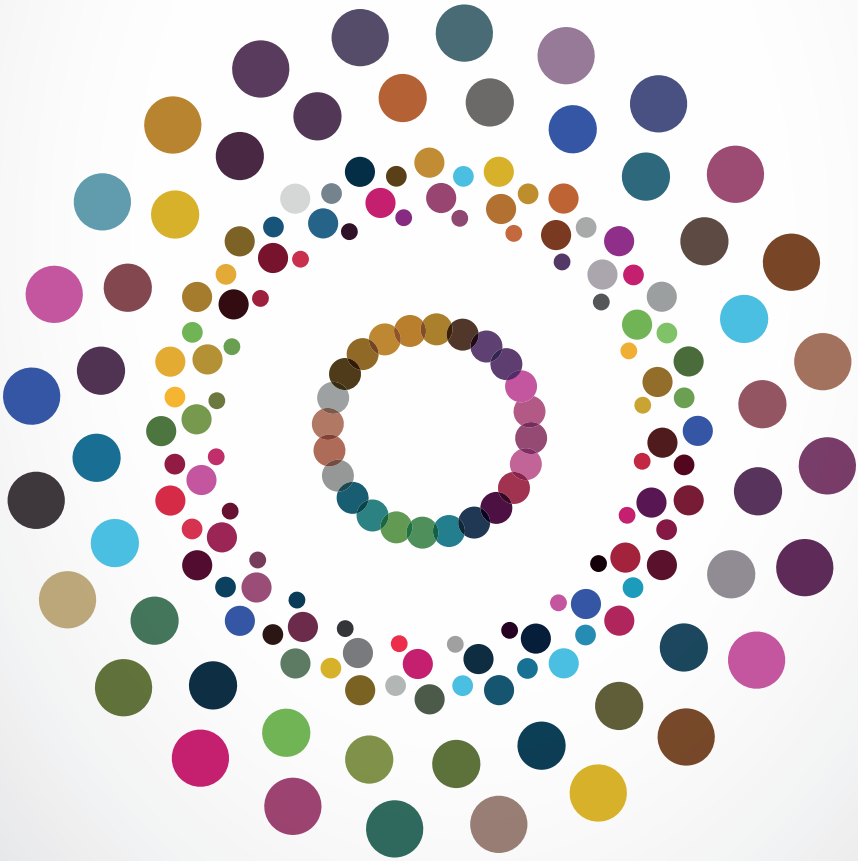
NUMBER 2

CYTOPLAN

THE HEALTH INFORMATION SERIES



CANDIDA

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Candida

There are more micro-organisms in the gastrointestinal tract than there are cells in the whole of the human body – a staggering fact and one that highlights the importance of making sure that there is a healthy balance between the 'friendly' and 'undesirable' micro-organisms that populate this area of the body. Opportunistic pathogens, such as *Candida*, may in normal circumstances be a harmless part of our intestinal flora. However, gastrointestinal and other symptoms arise when overgrowth of this fungus occurs, usually as a result of stress, antibiotics, poor diet or other factors.

What is *Candida*?

The term '*Candida*' usually refers to the species *Candida albicans*, a yeast-like fungus and single-celled organism. In the gut, if the opportunity arises, *Candida albicans* can rapidly multiply and outnumber the desirable native flora, adopting its hyphal form and growing long branches which invade the cells of the intestinal lining.

The resultant overgrowth and toxins it releases (including acetaldehyde) can irritate and damage the cells of the gut wall, creating inflammation and triggering increased intestinal permeability (or leaky gut), and allowing undigested food molecules and other antigens to pass into the bloodstream. Leaky gut has been linked to various health concerns, including allergic reactions and auto-immune conditions.

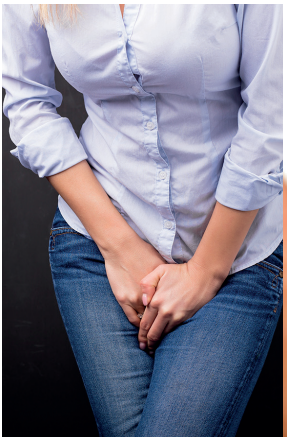
Candida albicans is also responsible for the class of infections described as 'thrush', involving the skin or mucous membrane linings of the mouth, throat, vagina or urethra.

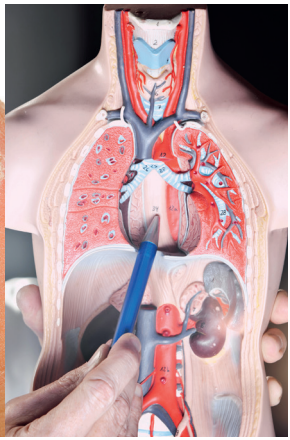
Common forms of *Candida*:

- **Thrush** - this is the common name for a mouth or genito-urinary tract infection caused by the *Candida albicans* yeast. It affects moist surfaces around the lips, inside the cheeks, on the tongue and palate or in and around the vagina. Thrush is common in people with diseases such as cancer and AIDS, which both suppress the immune system. Thrush can develop in people with normal immune systems, too, particularly in people with diabetes or long-lasting irritation from dentures

- ***Cutaneous (skin) candidiasis*** - *Candida* can cause skin infections, most commonly in areas of skin that receive little ventilation and are unusually moist. Some common sites include the 'nappy' area; the hands of people who routinely wear rubber gloves; the rim of skin at the base of the fingernail, especially for hands that are exposed to moisture; areas around the groin and in the crease of the buttocks; and the skin folds under large breasts

- **Oesophagitis** - *Candida* infections of the mouth can spread to the oesophagus, causing oesophagitis. This infection is most common in people with AIDS and people receiving chemotherapy for cancer





Those at risk of *Candida*

Candida overgrowth occurs when normal immune system defences are weakened by stress, illness or poor diet (for example, diets high in refined carbohydrates and sugars and low in essential micronutrients). Chronic stress is known to negatively impact the immune system and is frequently accompanied by poor diet; this combined with inadequate friendly bacteria provides *Candida* with the ideal environment in which to thrive.

Factors that can contribute to *Candida* overgrowth include:

- Eating a diet high in refined carbohydrates and sugar
- Consuming a lot of alcohol
- Living a high-stress lifestyle
- Taking antibiotics, as these reduce levels of friendly bacteria thus giving *Candida* an opportunity to take their place
- Taking certain prescription medications which may predispose to overgrowth. These include oral contraceptives, hormone replacement therapy, glucocorticoid therapy and proton pump inhibitors (PPIs)
- Hormonal changes, for example, as occur during pregnancy

Thrush is also more prevalent for those wearing synthetic undergarments, including tights. Recurrent infections may be linked to sexual partners, therefore ensuring partners are free of symptoms is essential to reduce the risk of reinfection.

Common signs and symptoms of *Candida* overgrowth

Candida albicans produces toxins, including acetaldehyde, which can result in a wide range of symptoms. The most commonly experienced are heavy bloating and alternating diarrhoea and constipation. Additional symptoms presented may include:

- Skin and nail fungal infections, such as athlete's foot or toenail fungus
- Feeling tired and worn down, or suffering from chronic fatigue or fibromyalgia
- Digestive issues such as acid reflux, bloating, nausea, diarrhoea and constipation
- Difficulty concentrating, poor memory, lack of focus, ADD, ADHD and brain fog
- Skin issues like eczema, psoriasis, hives and rashes
- Irritability, mood swings, anxiety or depression
- Vaginal infections or urinary tract infections (e.g. recurrent cystitis)
- Severe seasonal allergies or itchy ears
- Strong sugar and refined carbohydrate cravings

Candida albicans has also been linked to the development of autoimmune diseases such as coeliac disease, Hashimoto's thyroiditis, rheumatoid arthritis, ulcerative colitis, lupus, psoriasis, scleroderma and multiple sclerosis.

Diagnosis

With such wide-ranging symptoms, it is easy to see why diagnosis (in particular, self-diagnosis) is difficult. Sometimes doctors will order both a stool test and an antibodies test to obtain a fuller picture of what is happening in both the digestive and immune systems. Referring to the GP is always recommended to ensure other health conditions are not overlooked.

Stool tests:

As well as via the GP, testing for *Candida* is available in private laboratories. The more comprehensive tests available also include testing for parasitic infection, a very common issue which can produce very similar symptoms. The most frequent source of parasitic infections includes pets, farm animals and foreign travel.

Blood tests:

The immune system produces IgG, IgA and IgM antibodies in response to a *Candida* infection. The levels of each of these antibodies can signify that a *Candida* overgrowth is currently present, or has been present in the recent past. This is the test most likely to be ordered by medical professionals. However, it tends to be less reliable than a stool analysis.

Urine tests:

Organic acid tests can identify imbalances in the gut and likely pathogenic organisms. For example, where yeasts are present levels of tartaric acid, citramalic acid and arabinose may be raised. These tests are available privately through a nutritional therapy practitioner.

Anti-*Candida* Diet

Your client has reduced sugar, sugary foods, fungus-related foods, fermented foods and many more foods from their diet, so why has this elimination diet not eradicated these pervasive fungi?

The traditional anti-*Candida* diet with no sugar, fruit or yeast may be difficult for people to continue long-term. *Candida* fungi are capable of withstanding long periods of reduced food availability, and in response to this diet, may reduce in number and become less active. Upon reintroducing the sugars and refined carbohydrates the fungi will re-establish, resulting in a return of symptoms. Those continuing to follow strict exclusion diets may be surprised by the adaptability of the *Candida* fungi to switch to protein digestion as its food source when carbohydrates and sugars have been eliminated. When this stage is reached it may be impossible to eradicate the overgrowth of *Candida* safely by dietary means alone.

For a number of reasons, the traditional anti-*Candida* diet may be an outdated approach and the focus now is on supporting the immune system and rebalancing the gut flora. Certainly, eating sugary foods (including fruit juice) is a bad idea as it will suppress the immune system (as well as having many other negative health effects). Fruit, however, does not need to be totally excluded – one to two portions per day of low sugar fruits such as berries, plums, apples or pears can be eaten.

The diet should be rich in natural fibre and complex carbohydrates, as found in vegetables, low-sugar fruits, nuts, seeds with modest amount of beans. Reducing the dietary intake of refined sugars and carbohydrates is beneficial for the immune system. Preservatives, additives, processed and highly refined foods should be avoided as much as possible.

Dairy products provide a high level of lactose (milk sugar), so reducing intake whilst eradicating *Candida* can be helpful. Fermented and yeast containing foods are frequently removed from an anti-*Candida* diet. Whilst reducing bread and processed food is a healthy option, it should be remembered that yeasts are not used as food by *Candida albicans* and will not increase *Candida* colonisation. Fermented and yeast containing foods, therefore, should not be a problem for *Candida* sufferers: the confusion often arises where food intolerance is also present and the individual has become sensitised to yeast – and as a result reacts to yeasts and anything with a similar cell structure. This is a common situation when the gut wall has become compromised.

5R Programme -
Remove, Replace, Reinoculate, Repair and Rebalance
(developed by Dr Jeffrey Bland)

Functional medicine practitioners use a 5-step plan to manage *Candida* overgrowth and heal the gut. This programme involves identifying and removing dietary and lifestyle factors that may be damaging the gut, replacing missing factors and adding in gut healing nutrients for repair.

Identifying and understanding potential causative and maintaining factors is important for the successful resolution of *Candida* overgrowth. Consider factors discussed such as diet, lifestyle, predisposing health conditions and medications.

Candida eradication can result in some unpleasant symptoms created during dieback of the *Candida* fungus: we would therefore recommend that this is not undertaken during pregnancy, but instead forms part of the preconception healthy diet and lifestyle plans. Rapid eradication may not be appropriate for those with serious illness or recuperating: for those, we suggest a more gentle support programme is considered.

REMOVE

This refers to removing factors that may be contributing to poor gut health and imbalanced gut flora: all gluten containing foods, sugar, alcohol, conventional dairy products and any other known food sensitivities; stress; and non-steroidal anti-inflammatories (unless these have been prescribed by a medical practitioner).

Candida is part of the normal gut flora so it may not be possible to remove it totally; the aim is to reduce any overgrowth and rebalance the gut flora. Options include pharmaceutical drugs, but various natural nutrients are available with anecdotal and

historical usage. There are however no currently permitted health claims in relation to *Candida* reduction or eradication.

