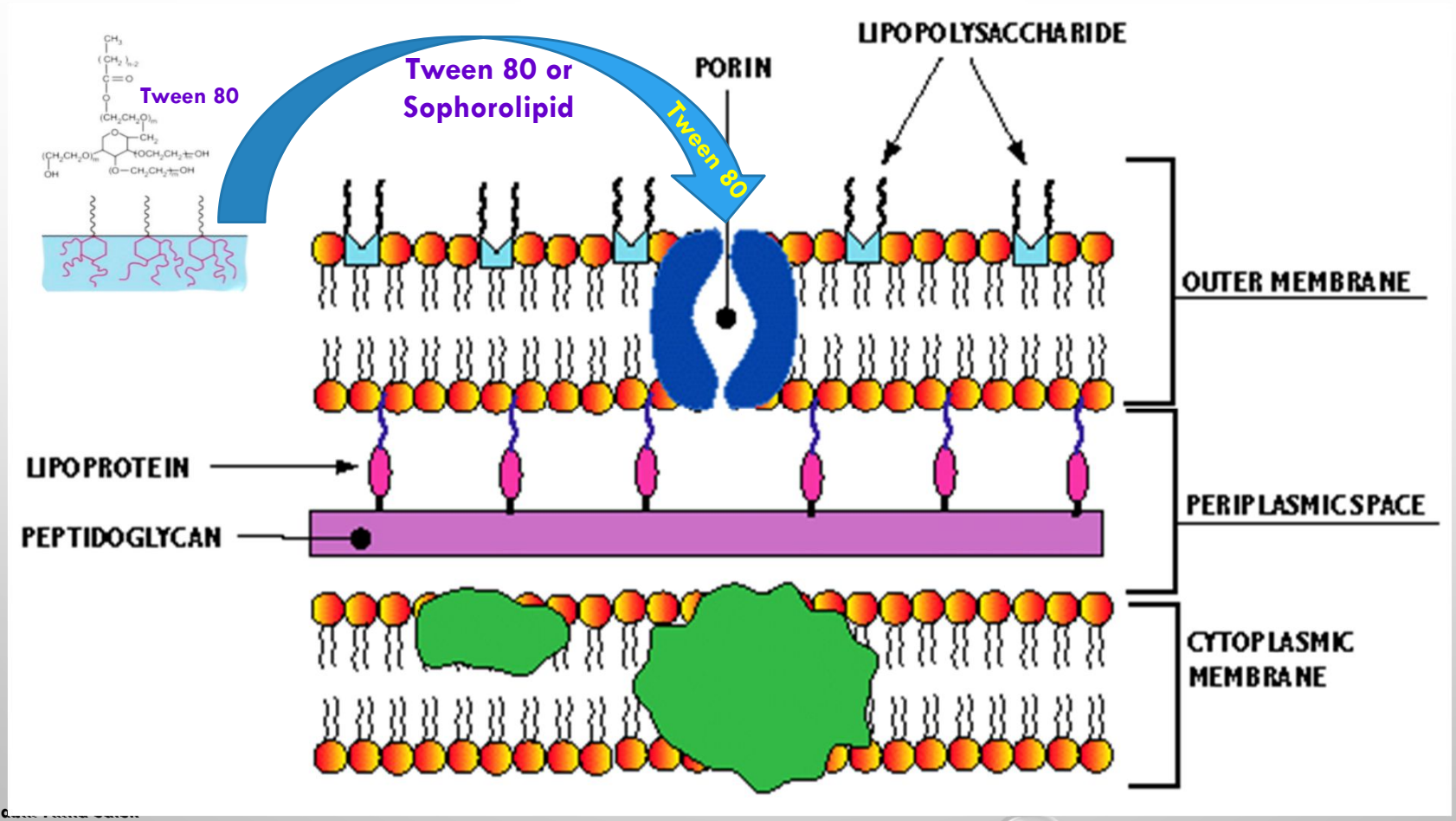


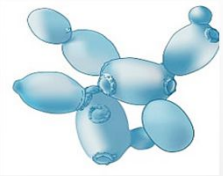
MEMBRAN VON GRAM-NEGATIVEN BAKTERIEN: BEDEUTUNG DES PORINS



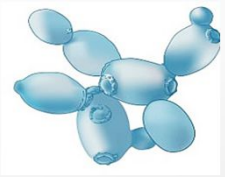


Membran von Gram-negativen Bakterien: Bedeutung des Porins

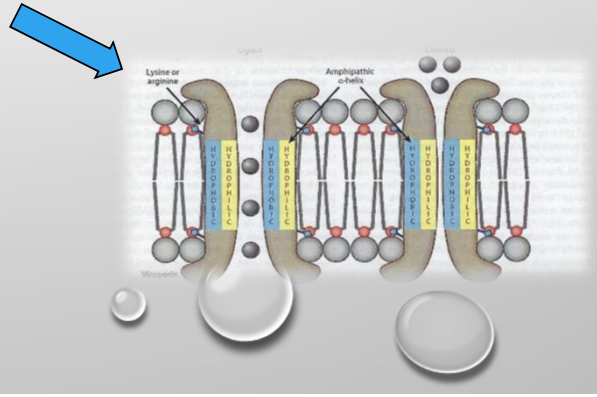




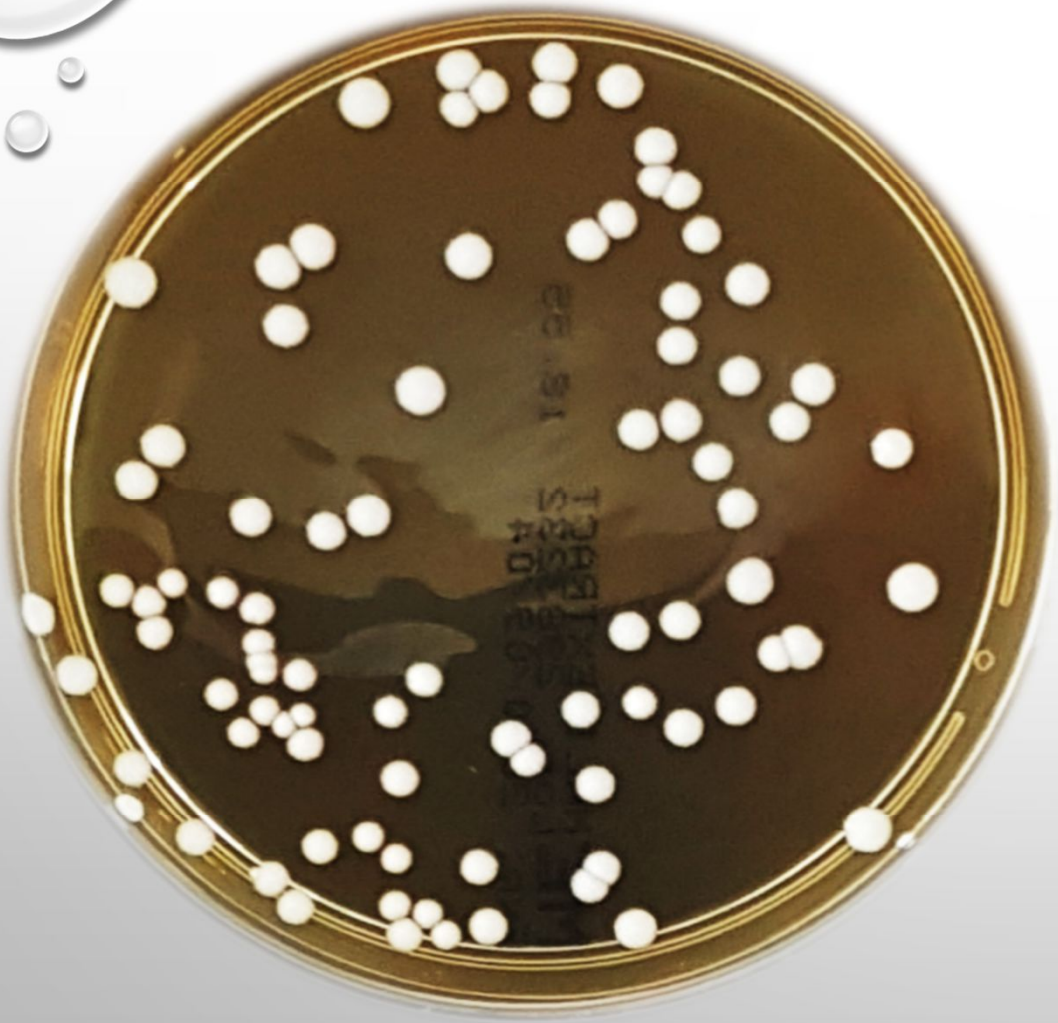
