

## Report on Walsh-Pfeiffer Sydney Outreach Clinic, Training Initiative and Conference

Dr. William Walsh from the Pfeiffer Treatment Centre in Illinois USA, Dr. Mary N. Megson, (a Developmental Pediatrician from the Pediatric & Adolescent Ability Center at Richmond, Virginia USA), and Dr. Woody McGinnis MD, (organizer of the first Oxidative Stress in Autism Symposium in New York) came to Sydney in April 2008 to train Australian and New Zealand medical practitioners in Walsh-Pfeiffer techniques for assessment and treatment of mental illnesses, behaviour and learning disorders, autism spectrum disorders and Alzheimer's disease and to conduct consultations with patients with these disorders.

Twenty-seven medical practitioners attended the training - seven new doctors and twenty previously trained who returned for further training. The members of this Class of 2008 were most enthusiastic - they find this style of training where they gain 'hands-on' experience to be some of the best they have received. Many of those who had attended previous training felt that each time they have returned they are delighted at how much more knowledge they gain as the three doctors carrying out the training are doing research all year and bring the results of that research to each year's training.

This year Dr. Woody McGinnis gave a lecture on his research in his special area of interest: the Mauve Factor (formerly known as kryptopyrrole). The two-part review article *Discerning the Mauve Factor* by Woody McGinnis, William Walsh, Abram Hoffer and others has just been published in the March/April and May/June issues of the journal *Alternative Therapies in Health and Medicine* [2008; 14(2&3)].



Dr Bill Walsh and Dr Mary Megson

Ninety-nine patient consultations were conducted and these were again highly successful. It is a delight to see patients returning with success stories and reporting the progress they have been making.

The Outreach Conference was held at the North Shore Christian Centre, with Dr. Megson, Dr. McGinnis and Dr. Walsh as Keynote Speakers.

Other speakers at the conference were Dr. John Criticos GP, of Sydney; Brett Lambert of SAFE Analytical Laboratories; Maria Hunt of Body Ecology; and Philip Thebault, who spoke on the importance of enzymes.

A highlight of this year's Conference was the conferral on Marion Redstone of the Health Research Institute/Pfeiffer Treatment Centre Award of Merit. Dr. Walsh took great delight in presenting Marion with the Award for her years of outstanding service in organizing the Outreach Program. Marion advised that she is stepping down due to ill-health and passing the organization of the Outreach Program over to Bio-Balance Health Association.

**A DVD of the Conference is available from:  
Music & Electron Services  
Michael Redstone  
Phone: 0411 190 158.**

The 2009 Outreach program will again be held at the Rydges Hotel Sydney in April – exact dates to be notified. Already some of the trained doctors have indicated that they will be returning next year for further training. Some patients from Darwin and Perth traveled to Sydney for a consultation this year. We hope that some Northern Territory and West Australian doctors will attend next year's training so that patients in these areas will have local practitioners trained in Walsh-Pfeiffer techniques to provide ongoing support.

**Judy Nicol**



Dr Mary Megson and Dr Woody McGinnis

# CHEMICAL IMBALANCES AND CRIMINAL VIOLENCE

by  
**William J. Walsh, PhD**  
Health Research Institute

[**Editor's Note:** This article was first published 20 years ago but it remains as relevant as ever.]

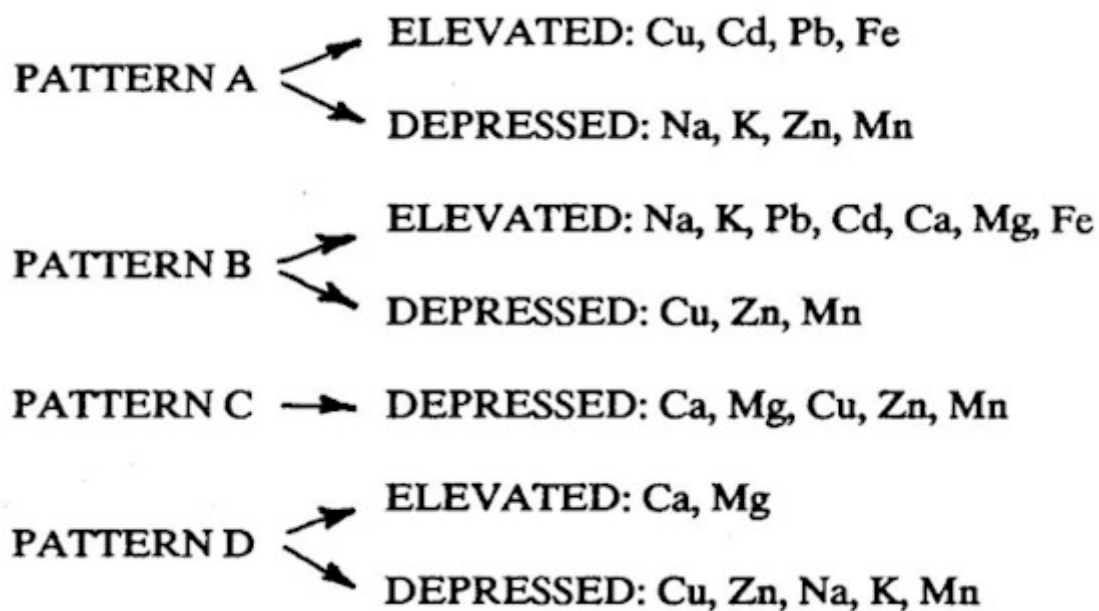
For centuries, research aimed at reducing the incidence of criminal violence has largely failed. Literally hundreds of psychoanalytic techniques, behaviour modification systems, and experimental drug therapies have been attempted, and none has proven to be effective. The sad truth is that most violent criminals become recidivists, whether they participate in rehabilitation programs or not. Society simply doesn't know how to remediate its criminal population, and the national trend is toward longer sentences and increased application of the death penalty.

