# Probiotics found to reverse depression without side effects of SSRI antidepressants

By **Earl Garcia**

(Natural News)[11] Lactobacilli, beneficial bacteria commonly found in probiotics, proves to be a potential treatment for depression. Researchers at the University of Virginia School of Medicine examined the effects of stress in mice and noted a significant loss of lactobacilli in the process. The scientists found that the loss in lactobacilli results in the subsequent manifestation of symptoms associated with depression. However, feeding mice with food containing *Lactobacillus reuteri* helped the animals return to almost normal.

Lactobacilli appears to affect the levels of a blood metabolite called kynurenine. The blood metabolite is known to trigger the onset of depression. The researchers note a surge in kynurenine levels when loss of lactobacilli takes place, which in turn leads to the onset of depressive symptoms in the animals. However, maintaining high levels of kynurenine diminishes the effects of the beneficial bacteria, researchers say.

"The big hope for this kind of research is that we won't need to bother with complex drugs and side-effects when we can just play with the microbiome. It would be magical just to change your diet, to change the bacteria you take, and fix your health – and your mood," says lead researcher Alban Gaultier.

The findings are published in the journal Scientific Reports.

Results of the recent study are reflective of a systematic review published in the journal CNS & Neurological Disorders Drug Targets. According to the analysis, gut microbiota play a key role in regulating stress response and in the development of the central nervous system during critical stages. The review confirmed that probiotics help mitigate anxiety and depressive-like behaviors in animal models.

## Human studies establish link between probiotics and depression

A vast number of human studies from the last few years have demonstrated the beneficial effects of probiotics in alleviating depressive symptoms. In 2011, French researchers found that daily consumption of a probiotic formulation helped ease psychological distress in study participants. Both *L. helveticus* and *B. longum* strains were shown to promote beneficial psychological effects in volunteers, the researchers wrote in The British Journal of Nutrition. Researchers at the University of California, Los Angeles also found that women who drank milk that contained probiotics exhibited less activities in brain areas associated with emotions compared with those who drank plain milk.

Another study published in the journal Nutrition showed that participants with major depressive disorder who regularly took probiotic supplements had significantly lower Beck Depression Inventory total scores compared with those in the placebo group. A meta-analysis published last year also revealed that study participants who were on probiotics treatment showed relatively low incidence of depression. The findings appeared in the journal Nutrients.

Probiotics consumption may also help regulate mood, a Dutch study found. Researchers at the Leiden University in the Netherlands examined 40 healthy participants and classified them into two groups: the probiotics group and the placebo group. Study data showed that patients in the probiotics group exhibited less reactivity to sad moods compared with those in the placebo group.



"Even if preliminary, these results provide the first evidence that the intake of probiotics may help reduce negative thoughts associated with sad mood. As such, our findings shed an interesting new light on the potential of probiotics to serve as adjuvant or preventive therapy for depression," said study author Lorenza S. Colzato.

Another study published in Psychopharmacology revealed that people who took prebiotics — compounds that promote probiotic growth — paid less attention to negative information and more focus on positive information during a computer test compared with those who took a placebo. Researchers also found that participants in the prebiotics group had lower cortisol levels in their saliva than those in the placebo group. High cortisol levels were known to induce stress.


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# The Probiotics news

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## Message from the Editor

19th Edition

In this issue, our editorial team has the privilege and opportunity of a personal interview with Prof Gregory Reid, a prominent scientist, researcher and owner of two most well-documented probiotic strains for the management of vaginitis and recurrent urinary tract infections.

We have also featured a short article on the quality and safety issues of probiotics since it is being prescribed more frequently nowadays.

Finally, is there a role of probiotics in the management of depression? Please read on to find out more.

God bless!

Melvin Wong
Editor-in-chief

## Interview with Dr Gregor Reid

By **Nah Li Ching,** Executive Editor

On 16 March 2017, MD Pharmaceuticals had the privilege of meeting Dr Gregor Reid, the pioneering researcher who co-discovered and developed the two well-known probiotic strains for women's health - *Lactobacillus rhamnosus* GR-1 and *Lactobacillus reuteri* RC-14.

### *About Dr Gregor Reid*

Dr Gregor Reid is Professor of Microbiology and Immunology and Surgery at the Schulich School of Medicine and Dentistry of the University of Western Ontario, as well as the Director of the Canadian Centre for Human Microbiome and Probiotics Research at Lawson Health Research Institute, both in London, Ontario.