Mechanismus der Funktion YCPs



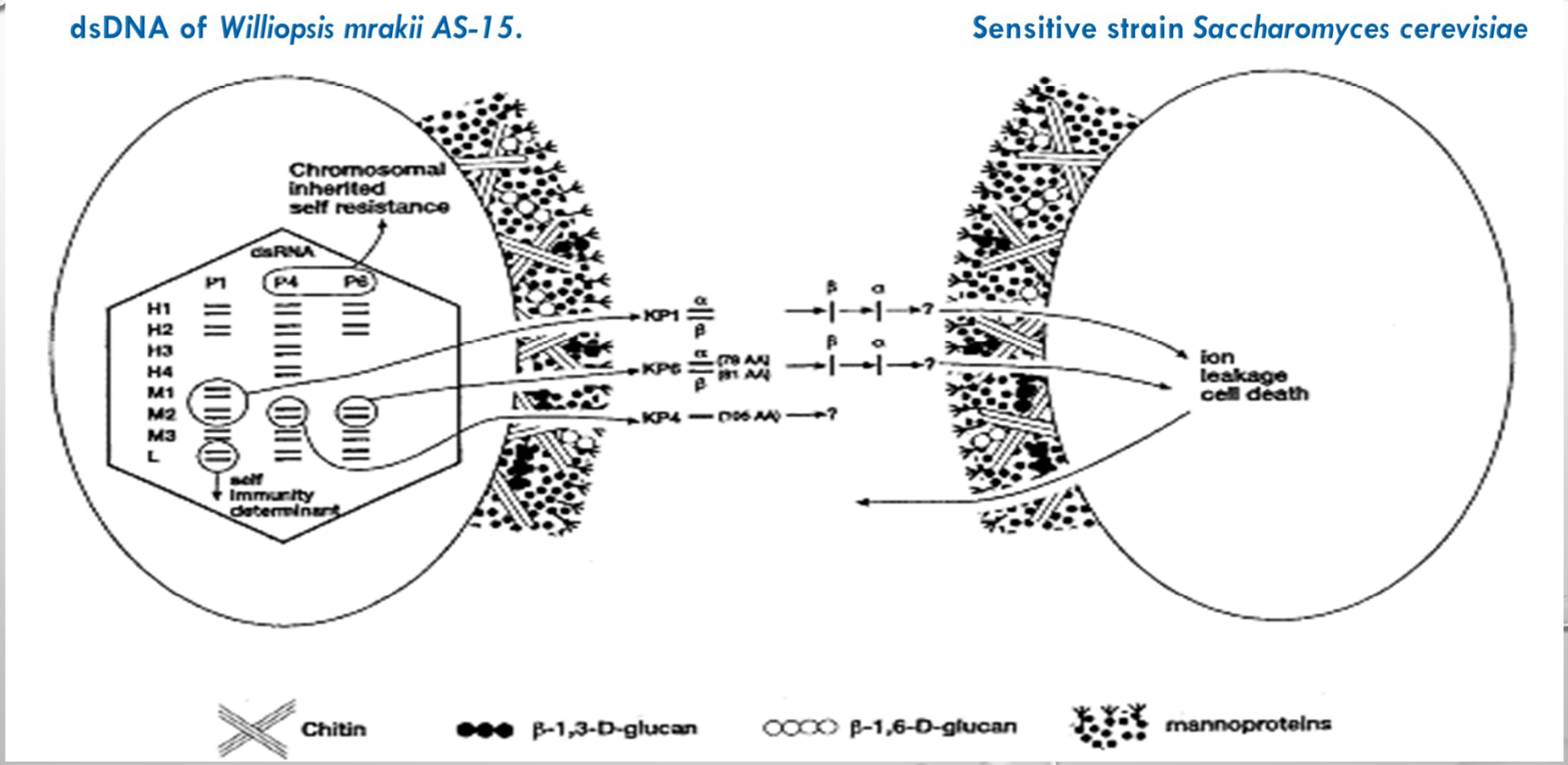
Diese Struktur konnte sowohl durch unsere Präparaten als auch durch kompetente Substanzen, wie Enzymen und Proteinen aus unseren YCPs, zerstört werden die teilweise die Phospholipid-Doppelschicht der Bakterien- oder Hefemembran (Envelope).



