


Methylation and mood nutritional support for depression

It is estimated that **45%** of Australians will experience a mental health condition in their lifetime¹




In any one year, around **1 MILLION** Australian adults have **DEPRESSION**¹

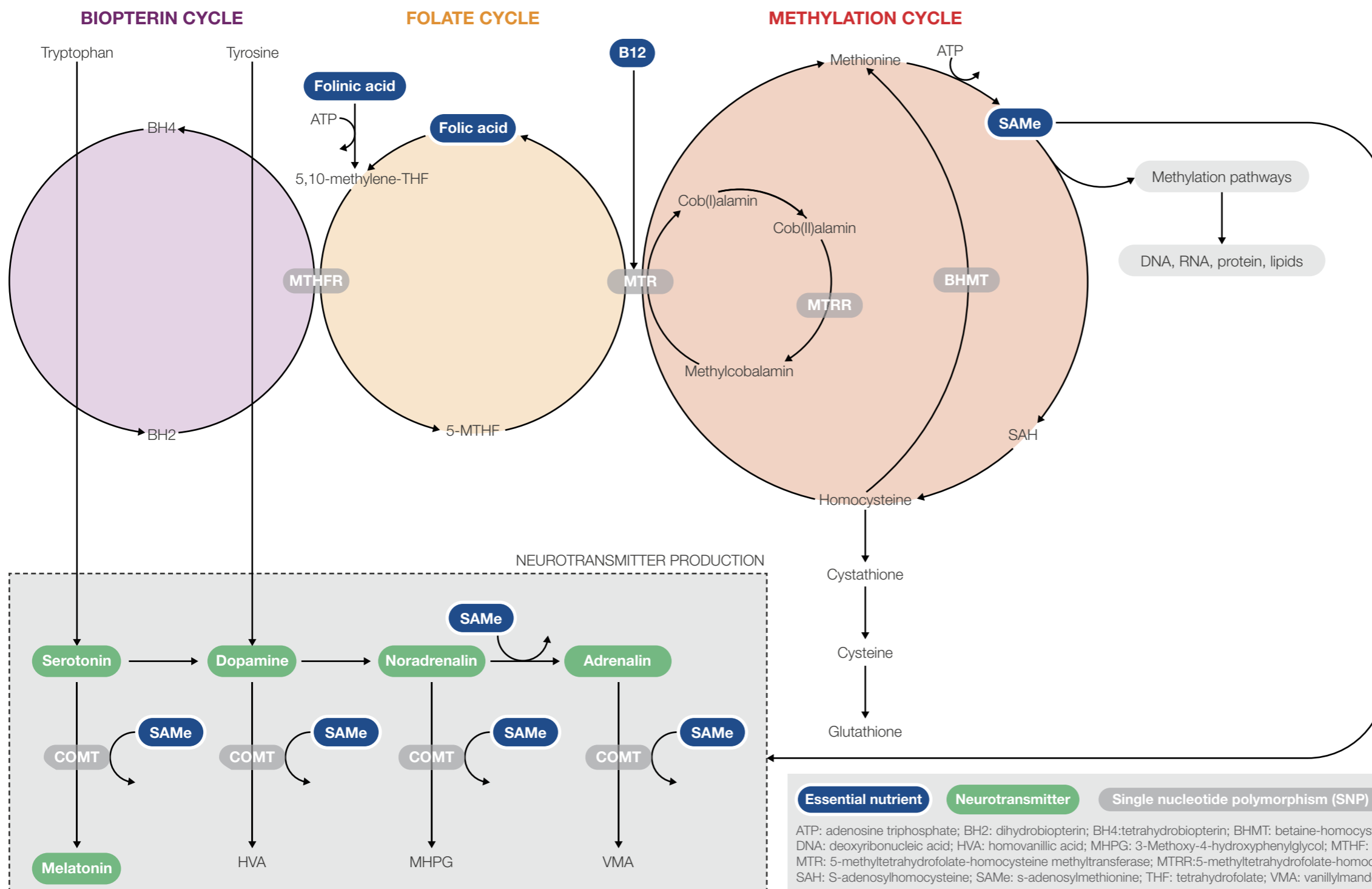
The majority of depressed patients do not experience remission when treated with a first-line antidepressant²



METHYLATION is required for the synthesis of neurotransmitters and the function of postsynaptic receptors³



NUTRITIONAL SUPPORT FOR DEPRESSION²⁻¹⁸



SAMe
S-adenosylmethionine or ademetionine (SAMe) is found in every living cell in the body where it functions as one of the chief methyl donors, involved in more than 100 reactions.⁸

One of the most important roles of SAMe is the metabolism of neurotransmitters including serotonin, dopamine and noradrenaline.^{9,10} Low SAMe levels have been found in patients with low mood, with SAMe supplementation leading to raised serotonin, dopamine and phosphatidylserine levels, and improved binding at neurotransmitter receptor sites.¹⁰ Numerous clinical trials have shown its beneficial effects on mood.¹¹⁻¹⁴

Vitamin B12 and folic acid
Both vitamin B12 and folic acid are involved in the synthesis of SAMe in the body. Vitamin B12 is a cofactor for methionine synthase, an enzyme which is also dependant on folate. In the one-carbon metabolism pathway, methionine synthase remethylates homocysteine to form methionine, which is then synthesised into SAMe.^{15,16}

Folate and B12 are also required by the brain for the synthesis of neurotransmitters. Both vitamin B12 and folate are required for maintaining normal healthy mood and cognitive function.¹⁵⁻¹⁷

Folic acid has been described as the metabolically active form of folic acid. It avoids the deconjugation and reduction steps that folic acid undergoes in order to be metabolised into the active coenzyme forms.¹⁸

Essential nutrient **Neurotransmitter** **Single nucleotide polymorphism (SNP)**

ATP: adenosine triphosphate; BH2: dihydrobiopterin; BH4:tetrahydrobiopterin; BHMT: betaine-homocysteine S-methyltransferase; COMT: catechol-O-methyltransferase; DNA: deoxyribonucleic acid; HVA: homovanillic acid; MHPG: 3-Methoxy-4-hydroxyphenylglycol; MTHF: methylenetetrahydrofolate; MTHFR: methylenetetrahydrofolate reductase; MTR: 5-methyltetrahydrofolate-homocysteine methyltransferase; MTRR:5-methyltetrahydrofolate-homocysteine methyltransferase reductase; RNA: ribonucleic acid; SAH: S-adenosylhomocysteine; SAMe: s-adenosylmethionine; THF: tetrahydrofolate; VMA: vanillylmandelic acid