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Institutionen för Molekylära Vetenskaper
Department of Molecular Sciences

Optimization of probiotic capacity

Project focusing on assessing interactions between *L. reuteri and host cells and the correlation to production parameters*

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Lactobacillus reuteri

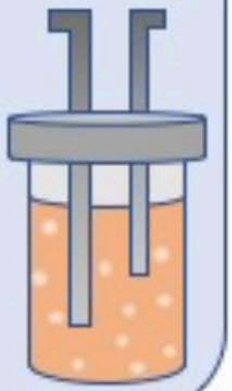
- Among the worlds most studied probiotic bacteria
- Clinically proven in a variety of different research fields
  - Paediatric health:
    - Reduced crying-time in infant colic (1)
    - Preventive of diarrhoea (2)
    - Various other implications (3)
  - Adult health:
    - Preventive of periodontal disease and gingivitis
    - *Helicobacter pylori infections*

(1) Meta-analysis by Sung et al 2017. Published in Paediatrics
(2) Randomised Clinical Trial by Francavilla et al. 2012. Published in Alimentary pharmacology and therapeutics
(3) Review on L.reuteri in children by Magdalena Urbańska and Hania Szajewska 2014. Published in European journal of pediatrics.

Factors

Different productions parameters
pH
Oxygen pressure
Carbon source
Starvation mode

Production:
Cultivation
Formulation
Desiccation (freeze-drying)



Responses

Traditional:
Production survival,
storage stability

Developed herein:
vitality
+ stress tolerance
+ bioactivity
+ probiotic capacity

Aims

- Overall aim to increase the potency of *L. reuteri*
  - Better understand the impact of production/production parameters on stress tolerance and bioactivity
  - Acquire further knowledge concerning the underlying molecular mechanisms of increased stress tolerance and bioactivity
- Asses genomic and metabolomic changes in lyophilized *L. reuteri*
  - Better understand changes associated with genes and/or genetic expression giving rise to changes in probiotic properties and vitality.

Methods

- Fermentation, formulation and lyophilization
- Cell lines simulating conditions of interest
  - Expresses differentiation properties of intestinal epithelial cells
  - Simulation of inflammation
  - Intestinal porcine enterocytes reflecting epithelial functionality
  - Functional pain cell line
- Potentially animal trials

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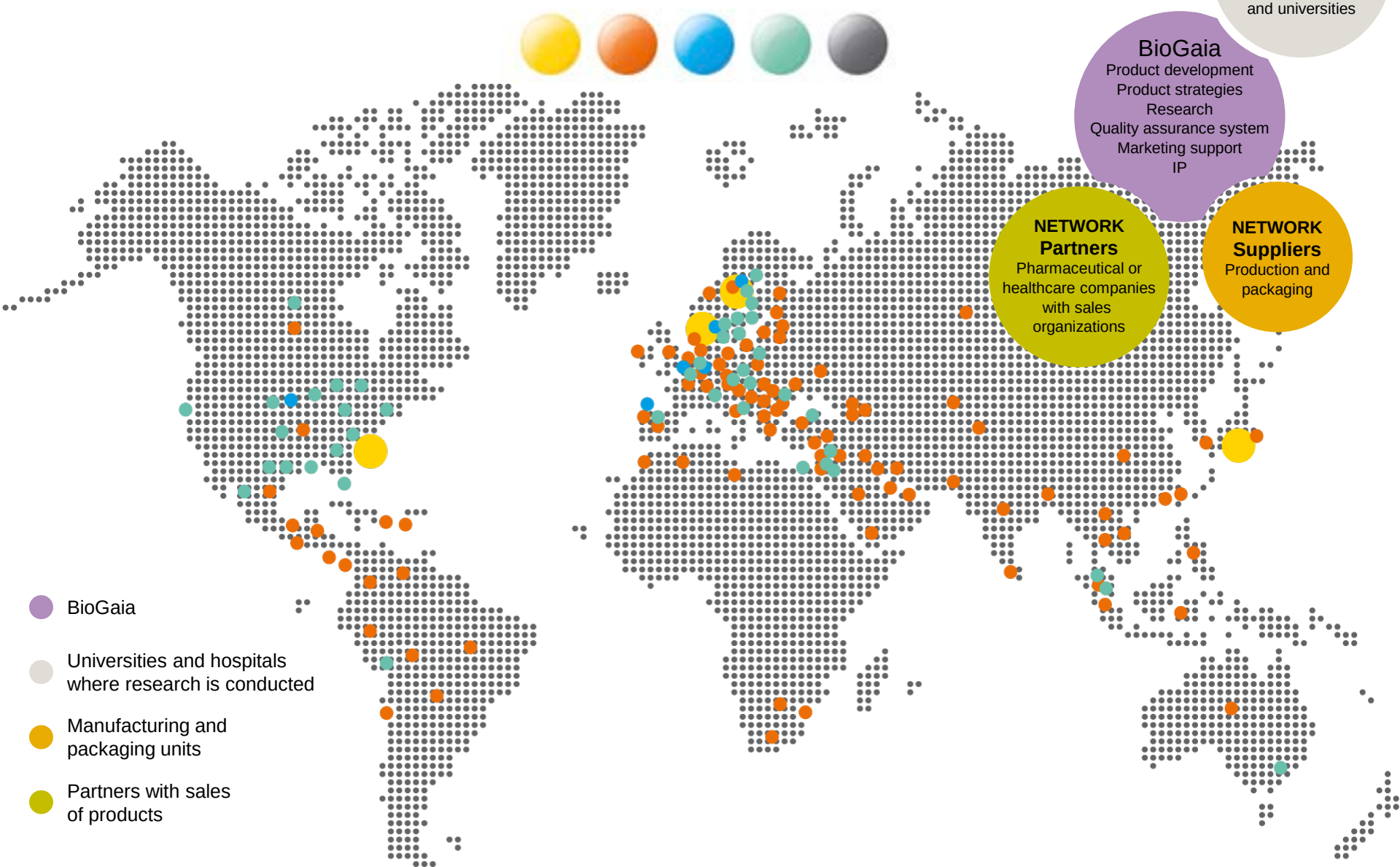
Probiotics grounded in evolution
Driven by science



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MISSION

BioGaia conducts research and development to offer consumers clinically-proven, health-promoting, patented and user-friendly probiotic products

VISION

BioGaia's vision is to be a ground-breaking leader in probiotics

- Collaborations
  - Worldwide research network
  - SLU
  - Lund University
- Preclinical studies guide collaborating partners
- Brand new research facility in Eslöv
  - Main location switch in two years

References

- 1.http://pediatrics.aappublications.org/cgi/pmidlookup?view=long&pmid=29279326
- 2. https://www.ncbi.nlm.nih.gov/pubmed/22680836
- 3.https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4165878/table/Tab1/?report=objectonly