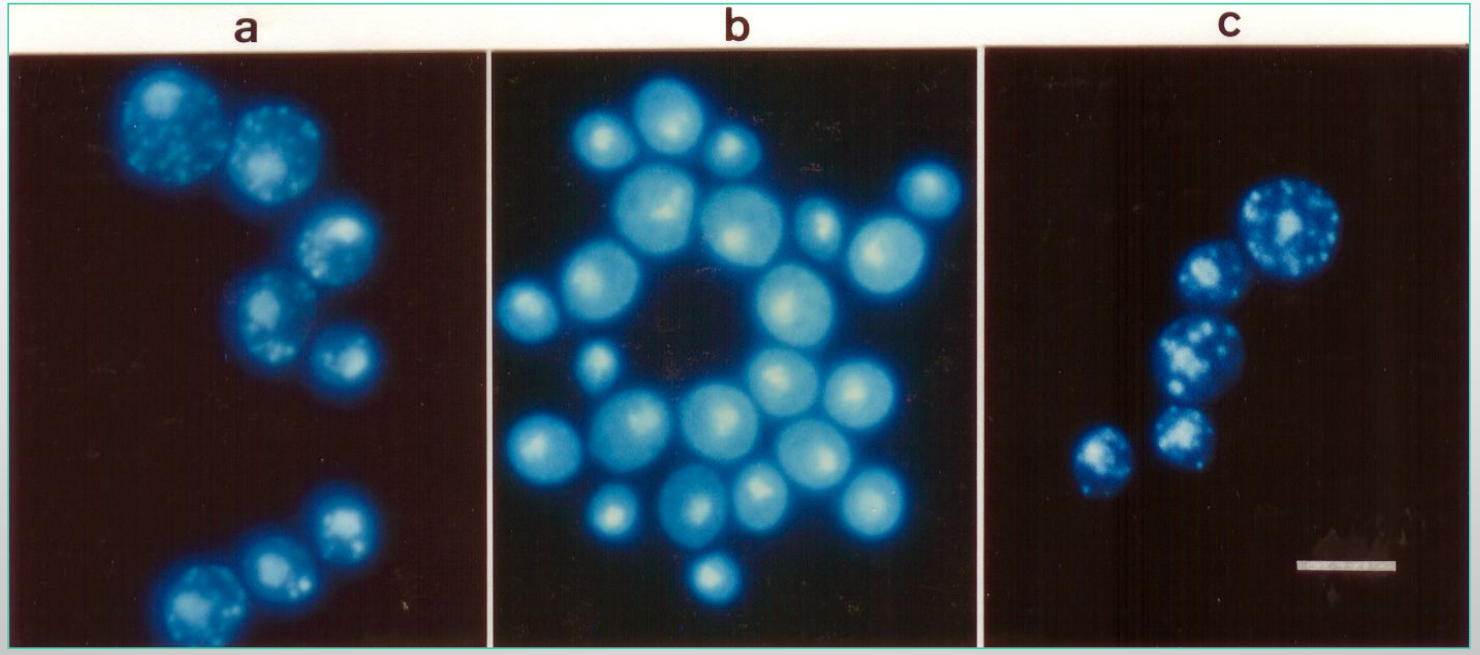
Williopsis mrakii



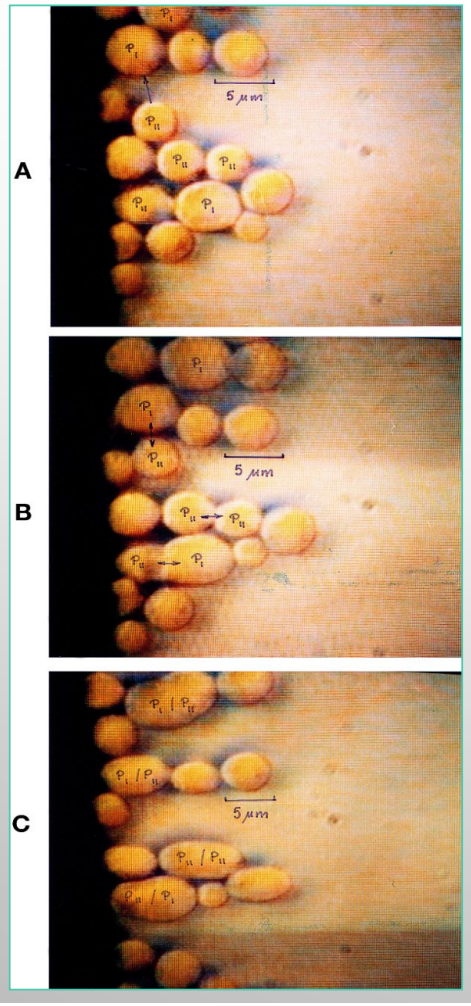
Killer strain *Williopsis mrakii* AS-15 with chromosomal dsDNA



Fluorescence micrographs of DAPI-stained yeast spheroplasts/protoplast von *Williopsis mrakii* AS



Electrofusion of *W. mrakii* protoplast and isolation of „gigant“ cells



Electrofusion

A. Dielectrophoresis

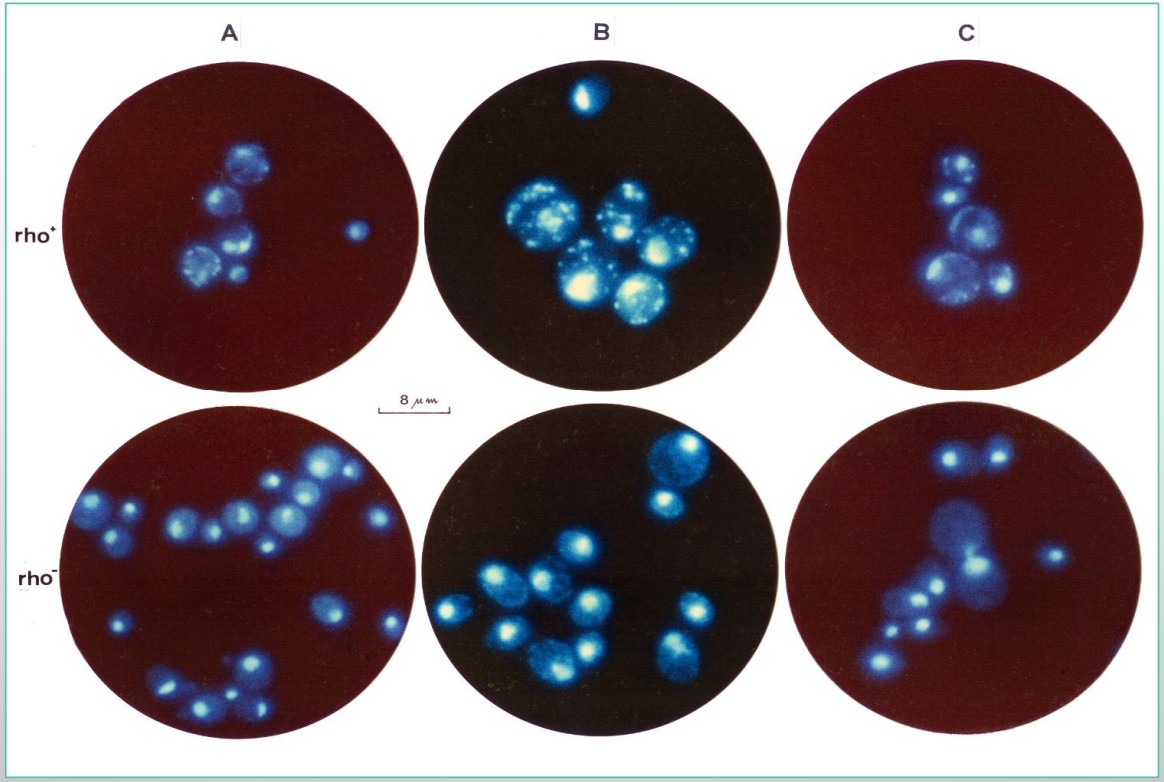
Electrofusion

B. Disturbance of phospholipides

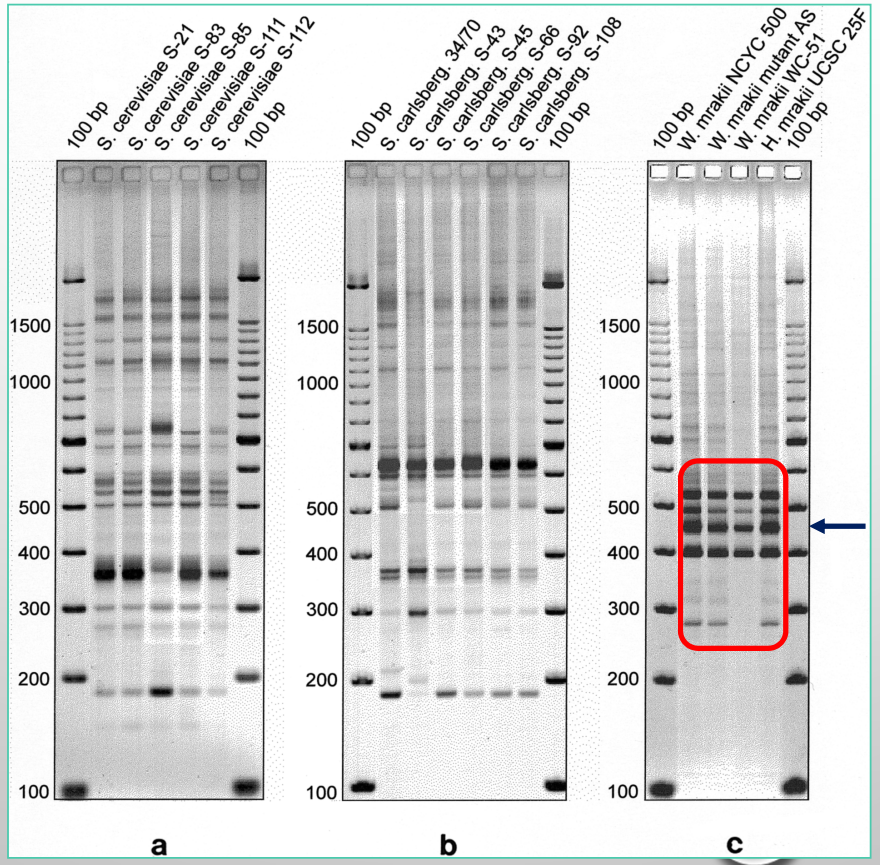
Electrofusion

C. Fusion of cytoplasms & after that isolation„gigant“ cells

Fluorescence micrographs of DAPI - stained yeast cells of *rho*$^{+}$ and *rho*$^{-}$



IL-PCR-fingerprints of *S. cerevisiae* and *Williopsis mrakii* generated by IL-primer GR