The lack of progress in combating crime and violence has resulted from several factors. First and foremost, there is no clear understanding of the basic causes of violence and antisocial behaviour. Criminologists still debate whether the predominant cause is psychological, sociological, biological, or something else. Another barrier to progress is the fact that criminal violence is not a single condition, but rather a diverse set of afflictions. The inadequacy of classification methods for separating criminals into appropriate groups has hindered progress over a century.

A ray of hope has been provided by twin and adoption studies in Scandinavia, which present the first solid evidence of an inborn predisposition to criminality. Christiansen made a survey of nine twin-criminality studies.<sup>1</sup> In these studies, identical (monozygotic) and fraternal (dizygotic) twins were compared with respect to concordance of criminality between twins within each of the two groups. Wilson and Herrnstein<sup>2</sup> pooled Christiansen's and other data and found identical twins to have concordance of 0.69, compared to only 0.33 for same-sex fraternal twins. This result clearly indicates a substantial genetic component in criminal behaviour.

Mednick et al.<sup>3</sup> evaluated Scandinavian adoption records focusing on cases in which a biological parent or adoptive parent evidenced criminality. Their evaluation showed a strong relationship between criminality of biological parents and their sons. In a separate adoption study, Cloninger *et al*<sup>4</sup> found that sons whose biological parents had a criminal record were four times as likely to have a serious criminal record, compared with those without familial criminality. This effect far exceeded the effects of environmental factors studied including adoptive parent criminality, child abuse, and poverty.

The Health Research Institute has observed distinctive chemical imbalances in violent subjects<sup>5</sup> and has developed the classification system<sup>6</sup> based on hair chemistry as shown in the accompanying table.



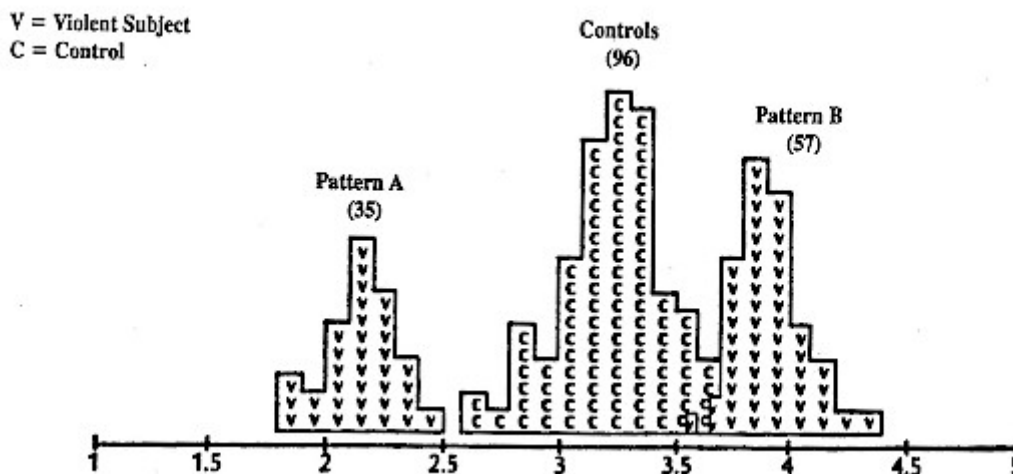
**Distinctive Chemical Imbalances Observed in Criminals**

The Type A and B patterns were discovered in a sibling experiment involving 24 pairs of brothers, ranging in age from 8 to 18 years. Each of the sibling pairs included an extremely delinquent, violent brother and a brother who was an "all-American boy" with no history of behavioural or academic problems. The violent siblings were found to possess the Type A or Type B imbalances whereas the controls did not. This result was confirmed in a field test involving 96 extremely violent persons and 96 non-violent controls, the two groups balanced with respect to age, race, and socioeconomic level as a child. The accompanying figure displays these groupings.

Subsequent testing of general delinquent populations revealed that C and D type hair-chemistry patterns (see the table) are common to persons exhibiting low-to-intermediate aggressiveness. Two recent double-blind experiments in California (with 90 and 198 subjects, respectively) have confirmed the high incidence of the A/B/C/D patterns in criminal populations and their low incidence in the general population. These distinctive patterns have been found in violent subjects of all races, age groups,

and socioeconomic levels. Studies of mass murderers and serial killers (including Charles Manson, Henry Lee Lucas, James Huberty, and Patrick Sherrill) have revealed intense A or B patterns to be present in most cases.

Clinical studies of violent persons exhibiting the A/B/C/D hair-chemistry patterns have been performed by Carl C. Pfeiffer, MD, PhD, and others at the Brain Bio Center in Princeton, New Jersey and elsewhere. Type B subjects are the most uniform, exhibiting elevated kryptopyrrole (decomposition product of vitamin B6 and zinc) in urine; depressed spermine, zinc, and manganese in blood; and elevated blood lead, along with high histamine levels and hypoglycemia. Dr. Pfeiffer has named kryptopyrrole in urine "pyroluria." Type A subjects are generally found to have a histamine disorder; elevated copper and lead in blood; and zinc deficiency, with about 40 percent exhibiting pyroluria and/or hypoglycemia. Most Type C subjects are very slender, and malabsorption is usually the only chemical imbalance found. At this writing, 100 percent of all Type D subjects have been observed to be hypoglycemic, although many are also malabsorbers.



**Field Test Data, Using a Discriminate Function Based on Na, Zn, and Cu ppm Concentrations**

Approximately 200 Type A, B, C, or D subjects have been placed on individualized treatment programs to correct the specific chemical imbalances observed. These treatments (designed by Dr. Pfeiffer) consist of vitamin, mineral, and amino acid supplements, together with dietary recommendations. The treatments are quite different for each body chemistry type, and great care must be taken in characterizing each subject. The optimum treatment for a Type A person would probably worsen the condition of a Type B person. Indiscriminate dosing of delinquent populations with multivitamins appears to be harmful to Type A's, neutral to Type B's, and beneficial to Type C and D. Because of the

potential for making a serious condition worse, individualized treatment programs should be designed by suitably experienced medical professionals.

Confidential surveys of parents, teachers, and counsellors show that more than 75 percent of the treated subjects report a "significant improvement," with best results obtained with children. Since this information is anecdotal, these treatments must be regarded as unproven until double-blind, controlled experiments measuring treatment effectiveness is done. The Health Research Institute plans to begin two such experiments in California in 1988

The "nature vs. nurture" debate still continues in the field of criminology. However, the evidence is mounting that both factors are important ingredients in forming criminal personality. The principal cause of violent crime appears to be a biochemical predisposition triggered by environmental stress. The eventual solution to this critical societal problem may lie in the fields of biochemistry and nutrition.

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<sup>1</sup>Christiansen, K.O., "A review of studies of criminology among twins," in S.A. Mednick and K. O. Christiansen (eds.), *Biosocial Bases of Criminal Behavior*, New York: Wiley, 1977.

<sup>2</sup>Wilson, J.Q., and R. J. Herrnstein, *Crime and Human Nature*, New York: Simon and Schuster, 1986, pp. 90-95.

<sup>3</sup>Mednick, S. A., W. F. Gabrielli Jr., and B. Hutchings, "Genetic influences in criminal convictions: Evidence from an adoption cohort," *Science* 224:891-94, 1984.

<sup>4</sup>Cloninger, C. R., S. Sigvardsson, M. Bohman, and A. L. von Knorring, "Predisposition to petty criminality in Swedish adoptees. II. cross-fostering analysis of gene-environment interaction," *Archives of General Psychiatry* 39:1242-47, 1982.

<sup>5</sup>Raloff, J., "Locks – A key to violence?" *Science News*, 124:122-25, 1983.

<sup>6</sup>Walsh, W, J., "Chemical Classification of Violent Criminals," Report No.HRI-104-3, 37<sup>th</sup> Annual meeting of the American Chemical Society, San Diego, 1985.

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*NOHA NEWS*, Vol. XIII, No. 2, Spring 1988, pages 3-4.

### What is methylation?

Methylation refers to the controlled transfer of a methyl group, made up of a carbon atom and three hydrogen atoms, abbreviated CH<sub>3</sub>. Such movement of carbon atoms goes on in every cell and tissue of the body, for methylation is involved in hundreds of chemical reactions that regulate cell energy, healing, immunity and genetic expression of DNA and RNA. All of these reactions are responsive to environmental conditions.

Thus methylation is a central feature of adaptation to the ever-changing physical and chemical conditions of life.

## EPIGENETICS AND MENTAL ILLNESS

Following are two recent reports on epigenetic factors in mental illness. – one about a paper published in the *American Journal of Human Genetics* in March 2008 on epigenetic changes in schizophrenia and bipolar disorder; the other a US National Institute for Mental Health press release about a symposium on epigenetic factors in depression held on 5 May at the American Psychiatric Association's 2008 annual scientific meeting.

### What is epigenetics?

Until recently, scientists saw our genetic code as an unalterable blueprint or, in the case of families with long histories of inherited illness, a life sentence. You inherit some faulty DNA from your parents, and your genes set in motion the inexorable chain of biological events that sentence you to Alzheimer's, cancer or any number of other genetic diseases.

