# The warrior gene hypothesis: Questioning the science

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**Abstract:** Professor G. Raumati Hook discussed the hypothesised 'warrior' gene by introducing the science behind the research, the conclusions drawn from that research and their implications within the wider community (Hook, 2009). The pivotal factor in this research, however, is the science: is the presented science plausible, with its grounding in solid data? The focus of this Peer Commentary tightens to just that of the science behind this research and its contextualisation, with a number of questions being raised.

**Keywords:** biochemistry; genetics; MAO-A; Māori; protein; science; warrior

## Introduction

Jules Henri Poincaré (1854-1912) an eminent mathematician, theoretical physicist and philosopher of science stated that:

> Science is facts; just as houses are made of stones, so is science made of facts; but a pile of stones is not necessarily a house and a collection of facts is not necessarily science (Poincare, 1905, p. 141).

When it comes to science, the facts all start with deoxyribonucleic acid (DNA). DNA is broken up into segments, called genes, and one of the central concepts in biology is the control of gene expression. DNA is enzymatically scanned and used as a blueprint for the construction of proteins, and it is these proteins that are able to carry out the various functions of the human body. These functions are exquisitely regulated and controlled. Some of the controls, for example, determine when specific proteins should be produced. Complementary regulations to timing of expression include controlling whether a protein shall be manufactured in an active or inactive form, or regulating how long that protein is likely to persist within the body, to carry out its function. Other controls determine where in the body the different proteins will be produced and in what abundance. The human genome, or all of the DNA carried by humans, is composed of 2.85 billion base pairs, organised into 25,000 genes (Human Genome Consortium, 2004) with conservative estimates of the total number of human proteins ranging from 50,000 to 100,000 (Harrison, Kumar, Lang, Snyder, & Gersteina, 2002). Seeing these numbers under such fine regulation, does it seem likely that one single protein can and does determine and control one global trait in humans?

## The science behind the 'Warrior Gene' hypothesis

As discussed by Hook (2009) the MAO-A gene has recently come under scrutiny as being a single gene, a single protein, that is being promoted as being able to control one global trait in humans. Sabol, Hu and Hamer (1998) researched the MAO-A gene and realised that the promoter (or segment of DNA that allows enzymatic scanning of the gene) contains a specific repeated segment of DNA, and that the total number of repeats present influenced the abundance of the MAO-A protein. The function of the MAO-A protein is thought to affect moods; thus it was felt that a greater understanding of this protein and its regulation may yield anti-depressive or anti-mania pharmaceutical interventions (Caspi, et al., 2002; Merriman & Cameron, 2007; Sabol et al., 1998). The conclusion, itself, was founded on the DNA testing

of 2156 individuals, 75.6 % of whom were White/ Non Hispanic, and 24.4 % of whom were either Asian/ Pacific Islander or Hispanic/ Latino or African American/ Black (Caspi et al., 2002; Lu et al., 2002).

Lea & Chambers (2007) combined the above genetic data with DNA testing results from an additional 46 Māori males and concluded that, based on the genetics of these 46 individuals, all Māori exhibited a reduced MAO-A protein expression profile. Further, it was stated that "Polynesian males who embark on long, dangerous canoe voyages and engaged in (and survived) war with other islander tribes carried the AGCCG haplotype" (Lea & Chambers, 2007, p. 3). It was suggested that, over time, this resulted in a lesser abundance of MAO-A protein in all Māori, and that because "it is well recognised that historically Māori were fearless warriors…the MAO-A gene may have conferred some selective advantage during the canoe voyages and inter-tribal wars that occurred during the Polynesian migrations" (Lea & Chambers, 2007, pp. 3-4).

The hard sciences are so called because of their requirement for empirical proof; every statement must be backed up by good quality proof or references to such good quality proof. As with other topics, however, context can be and frequently is just as important. Within the research discussed here, the work of Lea and colleagues offer the persistence of the AGCCG haplotype in all Māori, and thus a reduced MAO-A expression profile in comparison to those of White/ Non Hispanic descent, as their fact.(Lea & Chambers, 2007: Lea, Hall, Green & Chambers, 2005). The proof offered for this fact is the extrapolation of data from just 46 individuals (Lea & Chambers, 2007). The contextualisations offered for this fact are firstly, that a single gene, a single protein, can and does control one global trait in humans and secondly, that the single defining feature of Māori society was fighting as a warrior and partaking in inter-tribal wars. Ergo, their final conclusion is that the *MAO-A* gene is a warrior gene (Lea et al., 2005; Lea & Chambers, 2007).

In analysing the logic of this conclusion, and the science behind it, a number of questions are raised. Is the genetic data from 46 individuals enough to make sound and valid conclusions regarding the genetics of an entire people? What is the potential sampling error for the work from such a small test group? Could taking this potential sampling error into account shift or alter the final conclusions drawn from the data? Given the variations and regulations discussed above, does it seem likely that this one genetic type determines and controls the propensity for war in humans? Is the single defining feature of Māori society one of war and fighting, so that the genetics of Māori, and every variation therein, are solely geared towards such war and fighting? Could this research, as a whole, simply be pointing towards the idea that different human societies and populations exhibit different personality traits, which is reflected by different genetics and different biochemistries? To what extent does personal experience, individual choice and societal pressures impact upon violent and warrior behaviour? Has the hypothesis been tested by comparing a similar analysis to other 'warrior' populations? Overall, is this research a pile of stones, a house or a work in progress?

## A wider context for the science

Hook (2009) raises and discusses a number of implications from the conclusions of this research, implications which range from surprising to offensive to horrifying. The conclusions offered by Lea and colleagues were vocally opposed by other researchers (Merriman & Cameron, 2007). Interestingly the Lea group agreed with disregarding the link between Māori and contemporary violence issues, going so far as to state that this link has "no scientific support whatsoever and should be ignored" (Lea & Chambers, 2007, p. 4). Yet they firmly stand in support of their hypothesised link between Māori and historical violence issues. The science behind this latter link, and the support therein, needs to be analysed in a wider context, before any decisive or constructive conclusions can be drawn.

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