A functional deletion polymorphism has been linked to emotional memory and post-traumatic stress disorder by researchers at the Brighton and Sussex Medical School in the United Kingdom. The study replicates pioneering research by de Quervain that found enhanced emotional memory to be associated with a deletion in the ADRA2B gene, and is the first study to find that emotional memory is diminished by certain classes of antidepressants, according to genotype. Previously, no studies have investigated the relationship between genetic variants and drugs that influence emotion.

Emotional memory is the enhancement of memory due to an emotional experience. It is linked to emotional disorders, and plays a role in depression and anxiety disorders. Individuals with a deletion in the ADRA2B gene are more likely to be adversely affected by negative emotional stimuli or traumatic events.

The study took 119 healthy, white, male volunteers aged 18-40, and genotyped them for the ADRA2B deletion polymorphism. 16 were homozygous carriers, 48 were heterozygotes, and 55 were non-carriers. In a double-blind, randomized trial, participants were given 4mg of the noradrenaline reuptake inhibitor antidepressant Reboxetine, or a placebo. Participants were then given an emotional memory task comprising pictures rated for arousal, then later tested for emotional memory recall. The study was not financed by any pharmaceutical company, and the authors declared no competing financial interests.

KEY FINDINGS:

- ADRA2B deleted individuals (D) demonstrated enhanced memory for negative stimuli compared with individuals who did not have the deletion (I)
- The study found increased arousal ratings for negative versus neutral stimuli in deletion individuals; ADRA2B deletion carriers were more likely to be adversely affected by a negative or traumatic emotional experience
- Reboxetine had no significant effect on ADRA2B deleted individuals (D); it reduced enhanced memory for negative stimuli in deletion non-carriers (I)
- This is the first demonstration of genetic variation influencing antidepressant drug effects on emotional processing in humans


British study confirms link of the ADRA2B gene and its deletion polymorphism to emotional memory and establishes a pharmacogenetic association.
SNP SUMMARIES

ALPHA-2 ADRENERGIC RECEPTOR
ADRA2B

To summarize, individuals with deletion variants of ADRA2B may be more susceptible to traumatic memories after emotional or traumatic events. They might also be more resistant to drug treatment.

RESOURCES: