

Nutritional Strategies for Infections

Enhancing our Defences

Pharma Nord Webinar, 10th Feb 2026



Agenda for today

1

Overview of the immune system

2

Key influences on immune system function

3

The importance of dietary choices & gut health

4

Focus on key mechanisms of micronutrients with
European Food Safety Authority (EFSA) approved claims

5

Putting our knowledge into practice – which nutrients to suggest?



Today's Speaker

Katie Sheen

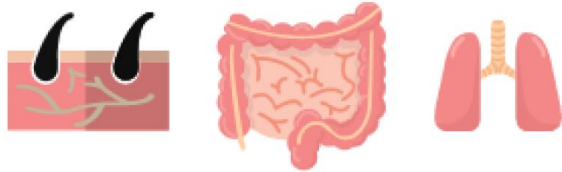
FdSc, Dip.ION, PGCert, MA Ed

Registered Nutritional Therapist (CNHC)

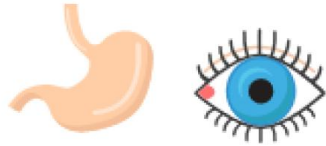
- Teaching post graduate nutritional education since 2009
- Private practice at Amaranth in Cheshire – winner of CAM Clinic of the Year 2010
- Began weaving mindfulness into nutritional protocols from 2011, whilst Module Leader for MSc Nutritional Therapy at University of Worcester
- Contributing author 'Tears Become Rain' & ION's 'Colourful Kitchen Collection' cookbook

Innate Immune System

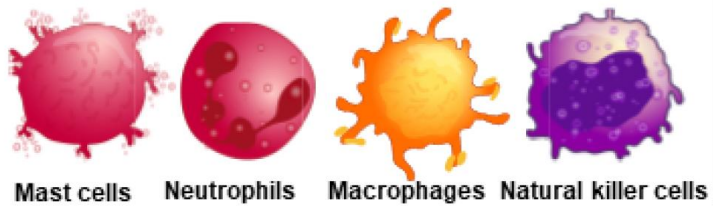
**Physical barriers:
Skin; organ mucosal layers**



**Chemical barriers:
Stomach acid; lysozymes in eye**



**Innate response: Inflammatory
response cells**



Mast cells

Neutrophils

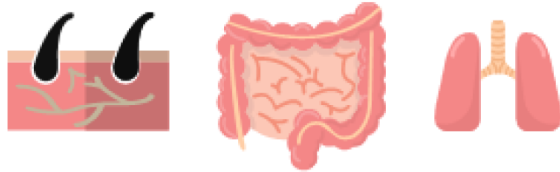
Macrophages

Natural killer cells

The Immune System

Innate Immune System

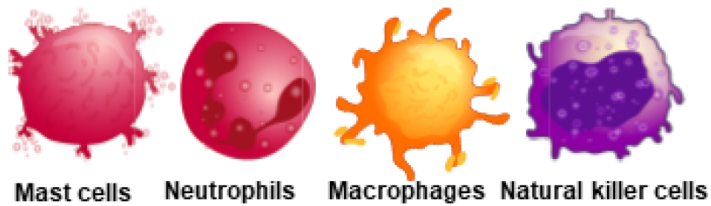
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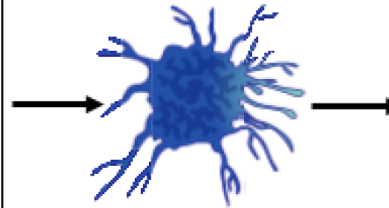