He has received numerous awards over the years; amongst which include the Distinguished Alumni Achievement Award at Massey University, in 2011, and membership of the Royal Society of Canada.

### *What did he share?*

Dr Gregor Reid generously shared with us his view of the probiotics available in the market. He felt that the term "probiotics" have been loosely used on the labels by some marketers, and it should not be the case because the term has a definition that should be strictly adhered to, that is "live microorganisms which, when administered in adequate amounts, confer a health benefit on the host". He emphasized the importance of using only probiotics that have been clinically studied and tested in humans, usually by comparing it with placebo. This is the only way to prove that administration of probiotics results in a properly documented benefit. Consumers need to know what they are buying, based on the claims on the labels.

### *About the 2 strains - Lactobacillus rhamnosus GR-1 and Lactobacillus reuteri RC-14*

The two strains were selected by Dr Reid and Dr Andrew Bruce in the mid 1980s during their research of microorganisms. They hypothesized that through administration of the strains to the vagina of women who had lost their natural lactobacilli, it might reduce recurrences of bladder and vaginal infection. Their first clinical study was published in the Canadian Journal of Microbiology in 1988, titled "Intravaginal installation of lactobacilli for prevention of recurrent urinary tract infections".

Today, products containing these two strains have been widely marketed, benefitting women all around the world.

From his research and feedback from patients, Dr Reid shared that when women are inflicted with bacterial or fungal infections of the vagina, the addition of lactobacilli probiotics to conventional treatment with antibiotics and antifungals has proven to induce better cure rates. Additionally, as recurrent infections are common, he advised that these women should consume lactobacilli probiotics on a long-term basis to prevent recurrence.

Dr Reid emphasized that strain specificity is important. Not all lactobacilli are the same. For women's vaginal and urogenital health, only *Lactobacillus rhamnosus* GR-1 and *Lactobacillus reuteri* RC-14 have been proven to work in clinical studies. The two strains have also been studied and shown to work synergistically. Making reference to the analogy of choosing cars like Mercedes Benz or BMW over not-so-good, cheaper cars, the choice is clear since the former have been tested and proven to be of first class quality. Likewise, for lactobacilli, strain A will not be identical to strain B. Doctors should therefore only choose evidence-based probiotic strains that have been scientifically proven for specific indications in human studies.

Given the beneficial effects of probiotics which people are now increasingly aware of, Dr Reid added that a good way of getting these beneficial microorganisms into the body is to take the supplements on a regular basis.

### *Beyond women's health*

Dr Reid's current research has since expanded to the study of the potential benefit of probiotics in breast health, and to detoxify environmental pollutants. He has also been reaching out to the impoverished African communities to provide access to probiotic yogurt made by local people with the hope of improving gut and reproductive health and immunity.

We thank Dr Gregor Reid for his positive sharing of knowledge and experience, and wish him all the best in his future work. Dr Reid will be speaking in Singapore at a conference for the International Scientific Association for Probiotic and Prebiotics in June 5-7, 2018, for which attendance will be available.



# Probiotics: Quality and Safety Issues

By **Tay Jia Yuan,** Executive Editor

How do you choose a probiotic for your patient? Doctors, pharmacists and dietitians may have pondered over this question when they are faced with different patients with different medical conditions. It is common knowledge that different probiotics are known to confer benefit for different medical needs. However, what happens if you are faced with many different formulations of probiotics that are available in the market? Patients often face this issue as well. With the growing awareness and acceptance of probiotics as supplements to improve our health issues, it comes with a surging number of probiotic products in the market.

While the number of choices among probiotic products may be overwhelming, the overarching principles in selection of an appropriate probiotic for your patient are clear. In fact, they are similar to that of selection of any other therapeutic drug.

Here are some considerations for a probiotic product for your patient:

### *- Type of probiotic strains present*

o Do all probiotic strains serve the same purpose? Definitely no. Different probiotic strains have been studied for their efficacy for different medical conditions. Within the same genera, different strains are recommended for different benefits, for example *Lactobacillus plantarum* 299v is clinically proven to alleviate symptoms of irritable bowel syndrome like abdominal pain and bloating[1], while *Lactobacillus rhamnosus* GR-1 and *Lactobacillus reuteri* RC-14 work synergistically to benefit urogenital health in women[2].

### *- Number of strains present*

o Contrary to consumer belief, less may be more. Having multiple probiotic strains packed into a single product does not necessarily constitute a power pack.

Combinations of strains found in a probiotic supplement should be based on evidence, instead of numbers. In an in-vitro study conducted to examine the potential of inter-species inhibition and inhibition of pathogens, 15 probiotic bacterial strains were put together and it was found to show significant cross inhibition of growth amongst the strains, suggesting that together they would be less effective at inhibiting pathogens such as *Clostridium difficile*[3].

### *- Number of colony forming units (CFU)*

o Number of CFU of a particular probiotic strain in a single product should match the effective dose studied in human studies, which typically is in the range of 100 million to 10+ billion CFU per dose[4].

### *- Prebiotic vs no prebiotic*

o According to the Food and Agriculture Organization of the United Nations (FAO), prebiotics are non-viable food components that confer a health benefit on the host associated with modulation of the microbiota[5]. Prebiotics are fiber but a fiber need not be a prebiotic. The usual target genera of prebiotics are lactobacilli and bifidobacteria, with bifidobacteria being more commonly modulated due to its higher density in the intestines and its preference for oligosaccharides. Fructooligosaccharides (FOS) and galactooligosaccharides (GOS) are the more commonly studied prebiotics, with dietary benefit in patients at 5-8g/day[6]. To name a few, suggested benefits of prebiotics include improvement in gut barrier function and host immunity, reduction of potentially pathogenic bacteria subpopulations (e.g. clostridia), enhancement of the bioavailability and uptake of minerals, including calcium, magnesium, and possibly iron, promoting of satiety and weight loss[5,7]. Whether the presence of a prebiotic is critical in the effectiveness of a product falls back on the presence of clinical evidence behind its therapeutic claim. While prebiotics are less extensively studied as compared to probiotics, evidence of a correlation between the measurable physiological outcome and modulation of microbiota at a specific site should be present at the very least.



### *- Delivery and viability of probiotic strains*

o Delivery of the probiotic strains to the desired site of action is often a concern to manufacturer, just like delivery of any therapeutic product.

o The most common form of delivery of probiotics is through use of lyophilized probiotic strains. Lyophilization has been suggested to improve stability and viability of the formulation itself as a result of the low water activity. Not without its disadvantages, lyophilization is however detrimental to survival of microorganisms, which then brings about the need for cryo-protection or microencapsulation. Cryo-protection is a technique of preventing damage to cells of microorganisms, for example, using inulin, polyalcohol glycerine, sorbitol to name a few. Microencapsulation, being the other alternative to cryo-protection, may be employed using polysaccharide or protein-based systems. When microencapsulated using polysaccharides (which may also function as prebiotics), it not only allows for enhanced viability of probiotic strains, it also provides an advantage of producing a synbiotic formulation[8,9].

o To be able to reach the lower digestive tract to exert their benefit to the host, the microorganisms also need to show tolerance to the acidic condition of the stomach and resistance to degradation by bile salts. Ability to tolerate the acidic gastric environment also varies species to species and within strains, with lactobacilli being more viable in gastric conditions as compared to other species. Microencapsulation of probiotic strains has been studied as a feasible solution to improving its viability in such adverse conditions, while use of enteric coating of tablets or capsules may be employed as well[8,9].

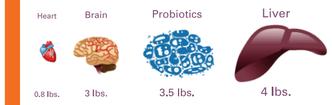
### *- Safety concerns*

o Generally considered safe for consumption by most people, there are typically few or no adverse effects to using probiotics. Side effects, if encountered, are typically self-limiting. These may include flatulence or mild abdominal discomfort. There are however groups of patients who may not be recommended to start on probiotics. There have been rare reports of bacteremia in patients with a background of leaky gut, short gut or intestinal bleeding. Severely ill or immunocompromised patients are also not suitable candidates for use of probiotics[10].

Even when faced with an overwhelming number of probiotic products in the market, with the understanding of product characteristics that affect the suitability of probiotics for a patient, the choice should be clear. A product backed by sound clinical evidence from human studies can be assured to confer health benefit to patients of need.

## Quick Facts

**Probiotics in our body outweigh our brain**




The typical human brain weighs about 3 pounds, and a healthy human body will have over 3.5 pounds of probiotic bacteria and organisms (according to Casey Adams Ph.D.) The fact that our heart weighs only 0.8 pounds, our liver weighs about 4 pounds, makes our probiotic bacteria one of the largest organs in our body.

Ref: Probiotics.org