However, the emerging field of epigenetics is revolutionizing the study of mental health - and challenging the belief that DNA is destiny.

Epigenetics is the study of certain kinds of chemical 'switches' that turn genes on or off, thereby altering gene expression (that is, how actively a gene is used to make a protein) without affecting the genetic code. For example, methyl groups affixed to DNA (methylation) [See box – Ed.] inhibit gene expression, whereas acetyl groups added to proteins called histones (acetylation) loosens chromosome structure, making the underlying genes easier to transcribe. [NOTE: Epigenetics research could have direct relevance to Pfeiffer treatment, in view of the role of methylation in Pfeiffer treatment protocols.]

According to Arturas Petronis, head of the Krembil Family Epigenetics Laboratory at the Centre for Addiction and Mental Health in Toronto: "There is growing evidence that we are custodians of our genes, rather than passive carriers. And our lifestyle choices may alter our DNA and that of our children. As one writer explains it, 'If DNA is the hardware of inheritance, the epigenetic operating system is the software' that's controlling our genes and keeping our bodies running.".... "Epigenetics represents the interface between the genome and the environment. It is the second genetic code that turns your genes on and off without altering the DNA sequence."

Moshe Szyf, a McGill University professor and pioneer in the emerging field of epigenetics, asserts: "This is an entirely new way of looking at, diagnosing and treating human disease. Epigenetics will completely change the face of medicine."

## Epigenetic Changes Identified in Schizophrenia & Bipolar Disorder

[Adapted from an online report dated 11 March 2008 at [schizophrenia.com](http://schizophrenia.com).]

In a new study announced in March 2008, scientists report that they have discovered epigenetic changes (that is, chemical changes to a gene that do not alter the DNA sequence) in individuals with schizophrenia and bipolar disorder. This is the first epigenome-wide investigation in psychiatric research, and this groundbreaking data may be a significant step on the journey to fully understanding major psychosis and also helping in identifying with greater knowledge how to prevent schizophrenia and bipolar disorder.

Epigenetics is a fast-growing new area in medicine. Recent epigenetic research has provided evidence that our diet, the chemicals we are exposed to and even our behaviour toward one another can cause changes in the way our genes are expressed, and may contribute to or trigger mental illnesses like schizophrenia and bipolar disorder - and that some of the epigenetic changes may even be passed on to future generations.

Recent research has identified epigenetic changes that have been linked with increased risk of mental illness. For example, researchers have discovered that baby mice and rats - when they are not licked, groomed and soothed by their mother as much as other infant mice and rats - grow up to be much more fearful and anxiety prone (the rodent version of an anxiety disorder). Interestingly, research is suggesting similar results in humans. This is just one example of many possible epigenetic factors that may play a role in mental illness.

In essence, the epigenetic factors seem to be a way to explain how the "environment" part of the causal factors in schizophrenia and bipolar disorder are believed to interact with the "genetic" risk factors of schizophrenia - to ultimately trigger psychosis. The epigenetic factors seem to be anything from nutritional factors to early psychological stress, or any of the other identified factors. One important fact to note is that it is impossible to tell retroactively what caused schizophrenia or bipolar disorder in a person as so many different environmental (biological and psychological) factors have been identified as risk factors

Studies have shown that the early positive environment of young mammals results in long-term epigenetic changes that can help or hinder the animal throughout its life. In fact, it is research

like this that is suggesting how the psychosocial environment we grow up in can have long-term impact in our biological development. Some researchers believe that it is the epigenetic effects of prenatal environmental factors like nutrition and stress that may be behind the increased risk for mental illness in some children.

### Epigenomic profiling

In this new study, Dr. Arturas Petronis, senior scientist in Canada's Krembil Family Epigenetic Laboratory at the Centre for Addiction and Mental Health (CAMH) in Toronto, and his team studied 12,000 locations on the genome using an epigenomic profiling technology developed at CAMH. Approximately one in every two hundred of these genes showed an epigenetic difference in the brains of psychiatric patients, including notable differences in the methylation of 40 specific genes in comparison with the control group.

Significantly, these changes were noted on genes involved in neurotransmission (the exchange of chemical messages within the brain), brain development, and other processes linked to disease origins

Dr. Petronis explains that these epigenetic changes may be the missing link in understanding what causes an illness. "The DNA sequence of genes for someone with an illness like schizophrenia or bipolar disorder and for someone without a mental illness often look the same: there are no visible changes that explain the cause of the disease. But we now have tools that show us changes in the second code - the epigenetic code - which may give us some very important clues for uncovering the mysteries of major psychosis and other complex non-Mendelian illnesses."

This proof-of-principle study is the first demonstration of what CAMH epigeneticists have hypothesized for the last 10 years. "Until now, we only had theories that epigenetic changes were important to understanding what causes major psychosis," explains Dr. Petronis. "Now we have the tools and expertise to support our theories and we can look at conducting larger studies, which will hopefully give us an even better understanding of psychiatric illnesses. And once we understand the primary molecular causes of an illness, we can advance diagnosis and treatment approaches, and possibly even prevent illness.