**Innate response: Inflammatory
response cells**

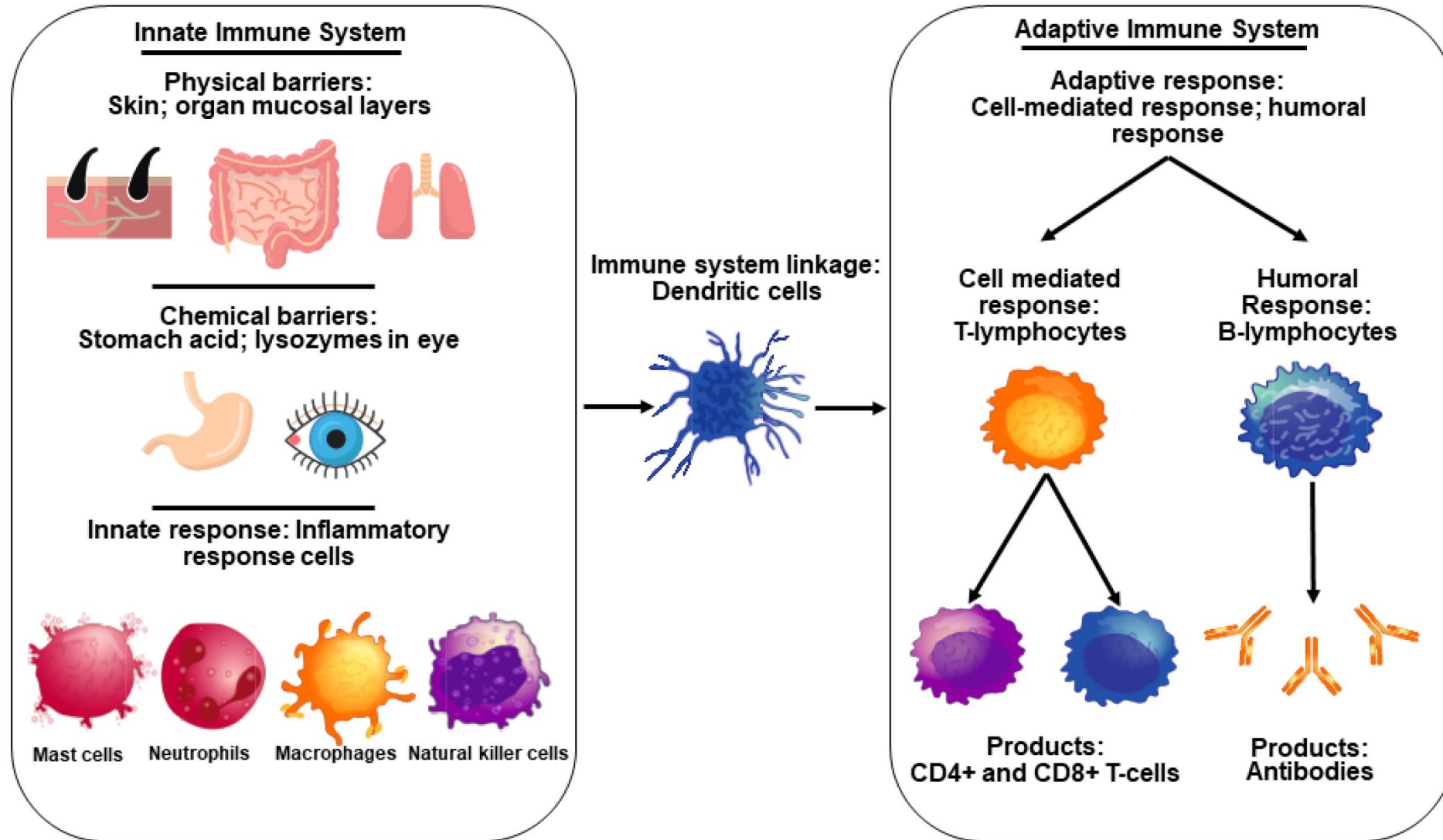


Mast cells Neutrophils Macrophages Natural killer cells

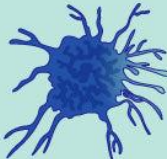
Immune system linkage:
Dendritic cells



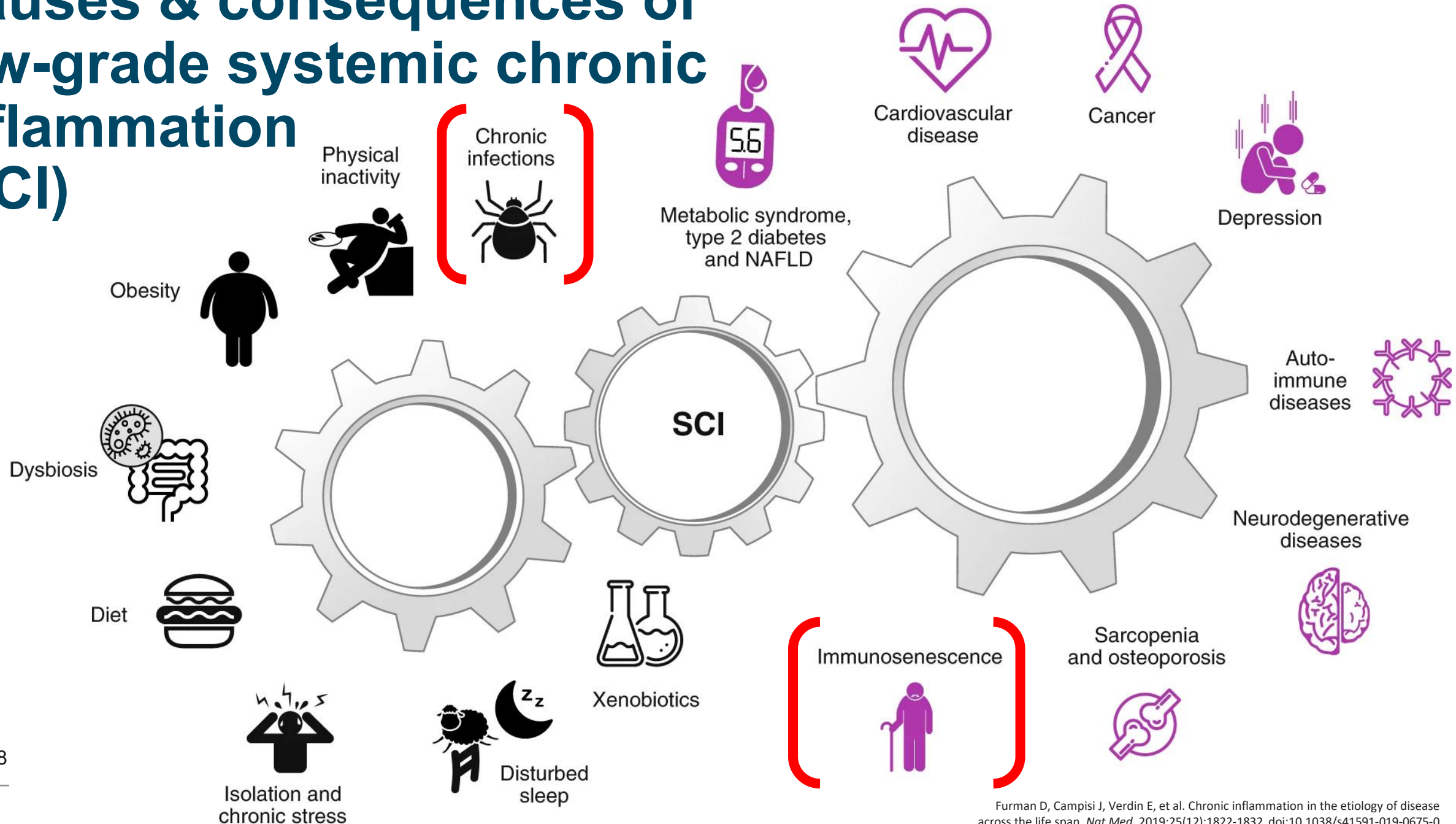
The Immune System



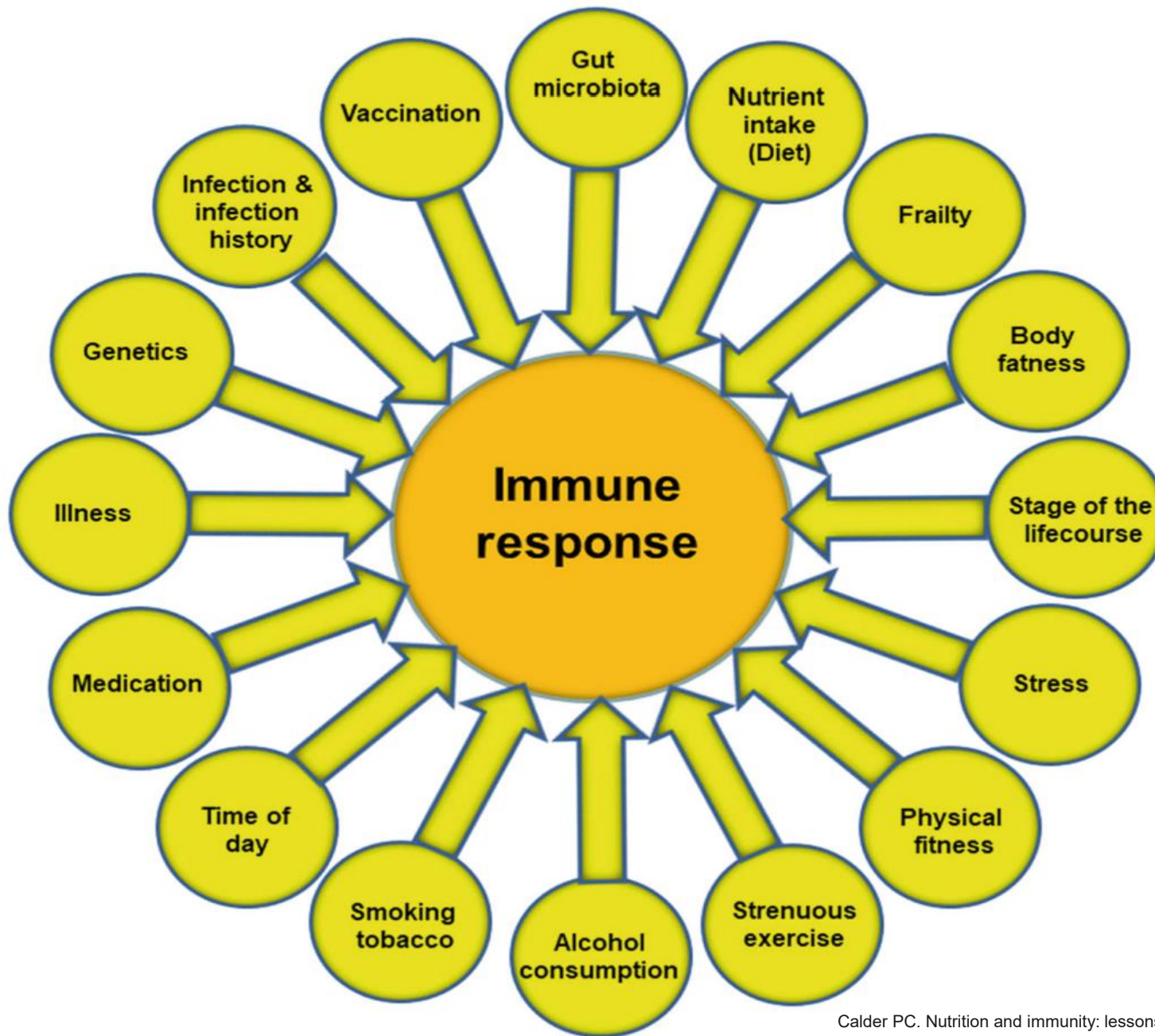
Immune Cells: Stages of Response

Stage of Immune Response	The Scouts	First Responders	Call for Backup	Peak Inflammation	Targeted Attack	Clean-up & Recover	Body Remembers
		 neutrophil  mast cell	 macrophage  monocyte	 dendritic cell  macrophage	 T cell  B cell	 T cell  B cell  macrophage	 B cell  T cell
	No symptoms yet.	Redness, swelling, pain, low-grade fever and sometimes itching or runny nose.	Increased fatigue, body aches, and swollen lymph nodes, mild to moderate fever.	Exhaustion and weakness, high fever (often), swollen lymph nodes, and congestion or mucus production.	Ongoing fatigue, mild fever reduction, congestion or mucus clearing, less swelling and pain.	Decreasing fatigue, Minor soreness, Improved breathing and clear sinuses, normalizing energy levels.	No symptoms, enhanced protection.
	Invasion Begins	Within Hours	Within 1 - 2 Days	2 - 3 Days After Infection	3 - 5 Days After Infection	5 - 10 Days After Infection	Long-Term Immunity

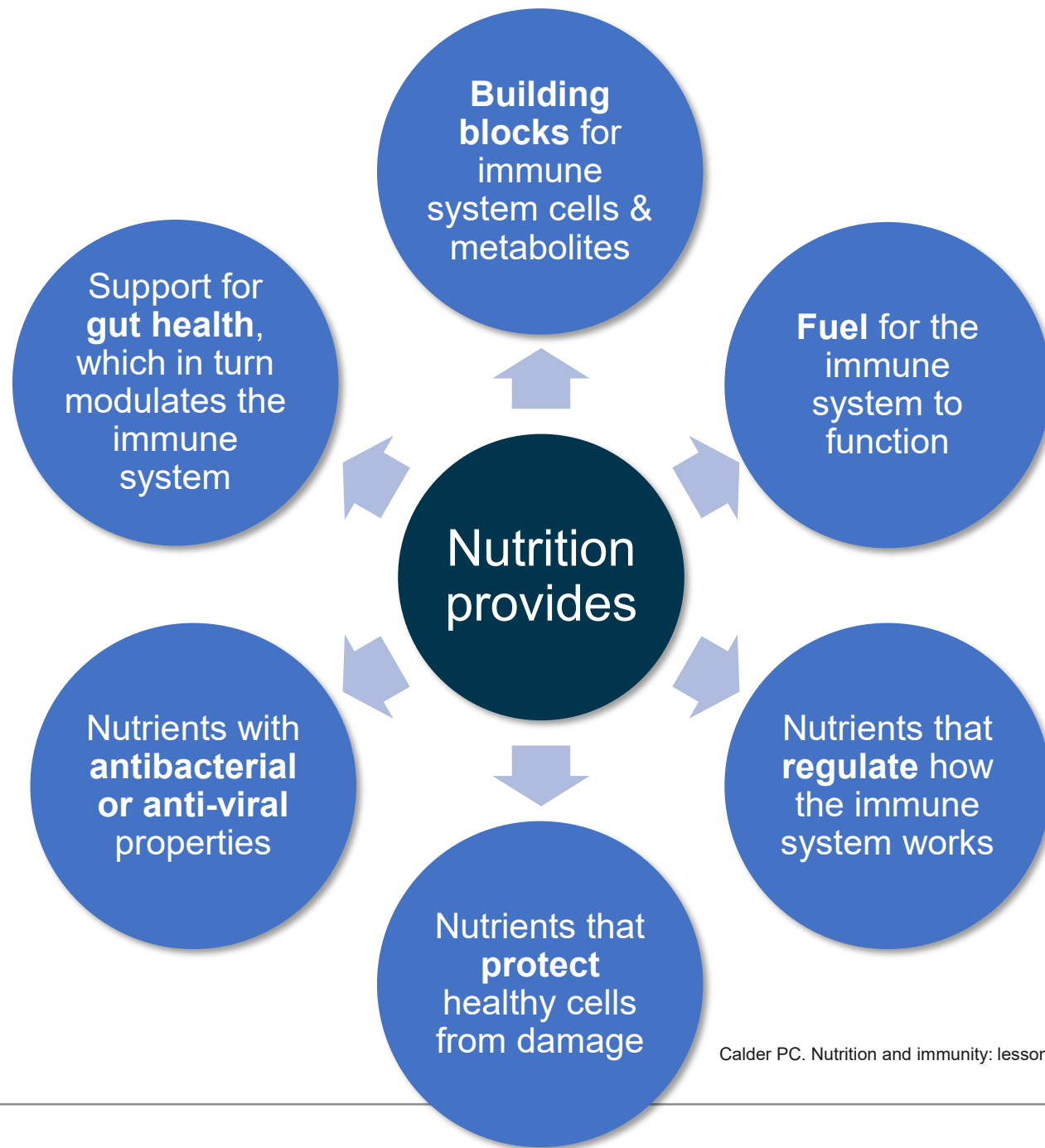
Causes & consequences of low-grade systemic chronic inflammation (SCI)



Factors that affect the immune system



How nutrition supports the immune system



Dietary Fibre

96% UK adults don't meet NHS fibre recommendation for adults: **>30g fibre / day**

- This intake is associated with lower risk of heart disease, stroke, type 2 diabetes & bowel cancer

Benefits of good dietary fibre intakes include:

- Increased number & diversity of beneficial gut microflora
- Increased short-chain fatty acids (SCFAs: acetic, propionic & butyric acids) produced by the microflora
 - SCFAs support barrier function, regulate immune responses (**especially against viruses**), & improve health of cells in the gut



Pharma Nord Formulation

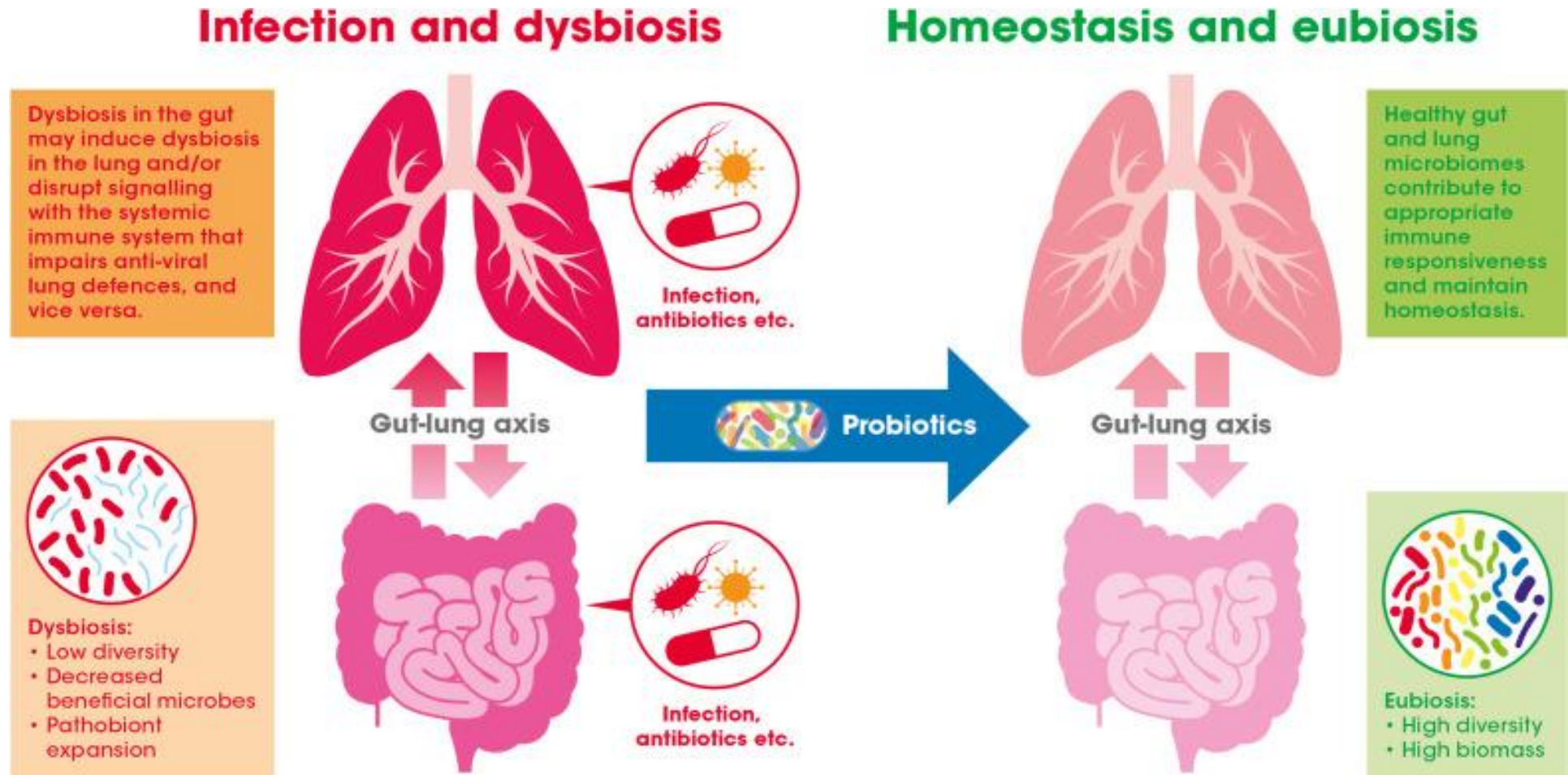
Bio-Fibre

- Blend of soluble & insoluble natural fibres from sugar beets & lemon peel
- Helps to support regular bowel movements
- Manufactured under Danish pharmaceutical control
- Suitable for vegans & vegetarians

Dosage: 4 to 12 tablets per day, depending on the feeling of wellbeing that is obtained as correct dietary level is reached



Gut health affects the whole body...

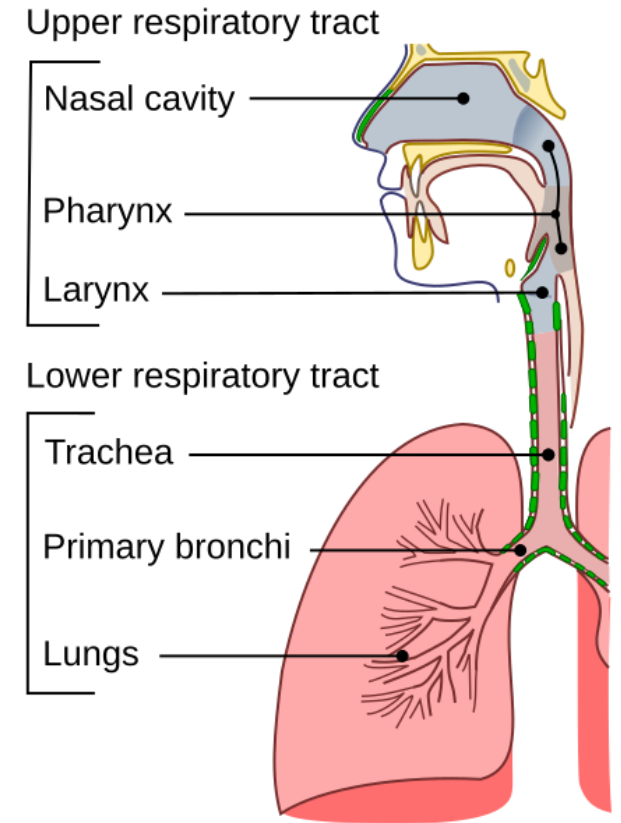


Probiotics to help prevent URTIs

2022 Cochrane review of 23 trials involving 6950 participants aged from 1 month to >85 years assessed effectiveness & safety of probiotics compared with placebo or no treatment, in **prevention** of acute **upper** respiratory tract infections (URTIs)

Concluded that probiotics:

- reduce number of participants diagnosed with URTIs
- reduce number of participants who use prescribed antibiotics for acute URTIs



Pharma Nord Formulation

Bio-Culture

- Each capsule contains 4 billion scientifically documented lactic acid bacteria
 - Lactobacillus acidophilus (La-5®)
 - Bifidobacterium lactis (BB-12®)
- Does not require refrigeration
- Small enteric-coated capsules that are easy to swallow & ensure viability of bacteria
- Suitable for vegetarians
- Manufactured under Danish pharmaceutical control

Dosage: 1 capsule 3 times per day, with food



*Lactobacillus acidophilus
preferentially colonises the
small intestine*

*Bifidobacterium lactis
preferentially colonises the
large intestine*

Cranberry for Urinary Tract Infections (UTIs): Mechanisms

E.coli is the causative bacteria in 85% UTI cases

- Cranberry metabolites, particularly A-type PACs, flavonoids, & phenolic acids block E.coli adhesion to urothelial cells, reducing UTI recurrence
 - D-mannose, a monosaccharide naturally found in fruits such as cranberries, works in the same way
- **Gut microbiota-driven transformation of PACs into bioactive metabolites enhances efficacy**



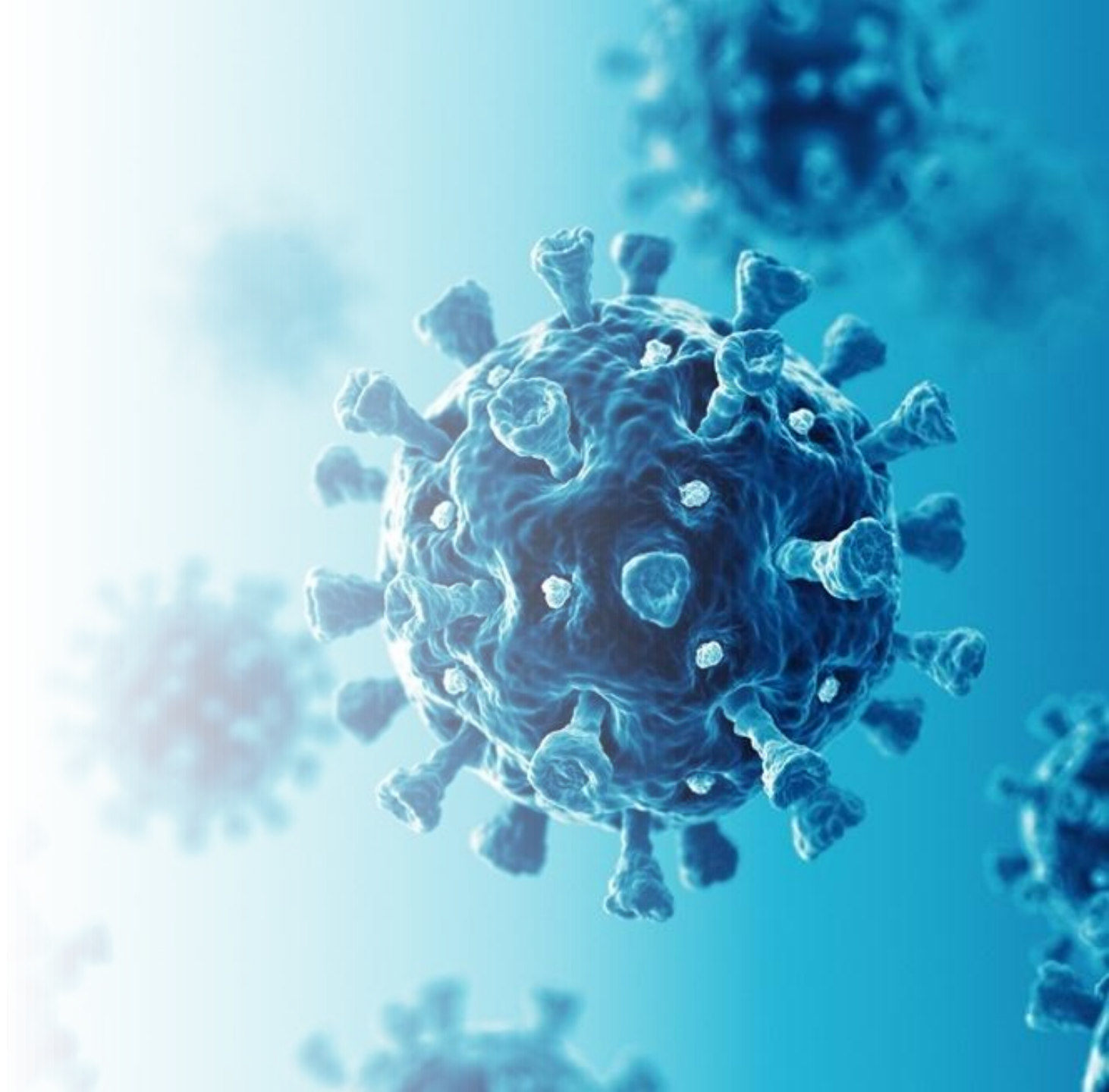
Cranberry for Urinary Tract Infections (UTIs)

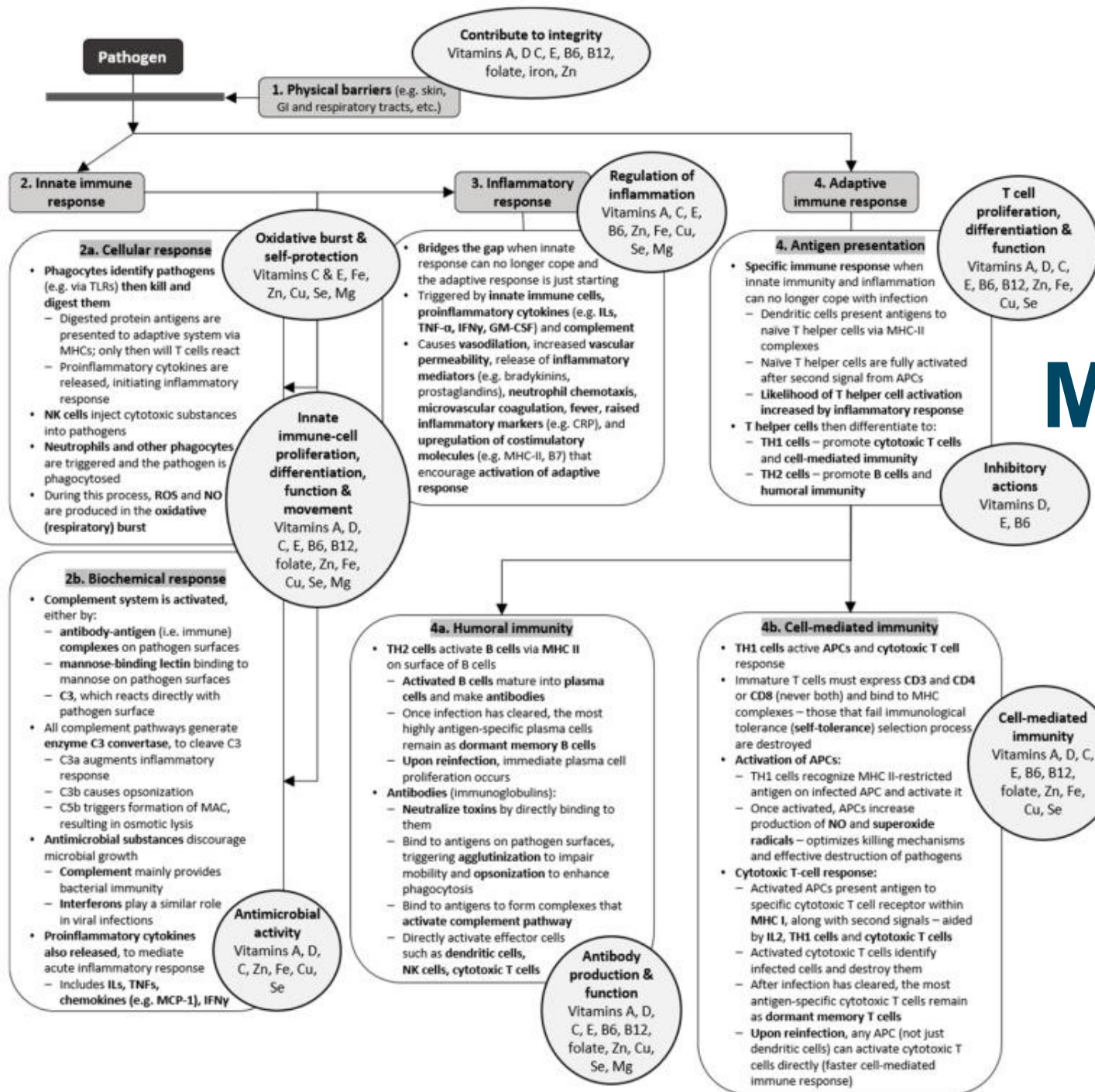
2024 meta-analysis & systematic review of 10 RCTs (1,217 in treatment groups & 1,221 controls) of **preventative** use of cranberry products concluded:

- Daily intake of proanthocyanidins (PACs) of at least 36mg → risk of UTIs reduced by 18%. No statistical significance risk decrease below 36mg.
- >36mg dose effective after 12 - 24 weeks duration
- Reduced risk of UTIs only found in subgroups that just included females



Fundamental nutrients for infections





Micronutrients for immune support

Gombart AF, Pierre A, Maggini S. A Review of Micronutrients and the Immune System-Working in Harmony to Reduce the Risk of Infection. *Nutrients*. 2020;12(1):236. Published 2020 Jan 16. doi:10.3390/nu12010236

Nutritional status is crucial

- Malnutrition is the most common acquired cause of immunodeficiency worldwide
 - Nutritional deficiencies blunt both innate & adaptive immune responses to pathogens
- It's a bidirectional relationship: malnutrition is both cause & consequence of infectious diseases
 - Eg: viral infections (RNA viruses in particular) are known to induce & promote oxidative stress, consequently increasing the body's demand for micronutrients, especially those related to antioxidant enzymic systems
- No human evidence to support the old saying “Starve a fever, feed a cold”

Birk R. Nutrigenetics of antioxidant enzymes and micronutrient needs in the context of viral infections. *Nutr Res Rev.* 2021;34(2):174-184

Locks LM, Parekh A, Newell K, et al. The ABCDs of Nutritional Assessment in Infectious Diseases Research. *J Infect Dis.* 2025;231(3):562-572

Sankararaman S, Venegas C, Seth S, Palchaudhuri S. "Feed a Cold, Starve a Fever?" A Review of Nutritional Strategies in the Setting of Bacterial Versus Viral Infections. *Curr Nutr Rep.* 2024;13(2):314-322.



Nutrient deficiencies & *risk* of infections

Nutrient Deficiency:	Strongest evidence for increased risk of:
Vit C	Incidence & severity of pneumonia & other infections
Vit D	Respiratory Tract infections (RTIs)
Vit A	Diarrhoea, Measles, Malaria Pathogens in mucosal epithelium (eg. eyes, respiratory & GI tracts)
Vit B6	Reduced ability to respond to pathogenic challenges
Zinc	Bacterial, viral & fungal infections (particularly diarrhoea & pneumonia)
Iron	RTI more frequent & last longer (Evidence in children only)
Selenium	Increased viral virulence. RTIs in first 6 weeks of life in children
Magnesium	Recurrent bacterial infection Fungal infections

Gombart AF, Pierre A, Maggini S. A Review of Micronutrients and the Immune System-Working in Harmony to Reduce the Risk of Infection. *Nutrients*. 2020;12(1):236. Published 2020 Jan 16. doi:10.3390/nu12010236



Nutrient losses during active infections

Multiple micronutrients are depleted during active infections. Particularly high losses have been noted for:

- Vits A, C, & E
- Calcium
- Zinc
- Iron

Good micronutrient intake is essential to support recovery, but often made more difficult:

- food intake may decrease during illness (for variety of reasons)
- antibiotic use may deplete certain micronutrients

Gombart AF, Pierre A, Maggini S. A Review of Micronutrients and the Immune System-Working in Harmony to Reduce the Risk of Infection. *Nutrients*. 2020;12(1):236. Published 2020 Jan 16. doi:10.3390/nu12010236
Prescott JD, Drake VJ, Stevens JF. Medications and Micronutrients: Identifying Clinically Relevant Interactions and Addressing Nutritional Needs. *J Pharm Technol*. 2018;34(5):216-230

Supplementing nutrients during *active* infections

Nutrient	Benefits identified in symptoms of:
Vit C	• common cold in adults & children • pneumonia in adults & older adults
Vit D	• influenza, upper RTI & tuberculosis, in adults & children
Vit A	• non-measles pneumonia • measles-associated diarrhoea • RTI in children
Zinc	• common cold in adults & children

Gombart AF, Pierre A, Maggini S. A Review of Micronutrients and the Immune System-Working in Harmony to Reduce the Risk of Infection. *Nutrients*. 2020;12(1):236. Published 2020 Jan 16. doi:10.3390/nu12010236

Mechanisms of vit C in immunity

- Protects against oxidative damage
- Supports our first line of defence - **barrier function** - by promoting collagen synthesis & wound healing
- Enhances production & functions of all immune system cells, including production of antibodies



Example Mechanism:

Supports Neutrophils

- Vit C stimulates neutrophil migration to the site of infection
- Vit C accumulates in neutrophils to enhance their activity, leading to the killing of bacterial cells
- Vit C supports removal of 'spent' neutrophils from site of infection (decreasing excess oxidative stress to healthy cells)



Neutrophil

One of the most abundant white blood cells, uses **oxidative stress** to kill pathogens

Pharma Nord Formulation

Bio-C-Vitamin

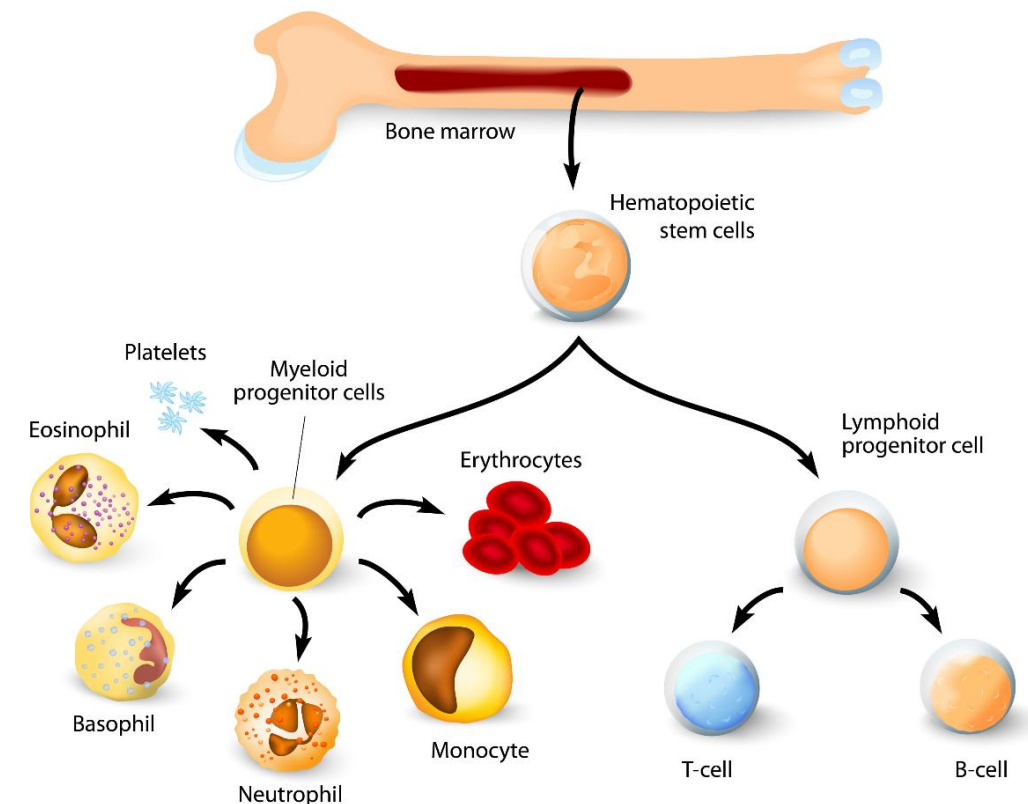
- Non-acidic form (calcium ascorbate) makes it gentle on the stomach
- Documented high bioavailability
- Featured in human clinical trials
- Manufactured under Danish pharmaceutical control
- Registered as a medicinal product in Denmark

Dosage: 1 tablet per day (can be crushed)



How does Zinc contribute to immune function?

- Healthy bone marrow
 - therefore, supporting immune cell production
- DNA & protein synthesis
 - contributing to the structure of all elements of immune system (cells, antibodies etc)
- Effective signalling between cells of the immune system
- Reduction of oxidative stress



Zn deficiency may result in subtle symptoms

- Increased risk of infections
- Impaired taste / loss of appetite
- Hair loss
- Infertility
- Delayed wound healing

Risk factors include

- Older adults (65 years +)
- Vegetarians whose primary Zn sources are grains & legumes (due to **phytate** content that inhibits absorption)
- Individuals with gastrointestinal conditions including:
 - Severe/persistent diarrhoea
 - Inflammatory bowel diseases
- Pregnant & lactating women

2021 Cochrane review of Zinc in Viral Respiratory Infections

2021 review & meta-analysis of 28 randomised controlled clinical trials (RCTs) with a total of 5446 participants:

- participants were generally healthy
- but all had symptoms of mild to moderate viral respiratory tract infections (RTIs)

Results:

- On average, symptoms resolved 2 days earlier with sublingual or intranasal Zn (compared to placebo)
- There were clinically significant reductions in day 3 symptom severity scores (around the peak of acute respiratory illness)
- *Without* Zn, 19 more adults per 100 were likely to remain symptomatic on day 7

Benefits of Zinc supplementation found in research includes:

- **Autoimmune** diseases, inc. rheumatoid arthritis
- **Bacterial** infections, inc. H pylori
- **Parasitic** infections
- **Viral** infections, inc. common cold & diarrhoea

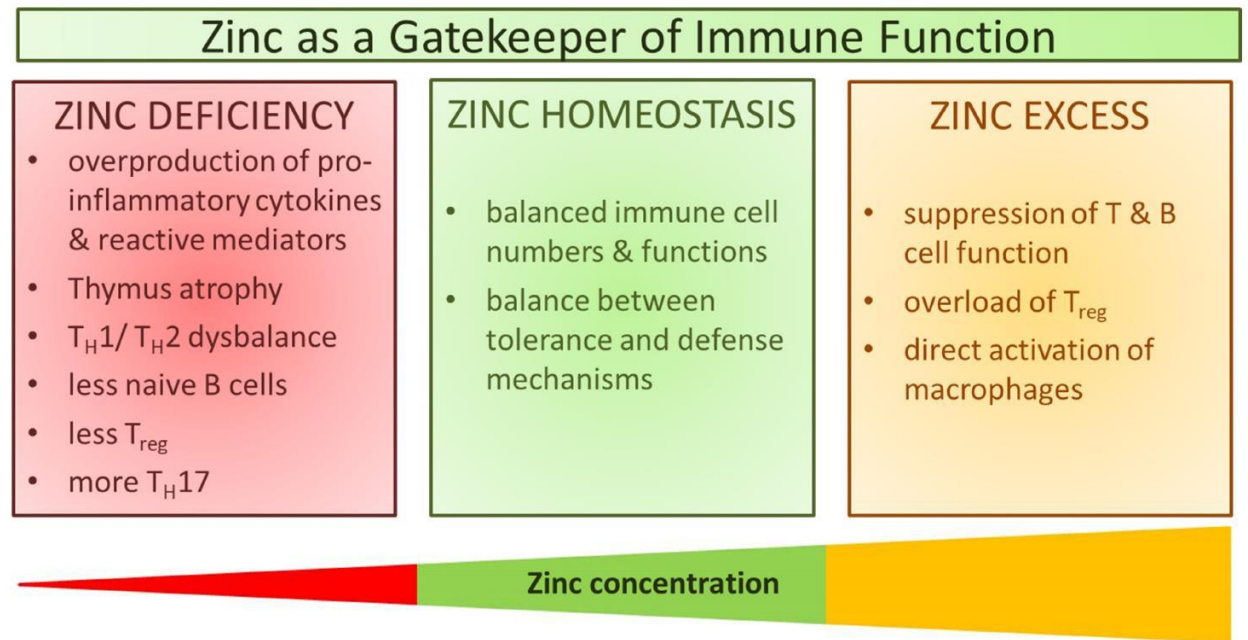
2013 Cochrane analysis: *16 trials, 13787 participants*