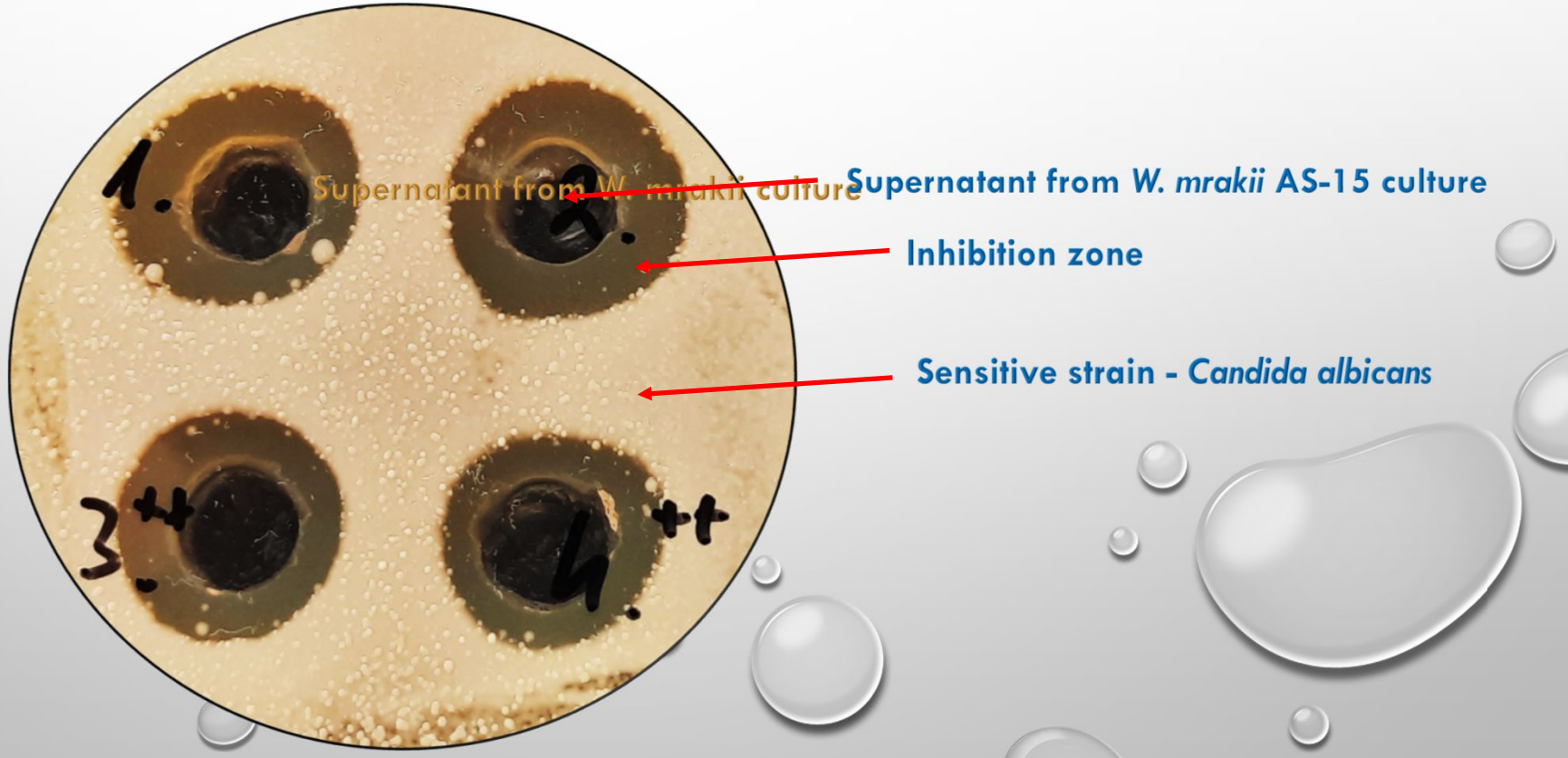


Williopsis mrakii

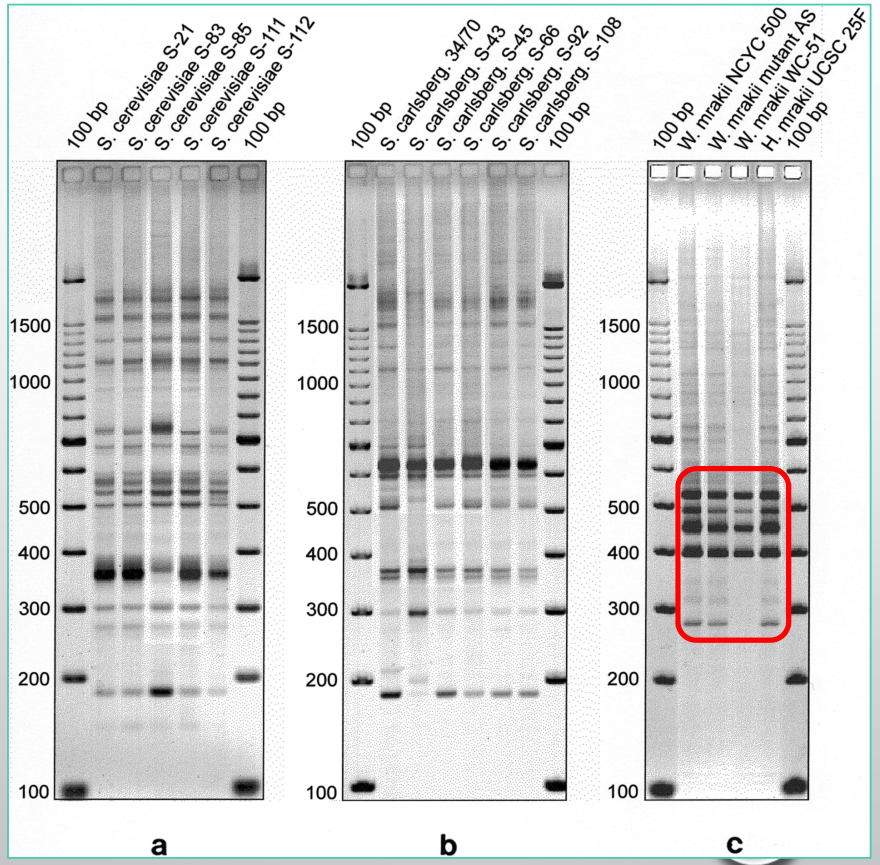
Killer activity assay

Petri dishes carrying assays for killer activity of best single colonies from "gigant" cells, incl. *Williopsis mrakii* AS-15

YEAST COMPLEX PROTEINS FROM *WILLIOPSIS MRAKII* AS-15 AGAINST PATHOGENIC FUNGI



IL-PCR-fingerprints of *S. cerevisiae* and *Williopsis mrakii* generated by IL-primer GR



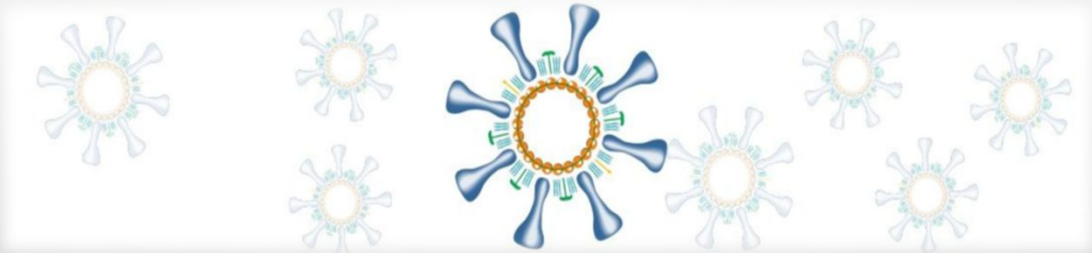
Yeast killer System

The yeast system has been shown to have advantages over conventional systems as a “vaccine vehicle”.

For example,

***Williopsis mrakii is* generally regarded as safe for animals and human beings.**

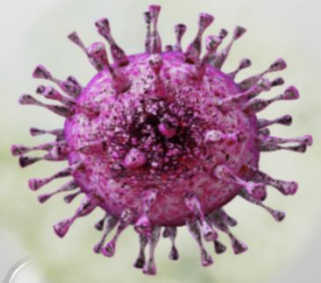
YEAST COMPLEX PROTEINS FROM *WILLIOPSIS MRAKII* AS-15 AGAINST VIRUSES



Therapeutic oral medicine against SARS-CoV-2

We are presenting an integrative antiviral drug methodology, which combines a systems pharmacology-based network medicine platform that quantifies the interplay between the Coronavirus and host (human macrophage) interaction and beak drug targets in the human network. The basis for that medicine are:

- Yeast killer protein / glycoprotein,
- Specific hydrolases and effector,
- Immunomodulator



ABSTRACT NO. AMS0413151934

FIELD EVALUATION ON THE CLINICAL EFFICACY OF YEAST KILLER TOXINS IN THE TREATMENT OF PIGS AND CALVES WITH CLINICAL SIGNS OF DIARRHOEA (ENTERITIS)

DEUTSCHES PATENT NR. 199 12 439.6-09
KILLER TOXINS DERIVED FROM YEAST TO BE USED FOR PHARMACEUTICAL MANUFACTURING

DR. HABIL. ANNA SALEK; DR. FERDINAND ROTT; PROF. S. DONHAUSER
INROPHARM - VET. PHARM. PRODUKTE - GMBH & CO. KG, 94081 FÜRSTENZELL, GERMANY

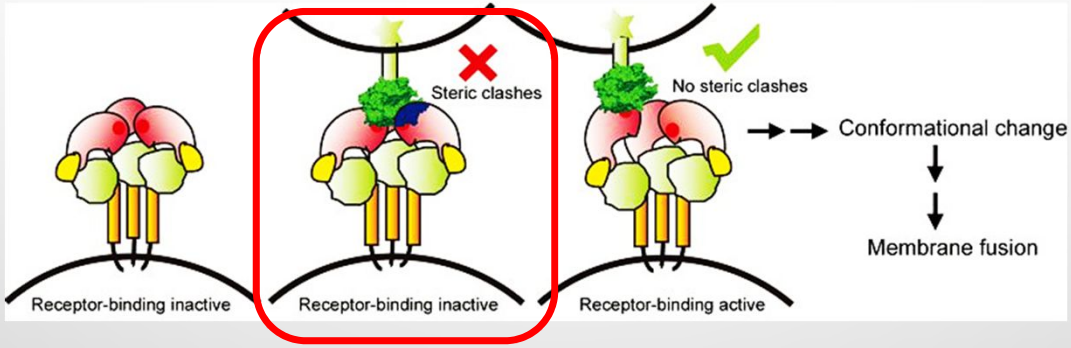
ALMOST 70 % OF THE DISEASED PATIENTS (PIGLETS AND CALVES) WERE HOUSED IN FARMS WITH ENDEMIC INTESTINAL INFECTIONS. A PART OF THESE PATIENTS, ESP. CALVES, WAS PRE-TREATED ABOUT 1 – 5 TIMES WITH ANTIBIOTICS, BUT PIGLETS ONLY WITH KILLER TOXIN AS-15.

THE EFFECT OF THE TREATMENT WITH TESTED KILLER TOXINS WAS MAINLY POSITIVE (80%) IN INFECTIONS SUSPECTED TO BE CAUSED BY *E. COLI* AND VIRUSES (ROTA-, CORONA VIRUS).

IN ADDITION, A REDUCED EFFECT WAS OBSERVED IN INFECTIONS CAUSED BY BACTERIA *CLOSTRIDIUM SP.*

Mechanism of neutralisation a spike and ACE2 in SARS-CoV-2

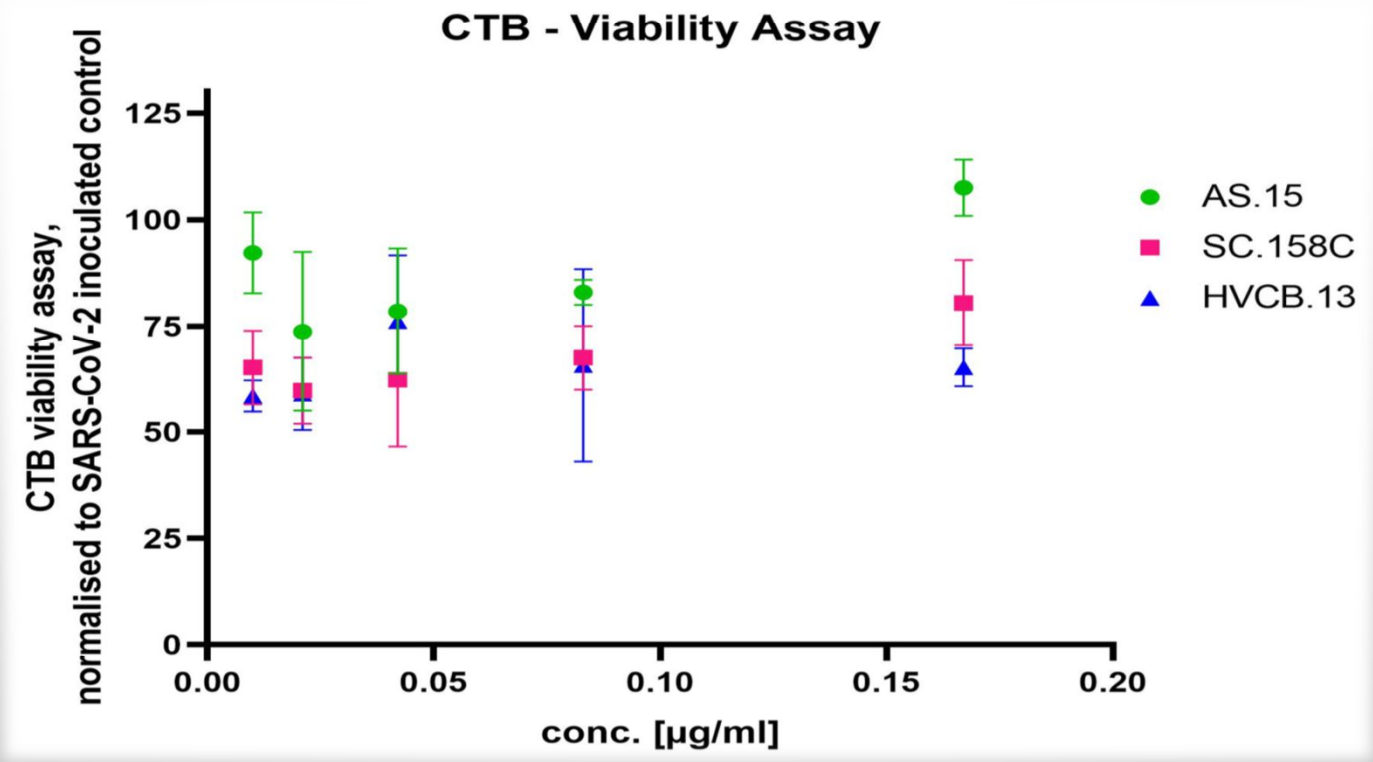
The protein, e.g. yeast killer glycoprotein, that functionally associate with Coronavirus (COVID-19) infection (i.e. with spike or envelope) and has localized in the subnetwork within the comprehensive human receptor.



The basis of this mechanism is the specific binding of the corresponding receptors from killer glycoprotein together with glycoprotein receptors of S1 spike Coronavirus with high-mannose-content glycan's.

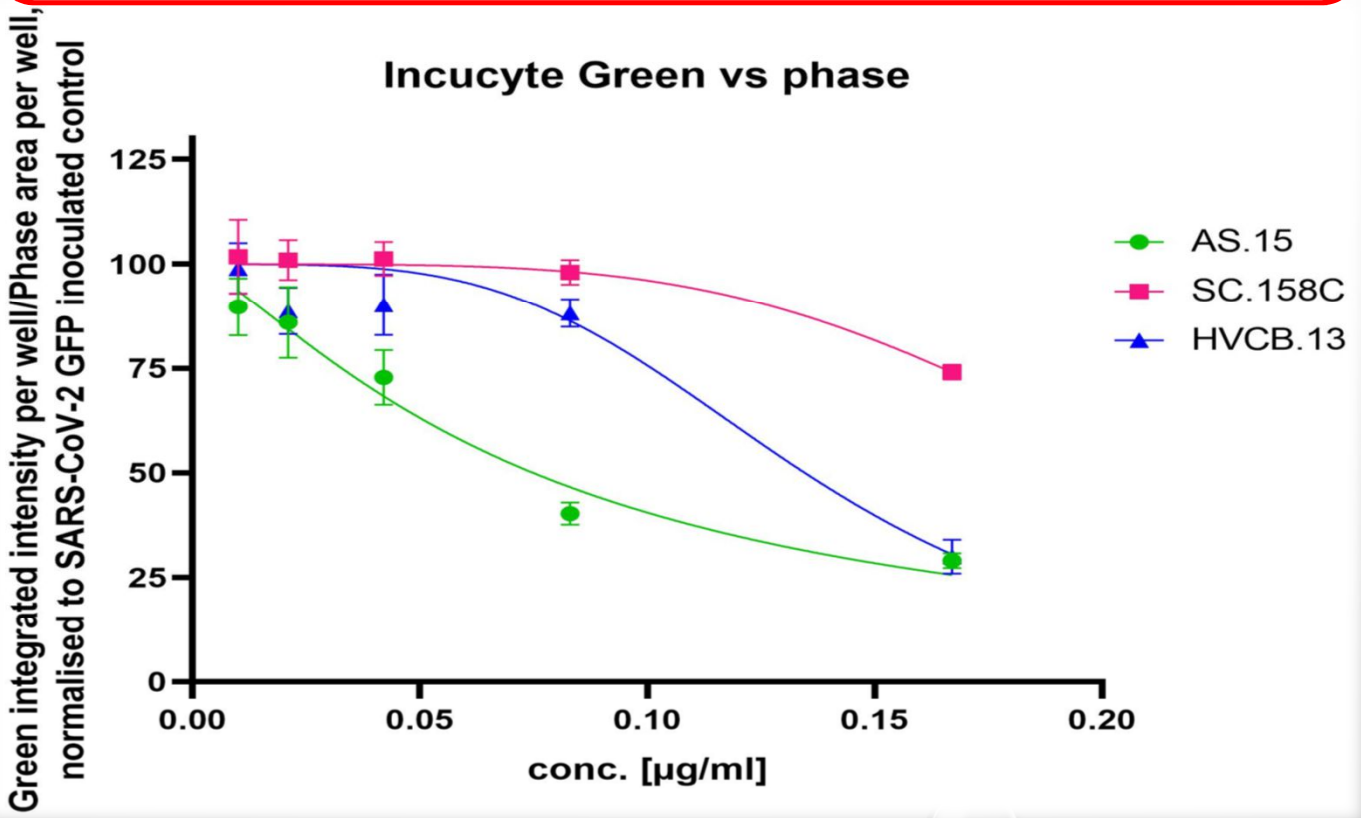
Killer toxin make structural changes in viral RBDs.

Direct virological test



Die Konzentrationen sind hierbei anhand der von Startkonzentration 1 µg/ml berechnet.

Wir sehen hierbei teilweise Inhibitionen der Infektion von bis zu 70% in den oberen Konzentrationen. Vor allem AS.15 zeigt einen dosisabhängigen Effekt auch mit niedrigeren Konzentrationen.

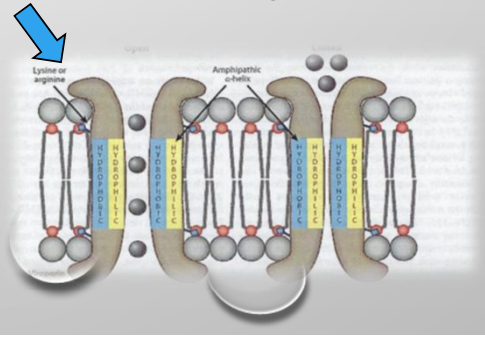


Mechanism of neutralisation a spike and ACE2 in SARS-CoV-2

Moreover, the viral ribonucleocapsid is encased within a bilayer lipid envelope containing three above-mentioned proteins.

In addition, single nucleocapsid structure the nucleocapsid is an important subunit for packaging the viral genome (ssRNA) through protein oligomerization.

This structure could be destroyed through killer toxins as well as through competent like proteases and biological substances from our oral medicine, which partly destroyed phospholipids bilayer of Coronavirus envelope.



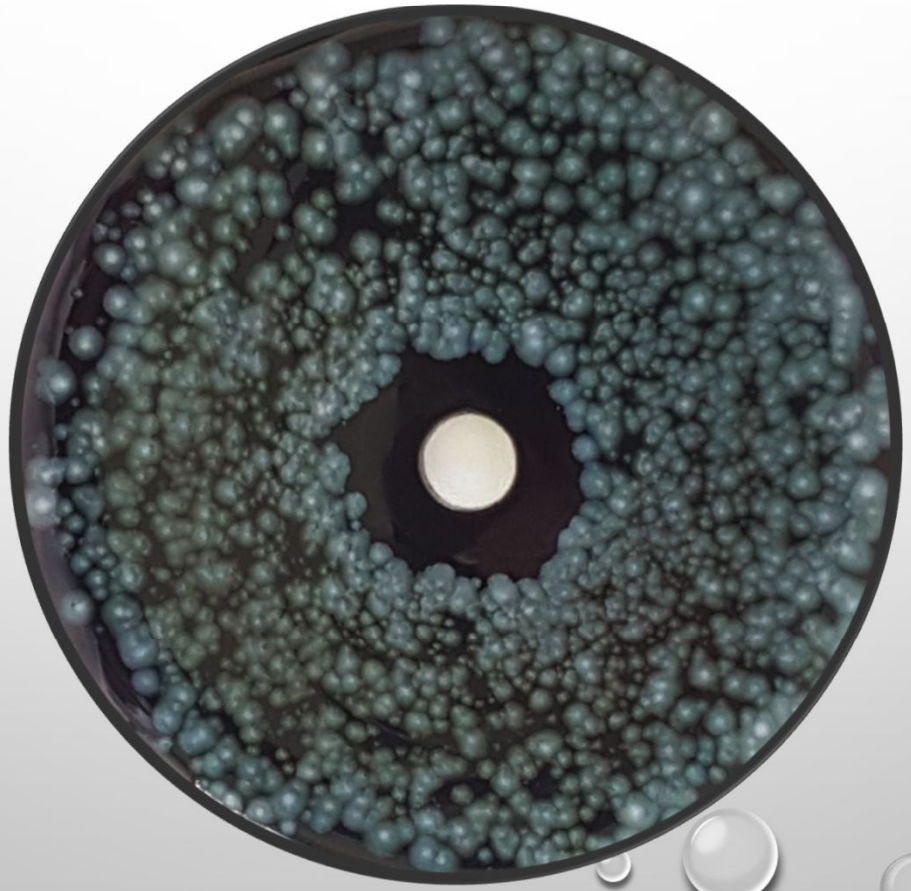
YEAST COMPLEX PROTEINS FROM *WILLIOPSIS MRAKII* AS-15 AGAINST BACTERIA

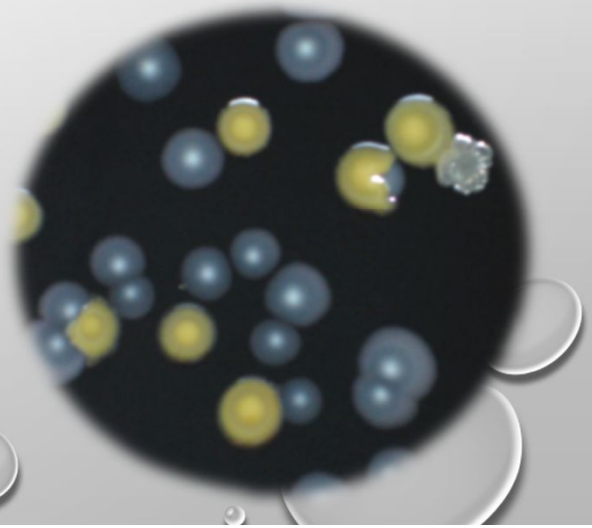
- ***Legionella pneumophila***
- ***Pneumocystis carinii***
- ***Eterobacter aerogenes***
- ***Pseudomonas aeruginosa***
- ***Salmonella***

Influence of YCPs activity on bacteria *Enterobacter* spp., *Salmonella* spp. und *Pseudomonas* spp.

	KT 10x	KT+Guar	KT+Sorbinsäure	KT+Sorb.+Guar	KT+Milchsäure	KT+Milchs.+Guar	KT+Milchs.+Sorb.	KT+Milchs.+Sorb.+Guar	KT+Sorb.+Guar+Raft.	KT+Sorb.+Milchs.+Guar+Raft.	KT+Glycerol
Entrobacter	82	70	37	37	47	47	58	58	58	47	47
Salmonella	126	126	58	37	47	58	58	47	58	47	37
Pseudomonas	126	126	126	126	159	159	126	96	47	142	126

Killer proteins AS-15 destroyed membrane of *Legionella pneumophila*





Conclusion

Having regard to the selection of <u>our oral preparation</u>,

which contains specific proteins (antigen, like IgG)

against Coronavirus – would be best medical need,

possibly allowing simultaneous immunization

human organism before SARS-CoV-2 infection.

This preparation could be soon in market.

EVALUATION OF DERMATOLOGICAL EFFECTS OF COSMETIC FORMULATIONS CONTAINING ANTIMICROBIAL YEAST COMPLEX PROTEINS EXTRACT WITH SOME ANTIOXIDANT SUPPLEMENTS

The evidence that reactive oxygen species are involved in the aging process and in the pathogenesis of many diseases as well as the indication that topical application and systemic administration of antioxidants has biological effects led to a great interest in the potential role of specific active substances in these effects.

Some studies showed that antioxidants acting as photo protectives could maintain or restore a healthy skin barrier. Among the frequently used antioxidants in anti-aging products we can point out vitamin A, C and E derivatives as well as yeast antimicrobial proteins (YCPs).

EVALUATION OF DERMATOLOGICAL EFFECTS OF COSMETIC FORMULATIONS CONTAINING ANTIMICROBIAL YEAST COMPLEX PROTEINS EXTRACT WITH SOME ANTIOXIDANT SUPPLEMENTS

On the other hand, a new tendency in cosmetic formulations is the use of biotechnological raw materials for antioxidant, immunomodulatory and photo protective purposes.

Moreover yeast complex proteins extract with very low concentration of lactic acid (in probiotic level) assuming a prominent role among biotechnological raw materials.

That it is rich in amino acids that can have moisturizing properties, peptides, glycoproteins and polysaccharides (β-glucan) that can present wound healing and cell renewal antimicrobial, antiallergy and probiotic effects.

EVALUATION OF DERMATOLOGICAL EFFECTS OF COSMETIC FORMULATIONS CONTAINING ANTIMICROBIAL YEAST COMPLEX PROTEINS EXTRACT WITH SOME ANTIOXIDANT SUPPLEMENTS

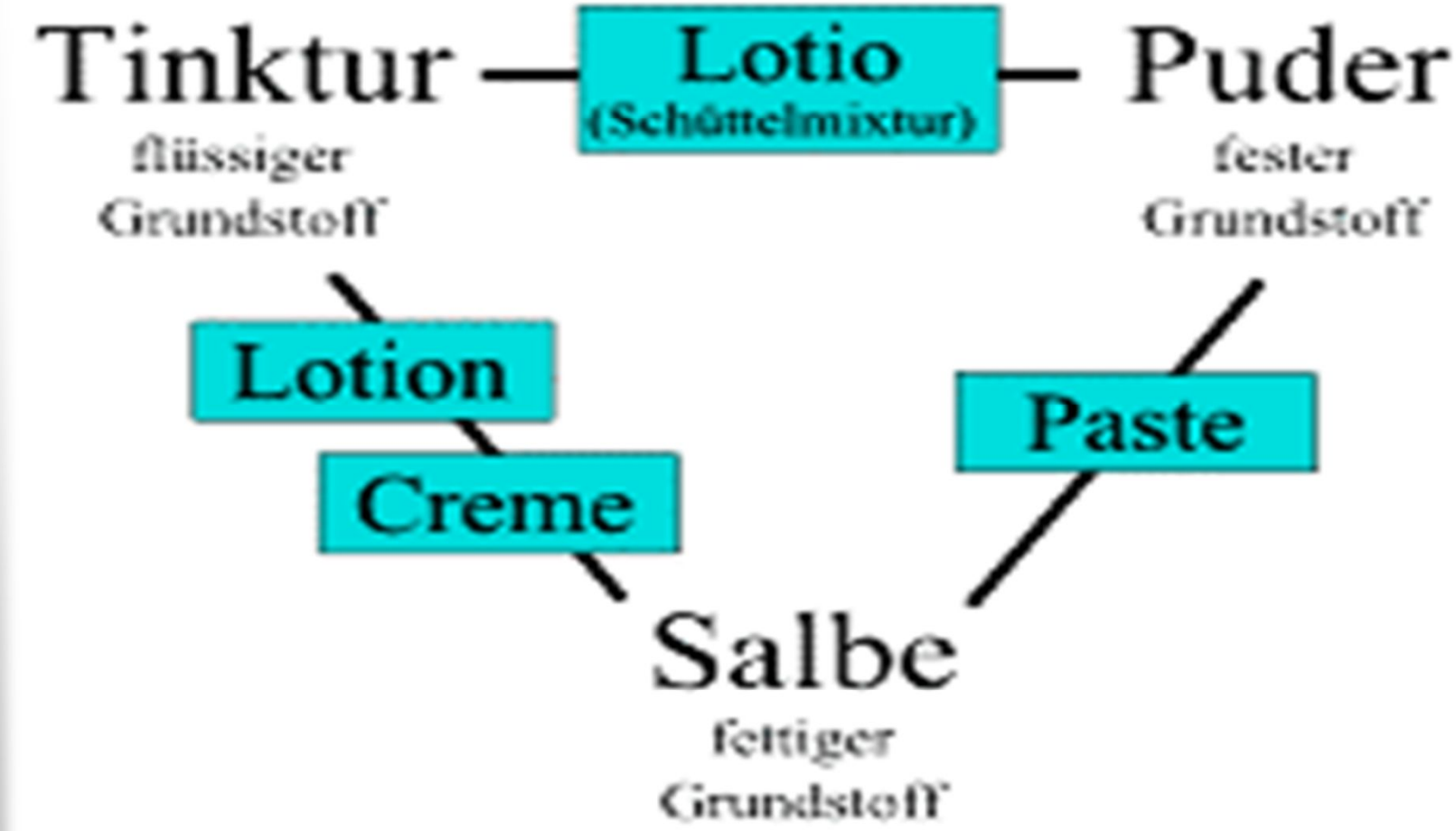
CONSEQUENTLY, ACCORDING TO THESE PREVIOUS STUDIES, IT CAN BE SUGGESTED THAT YEAST COMPLEX PROTEINS EXTRACT WITH SUPPLEMENTS OFFERS GREAT POTENTIAL FOR THE PREVENTION OF PHOTO AGING, ANTIMICROBIAL AND OXIDATIVE STRESS DISEASES, BECAUSE DESPITE ITS IMMUNOMODULATORY ACTIVITY, IT PRESENTS ANTIOXIDANT AND ANTIMICROBIAL ACTIVITY CAN IMPROVE PHOTO AGED AND HEALTHY SKIN. NOW, THERE IS A GREAT TENDENCY IN THE COSMETIC AREA IN THE DEVELOPMENT OF MULTIFUNCTIONAL COSMETICS.

THEREFORE, IT IS VERY IMPORTANT TO EVALUATE THE PERFORMANCE OF COSMETIC PRODUCTS CONTAINING YCPS EXTRACT WITH SOME SPECIAL SUPPLEMNTS.

EVALUATION OF DERMATOLOGICAL EFFECTS OF COSMETIC FORMULATIONS CONTAINING ANTIMICROBIAL YEAST COMPLEX PROTEINS EXTRACT WITH SOME ANTIOXIDANT SUPPLEMENTS

BASED ON THESE CONSIDERATIONS, WE EVALUATED THE DERMATOLOGICAL EFFECTS OF COSMETIC FORMULATIONS CONTAINING YEAST COMPLEX PROTEINS EXTRACT AND/OR SOME SPECIFIC SUPPLEMENTS IN ORDER TO IMPROVE SKIN CONDITIONS AND TO PROMOTE HEALTHY SKIN.

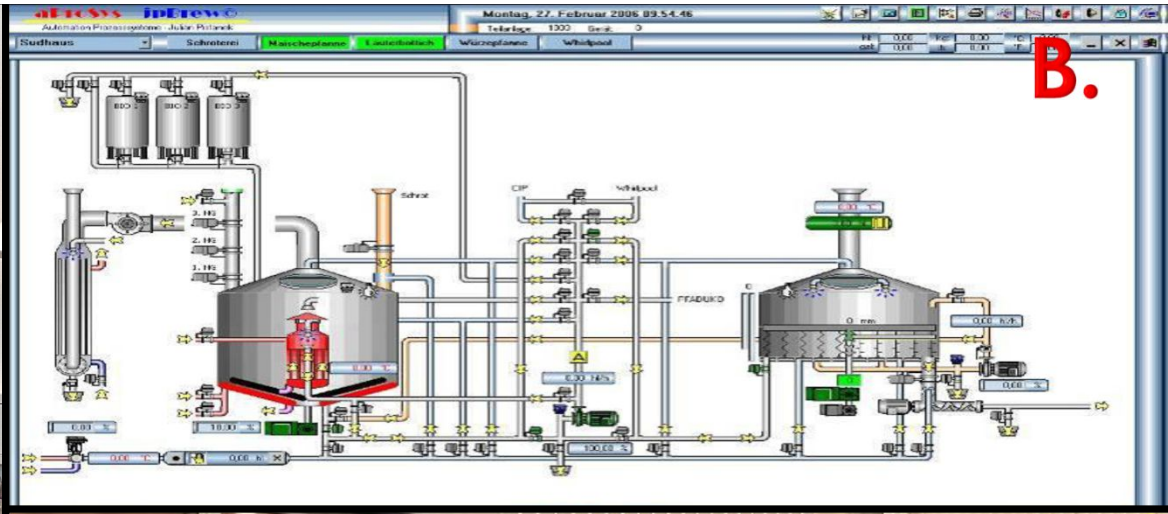
FINALLY, COMPLETE EVALUATIONS SUCH AS THE ONES PERFORMED IN OUR STUDY ARE VERY IMPORTANT IN THE DEVELOPMENT OF NEW COSMETIC PRODUCTS TO EVALUATE THE BEST CORRELATION BETWEEN RISK AND BENEFIT AND TO OBTAIN SAFE AND ANTIMICROBIAL COSMETIC PRODUCTS.


Tinktur
flüssiger Grundstoff
Lotio
(Schüttelmixtur)
Puder
fester Grundstoff
Lotion
Creme
Paste
Salbe
fettiger Grundstoff

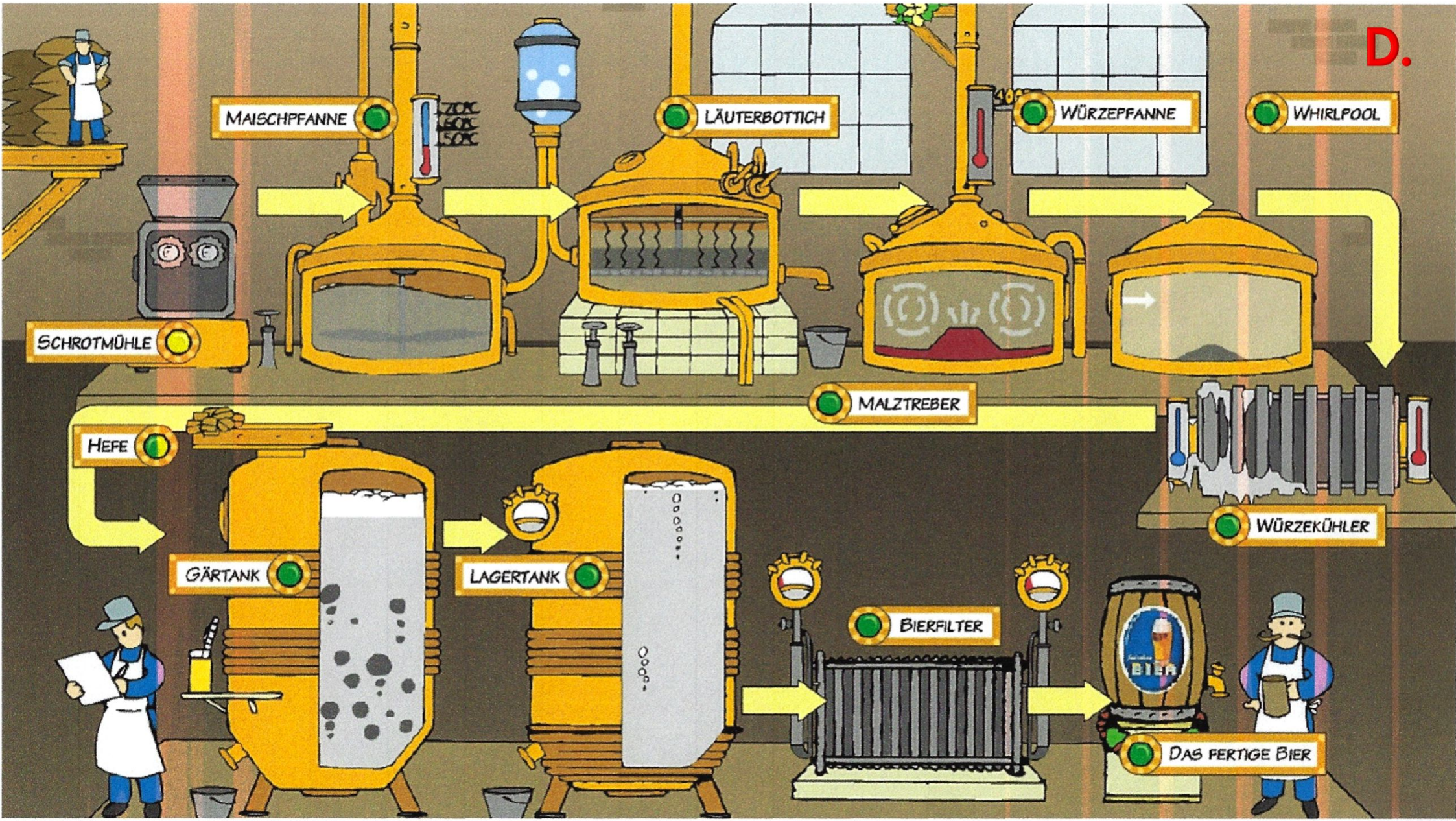
YEAST COMPLEX PROTEINS FROM *WILLIOPSIS MRAKII* AS-15 PRODUCES IN BREWERY:

- **Microtechnical scale (A, B, C)**
- **Technical scale (D)**


A.
BOENGINEERING
BOENGINEERING
BOENGINEERING


B.
Sudhaus
Schroterei
Maischepfanne
Lautertottich
Würzepfanne
Whirlpool
CIP
Whirlpool
FRABUKO


C.


D.
MAISCHPFANNE
LÄUTERBOTTICH
WÜRZEPFANNE
WHIRLPOOL
SCHROTMÜHLE
MALZTREBER
HEFE
WÜRZEKÜHLER
GÄRTANK
LAGERTANK
BIERFILTER
DAS FERTIGE BIER


Brewery - yeast fermentation
Yeast Complex Proteins in supernatant

Immunity Test

THANK YOU FOR YOUR ATTENTION!

Cosmetik creme

e-mail: anna.salek@t-online.de