

QML PATHOLOGY

newsletter February 09

>>New 'Old' Tests - DNA Tests Answering Old Questions Dr Nigel Brown, Pathologist in Charge - Molecular Pathology

DNA tests are not just for classic 'inherited diseases' like cystic fibrosis and haemochromatosis. They can also look for genetic risk or diagnostic factors in complex diseases where hereditary plays some part, show the changes in cancer cells, and signal the presence of bacteria or viruses without having to grow them in the lab (see Fig. 1 overleaf).

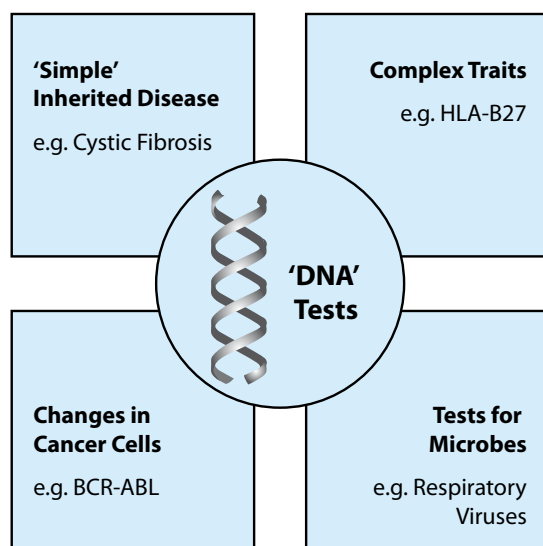
>> New 'Old' Tests - DNA Tests Answering Old Questions

Dr Nigel Brown, Pathologist in Charge - Molecular Pathology

For this discussion, I use the term 'DNA Tests' as a common name, although some of these tests are actually RNA based. Nucleic acid testing is another term used to cover DNA and RNA testing.

Let us look at how these new tests can replace or complement the past ways of doing things.

Figure 1 - DNA tests in Pathology



Replacement tests: DNA tests that replace previous methods

HLA-B27 test

A number of immune based diseases have an association with the major histocompatibility antigen HLA-B27 (see Table 1). The HLA-B27 type refers to a protein expressed on the cell surface but this protein arises from a gene on chromosome 6. By looking at the gene from which the protein is produced, a person's HLA type can be determined by a DNA test.

In the 1950's, when HLA type was first being assessed, testing was based on mixing together leukocytes from two sources and observing for in vitro cytotoxic effects. This was modified to a microdroplet methodology using antisera in the 60's. Flow cytometry of antibody marked cells was introduced in the late 80's. By the new century DNA testing that determines the HLA-B27 type by detecting the specific underlying DNA sequences was being established as the preferred method (See Fig. 2).

However, whether the results are obtained by DNA testing or more traditional methods, controversies over application of HLA-B27 testing remain the same. For example, in the diagnostic algorithm for Ankylosing Spondylitis some rheumatology experts support a role for HLA-B27 testing in general practice [Ann Rheum Dis 2005; 64: 659-663], while others advise leaving testing until after specialist referral [MJA 2008; 188: 235-237].

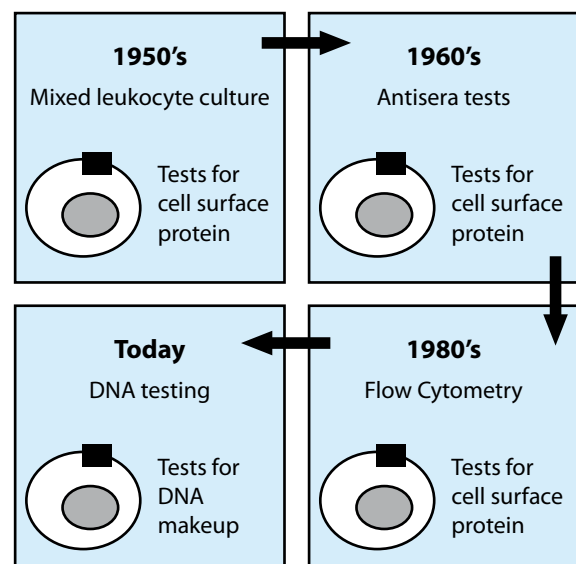
Table 1

Some HLA-B27 Associated Conditions
Ankylosing spondylitis
Reactive arthritis (previously referred to as Reiter's syndrome)
Psoriatic arthropathy
Enteropathic arthropathy
Acute anterior uveitis

Microbial testing

In some cases detection of microbes by detecting their genome has completely replaced culture methods in routine clinical practice. For example, Herpes simplex virus (HSV) testing previously took up to seven days when done by viral culture. Today QML Pathology detects the virus in swab and fluid by DNA tests that detect specific parts of the HSV genome. This testing provides results in approximately 24 hours.