- Zinc (lozenges) reduced duration of cold if given within 24 hours of first symptoms
- **Study suggests dosage of 75mg Zinc per day during cold**

Singh M, Das RR. Zinc for the common cold. Cochrane Database Syst Rev. 2013;(6):CD001364. Published 2013 Jun 18

Avoid excess Zinc (long term)

- Zinc at daily doses of **50-180 mg** for 1-2 weeks is not associated with serious side effects
- *Long-term* consumption of zinc **> 40 mg/day** can result in:
 - Copper deficiency
 - Suppression of lymphocyte function



Wessels I, Maywald M, Rink L. Zinc as a Gatekeeper of Immune Function. *Nutrients*. 2017; 9(12):1286. <https://doi.org/10.3390/nu9121286>

Science M, et al Zinc for the treatment of the common cold: a systematic review and meta-analysis of randomized controlled trials. *CMAJ*. 2012;184(10):E551-561.

Food and Nutrition Board, Institute of Medicine. Zinc. Dietary reference intakes for vitamin A, vitamin K, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium, and zinc. Washington, D.C.: National Academy Press; 2001:442-501

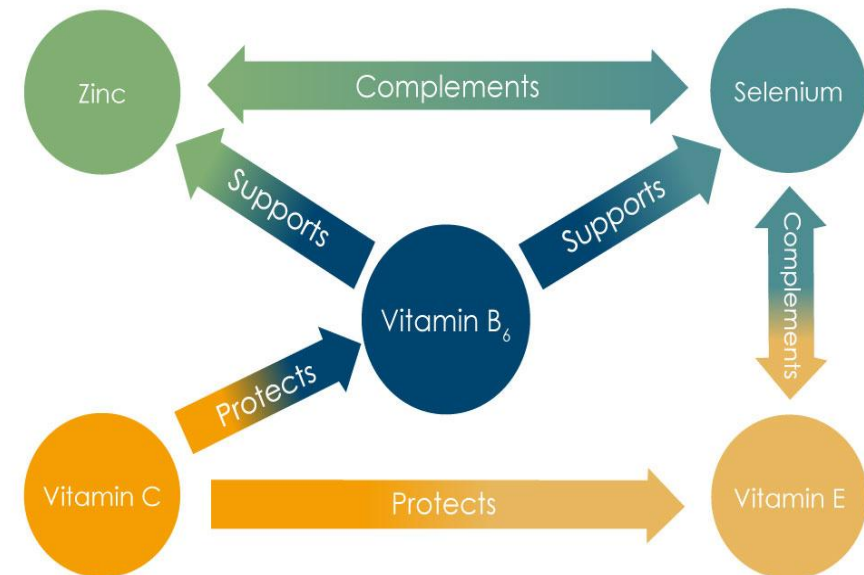
Pharma Nord formulation

Bio-Selenium + Zinc

Powerful combination of antioxidants optimized from over 30 years of research

- Each tablet contains: selenium 100mcg, zinc 15mg, vit B6 2mg, vit C 90mg & vit E 15mg
- Nutrients work synergistically to support normal functioning of immune system, whilst helping to protect body cells from oxidative damage
- Manufactured under Danish pharmaceutical control

Dosage: 1 or 2 tablets per day, with food



Bio-InfluZinc + C

Pastilles

- Contains natural acerola cherry extract, a rich source of vit C
- Soothing sugar-free pastilles for nose & throat
- Manufactured under Danish pharmaceutical control
- 2.5 mg zinc & 15mg vit C per pastille

Dosage: 3-6 pastilles a day



Key Selenoproteins in immunity



Glutathione Peroxidases

- Protects cell membranes & DNA from oxidative damage
- Helps to prevent excessive inflammation



Selenoprotein P

- Helps to prevent excessive inflammation
- SeP is found to be low in infections including COVID-19 cases



Thioredoxin reductase

- Ensures proper replication of immune cells
- Regenerates antioxidants (including Q10)

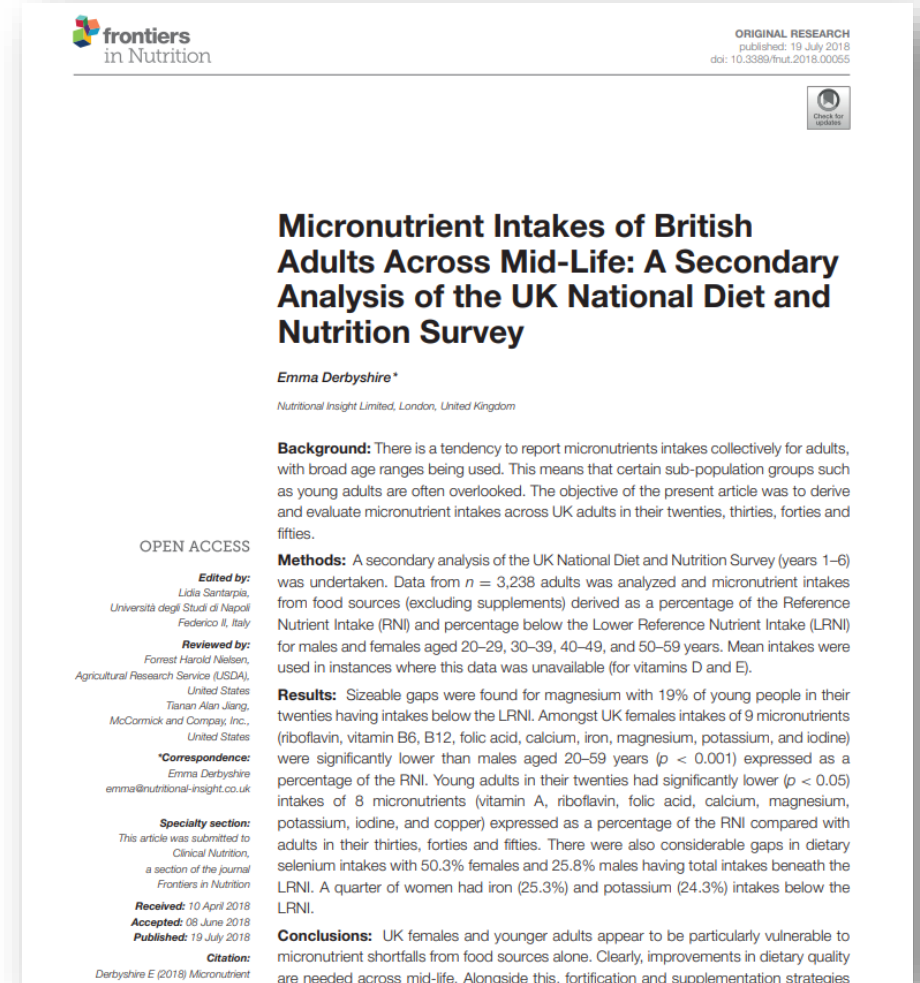
Selenium intakes in the UK are too low

46% Females

26% of Males

in the UK don't achieve the LRNI for selenium

LRNI (Lower Reference Nutrient Intake) is minimum level needed to avoid short latency health issues



What symptoms might be related to low selenium?

- Weakened **immune system**
- Depressed mood, anxiety & confusion
- Muscle weakness
- Infertility
- Fatigue
- Weakened hair / hair loss



Selenium-yeast **SelenoPrecise**

- SelenoPrecise demonstrates **88.7% absorption**
 - Regular (inorganic) selenium supplements demonstrate lower bioavailability (around 50%)
- EFSA approved for bioavailability & safety
- Contains >30 organically bound Se compounds
- Used in >40 published scientific trials
- Manufactured under pharmaceutical control

Dose: 1 tablet per day containing 200ug Se



Vitamin A in Immunity

- Supports *development* of immune system
- Supports *function* of both innate & adaptive immunity
- *Maintains* body barriers
 - eg: supports immune tolerance by supporting gut barrier function, keeps the mucousal lining of the nose healthy
- *Regulates* some genes involved in immune function



Signs of possible vit A deficiency

Early-stage deficiency:

- Dry, easily irritated eyes, dry hair, dry mouth, dry/itchy/bumpy skin, broken nails, **more frequent infections**
- Changes in vision, especially not being able to see as well at night

If vit A deficiency is severe serious problems can develop, including permanent blindness

Some other symptoms of vit A deficiency include:

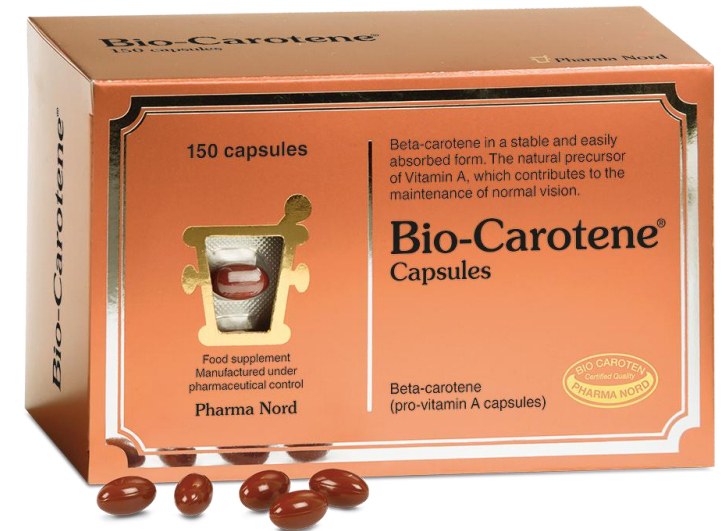
- Loss of tears
- Sores in the eyes
- Fatigue
- Dry cracked lips, mouth sores
- Diarrhoea
- Bladder infections
- Vaginal infections
- Upper/lower respiratory infections
- Poor & delayed wound healing

Pharma Nord Formulation

Bio-Carotene

- Supported by scientific evidence in >90 clinical studies
- 9mg beta carotene per capsule (equivalent to 4 large carrots)
- Each capsule contains 1.5mg (1,500 µg) vit A equivalent
- Manufactured in oil matrix for stability & bioavailability
- Designed to withstand stomach acidity to ensure optimum absorption in the small intestine

