

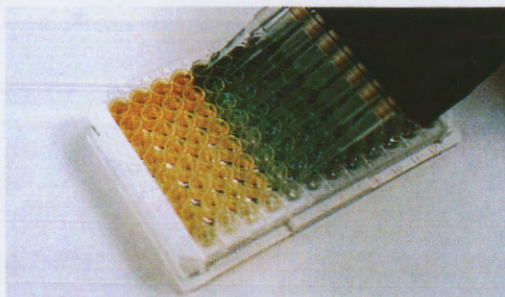
Parvovirus B19 infection – an underestimated problem

Established in January 1998, the purpose of all research and development work carried out in the biotechnology laboratory at NUI Maynooth is twofold. Firstly it is our aim to carry out strategic immunological research, and secondly to translate this knowledge into valuable commercial realities. The group has two main areas of interest:

1. Parvovirus B19.

Parvovirus B19 (B19) is a human pathogen which can cause a mild flu-like illness and joint pain. More importantly, foetal loss can occur if infection occurs during pregnancy, and it is conservatively estimated that upwards of 5,000 pregnancies are lost annually in the European Union due to B19 infection. The work of our group is primarily directed towards the development of sensitive viral and anti-viral antibody detection systems, and at understanding the fundamental immune mechanisms operating against this virus (in collaboration with Dr B.P. Mahon, NUI Maynooth).

A polymerase chain reaction (PCR) based assay for the detection of parvoviral DNA has been developed in collaboration with Biotrin International, and current efforts are directed towards the establishment of this test as a



Microplate detection of viral nucleic acid.

screening tool for testing both infected individuals and pooled blood products. Use of this robust and sensitive test system in clinical laboratories should aid in the successful treatment of pregnant women infected with B19 during pregnancy by identifying B19 both prior to and post-treatment, respectively.

Regarding immunity studies, we, along with others, have recently demonstrated that immunity against this virus may be compromised due to selective antibody loss in the post-infection recovery period (Kerr et al., *Journal of Medical Virology*, 57, 179-185, 1999). In a Health Research Board funded project, sensitive *in vitro* cell culture systems, in association with highly purified recombinant B19 antigens, are being employed to explore the unique nature of the

immune response to parvovirus B19. Insight into immune mechanisms against B19 should facilitate anti-viral treatment and vaccine development.

2. Immunodiagnostic assay development

Work in the biotechnology laboratory, in collaboration with a number of Irish biotechnology companies, is also directed towards immunodiagnostic assay development and the production of recombinant proteins for both immunodiagnostic and vaccine uses. To date, our laboratory has successfully completed one joint Enterprise Ireland/Tridelta Development Limited funded project to develop an automated assay system for the stress response protein, Haptoglobin.

Another Enterprise Ireland funded project has facilitated the establishment of a recombinant protein expression unit, and currently a number of model proteins (e.g. parvovirus B19 NS1 protein) are under investigation to establish the feasibility of using the baculovirus/insect cell expression system for the secretion of commercially relevant diagnostic antigens.

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