The Krembil Family Epigenetics Laboratory is the only psychiatric epigenetics laboratory in North America and one of the few programs exploring this field.

*American Journal of Human Genetics*, Vol 82, Issue 3, 696-711, 3 March 2008: Mill J, Petronis A et al: - Epigenomic Profiling Reveals DNA-Methylation Changes Associated with Major Psychosis.

## Report on NIMH Symposium on Epigenetics of Depression

WASHINGTON, DC, May 5 — Epigenetics — the examination of how environmental factors like diet, stress, and post-natal maternal behavior can change gene function without altering DNA sequence — plays a major role in depression and in the actions of antidepressant medications. New studies in the field are revealing new molecular targets for better therapies for depression, scientists say.

Participating researchers spoke at a press conference today following a National Institute of Mental Health (NIMH)-sponsored symposium on epigenetics during the American Psychiatric Association Annual Meeting here. NIMH is a part of the National Institutes of Health.

"The mechanisms that precipitate depression, such as stress, are incompletely understood," says Eric Nestler, MD, PhD, of the University of Texas Southwestern Medical School in Dallas, and organizer of the symposium. "One mystery of the disease is its long-lasting nature and delayed response to antidepressant treatment. This persistence is thought to be influenced by slowly developing but stable adaptations, which might include epigenetic regulation."

Unlike mutations, epigenetic changes aren't variations in the sequences of the building blocks that make up the DNA in a gene. The genes remain stable, but environmental factors — such as stress, diet and maternal care received early in life — act on the supporting structures of DNA, such as chromatin (molecules that package genes into chromosomes). Certain chemical reactions can unravel the chromatin, causing the DNA code that comprises a gene to be exposed for longer or shorter periods of time, essentially turning the gene on or off, and allowing it to produce more or less protein. This change in protein production, in turn, can affect physical and behavioral traits, and can be passed on from one cell to the next as they multiply within an organism, and even from parents to children.

Depression is a common, chronic and debilitating disease that affects more than 15 million Americans. Although many patients benefit from antidepressant medications, psychotherapy and other treatments, not all patients respond to treatment. This underscores the need for more effective treatments.

The recent epigenetic studies in depression are a high priority for the field because they allow characterization of important changes in chromatin mechanisms that occur in the brain of animal models of depression during antidepressant treatment, and in studies of human post-mortem brain tissue.

### Subtle Changes Traced to Depression-Like Symptoms

At a molecular level, Nestler and his colleagues have found changes in chromatin remodeling in particular genes in brain areas known as the nucleus accumbens and hippocampus in response to chronic social stress.

"In both brain regions, we have been able to directly relate these chromatin changes to some of the behavioral abnormalities observed," says Nestler. In animal models of chronic stress, Nestler and his

colleagues manipulated chromatin in these brain areas in ways that produced antidepressant-like effects.

This work provides new insight into the molecular mechanisms by which chronic stress produces lasting changes in specific brain areas to cause depression-like symptoms, says Nestler. The findings also suggest new leads for the development of new antidepressant treatments.

### Modifications Enhance Therapeutic Response

In other studies, Schahram Akbarian, MD, PhD, and his colleagues at the University of Massachusetts Medical School in Worcester, MA, are studying changes in methylation, a type of chemical modification of the DNA and of histones, the protein "backbone" of chromatin.

"We found that these chemical modifications in brain chromatin are dynamically regulated from the perinatal period to old age, and could be involved in epigenetic control of gene expression, including genes for brain-derived neurotrophic factor and other genes implicated in mood and anxiety spectrum disorders," says Akbarian.

His epigenetic findings may have direct implications for the design of novel antidepressant treatment strategies. Preliminary findings from studies in mice in Akbarian's laboratory indicate that chemical modification of epigenetic-related factors could enhance the therapeutic response to frequently prescribed antidepressant drugs such as fluoxetine (Prozac) or monoamine oxidase inhibitors. These findings also suggest that a better understanding of epigenetic and other "non-genetic" mechanisms operating in the human and animal brain may, in the future, lead to better treatment options for patients diagnosed with a major mood disorder.

### Maternal Care Affects Behavior

Michael Meaney, PhD, of McGill University in Montreal, reports how early maternal separation alters the methylation state of specific genes in the rodent hippocampus, and triggers long-lasting behavioral effects.

Meaney and his colleagues have found that differences in maternal care, such as grooming and licking, can change how rat pups' behavioral and hormonal response to stress develops. This leads to persistent lifelong changes in the pups' response to stress and how they process information about stressors.

"This may reveal experience-dependent adaptability in the chemistry of the DNA and chromatin structure," Meaney says.

Source: [www.nimh.nih.gov/science-news/2008](http://www.nimh.nih.gov/science-news/2008)

Further reading:  
The New Genetics of Mental Illness  
by Edmund S Higgins  
*Scientific American Mind* - June 2008,  
Pages 41 - 47

## ADVICE TO MICE: A commentary on the Reward and Punishment Game

There are all manner of opportunities for white mice today. When I was young, it was either straight into a pet-shop or try to scratch out a living off the corporation rubbish dump. Neither was exactly a bed of roses. Pet-shops were doss-houses for down-and-outs – stray cats, stolen dogs, and so on. But they were a darn sight better than a rubbish dump. Wild albinos never stood a chance there. Every dump had its population of ‘pinkies’. You’d see them begging by piles of old tin cans, shuffling off to spend what they could get on surgical spirit and orange juice.