Dosage: 1 capsule per day, directly after food



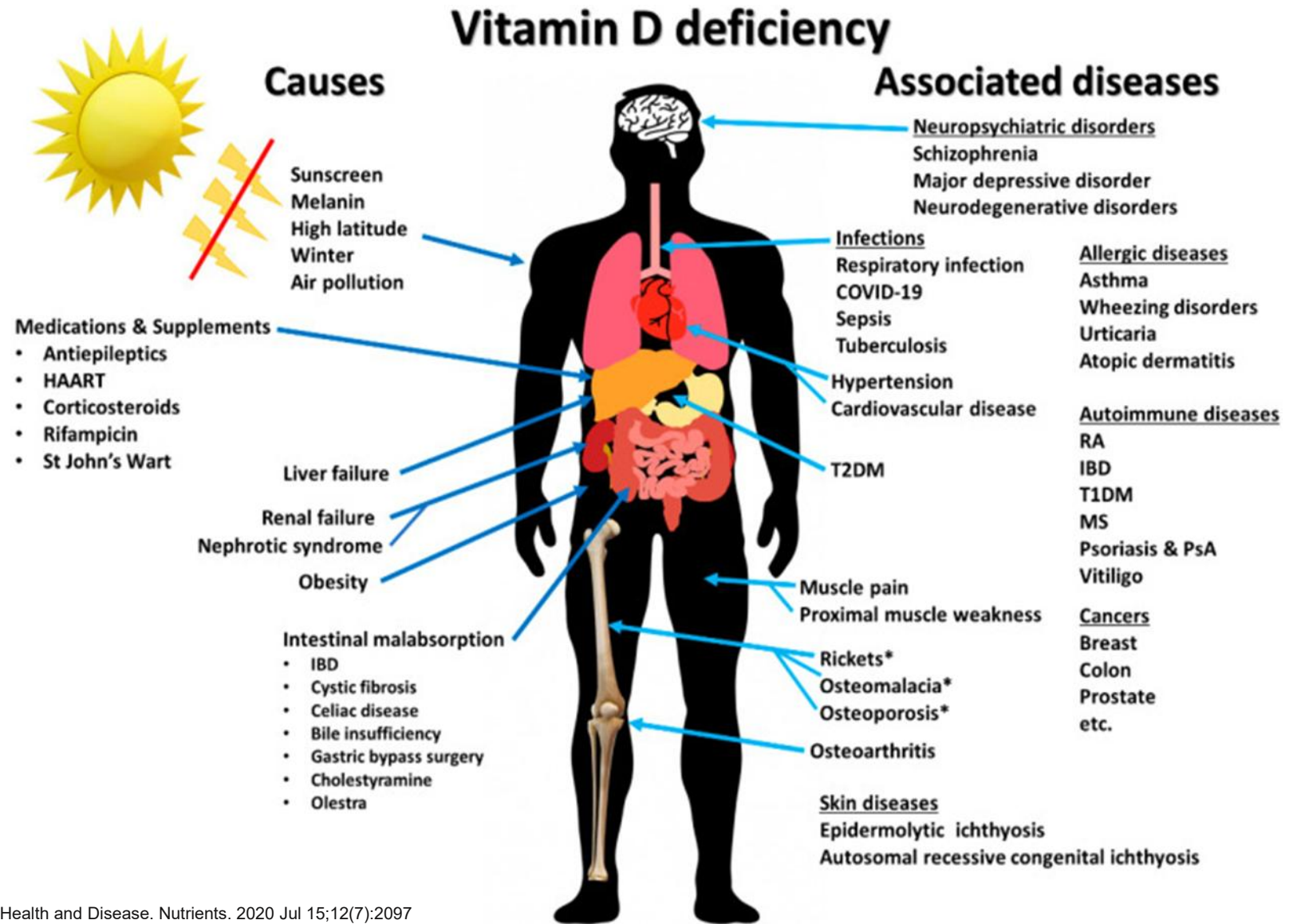
Vitamin D

- Has a modulating (balancing) effect on the immune system
- Plays a crucial role in enhancing the body's barriers, helping to protect against bacterial & viral infections



Vit D Deficiency

- Associated with common infections such as colds, flu, pneumonia, COVID-19
- Found in majority of ICU patients worldwide (children & adults)



Charoenngam N, Holick MF. Immunologic Effects of Vitamin D on Human Health and Disease. *Nutrients*. 2020 Jul 15;12(7):2097
 Martineau AR, Jolliffe DA, Hooper RL, et al. Vitamin D supplementation to prevent acute respiratory tract infections: systematic review and meta-analysis of individual participant data. *BMJ*. 2017;356:i6583. Published 2017 Feb 15. doi:10.1136/bmj.i6583
 Hill A, Starchl C, Dresen E, Stoppe C, Amrein K. An update of the effects of vitamins D and C in critical illness. *Front Med (Lausanne)*.

Vit D conversion

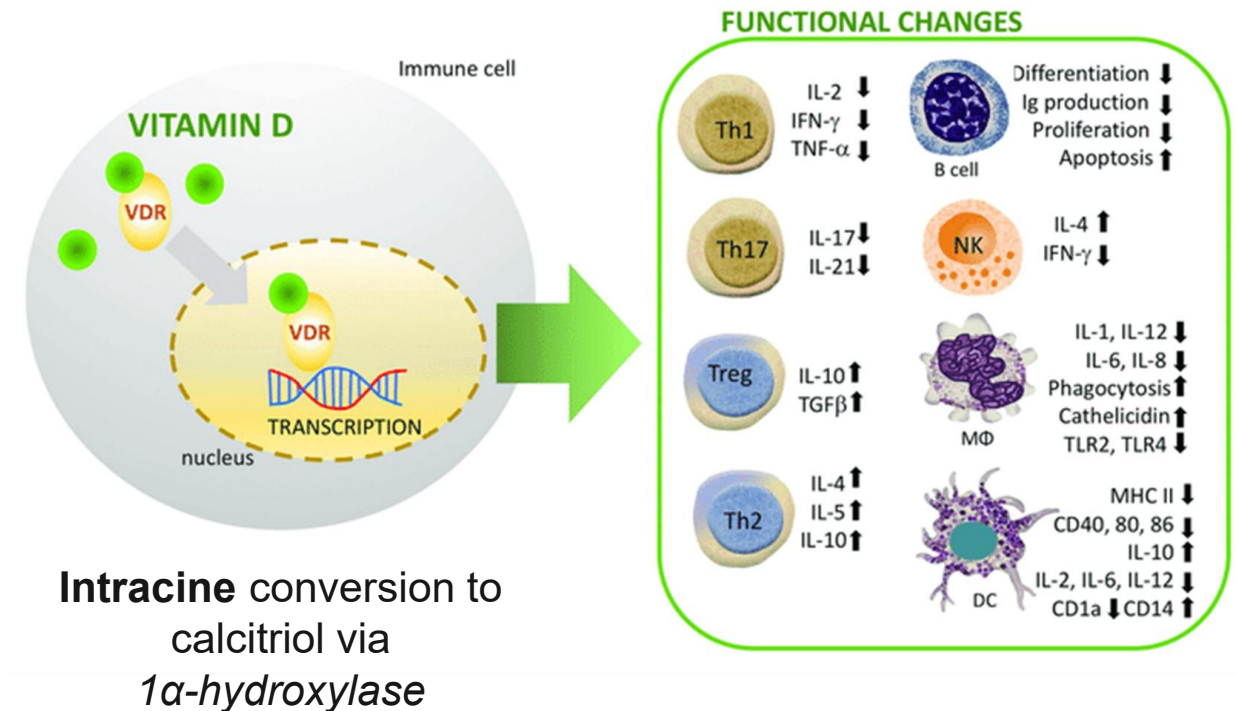
In 1980s, vit D receptors (VDRs) were found on immune cells

- Immune cells can convert vit D to the active form **directly**, promoting positive changes in the way they function

Example:

Improved 'antigen presenting'

- hence faster alerting of acquired immune system



Vitamin D: Government advice

Everyone in the UK should consider taking daily vit D supplement of 10 mcg (400 IU) **during autumn & winter** as a preventative measure

- Those at risk of deficiency should take this dose all year round: people who
 - are not often outdoors eg. frail, housebound, in a care home
 - wear clothes that cover up most of their skin when outdoors
 - have dark skin



Pharma Nord formulation

D-Pearls®

A high quality, evidence-driven vitamin D3

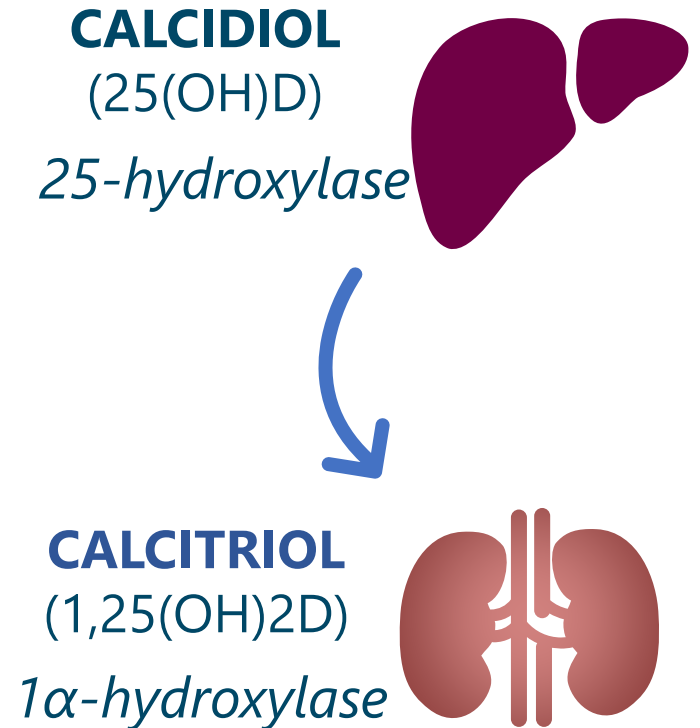
- Small, easy to swallow 'pearl' capsules
- Dissolved in cold-pressed olive oil to enhance absorption
- Available in a wide range of strengths (800 IU – 5000 IU), including the plant-based D-Pearls Green (1,520IU) derived from algae
- Documented bioavailability, proven in human clinical trials
- Manufactured under Danish pharmaceutical control



Dosage: ideally led by a vitamin D test

Vitamin D metabolism

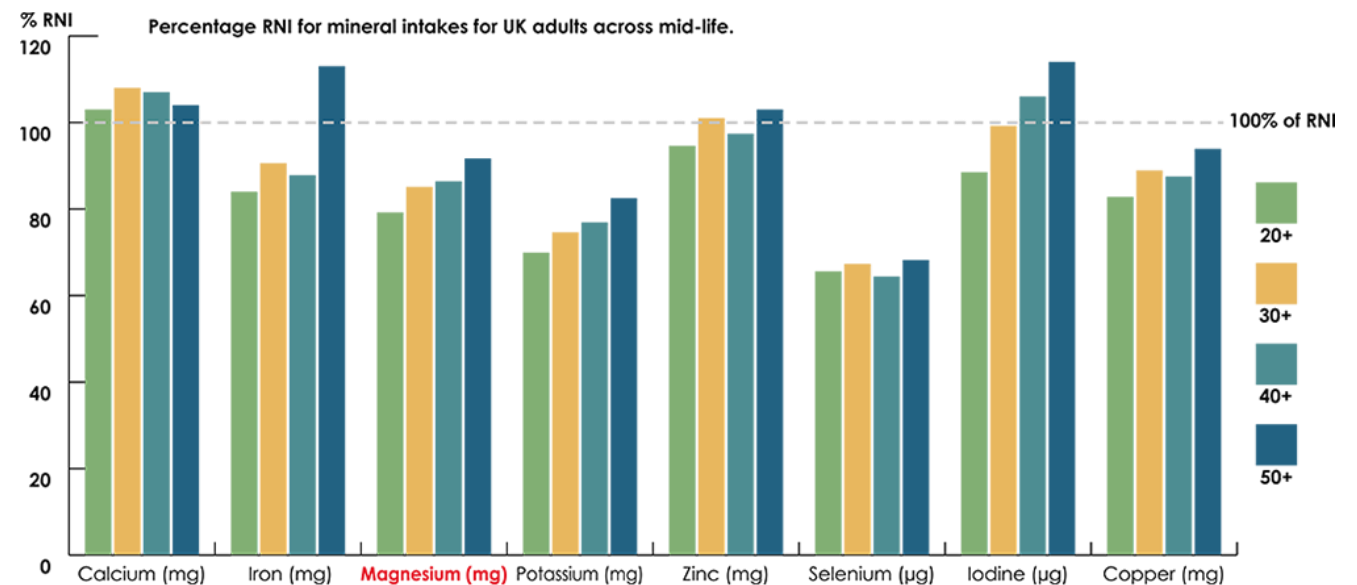
- Vit D is stored in the liver as **calcidiol**
 - Conversion to calcidiol requires a **magnesium** dependant enzyme called *25-hydroxylase*
- Calcidiol is then used to produce **calcitriol**
 - Also known as '*biologically active vitamin D*'
 - Conversion requires another **magnesium** dependant enzyme called *1 α -hydroxylase*
 - This process occurs primarily in the **kidney**



