Genotype–phenotype correlations with personality traits of healthcare professionals: a new use for the Human Genome Project

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MAPPING OF THE ENTIRE human genome in the Human Genome Project has shed considerable light on the genetic basis of a number of human diseases. For example, many regions of the human genome have been reported to show linkage to asthma or associated phenotypic features of atopic disorders.[1] Other diseases whose genetic basis has been illuminated by the Human Genome Project include insulin-dependent diabetes mellitus,[2] parasitic infection[3] and psychiatric disorders, including schizophrenia[4] and affective disorders.[5]

However, to date, the Human Genome Project has not been used to examine the genetic basis of different personality traits. Here, we rectify this omission. The medical profession is widely acknowledged to be composed of a wide range of personalities, spanning the spectrum from spectacular sparkle to bellicose belligerence. We therefore elected to perform a cohort study of healthcare professionals, comparing their genetic profile with their occupation and personality traits.

METHODS

A large cohort of healthcare professionals was recruited by targeting the readership of the *MJA* for the period 1 April 2000 to 1 April 2001.

Genetic characteristics

The genetic characteristics of fully informed, volunteer participants were determined by analysis of stored, neonatal heel-prick blood-spot samples. Guthrie newborn screening cards were retrieved, one spot of dried blood was punched out, and DNA was extracted using standard molecular biological techniques.[6] The extracted DNA was subjected to mutation analysis by sequencing and direct comparison with the control genome sequences from the Human Genome Project.

Behaviour and personality traits

Participants completed a psychometric questionnaire, which recorded details of their occupation, behaviour and personality traits. The questionnaires were based on DSM-9 criteria and were analysed independently of the results of genotyping.

Ethical approval

Ethics committee approval was waived.

Statistical analysis

When mutations were identified, the occupation and personality of the affected healthcare professional were assessed, and associations were sought using LOD scores for comparison with the proportions predicted by a Poisson d'avril distribution.

RESULTS

Several gene mutations were identified and found to be correlated with distinct personality traits, which were often strongly associated with particular groups of healthcare professionals (Box).

ABSTRACT

Objective: To describe the genetic basis of various personality traits.

Design: Prospective, blinded cohort study comparing questionnaire-reported personality traits with candidate genes for temperament, as revealed by genetic mapping in the Human Genome Project. Non-supervised questionnaires were mailed to *MJA* subscribers. DNA extracted from newborn screening blood samples of all New South Wales participants was used to perform mutation analysis for candidate personality genes.

Setting: Tertiary medical care in New South Wales, 1 April 2000 to 1 April 2001.

Participants: Healthcare professionals who admitted to reading the *MJA* on at least a semi-regular (monthly) basis.

Main outcome measures: Correlations between occupation, personality and gene mutations were sought using a LOD score in comparison with a classic Poisson d'avril distribution.

Results: Mutations were identified that suggested the existence of genes determining several personality traits. Genes coding for belligerence (*bel*), charisma (*lub*), cynicism (*dub*), housekeeping (*vac* and *uum*), lack of personality (*dul-1*), obsessive-compulsive behaviour (*pic-e*) and gullibility (*suk-r*) are described. These were found to be selectively represented in certain members of the healthcare profession.

Conclusions: The seven most important healthcare personality genes have now been described for posterity.

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Belligerence

The *bel* gene, which codes for the belligerent phenotype, has long been known to be a prerequisite for admission to surgical training, and is also expressed in hospital administrators. Theatre sisters have evolved resistance to their colleagues' belligerence, a condition described phenotypically as *bel indifference*.

Charisma gene

The gene coding for charisma is rich in polyunsaturated oils and is deemed *lub* for lubrication. Cardiothoracic surgeons are homozygous for the *lub* gene.

Cynicism gene

The gene for cynicism, originally called the *cyn* gene, was first recognised in writers of medical articles, who tried desperately to be humorous, but whose brave essays were frequently rejected by medical editors lacking the *fun-e* gene for humour. The *cyn* gene has since been renamed the *dub* gene, short for dubious.

Cardiologists who aspire to the charisma of their cardiothoracic surgical colleagues, but have a tinge of cynicism at their inability to compete, are frequently heterozygous for both genes, giving the classical *lub-dub* phenotype.

Housekeeping gene

The housekeeping genes (such as *vac* and *uum*) are inversely correlated with possession of a Y chromosome. It is thought that the Y chromosome causes steric interference with the housekeeping gene receptor, a condition known as "Y-bother?".

No-personality gene

Larger heel-prick samples paradoxically yielded fewer personality traits. Indeed, the bigger the sample, the fewer the personality genes detected. The greatest correlation was found for orthopaedic surgeons, who had a total deletion of all personality genes.

Obsessive-compulsive behaviour gene

The *pic-e* gene (e for editor), which codes for obsessive-compulsive behaviour, is significantly over-represented among medical journal editors, proof-readers and oncologists.

Gullibility gene

The genes coding for gullibility are not associated with any particular group of healthcare professionals, except possibly social workers. We did observe, however, an interesting birth-cohort phenomenon, in that subjects with the most gullible phenotypes, induced by a mutation in the *suk-r* gene, were found to have birthdays clustering around the beginning of the month of April, although they were not born yesterday.

DISCUSSION

The description of the seven major genes coding for personality and their association with particular medical phenotypes is an essential first step to being able to influence the future development of the medical profession. The Human Genome Project, which has already revolutionised our approach to human disease, has now given us the potential to modify human personality.

At present, it is only possible to become a member of the medical profession if one is lucky enough to be born with the correct genetic mixture of personality genes. Clearly, this is an iniquitous situation — as inequitable as selecting medical students because Daddy was a doctor. It contravenes the ethical principles of equity and justice.

The description of the personality genes raises new possibilities. Any person who aspires to be an orthopaedic surgeon, and who is unfortunate enough to possess any personality genes whatsoever, could elect to have a CBO (charisma bypass operation), whereby the genes for charisma and related personality traits are removed using gene shears.

On the other hand, any aspiring medical practitioner who instead prefers to become part of the caring profession will soon be able to request gene therapy to achieve this goal. Modified retrovirus vectors are already being developed, into which will be inserted a gene cassette coding for one or more of the personality genes. These retroviruses will be able to transfect personality genes into the host germ-line cells, leading to a sustained alteration in the personality phenotype of the prospective medical student. It might even be possible to develop a genetic construct of a surgeon who understands evidence-based medicine or a histopathologist who can communicate.

The future of the next generation of healthcare professionals is now firmly ensconced exactly where it should be — in the hands of the genetic engineer.

COMPETING INTERESTS

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Personality trait	Genotype	Phenotype
Belligerence	*bel*	All surgeons and hospital administrators
Charisma	*lub*	Oily charm; mostly cardiothoracic and plastic surgeons
Cynicism	Originally *cyn*, now *dub*	Writers of medical humour; cardiologists heterozygous
Housekeeping	*Vac* and *uum*	Inverse correlation with Y chromosome
No personality	*dul-1*	Orthopaedic surgeons
Obsessive-compulsive	*pic-e*	Medical journal editors, oncologists
Gullibility	*suk-r*	Social workers and those not born yesterday