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β-Glucans from yeast biomass

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Why beta glucans?

- Natural products
- Defined active substance
- Useful in treating and/or preventing various diseases
- Very low-to-negligible toxicity

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Why Yeast?

- Yeasts have been used for centuries
- In western countries the most common source of beta-glucans

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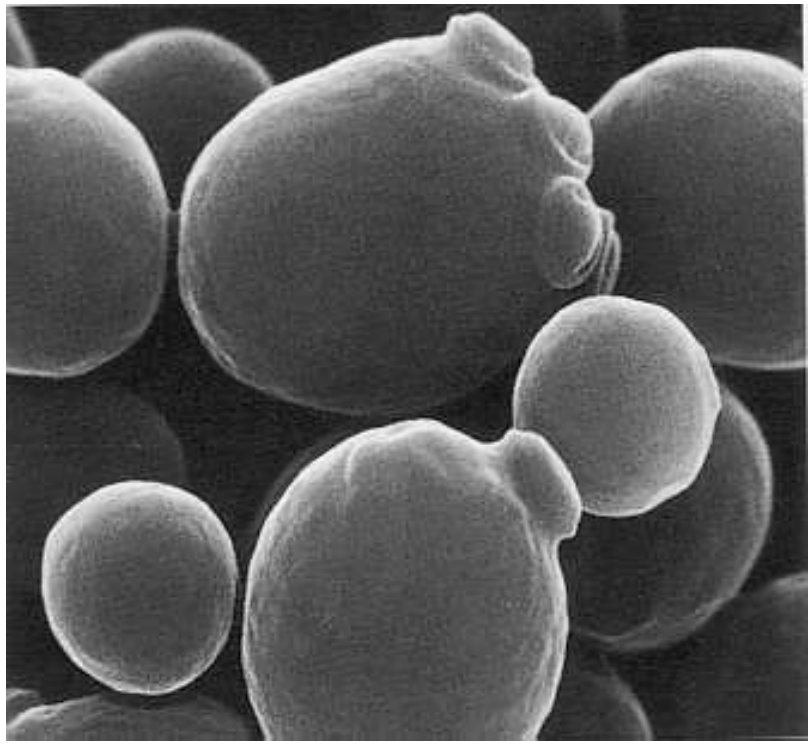
Saccharomyces cerevisiae



- used for fermenting processes in baking and brewery
- most studied organism (first eukaryotic organism that was sequenced)

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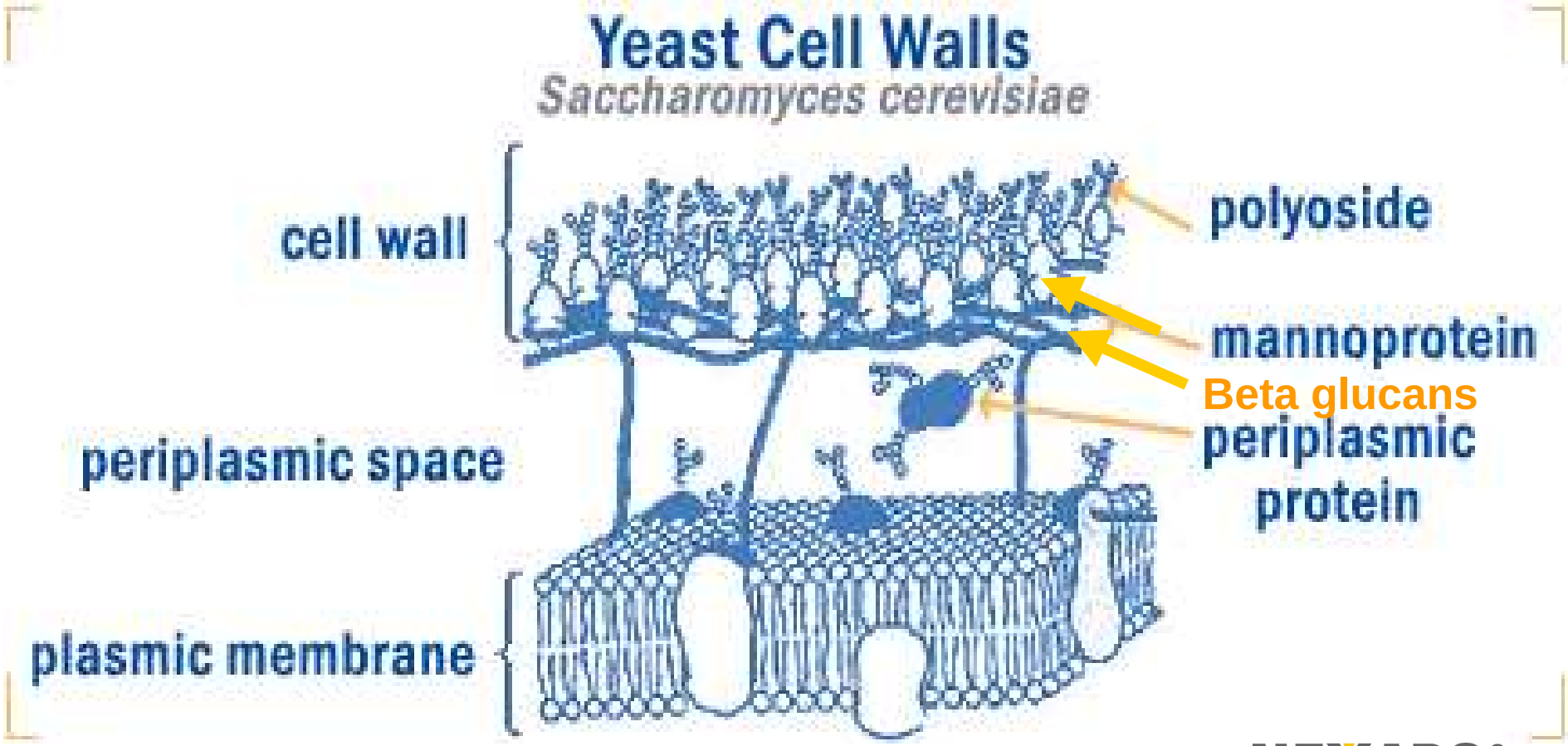
Saccharomyces cerevisiae



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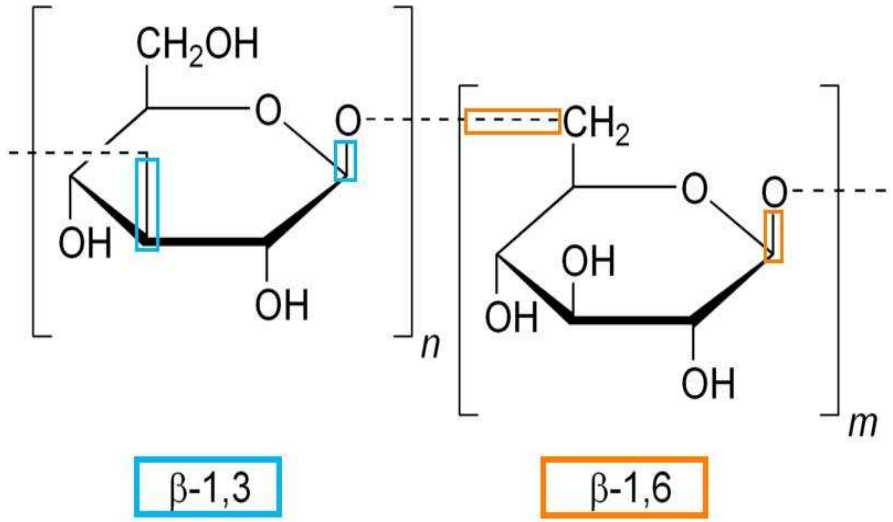
Beta glucans - Structure

- Chains of glucose molecules
- Beta glucans together with mannan oligosaccharides form the basic unit of the yeast cell wall



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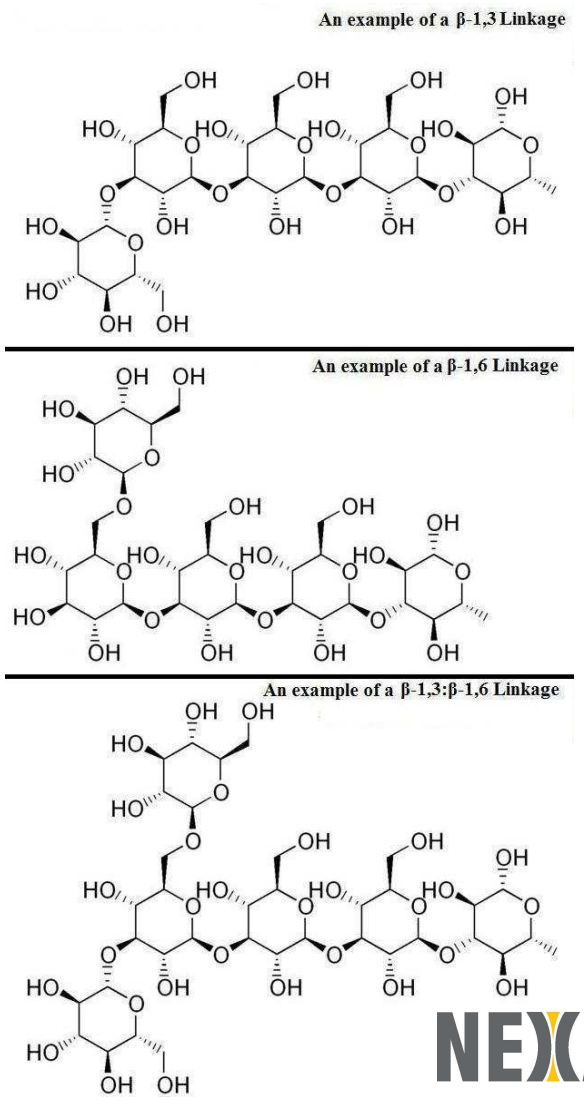
Beta glucans - Structure

- The most active form β -1, 3 D glucans are those which contain side chains at positions 1’and 6‘ (β -1,3/1,6 glucans)



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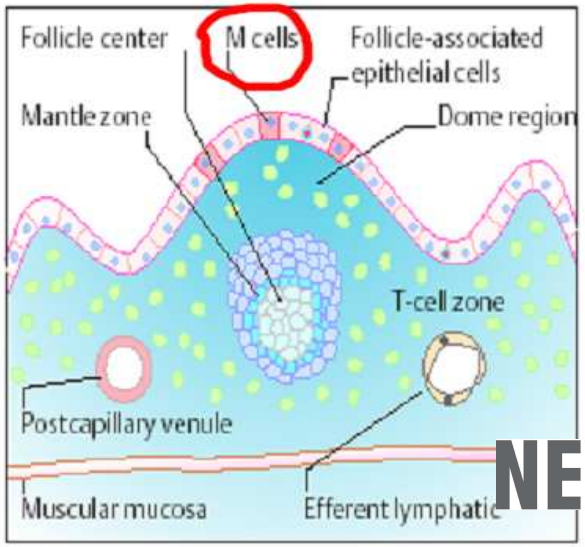
Beta glucans - Absorbtion

- Macrophages carry the orally absorbed particles of Beta glucan to the imune organs via the lymphatic system.



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Beta glucans - History

- 18TH Century
  - Certain infectiousus diseases showed a therapeutic effect on malignant processes
- 19TH Century
  - Less dangerous extracts of microbial cultures
- 20TH Century
  - Zymosan
  - Beta glucan

History of Immunomodulators		
1865	T.Bilroth	Endotoxin (LPS)
1894	W.Coley	Erysipel toxins
1936	J.Freund	Mycobacterium adjuvans (BCG)
1941	L.Pillemer	Zymosan
1968	N.DiLuzio	Yeast glucan
1971	G.Renoux	Levamisol