Foods, herbs and nutrients with anti-fungal properties

Caprylic Acid[1,2] 	Natural dietary fatty acid which assists in the maintenance of a normal intestinal micro-flora. Studies have indicated that dietary caprylic acid helps to inhibit the growth of *Candida albicans* and other opportunistic fungi in both the small and large intestines. Coconut oil contains caprylic acid. Choose extra virgin organic coconut oil. For cases of oral thrush it can be allowed to melt in the mouth and then swilled around and spat out. Eat some as well – coconut oil is nice added to smoothies or stirred into porridge once cooked.
Garlic[3,4] 	One of the best known foods associated with having anti-fungal properties with research that dates back to 1936 – including its ability to help with the removal of pathogens such as *Candida*. It should be consumed fresh, raw or as a good-quality supplement.
Oregano[5,6] 	A herb, which has been shown to possess a broad spectrum of anti-microbial activity, used to inhibit the growth of various food-spoiling fungi and yeast organisms, as well as demonstrating additional anti-fungal activity against non-pathogenic yeast.

Foods, herbs and nutrients with anti-fungal properties (continued)

Grapefruit Seed Extract[7,8] 	Often referred to as citricidal, has a long history as a cleansing agent. Research supports its use in combating a variety of common infectious agents, evidencing antibacterial activity against a number of gram-positive and negative organisms.
Green Tea Extract[9,10] 	A natural source of catechins, considered to provide anti-microbial properties against oral, intestinal and food-borne bacteria. Research points to green tea as a source of anti-fungal activity against *Candida* species.
Aloe Vera[11,12] 	Natural herb and spice mouthwashes can be used for oral thrush - aloe vera juice also provides an excellent healing and protective mouthwash and can be taken for gastro-intestinal support: Aloe Vera Inner Leaf Gel is the most appropriate.
Other foods and herbs 	Onions, bay, thyme, cloves and cinnamon have also demonstrated anti-fungal properties.

REPLACE

This refers to replacing factors that may be missing to support good digestive function (e.g. hydrochloric acid and digestive enzymes). It could also refer to replacing nutrients that are needed to support the immune system.

To support digestive function:

Hydrochloric acid (normally present in the stomach) assists in digestion, maintains a low pH and acts to destroy bacteria and some strains of ingested fungi. Low levels of hydrochloric acid (called hypochlorhydria) are frequently found in people who suffer from repeated *Candida* and bacterial infections. Correcting low stomach acid, if present, is an important part of any management programme. For those taking PPIs, with ulcers or gastritis, this will not be suitable and ensuring continual replenishment of native live bacteria is therefore essential.

Similarly, natural production of digestive enzymes may be compromised. Supporting adequate digestion of food will help with absorption and prevent undesirable gut flora such as *Candida* from using the food.

You might consider a hydrochloric acid supplement with digestive enzymes. Alternatively, one teaspoon of apple cider vinegar in a small amount of water can be taken with meals.

To support the immune system:

Supplement to ensure adequate levels of all essential micro-nutrients, including those for immune function. A well-balanced multivitamin and mineral is important for this, and in the short-term extra zinc, vitamin D and vitamin A, which are all important for immune function, may be warranted. For those who have a lowered immune function, additional support in the form of beta glucans may be helpful[13].

REINOCULATE

It is essential to rebalance the gut flora to prevent the repeated overgrowth of *Candida*. *Saccharomyces boulardii* is a micro-organism that is often used as part of anti-*Candida* protocols as it displaces pathogenic yeast species and secretes anti-fungals (capric and caprylic acid) and stimulates the immune system[14,15]. A multistrain live bacteria supplement can be used in addition.

Consumption of fermented foods, including sauerkraut, natural yoghurt and drinks (kefir, kombucha) containing live bacteria, will assist in maintaining a healthier digestive tract. Avoid any sweetened products. Replenishing the gastro-intestinal tract with a balanced variety of native live bacteria will provide greater support than the use of a single species of bacteria.

Eating foods rich in prebiotic fibre is also important – vegetables including onions, leeks, chicory, Jerusalem artichokes and dark leafy greens. Foods rich in polyphenols also encourage a healthy bacterial balance e.g. cacao, olive oil, coffee (fresh, organic) and tea.

REPAIR

To repair the gut, include healing foods and nutrients such as organic bone broth, L-glutamine[16], curcumin[17], essential fatty acids[18], vitamins A and D as well as live bacteria[19,20]. It is important this step is not overlooked – if the gut is not healed then (further) food sensitivities may develop and there may not be a full resolution of symptoms.

REBALANCE

This refers to considering other lifestyle factors and behaviours to change in the long-term to help maintain a healthy gut – so giving consideration to stress, sleep and physical activity as well as continuing with a healthy diet.