Getting about in the daytime was purgatory on account of their eyes. And as for moving about at night, they were like a searchlight in a blackout: the owls couldn’t believe their luck. And then science came, and life changed almost overnight. After generations of persecution, white mice were suddenly ‘in’. Scientific research changed us from being the most untouchable into the most hutchable animals in the history of Man.

The boom began, I suppose, with medical research. This is still a tremendous career outlet these days, but it is not without its attendant risks, of course. You pay your penny and take your chance. You could be lucky and be part of a skin-grafting team. Apart from finishing up like a harlequin quilt you come to no real harm. On the other hand, you may end up in toxicology tests at Porton Downs. Even so, by following the age-old rule “Never Volunteer”, you could stay there all your life and never have a day off sick. When they start to fumble around for test animals, just fade quietly away into a corner of the cage. The ones they can’t catch they invariably leave as controls. Never rush or panic, as this will draw their attention. And above all, don’t attack them: a cornered scientist can be vicious. If all else fails and they grab you anyway, pee on their hand.

I would like to say a word here about accommodation at research labs. By and large it is very good. The meals are regular and the food is excellent. There is room for improvement in other directions, however. I wish they wouldn’t persist in putting down sawdust. It gets all over your fur – you keep thinking you’ve got systemic dandruff. Newspaper would be better. None of your *Daily Sketch* rubbish though. Most of us prefer a heavy daily: *The Times* is favourite – especially if the crossword is on view. But for God’s sake change the paper every day. Never mind the hygiene: what were the answers to yesterday’s clues?

Although the level of treatment at senior research institutes is second to none, the conditions at the school laboratory level leave a good deal to be desired. Indeed, I have seen some of my toughest colleagues go to pieces on learning that they were to be posted to one particular secondary modern school in south-east London. The softening-up process in schools is pretty nasty but if you get through that you may be adopted as the form pet, and there are worse ways of earning a living.

Their favourite trick is the bell-jar torture. In this ‘experiment’, you are placed on a platform surrounded by water and an inverted bell-jar is put over you. After a while you find that the water level is rising and lapping around your paws. Whatever you do, don’t panic. Undue exertion will only make the water rise faster. Just sit perfectly still and sweat it out. You’ll find the water level slowly stops rising and ceases altogether after a while. When it does, they take you out. Their nerve always cracks before yours does.

The trendy thing is space research, but like everything else it has its ups and downs. I made only one trip myself and I can’t say I enjoyed the feeling of weightlessness overmuch. They forgot to strap me in for a start. Every time I breathed out I jetted across the cage and bashed my head against the bars. I got taken short, too, before we re-entered. That didn’t make me any too popular with the rest of the crew, as you can imagine.

I found my own métier in psychology. I run mazes and things. Psychologists are pleasant, simple-minded souls, and life is pretty good. Mind you, you need to be a cut above the average with the old grey matter. They don’t like dim animals doing intelligence work: it takes them far too long to get any results, you see. They’d never use rabbits, for example. They’re as thick as two planks. Naturally, it doesn’t do to be too smart, either. Most mazes are ineptly easy. It’s all you can do sometimes not to nod off in the middle of a run, paralysed with boredom. But you must appear to play the game and act as though the entire thing is straining the frontiers of your intelligence. You scratch their back and they’ll scratch yours.

Reward & punishment games present a bit of a problem. You’d think psychologists would know better. I am not altogether unknown in the trade as a cheese gourmet. I like nothing better than a rich, ripe wedge of Stilton. And what do I get? The same old indestructible cube of New Zealand cheddar, day after day. The first time I saw it I nearly had a blue fit. If that’s the **reward**, I thought, what’s the bloody punishment? Quite frankly, some mornings I prefer to press the wrong button on purpose. Anything is preferable to that pig’s breakfast – even 12 volts up the hooter.

**Source:** *Journal of Irreproducible Results*, circa 1970. For further information on *JIR*, see [www.jir.com](http://www.jir.com)

# Food & Mental Health

## How are food and mental health related?

The brain is one of the largest organs in the body and, like our hearts, livers and other organs, it is affected by what we eat and drink. However, unlike with other organs, the links between diet and the brain - and hence how we think and act - are not yet widely recognised.

Despite a large number of peer-reviewed and published research studies, scientific understanding of how food affects mental health is far from complete. However, it is already clear that our diets affect how our brains are made and how they work throughout our lives, from foetal development to old age. The significance of diet for mental health and well-being varies, but there appears to be no point in the human life-cycle at which diet has no effect.

There are some important nutrients for brain development and function, but they can only work properly if a wide range of other nutrients are also available in the right amounts and in proportion to each other. There is no "magic bullet" or single nutrient that holds the key to mental health and well-being.