Figure 2 - HLA-B27 Testing



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For the common respiratory viruses (including Influenza A and B, Parainfluenza 1, 2 and 3, Adenovirus, Respiratory Syncytial Virus and Human Metapneumovirus) QML Pathology uses Nucleic acid testing. Developing other viral nucleic acid tests is underway. Identification of *Bordetella pertussis* by DNA testing has replaced the time-consuming microbiological culture testing previously required for this organism. Nucleic acid testing for *Legionella pneumophila* is also available.

Complementary tests: DNA tests that provide either extra information or may rapidly provide partial information

Sometimes the DNA testing will add information to existing test regimens but not replace them.

Oncology cytogenetics – BCR-ABL testing

Many malignant conditions are known to be causally related to constitutive genetic changes within the malignant cells. Other genetic changes may be seen in malignant cells just reflecting the deregulated nature of cell growth in those conditions (e.g. multiple chromosome states called ploidies).

The most well known malignant marker is the Philadelphia Chromosome associated with chronic myelogenous leukaemia (CML). This is a chromosome translocation that creates a new active fusion gene named BCR-ABL. DNA testing is able to identify BCR-ABL and this test (actually based on RNA as a first step) is complementary to microscope based cytogenetic assessment of CML. As the BCR-ABL test is more sensitive than traditional cytogenetic analysis it has an important role in management of residual disease during treatment.

Gonorrhoea testing

Nucleic acid testing provides a rapid detection of *Neisseria gonorrhoeae* but can be complemented by culture testing of positives to determine antibiotic sensitivity.

Future DNA testing in medicine

Prenatal cytogenetics

The next decade will see high through-put DNA identification of chromosomal abnormalities not only being a screening test but being robust enough for definitive testing in some prenatal situations requiring cytogenetic analysis.

Today's visual microscope based analysis detects large-scale alterations that signal many of the traditionally defined prenatal conditions, such as trisomies. The challenge is

not only to have robust DNA testing equipment and tests in the laboratory but also to understand the implications of the subtle variations that these new methodologies are revealing. What was once thought of as a clearly defined 'normal human genome' is being shown to have much more individual-to-individual variation than previously has been appreciated. Fully understanding what is disease-associated and what is part of the rich tapestry of human variation is still many years off.

Personal genomics

What information on our health risks is best determined by history taking or phenotype measurements, for example serum cholesterol, and what is best based on testing a person's genetic make-up, is currently under debate. As mentioned for prenatal testing above, an understanding of what is part of normal variation and what is disease causing is some years off at least.

Added to this is the complexity of understanding what interactions across a number of genes mean for the final interpretation of genetic information. Assessing the role of environmental triggers, such as gut inflammation for the HLA-B27 related diseases mentioned above, is another added difficulty.

Overall it is reasonable to say that personal genomics, in the sense of simultaneously measuring many individual genetic changes, has not been shown to currently be a useful approach.

Dr Nigel Brown DipRACOG FRCPA



Consultant Chemical Pathologist
Head of Molecular Pathology Dept.

Ph: (07) 3121 4428

Email: Nigel.Brown@qml.com.au

Dr Brown joined QML Pathology in May 1999 as a Consultant Chemical Pathologist in the Biochemistry

Department of the West End laboratory. A graduate of the University of Queensland (1980), Dr Brown trained in pathology at the Royal Brisbane Hospital before obtaining his fellowship in chemical pathology in 1989. He remained at the Royal Brisbane Hospital for nearly a decade where, in addition to general chemical pathology, he explored his interests in genetics and errors of metabolism.