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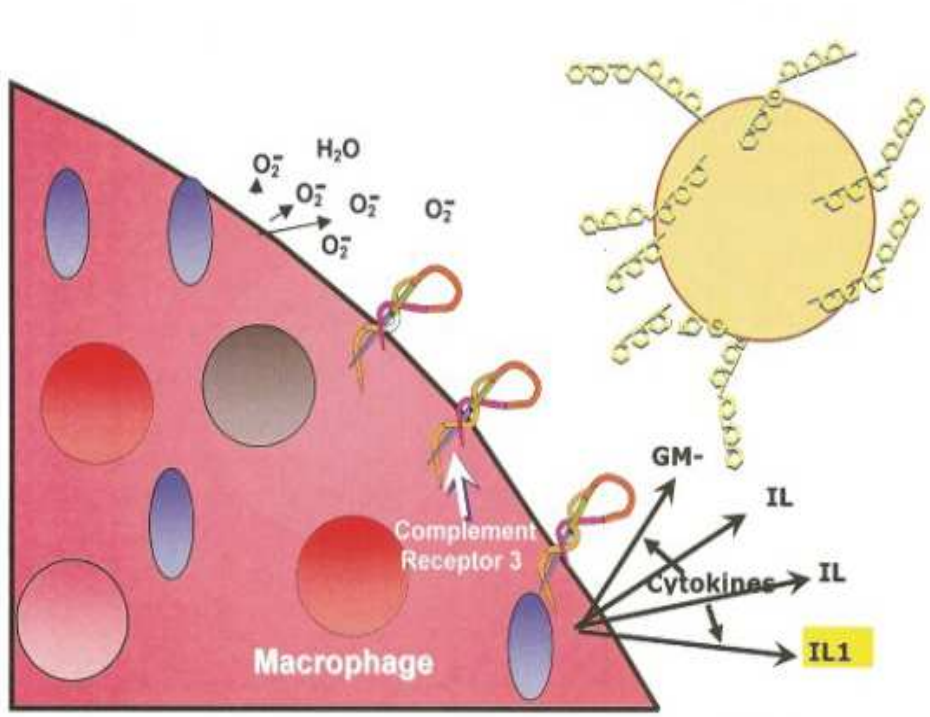
Mechanism of Action

- Non-specific (innate) imunity recognise surface of invading microorg. (PAMPs)
- Exact mechanisms of the action remain unclear
  - Dectin 1
  - TLRs (toll-like receptor 2)
  - Complement receptor 3 (integrin CD11b/CD18)



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Beta glucans - Efects

- Biological response modifiers (BRM)
  - Immunostimulants against infectious diseases
  - Imunoadjuvant therapy for cancer (primary in Japan)
  - Enhanced recovery of blood cell count after radiation
  - Promotes wound healing by activation of macrophages and fibroblasts
  - Lowering cholesterol level

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Beta glucans - tumor therapy

- Success requires anti-tumor antibody that generates iC3b on tumors
- Patients with breast cancer generate antibody response and will respond to glucan alone as long the tumors are targeted with antibody and iC3
- Humanized antibodies such as Herceptin and Rituximad are good targets for combined therapy with glucan
- Even tumors that have lost MHC class I might be targets
- May function to reduce myelosuppression caused by chemo- or radiation therapy

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Products

- A lot of beta glucans products on the market
  - various sources
  - pure and combined
- Beta glucan has proven efficacy by numerous studies
- Especially combined product must have confirmed efficacy

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Our products

Zymosan

(Beta glucan+mannan)

Imunostimulans

More info on www.nexars.com

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Our efficacy testing

Clinical studies

- questionnaires (CRFs) (overall health status, morbidity,digestion, etc.)