How long should be spent on each step and are the steps carried out in sequence?

This is a frequently asked question and really depends on the individual – certainly the Remove and Replace steps should be done together. For some people Reinoculate works well at the same time, for others it may be beneficial to go more slowly and wait for a few weeks before adding live bacteria supplements or significant quantities of prebiotic foods.

The repair phase can be started 4-6 weeks after starting the programme, so a guide would be:

Example: Gut Healing Protocol (for details of relevant products see pages 17-22)

Remove	**Weeks 1-8:** Anti-microbials for 6-8 weeks. Review after 8 weeks. Continue with other aspects of remove (i.e. sugar, processed foods etc)
Replace	**Weeks 1-8:** Hydrocholoric acid/digestive enzymes* supplement (i.e. alongside the anti-microbials). Review after 6-8 weeks **From week 1:** A multivitamin/mineral throughout the programme and continue afterwards **From week 1:** Immunovite - if immune system needs additional support. Review after 3 months. Can be used long-term at maintenance dose if needed.
Reinoculate	**Weeks 1-8:** Saccharomyces Boulardii **From week 9:** Multistrain live bacteria supplement (e.g. Acidophilus Plus) and continue with this long-term. Or alternate with Saccharomyces Boulardii (or both can also be used together)
Repair	**Weeks 4–12:** Use additional vitamins A* and D, omega-3 fatty acids, plus curcumin* and L-glutamine. Review after 8 weeks

**See contraindications on pages 18 and 21*

A note on Thrush

The presence of oral Candida, or thrush, can be treated topically. However, if the mouth (as the first section of the gastro-intestinal (GI) tract) is infected, it is highly probable that Candida is also present throughout the remainder of the GI tract.

Candida of the GI tract is considered a significant predisposing factor for vaginal thrush. Causative factors for vaginal thrush include those for GI Candida infections.

Prevention and maintaining the balance

Clearly not everyone is troubled by *Candida* overgrowth; and prevention is possible by maintaining good general health and a strong immune system, reducing stress where possible and eating a healthy diet high in fibre in order to encourage the growth of good bacteria.

Adequate stomach acid is important. Low levels of hydrochloric acid are frequently found in people who suffer from repeated *Candida* and bacterial infections. Correcting low levels of hydrochloric acid, if present, is an important part of any programme to reduce the risk of reoccurrence.

As with digestive health in general, the key to keeping *Candida albicans* in the 'minority' is by supporting the immune system and maintaining a healthy balance of friendly bacteria.

The problem with *Candida* overgrowth is that often when the treatment stops the infection reoccurs because the underlying causes, that is imbalanced gut flora and need for immune support, have not been addressed.

Conclusion

An effective *Candida* protocol should focus on cleaning up the diet, supporting the immune system and restoring a healthy gut flora balance.

The Cytoplan Practitioner Range to support the 5-R Programme

REMOVE

Anti-microbials

We have a range of anti-microbial products to support a healthy gut balance:

Caprylic Acid Plus (caprylic acid, garlic, oregano, grapefruit seed extract and green tea extract).
Other anti-microbials products: **Organic Garlic** and **Cytocleanse** (16 varieties of herbs specifically selected for their anti-microbial properties).

Aloe Vera

The inner leaf gel of Aloe Vera is a product which may well be beneficial to IBS symptoms of both constipation and diarrhoea. The inner leaf fillet contains higher levels of salicylates, and is used for its anti-inflammatory action, assisting with the healing of the gut[12]. Aloe Vera XL Inner Leaf Gel is the most suitable for digestive support. This product is low in preservatives.

REPLACE

Hydrochloric acid and digestive enzymes

It is essential that digestive function is optimal. As discussed, hydrochloric acid levels may be low (hypochlorhydria). Supplements providing hydrochloric acid in the form of betaine are available. Pancreatic enzymes released into the duodenum during digestion may also be inadequate, increasing digestive symptoms. Cytoplan's **Cyto-Zyme** combines betaine with plant based digestive enzymes to support digestion of protein, fat, fibre and carbohydrates.

Contraindications: hydrochloric acid and digestive enzyme supplements would be contraindicated for those with a history of peptic ulcers, gastritis and hiatus hernia and may not be appropriate for those taking prescribed proton pump inhibitors.

Betaine & Pepsin

A supplement with higher levels of hydrochloric acid along with the protein digesting enzyme pepsin. Not suitable for people with ulcers, gastritis or colitis.

Bromelain

A protein digesting enzyme from pineapple. May be suitable for people with mild gastritis. A gentler alternative.

Multivitamins and minerals

CoQ10 Multi & Foundation Formula 1

Other Products: **Wholefood Multi**, **Foundation Formula 2**, **Little People** and **Cyto Gold**.

Immunovite

Beta-glucans and additional nutrients (zinc, selenium, vitamin C) for immune support.

REINOCULATE

Live bacteria supplements

Acidophilus Plus

9 strains with activity throughout the whole GI tract. Small capsules. Most suited to people under 40 and ideal for long term use.

Fos-A-Dophilus

6 strains, capsules. Ideal for those over 40. High in *Bifidobacteria* found in the large intestine. Levels of *Bifidobacteria* decrease with age. Suitable for daily long term use.

Cytobiotic Active

Powder formula containing 8 strains. Ideal for all ages, from age 1.

Saccharomyces Boulardii

Friendly yeast. This yeast species is often used when travelling, for antibiotic-associated diarrhoea and for *Candida* infections. It can be used alone or in conjunction with the above products.

Vitamin A

Small tablet providing 5000iu retinol. Vitamin A is important for repair and maintenance of mucosal surfaces. It also has an important role in the immune system. Pregnant women or women planning a pregnancy need to be cautious with Vitamin A intake and should discuss any supplements with their medical practitioner. Vitamin A should not be taken long-term by heavy smokers or those who have ever smoked heavily.

Vitamin D

Adequate levels are important for good gut health and repair and low levels are linked to increased inflammation and many health issues. Levels can be low in the UK population so taking a multivitamin and mineral with good levels is recommended. Additional may be needed for a period of time to boost low levels especially during the winter months. Vitamin D is available from sun exposure in the UK between the months of April to October, 10am to 2pm on sunny days (avoid allowing skin to redden). Dietary sources include eggs, butter and oily fish but diet alone will not provide sufficient vitamin D.

Omega 3 fatty acids

We have a range of pure, clean oils – fish oils, krill oil, vegan DHA/EPA (from an algal source), flaxseed oil.

Organic Turmeric Plus

Organic Turmeric Plus – a phytonutrient herbal complex containing turmeric, cat's claw and gotu kola. This formula has been developed to support gastrointestinal integrity and repair. Due to its beneficial actions, curcumin is frequently used as part of gut healing protocols. In this supplement it has not been complexed with a component to increase its absorption so will largely remain and have positive action in the gut. Gotu kola has been included for its potential to assist in rebalancing the gut flora and gut repair. Cat's claw has a history of traditional use in digestive complaints.

L-glutamine

The amino acid L-glutamine is classified as a non-essential amino acid. Severe nutritional depletion, trauma or stress may result in insufficient production of glutamine to meet the body's requirements: glutamine is then considered to become conditionally essential. Glutamine assists in the regulation of the acid base balance of the body, and systems such as the immune system and gut also require glutamine for energy production. Glutamine has been found to have a positive impact on the intestinal barrier, reducing permeability and preserving mucosal integrity. Those taking aspirin and non-steroidal anti-inflammatory medication have a reduced turnover of the gut lining which predisposes to inflammation. Glutamine may be helpful here.

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Cytoplan Ltd provides an innovative range of science-based nutritional supplements supplying the needs of healthcare professionals and consumers. The company was founded in 1990 by health practitioners, including doctors and nutritionists, with many years' experience in nutrition therapy.

Cytoplan is a leader in the highly specialised food-based supplementation sector with a product range continually developed based on the latest nutrition research for optimally 'bio-effective' products. Not all vitamins and minerals are the same and a bio-effective nutrient is one that will easily be taken up into human metabolic pathways and have a biological outcome that is beneficial to health.

Cytoplan is wholly owned by the AIM foundation, a charitable organisation that addresses the issue of community wellbeing plus health and nutrition projects in the UK and overseas. Cytoplan has supplied supplements to over 6,000 health professionals in the UK and overseas such as doctors, dentists and nutrition therapists. The company offers an incentivised, nurturing and supportive programme for health professionals and students.

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