Infectious Diseases Report - Geographic Distribution - January 2009

ORGANISM	Regions (as per key below)															Total			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Jan	Dec	Nov	Oct
Adenovirus (not typed)	2	3	2				3		3	2	5	5		2		27	30	23	55
Adenovirus (typing pending)	1	4	1		1		10		5	7	9			1		39	37	37	54
Barmah Forest virus	1	4	1	2			3		4	3	6	6	2	3	2	37	29	26	29
Bordetella pertussis	12	25	6		1		18		26	6	43	14	5	3	1	160	146	97	112
Brucella species					1					1						2	3	1	3
Campylobacter jejuni																0	1	1	2
Chlamydia pneumoniae																0	0	0	0
Chlamydia trachomatis, not typed	49	91	25	16		1	86	1	46	21	142	42	15	28	16	579	484	389	570
Coxiella burnetii			1									1		2		4	9	8	11
Cryptococcus species																0	2	0	1
Cytomegalovirus (CMV)	2	13	2	5			10		11	1	18	13	7	1	4	87	67	39	66
Entamoeba histolytica																0	0	0	1
Enterovirus - not typed															1	1	3	0	5
Epstein-Barr virus (EBV)	3	17	7	1	1		20		18	3	28	9	15	4	4	130	123	108	124
Flavivirus unspecified	24	1					1		3	1	4	1		12		47	26	11	6
Hepatitis A virus		1							2							3	1	0	0
Hepatitis B virus	6	6	2	1		1	14		2	2	43	1	1	4	1	84	51	59	72
Hepatitis C virus	17	37	25	6	1		39		29	3	60	28	6	5	11	267	184	197	285
Hepatitis D virus																0	0	0	1
Hepatitis E virus											1					1	0	0	2
Herpes simplex Type 1	24	27	15	11	1		36		22	7	70	18	10	4	5	250	256	188	269
Herpes simplex Type 2	14	39	7	6	1		31		17	1	32	18	2	11	1	180	164	150	204
Herpes simplex virus - not typed	3	7	1		1		8		8	3	14	8	1	3		57	69	55	72
HIV-1	1						1				2					4	3	10	11
HTLV-1																0	0	0	0
Influenza A virus			1	1			5		8	1	8	4	3		1	32	31	24	30
Influenza B virus						1			1	1	2			1		6	3	11	18
Legionella species											1					1	1	0	0
Leptospira species	6											1				7	3	5	4
Measles							1									1	0	0	0
Mumps virus		1														1	0	0	1
Mycoplasma pneumoniae	4	4	4				13		9	1	9	3	3			50	53	38	66
Neisseria gonorrhoeae	5	3	1	1			2		1		5			5		23	28	23	24
Parainfluenza virus Type 1																0	0	0	0
Parainfluenza virus Type 2																0	0	0	0
Parainfluenza virus Type 3											1					1	18	16	38
Parvovirus		1	10		1		6		2		6	3	2			31	18	21	42
Pneumocystis carinii		1														1	1	0	0
Respiratory Syncytial virus	1	2							6	1	4	4		2		20	16	13	26
Rickettsia - Spotted Fever Group	1									1		1				3	5	0	0
Ross River virus	12	4	3		1		9		8	12	15	7	5	9	7	92	52	41	55
Rubella virus															1	1	1	0	0
Salmonella paratyphi A																0	0	0	0
Salmonella paratyphi B																0	0	0	0
Salmonella typhi		1														1	0	0	0
Shigella dysenteriae																0	0	0	0
Shigella flexneri																0	0	0	0
Streptococcus Group A	9	8	4		3		17		9	3	11	9	4	3	2	82	80	67	111
Toxoplasma gondii	1		2				1									4	0	2	2
Treponema pallidum	21	11	2	2	1	1	15		7		31	4		3	1	99	108	88	139
Trichomonas vaginalis	4				1		1					1	1	3		11	17	8	8
Varicella Zoster virus	14	25	7	1		1	39	1	19	13	43	16	3	7	2	191	158	151	245
Yersinia enterocolitica																0	0	0	0
TOTAL	237	336	129	53	15	5	389	2	266	94	613	217	85	116	60	2617	2281	1907	2764

REGIONS

1 Cairns
2 Gold Coast/Northern Rivers
3 Ipswich

4 Mackay
5 Mount Isa
6 New England
7 North Brisbane Suburbs

8 Northern Territory
9 Redcliffe
10 Rockhampton
11 South Brisbane Suburbs

12 Sunshine Coast
13 Toowoomba
14 Townsville
15 Wide Bay/Burnett

December 2008 and further historical clinical data can be obtained by contacting your local Medical Liaison Officer

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QML Pathology updates Feb 09

>> Opening of New Lab

QML Pathology is proud to announce that we will be opening a new laboratory at the Greenslopes Specialist Centre at Greenslopes Hospital in March 2009.

With renovations well under way, our new, modern laboratory will soon be operational, offering increased services to doctors and patients at Greenslopes Private Hospital. With this commitment, we hope to deliver a greater level of service and patient satisfaction in the hospital setting. QML Pathology collection staff will continue to be available on-site to provide services to hospital inpatients. If you would like any further information please contact Margaret MacPherson, Medical Liaison Officer, on 0413 760 961.

Travel Health Service Fax Number

Due to the relocation of our Central Laboratory in April 2006 the travel health fax number '3840 4478' is no longer in operation. Please discard any old travel health pads. If you require a new travel health pad, please contact your local Medical Liaison Officer or the Marketing Department on (07) 3121 4506.

As a reminder, we offer several methods of obtaining travel health information:

Online: Simply complete the travel health questionnaire on our website www.qml.com.au

Fax:

Please fax a completed questionnaire to (07) 3121 4478

Via your courier: Give your completed questionnaire to your QML Pathology courier.