Dietary magnesium intakes are low

According to the UK National Diet and Nutrition Survey:

- “A substantial proportion of adults aged 19 years and over had intakes below the lower reference nutrient intake (LRNI) for magnesium”
- Magnesium intakes have decreased due to changes in dietary habits & soil quality



Graph:

Dietary mineral intakes across UK adults across mid-life 2019

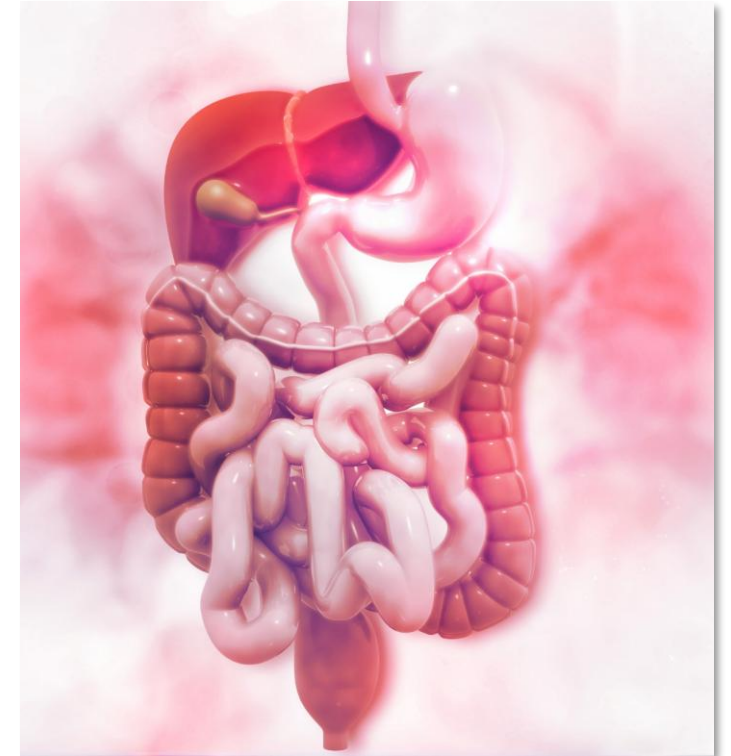
Risk factors for low magnesium include:

Some medications

- including some antibiotics, proton pump inhibitors, corticosteroids, diuretics, antivirals & chemotherapy

Digestive conditions

- related to malabsorption, (eg. Crohn's disease) or long-term vomiting / diarrhoea
- Low magnesium is often found in people with **type 2 diabetes**



Pharma Nord Formulation **Bio-Magnesium**

- Contains a complex of 3 forms of Mg, resulting in synergistic bioavailability
- Each tablet contains 200mg of pure Mg
- Forms a suspension in water
- Manufactured under Danish pharmaceutical control

Dosage: 1 or 2 tablets per day, with food



EFSA approved health claims B vitamins

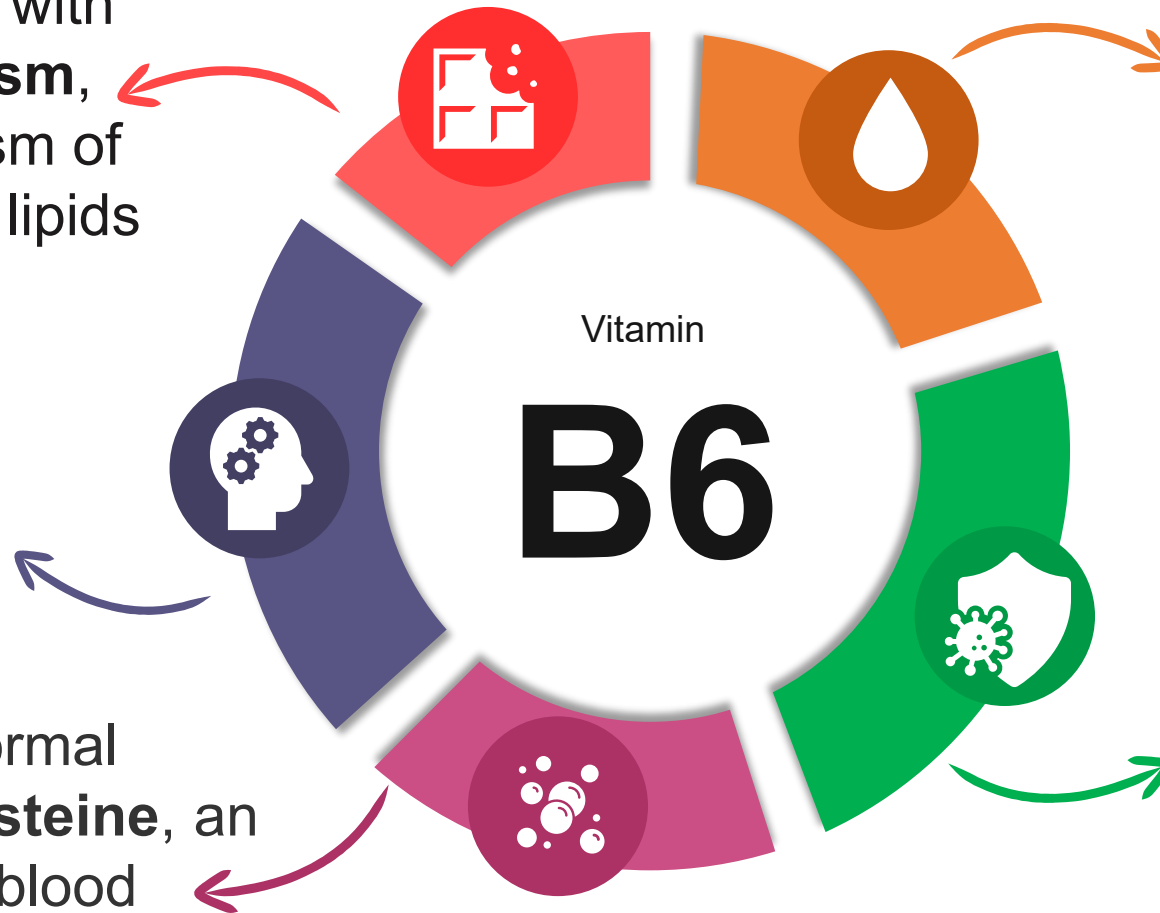
Health Claim	B Vitamin(s)
Normal energy-yielding metabolism	B1, B2, B3, B5, B6, Biotin, B12
Normal functioning of the nervous system	B1, B2, B3, B6, Biotin, B12
Normal psychological function	B1, B3, B6, Biotin, B12
Reduction of tiredness and fatigue	B2, B3, B5, B6, B12, Folic Acid
Contributes to normal homocysteine metabolism	B6, Folic Acid, B12
Supports normal red blood cell formation	B2, B6, B12, Folic Acid
Contributes to normal immune system function	B6, B12, Folic Acid
Helps maintain normal skin	B2, B3, Biotin
Supports normal hair maintenance	Biotin
Contributes to normal vision	B2
Helps maintain normal mucous membranes	B2, B3
Supports normal iron metabolism	B2
Helps maintain normal bones	B6
Supports normal teeth	B6

Vitamin B6 performs a wide variety of functions in the body, with involvement in > 100 enzyme reactions

Mostly concerned with **protein metabolism**, but also metabolism of carbs (glucose) & lipids

Plays a role in **cognitive** development

Helps maintain normal levels of **homocysteine**, an amino acid in the blood



Supports **haemoglobin** formation

Supports **immune function** in a variety of ways including promoting production of lymphocytes (type of white blood cell) & the signalling molecule IL-2

Bio-B-Complex

- Contains all eight B vitamins
- Suitable for vegetarians & vegans
- Manufactured under Danish pharmaceutical control

Dosage: One-a-day formula

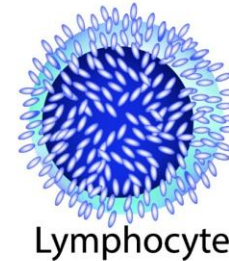
One Tablet Contains:

Niacin	50 mg
Pantothenic acid	25 mg
Vitamin B6	10 mg
Vitamin B2	8mg
Vitamin B1	7mg
Folic Acid	400 ug
Biotin	300 ug
Vitamin B12	5 ug

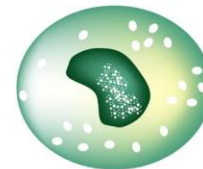


How does B12 contribute to immune function?

- Supports both **production & function of white blood cells**
 - White blood cells co-ordinate to defend the body from pathogens, including bacteria & viruses
- Acts as co-factor to produce ***nucleotides*** that stimulate the immune system



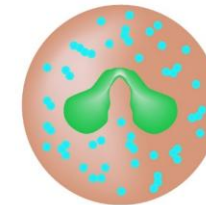
Lymphocyte



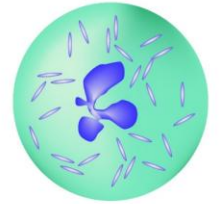
Monocyte



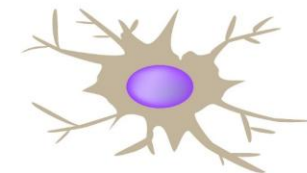
Leukocyte



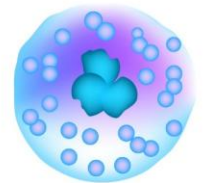
Eosinophil



Neutrophil



Dendritic cell



Basophil



Signs & Symptoms of B12 or Folate deficiency

- **Extreme fatigue**
- Psychological problems, which can range from mild depression or anxiety to confusion & dementia
- Problems with memory, understanding & judgement
- “Pins & needles” (paraesthesia)
- Sore & red tongue (glossitis)
- Mouth ulcers
- Muscle weakness
- Disturbed vision

NHS (2025) <https://www.nhs.uk/conditions/vitamin-b12-or-folate-deficiency-anaemia/>

Causes of B12 or Folate anaemia



Lack of vitamins

eg. diets low in meat/fish/eggs (contain B12) and/or vegetables (contain folate)

eg. vegan diet, restrictive diet or generally poor diet for a long time



Certain medicines

can affect absorption of B12 / folate

eg. anticonvulsants, metformin & proton pump inhibitors (PPIs)



Gastrointestinal issues or gastric surgery

if the stomach or gut lining is damaged, it may be harder to absorb nutrients

e.g. pernicious anaemia: immune system attacks healthy cells in stomach, preventing body from absorbing vit B12 from food



B12 forms

All forms of B12 are initially absorbed in similar ways

- The **natural forms** have better tissue retention & less urinary excretion than synthetic cyanocobalamin
 - resulting in better overall bioavailability
- **Methylcobalamin** is most popular:
 - robust documentation
 - nature identical form