- laboratory methods (neopterin)

IMUNOCOMPLEX ⇒

- *are suitable for strengthening an exhausted immune system in the elderly, long term or often ill.*
- *A very useful combination for stimulation of the immune system is beta glucans with mannans, probiotics and some of the vitamins and mineral (vit.B,C,E min. Se,Cr,Zn)*
- *Improves digestion (mainly during obstipation)*

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Our products

Beta glucan

HFSR

More info on www.nexars.com

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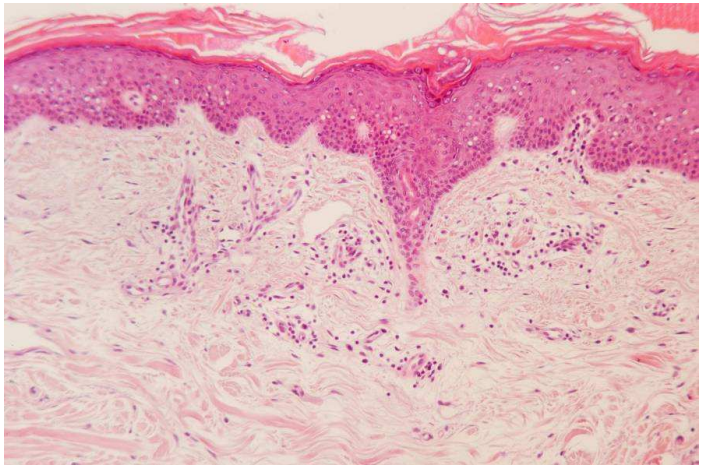
HFSR



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Beta glucans - NEXCREAM

- Activation of fibroblast
  - transcription factor (AP-1, Sp1, NF-κB, NF-1)

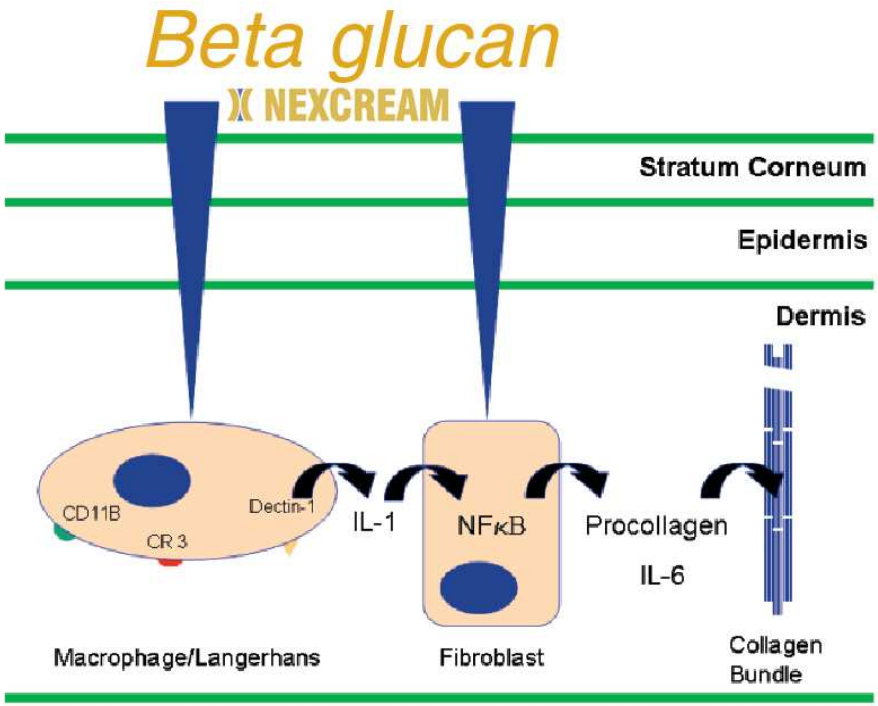
    → production of PDGF-A&B, FGF-a&b, TGF-α&β,

    VEGF, NT-3, etc.

    → macrophage infiltration, reepithelialization, collagen

    deposition, increase tensile strength
- Stimulation of macrophage

(Other Ingredients of NEXCREAM
- CANNABIS SATIVA OIL, MACADAMIA OIL, SHEA BUTTER, ALOE, UREA)



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Conclusion

- Beta glucan is defined active natural substance
- Yeasts have been used for centuries
- Beta glucan has proven efficacy by numerous studies
- Especially combined product must have confirmed efficacy

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Literature

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Thank You
for Your Attention.

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