This information will be provided within 24 hours (excluding weekends and public holidays). If you have not received your patient's travel advice after this timeline, please phone our Travel Health Service on (07) 3121 4506.

Easter Warfarin Care Clinic Hours

Over the Easter long weekend, the Warfarin Care Clinic will be closed for the registering of new patients. The lines will be closed from 6.00pm, Thursday, 2 April 2009 and will re-open from 7.00am, Tuesday, 14 April 2009.

During this time it is essential that any new patients on Warfarin are supplied with instructions and/or are referred to their local doctor for supervision. Patients who are currently monitored by QML Pathology and are being discharged from hospital will be accepted over this period.

The flu season is fast approaching!

Amount	Price (ex. GST)
50 or less	\$12.50ea
50 - 100	\$12.00ea
More than 100	\$11.80ea

Available to buy in boxes of 10 and single doses.
To order please contact QML Pathology Vaccines
on (07) 3121 4523 or Fax (07) 3121 4944

QML Pathology.



PATHVIEW

coming soon!

>> Doctor's Noticeboard

Wesley Medical Centre

Dr Christopher J Zappala, Thoracic and Sleep Physician
Dr Justin Hundloe, Thoracic and Sleep Physician
Dr Jennifer Wong, Nephrologist

Suite 24, Level 2
Wesley Medical Centre
40 Chasely Street
Auchenflower QLD 4066
Phone: (07) 3371 0500
Fax: (07) 3371 0522.

Dr Nicholas Demediuk, 'No Scalpel Vasectomy' & Neo-natal Circumcision service, has commenced at:

Suite E, Currimundi Court Medical Centre
768 Nicklin Way
Currimundi QLD 4551

Dr Demediuk has concentrated his practice on vasectomy surgery and, in addition to the standard no sedation/no scalpel/drive home safely afterwards service, is also able to offer a 'no needle' service to the needlephobic!

More information can be found by visiting the web site www.drsnip.com.au. Referrals can be made by contacting the practice on 1300 377 647 (1300DRSNIP).

Introducing Dr Hugh Won, Orthopaedic Surgeon

Dr Won is a new orthopaedic surgeon who is starting this year at the John Flynn Medical Centre. He was the first ever orthopaedic registrar at the Tweed Hospital back in 2003. His areas of special interest include hips & knees, as well as foot & ankle surgery. Apart from surgery for arthritis such as joint replacements, Dr Won also manages sports injuries and orthopaedic trauma. He currently has admitting rights to the John Flynn Private hospital and the Pindara Private hospital. He is also a locum consultant at the Tweed Hospital.

Referrals can be made through the Leg Bones Clinic, located at Suite 4E John Flynn Medical Centre, 42 Inland Drive, Tugun. Phone: 1300 65 64 88, Fax: (07) 5641 0955, Web: www.legbones.com.au.

Dr Len Yared wishes to advise that he continues to practice in obstetrics and general gynaecology at 643 Logan Road, Greenslopes.
Phone: (07) 3397 3331, Fax: (07) 3394 1071.

Dr Phil Lockie would like to advise that he has a new telephone number (07) 3834 7080. Based in Brisbane, Dr Lockie specialises in laparoscopic, hernia and weight loss surgical procedures. Visit www.drphillockie.com.au for further information.

New Collection Centres **Carrara**

Shop 2B, Carrara Food Fair
Cnr Gooding Dve & Nerang-Broadbeach Rd
Phone: (07) 5579 8430
Opening Hours:
7.30am - 12.30pm (Mon-Fri)

North Lakes

Cnr Winn St and Gregor St West
Phone: (07) 3886 2805
Opening Hours:
8.00am - 12.30pm, 1.30pm - 4.30pm (Mon-Fri)

Calamvale Central

Shop T64, Calamvale Central Shopping Centre
662 Compton Road
Phone: (07) 3711 2318
Opening Hours:
8.00am - 12.30pm, 1.00pm - 4.00pm (Mon-Fri)

Relocated Collection Centres **Kirwan**

Tenancy 2, 7-9 Thuringowa Dve
Phone: (07) 4723 4048
Opening Hours:
8.00am - 1.00pm, 2.00pm - 4.30pm (Mon-Fri)
8.00am - 12.00pm (Sat)

Kingscliff

Shop 14, Kingscliff Shopping Village
22 - 26 Pearl St
Phone: (02) 6674 2288
Opening Hours:
7.30am - 12.30pm, 1.30pm - 4.00pm (Mon-Fri)

Sunnybank (McCullough St)

Suite 21, McCullough Medical Centre
259 McCullough St
Phone: (07) 3344 2309
Opening Hours:
7.00am - 6.00pm (Mon-Fri)
7.00am - 12.00pm (Sat)