1. Cyanocobalamin

A synthetic form, inexpensive and commonly used in simple supplements

2. Methylcobalamin

Naturally occurring, found in foods and within the body

3. Adenosylcobalamin

Naturally occurring, unstable, rarely used as a supplement

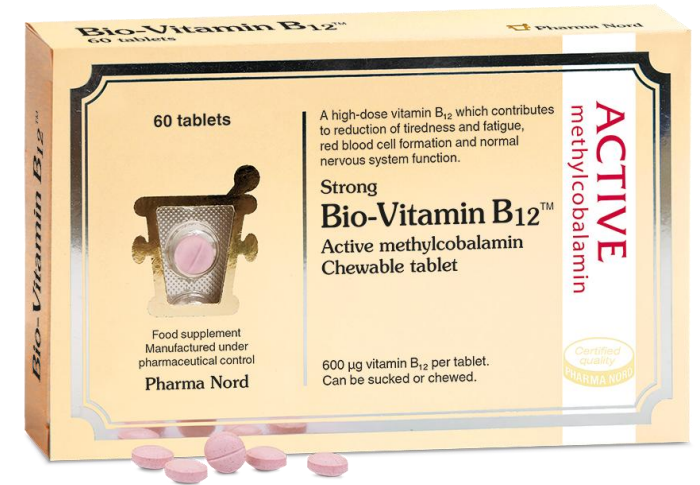
4. Hydroxycobalamin

Naturally occurring, synthetic form used in B12 injections

Bio-Vitamin B12

- **Methylcobalamin:** naturally occurring form of B12
- **Bioavailable**, peppermint flavour lozenges / chewable tablets each containing 600mcg Vit B12
- Suitable for **vegetarians & vegans**
- Manufactured under Danish pharmaceutical control

Dosage: 1 lozenge per day, dissolved in the mouth or chewed



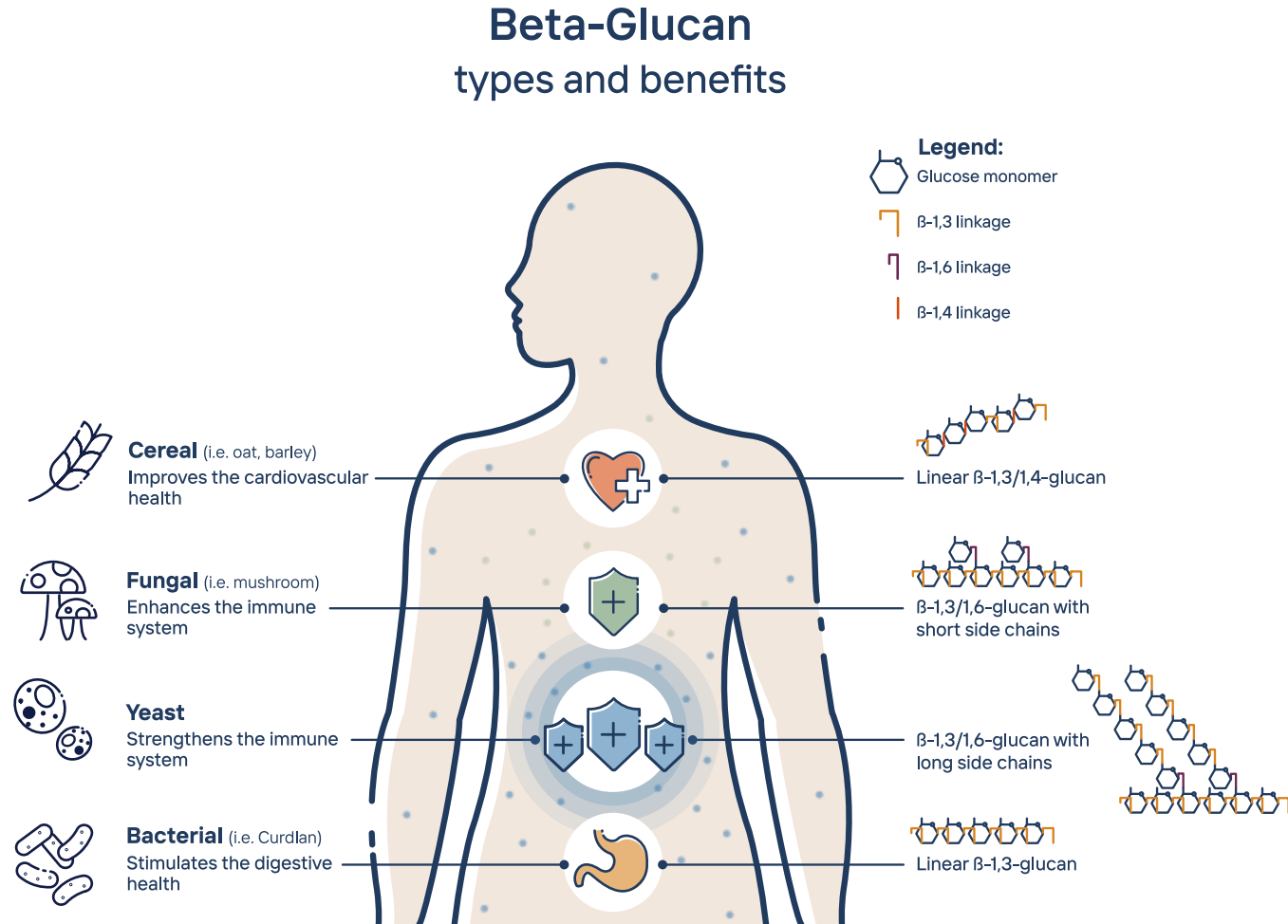
Beta-Glucans

To help *prevent* infections



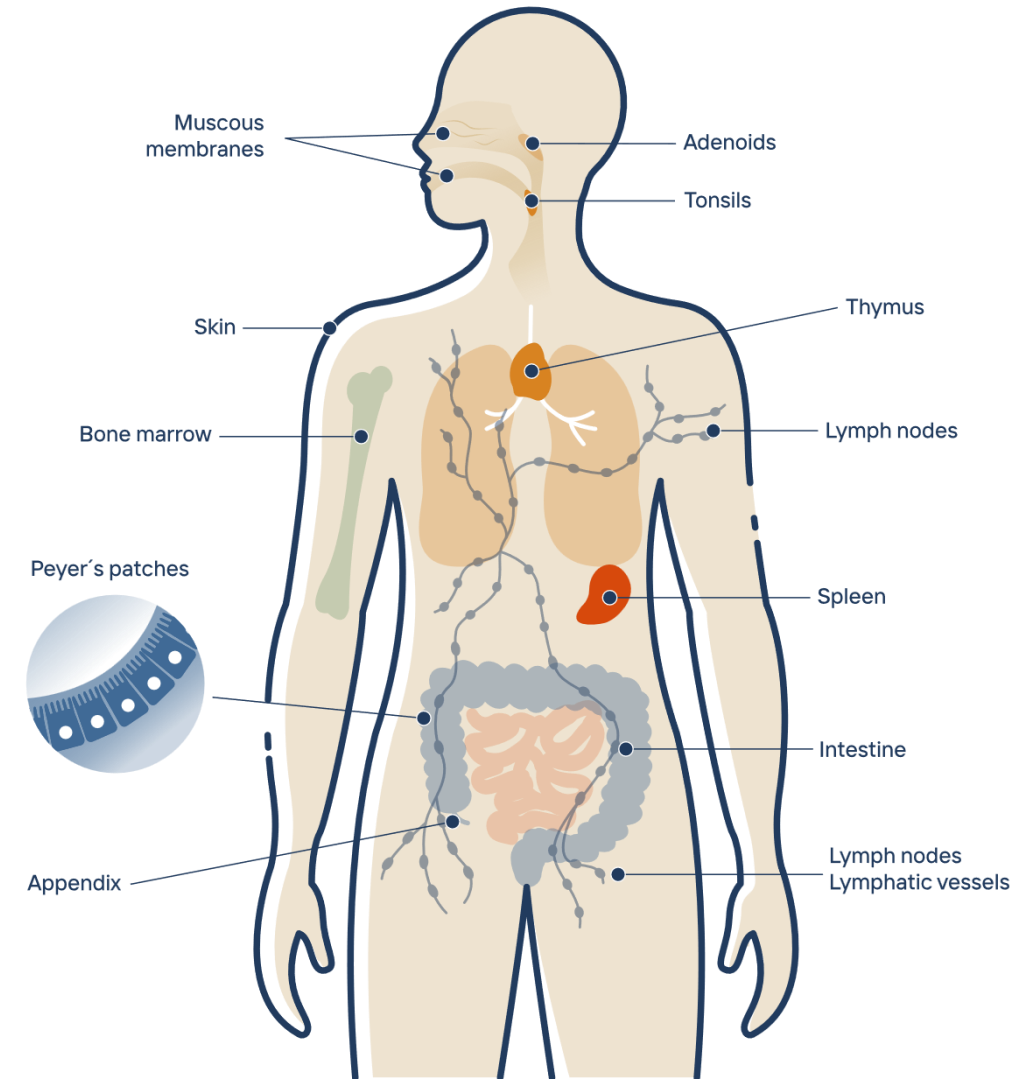
Beta-Glucans

- Insoluble form of carbohydrate obtained from cell walls of yeasts, oats, cereals, fungi, lichens, bacteria & marine algae
- Different sources have different molecular structures, hence a different effect on human body
- Yeast beta-glucan is the most thoroughly investigated



How Beta-Glucans support immunity

- Provide fermentable prebiotic fibres to feed the friendly bacteria in large intestine, producing short-chain fatty acids (SCFA) & increasing faecal bulk
- Identified by immune cells in the gut, to prime the innate immune system **prior to exposure to an antigen**
- White blood cells then respond more quickly, reducing the effect of bacteria, viruses, fungi & parasites



Garlic

Clinical studies show that garlic may help *prevent* viral infections in humans, including “high quality evidence” for preventing influenza

- enhances ability of innate immune system to kill invading pathogens

Yuan Y, Wang RT, Xia J, Cao HJ. Interventions for preventing influenza: An overview of Cochrane systematic reviews and a Bayesian network meta-analysis. *J Integr Med.* 2021;19(6):503-514.
Rouf R, Uddin SJ, Sarker DK, et al. Antiviral potential of garlic (*Allium sativum*) and its organosulfur compounds: A systematic update of pre-clinical and clinical data. *Trends Food Sci Technol.* 2020;104:219-234.
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Alliin & Allicin

Garlic contains > 30 sulphur containing compounds

- **Alliin** = most abundant sulphur compound in fresh & dry garlic (10–30 mg/g)
 - Alliin quickly converts into **allicin** when we chop, mince, crush or chew fresh garlic
- **Allicin** = key compound responsible for garlic's antiviral, immunomodulatory, anti-inflammatory & antioxidant properties



Garlic: evidence of antibiotic activity

In vitro studies show garlic has antibiotic activity against many bacteria, even when resistant to conventionally used antibiotics

These include:

- E. coli
- Staphylococcus aureus (staph)
- Enterobacter spp.
- Salmonella typhimurium



*Effect thought to be due to inhibitory effect of **allicin** on various enzymatic systems*

Bio-Garlic

- Each odourless tablet contains 300mg dried garlic powder, equivalent to 4.7 mg of active compound (alliin) in enterically coated form
- Delayed dissolution means that alliin & alliinase content is not broken down or inactivated in the stomach
 - Tablets fully dissolve in intestine where allinase activates & converts the alliin to allicin, significantly reducing risk of garlic breath

Dosage: 1 tablet per day, with food



Our next Webinar!

Nutrition for Eye Health: Mechanisms, Triggers & Clinical Interventions

- Tuesday **24th March 2026**
- 10:00 am – 11:00 am GMT
- Free CPD-certified webinar

Sign-up at pharmanord.co.uk/webinars



Speaker

Sue Camp

Registered Nutritional
Therapist and
Certified Functional Medicine
Practitioner

Thank you!

Please email
pro@pharmanord.com
For any queries!



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