

# Māori Health Review

Making Education Easy

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## Risk-taking: behind the warrior gene story

**Authors:** Merriman T and Cameron V

**Summary:** This report examines the scientific evidence behind the recent controversial claim by Lea and colleagues (see below for a link to the on-line abstract) that the low activity variant of the monoamine oxidase-A (MAO-A) gene was strongly associated with risk-taking and aggressive behaviour in Māori. The MAO-A gene is believed to be important for the correct regulation of dopamine and serotonin levels, via the production of the MAO-A enzyme which breaks down both neurotransmitters. The high activity gene variant (found in 65% of Caucasians) has up to a 10-fold greater activity than the low activity variant, and may therefore be more effective in removing excess dopamine and serotonin. In MAO-A deficient mice (which lack the enzyme entirely), dopamine and serotonin levels are increased and aggressive behaviours have been observed. The term "warrior gene" was first coined following a small, un-replicated experiment using Rhesus macaque monkeys. No evidence for an association between genotype alone and aggressive behavior was found in this study, and aggressive behaviour could be predicted by both low and high-activity gene variants under different environmental conditions. In the three largest population-based studies in humans (all in Caucasians) the results were all similar and suggested the high-activity MAO-A variant may be protective against adult anti-social behavior for children who were abused or neglected. The low-activity variant did not predict aggressive behaviour unless these additional environmental factors were also considered. The study presented by Lea et al. was conducted in a very small (n = 17) sample of Māori males. They found the low-activity MAO-A variant present in 60% of subjects, and called it the "warrior allele", suggesting it was strongly associated with risk taking and aggressive behaviour in Māori males. The authors of the current report, dispute this finding, citing a lack of scientific rigour and an absence of appropriate genetic epidemiological experiments testing for an association. They also point to evidence of racial variation between genetic associations indicating that results from a Caucasian population should not be extrapolated to Māori.

Hall D, Green M, Chambers G, Lea R. Tracking the evolutionary history of the warrior gene in the South Pacific. 11th International Human Genetics Meeting, Brisbane, Australia; August 6–10; 2006. Abstract at URL: <http://www.ichg2006.com/abstract/843.htm>

**Comment:** See comment below

**Reference:** *JNZMA. 2007; 120(1250)*

<http://www.nzma.org.nz/journal/120-1250/2440/>

## Warrior genes and risk-taking science

**Authors:** Crampton P and Parkin C

**Summary:** In this article, the authors summarise their concerns with regard to the veracity and ethics of the "warrior gene" line of research. They raise concerns with regard to the informed consent process. In line with ethical principals of research, all participants should have been advised that the research included the exploration of hypotheses linking the "warrior gene" with violent and antisocial behaviour, and that results may be extrapolated from the research participants to the larger Māori population despite the lack of evidence for association between the two. The authors ask questions about the scientific validity of an approach which has extrapolated from a small, likely non-random sample of Māori males to not only the entire contemporary male Māori population, but also to past generations. They also point to a lack of any association between genotype alone and anti-social behaviour from previous research and the risks of making a claim of causality on the evidence of association alone. Finally, the authors highlight the issue of skewed reporting and hype by the media, and comment that; "In such highly charged social and political settings, the scientist has a particular responsibility for the way in which findings are disseminated and for ensuring a clear public understanding of the limitations of the work to date."

**Comment:** Dr Rod Lea claimed in August 2006 that there is a genetic explanation for negative social and health statistics for Māori. Dubbed the warrior gene, Dr Lea stated that the low-activity MAO-A genetic variant "goes a long way to explaining some of the problems Māori have... they are going to be more aggressive and violent and more likely to get involved in risk-taking behaviour like gambling". Unfortunately, information about the research came mainly via the media and the reports were sensationalised, simplified and from the perspective of Dr Lea and his team. The media were quick to point to Māori and our genes as reasons to explain negative statistics. Not only were the wider, external issues ignored but scientists, ethicists and Māori were not given the opportunity to voice their concerns about the study. Thankfully, we have now been provided with expert opinions around the science and ethics of Dr Lea's work in the latest NZMJ. Dr Merriman and Dr Cameron question the scientific validity of Lea's genetic studies and Professor Crampton and Dr Parkin raise important ethical concerns. If you are considering large scale genetic research in your whanau, hapu or iwi, it would be useful to read the articles in their entirety. Aroha Mead and Moana Jackson have also critiqued genetic research undertaken by Dr Lea and others using a Kaupapa Māori epistemology. Their presentations were recorded at HRC's Hui Whakapiripi and Pridoc in 2006. Some Iwi (Ngai Tahu for example) already have guidelines in place for DNA research and it may be useful to consider the development of guidelines or recommendations prior to participation in research in which DNA samples are taken.

**Reference:** *JNZMA. 2007; 120(1250)*

<http://www.nzma.org.nz/journal/120-1250/2439/>

## Independent commentary by Dr Matire Harwood

*Dr Matire Harwood (Ngapuhi) has worked in Hauora Māori, primary health and rehabilitation settings as clinician and researcher since graduating from Auckland Medical School in 1994. She also holds positions on a number of boards, committees and advisory groups including the Health Research Council. Matire lives in Auckland with her whānau including partner Haunui and two young children Te Rangijura and Waimarie.*

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