The combination of nutrients that is most commonly associated with good mental health and well-being is as follows:

- polyunsaturated fatty acids (particularly the omega 3 types found in oily fish and some plants)
- minerals, such as zinc (in whole grains, legumes, meat and milk), magnesium (in green leafy vegetables, nuts and whole grains), and iron (in red meat, green leafy vegetables, eggs and some fruit);
- vitamins, such as folate (in green leafy vegetables and fortified cereals), a range of B vitamins (whole grain products, yeast and dairy products), and antioxidant vitamins such as C and E (in a wide range of fruit and vegetables).

This is, of course, the same type of healthy balanced diet that is widely recommended to reduce our risk of developing coronary heart disease, strokes, a range of cancers, diabetes and a number of digestive disorders and conditions.

People eating diets that lack one or more of this combination of polyunsaturated fats, minerals and vitamins, and/or contain too much saturated fat (or other elements, including sugar and a range of food and agricultural chemicals) seem to be at higher risk of developing the following conditions.

- Attention-deficit/hyperactivity disorder (ADHD)
- A range of depressive conditions
- Schizophrenia
- Dementia, including Alzheimer's disease.

The evidence so far does **not** show that these conditions can be prevented or cured by diet alone. However, evidence is accumulating that the combination of polyunsaturated fats, minerals and vitamins may help to:

- relieve the symptoms of some mental illnesses
- improve the effectiveness of medication for some conditions
- reduce the unpleasant side-effects of some medications.

The diet that would give us the right amount and balance of these nutrients would contain:

- lots of different vegetables and fruit
- a wide variety of whole grains, nuts, seeds and legumes
- some occasional oily fish, lean meat and dairy products.

## Food, mental health and evolution

It makes evolutionary sense that this type of diet would be good for both our physical and mental health. When food supplies were plentiful, our ancestors would have eaten broadly this kind of diet. Unfortunately that is not what most of us are eating now.

The agricultural and industrial revolutions, followed by the globalisation of world food trade mean that most people in rich countries (and growing proportions in poor countries) eat:

- small amounts of a few types of vegetables and fruit
- very few whole grain products - our carbohydrates are mostly refined (such as sugar and products made from white flour) - and from very narrow range of cereals (90% of the calories from cereals eaten in the UK are from wheat)
- very little oily fish
- but large quantities of intensively produced meat, meat products and dairy products
- unknown (and possibly unknowable) combinations of food and agricultural chemicals, either as intentional additives or accidental residues.

As a result, instead of our diets providing a healthy combination of polyunsaturated fats, minerals and vitamins, we are eating too much saturated fat, sugar and salt and not enough vitamins and minerals. Our analysis of the research indicates that this diet is fuelling not only obesity, cardiovascular disease, diabetes and some cancers, but may also be contributing to rising rates of mental ill-health and anti-social behaviour.

**Source:** [www.mentalhealth.org.uk/campaigns/food-and-mental-health/](http://www.mentalhealth.org.uk/campaigns/food-and-mental-health/)

### Resources:

A number of excellent resources (downloadable in PDF format) are available at the above UK Mental Health Foundation web address. These include:

*Feeding Minds: The impact of food on mental health Changing Diets, Changing Minds* (Report)

*Feeding Minds Web guide* (nutrients important for various mental conditions & foods where these are found)

*Healthy Eating Booklet*

*Mentally Healthy Recipes*

## Nutritional supplement treats 'negative' symptoms of schizophrenia

A nutritional supplement in widespread use promises hope for relief of 'negative' symptoms of schizophrenia.

The good news comes from Australian researchers who found the supplement – N-acetyl cysteine (NAC) -- reduces some of the distressing symptoms of the mental disorder not helped by existing medication.

Professor Berk and his colleagues reported in the US journal *Biological Psychiatry* that after a four-week trial with 84 people with chronic schizophrenia, those who received two grams a day of NAC had a significant reduction in "negative" symptoms such as loss of motivation, drive and initiative and social withdrawal. Those who received a non-active placebo showed no improvement. All 84 people continued to take their regular antipsychotic medication throughout the trial.

"We didn't see many changes in hallucinations and delusions," said Professor Berk. But he added that NAC complements antipsychotics, which do reduce such symptoms but fail to lower 'negative' symptoms. NAC also alleviated some side effects of the antipsychotics, among them restlessness and agitation.

"It's a safe treatment and doesn't appear to have significant side effects," said the team leader, University of Melbourne psychiatrist Michael Berk. "We know we're on to something," added Professor Berk, also with Barwon Health, The Geelong Clinic and the Orygen Research Centre.

According to Professor Berk, NAC relieves negative symptoms by helping to produce glutathione, a natural antioxidant that helps prevent so-called free radicals from damaging body cells and DNA. [See next column for more information on glutathione - Ed.] The brain is particularly sensitive to such damage. The team trialled NAC because the brain cannot take up glutathione supplements.

Psychiatrist Vaughan Carr, head of the Schizophrenia Research Institute, a national network of university experts, says the work is promising. "There have been no significant advances in the medical treatment of schizophrenia since the 1950s when the first truly effective antipsychotic medication (chlorpromazine) was introduced," said Professor Carr, also with the University of Newcastle.

Already, researchers in the US are following up the work, and Professor Berk's group has begun trials of NAC with people suffering the violent mood swings of bipolar disorder.

[Adapted from an article 'Diet supplement treats schizophrenia' – *The Australian*, 12 May 2008]

**Journal Reference:** N-Acetyl Cysteine as a Glutathione Precursor for Schizophrenia - A Double-Blind, Randomized, Placebo-Controlled Trial. - Berk M, Bush A I et al (Mental Health Research Institute of Victoria, Parkville; Department of Clinical and Biomedical Sciences, The University of Melbourne, Geelong; Orygen Youth Health, Melbourne) *Biol Psychiatry* 2008 Apr 22. [E-pub ahead of print]

## GLUTATHIONE

### Functions

A significant component of the body's collective antioxidant defences, and a highly potent antioxidant and antitoxin in its own right.

Glutathione is actually a tripeptide made up the amino acids gamma-glutamic acid, cysteine, and glycine. The primary biological function of glutathione is to act as a non-enzymatic reducing agent to help keep cysteine thiol side chains in a reduced state on the surface of proteins. Glutathione is also used to prevent oxidative stress in most cells and helps to trap free radicals that can damage DNA and RNA. There is a direct correlation with the speed of aging and the reduction of glutathione concentrations in intracellular fluids. As individuals grow older, glutathione levels drop, and the ability to detoxify free radicals decreases.

Glutathione is a small molecule found in almost every cell. It cannot enter most cells directly and therefore must be made inside the cell, from its three constituent amino acids: glycine, glutamate and cysteine. The rate at which glutathione can be made depends on the availability of cysteine, which is relatively scarce in foodstuffs.

Glutathione is the major antioxidant produced by the cell, protecting it from 'free radicals' ('oxygen radicals', 'oxyradicals'). These highly reactive substances, if left unchecked, will damage or destroy key cell components (e.g. membranes, DNA) in microseconds. Glutathione recycles other well-known antioxidants such as vitamin C and vitamin E, keeping them in their active state.

Glutathione is a very important detoxifying agent, enabling the body to get rid of undesirable toxins and pollutants. It forms a soluble compound with the toxin that can then be excreted through the urine or the gut.

Glutathione plays a crucial role in maintaining a normal balance between oxidation and anti-oxidation.

Glutathione is required in many of the intricate steps needed to carry out an immune response. For example, it is needed for the lymphocytes to multiply in order to develop a strong immune response, and for 'killer' lymphocytes to be able to kill undesirable cells such as cancer cells or virally infected cells.

Glutathione values decline with age and higher values in older people are seen to correlate with better health, underscoring the importance of this remarkable substance for maintaining a healthy, well-functioning body.

### Food Sources

Dietary glutathione is found in fresh and frozen fruits and vegetables, fish, and meat. Asparagus, avocado, and walnuts are particularly rich dietary sources of glutathione.

When thinking changes your mind, that's philosophy.

When God changes your mind, that's faith.

When facts change your mind, that's science



**Bio-Balance Health Association Inc:  
Application Form for Membership**

**Bio-Balance Background – Brief Overview**

Since its formation the Bio-Balance Health Association has moved to establish a means to treat patients suffering from behavioural disorders and mental illnesses such as schizophrenia and bi-polar disorder, depression, autism, ADD/ADHD and learning disorders based on technologies developed by the Health Research Institute-Pfeiffer Treatment Center (HRI-PTC).

HRI-PTC and outpatient treatment clinic in Chicago, Illinois, USA since 1989 has demonstrated a high level of effectiveness in treating these disorders by assessing each patient's body chemistry imbalances and prescribing an individualised nutritional supplement program to balance the body chemistry.

Bio-Balance's efforts resulted in Dr. William Walsh PhD-Chief Scientist and Director of HRI-PTC visiting Australia in 2004 and again in 2005, 2006, 2007 and 2008 to train Australian medical practitioners from all over Australia and New Zealand and to address public and practitioner meetings in Sydney, Brisbane and on the Gold Coast.

Further details on HRI-PTC and Dr. William Walsh PhD can be found on their website at [www.hriptc.org](http://www.hriptc.org)

- Newsletter keeping members informed on items of interest
- Internet chat/messaging site where members can communicate
- Range of library books
- Links to web sites of interest

Annual Membership is only \$5.00 for 12 months and all member information is strictly confidential.

For further information please contact Bio-Balance Health on

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Email [biobalance@optusnet.com.au](mailto:biobalance@optusnet.com.au)

Or visit our website at [www.biobalance.org.au](http://www.biobalance.org.au)

Or write to

Bio-Balance Health Association Inc

PO Box 7795

Gold Coast Mail Centre Qld 4217



**MEMBERSHIP APPLICATION FORM**

To join or renew your membership please return completed form to Bio-Balance Health, PO Box 7795, Gold Coast Mail Centre, Qld 4217

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