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Texas law allows conscientious immunisation exemptions

Paediatricians and health officials in Texas are alarmed at a new law that allows parents to have their children exempted from state-required immunisations on conscientious grounds. Before September 1, 2003, when the controversial law came into force, certain immunisations in Texas, as in most US states, were compulsory for all children attending school or day care, apart from those exempt on medical or religious grounds.

In an interview with the *Houston Chronicle* (July 3) Michael Foulds, president of the Texas Paediatric Society, said that "expanding exemptions will only increase the outbreak of deadly infectious diseases". Texas already has one of the lowest immunisation rates in the USA—67.9% in 2002 compared with the national rate of 75%. In Houston, the nation's fourth largest city, immunisation coverage was only 61.4% in 2001, the third lowest rate among urban areas in a survey by the US Centers for Disease Control and Prevention (CDC).

But the new law is a victory for

Parents Requesting Open Vaccine Education (PROVE), a pressure group representing 3500 families. PROVE's president, Dawn Richardson, who has

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Should parents have the right to choose?

long campaigned for parents' right to "choose what is best for their child", welcomes the law, which gives Texas parents "control over which vaccine risks their child will take".

Tom Spurgat, medical director of the Christus Rosa Children's Hospital in San Antonio, says that many parents who have conscientious objections to having their children immunised are "victims of unscientific information that serves as a scare tactic [by anti-vaccine organisations]". 3 years ago a

survey in Colorado, a state that already allowed "philosophical" exemptions, showed that children aged 3–18 years with immunisation exemptions were 22 times more likely to catch measles and nearly six times more likely to acquire pertussis than immunised children (*JAMA* 2000; **284**: 3145–50). CDC's William Atkinson says, "Any action that has the net effect of reducing the level of immunisation coverage in a population, such as a school, has the potential to be problematic, depending on how many children remain susceptible as a result".

Some parents who want to exempt their children from compulsory immunisations on conscientious grounds might be put off by the procedure, which involves obtaining a form from the Texas Department of Health and declaring their objections in an affidavit. Under the old law, parents were allowed to informally claim religious exemption without having to prove they practised a given religion.

Dorothy Bonn

Paths converge beyond the Toll

Researchers recently provided important new details about the innate immune response, the first line of immunological defence against pathogens. Bruce Beutler (Scripps Research Institute, La Jolla, CA, USA) and colleagues report that the protein Trif is an adaptor for both the Toll-like receptor 3 (TLR3) and TLR4 (*Nature*; published online July 23; DOI 10.1038/nature01889).

Because these two receptors recognise double-stranded RNA and bacterial endotoxin, respectively, this finding explains why infectious agents as different as viruses and bacteria can produce similar symptoms, says Beutler. His results are confirmed in an independent publication from a Japanese group headed by Shizuo Akira (Osaka University, Japan; *Science* 2003; **301**: 640–43).

Unlike the adaptive immune response in which specific antibodies

and T-cell receptors are produced in response to individual pathogens, in the innate immune response germline-encoded sensors detect general features of pathogens. In 1998, Beutler identified TLR4 as the receptor for the bacterial endotoxin lipopolysaccharide (LPS), a common constituent of Gram-negative bacteria, and it is now known that ten TLRs are encoded in the human genome, which between them can probably detect every type of microbe.

To find out more about the innate immune system, Beutler's team introduced germline mutations into mice and looked for animals that were unresponsive to LPS. These mice, which were susceptible to viral infections, have a mutation in a Toll/interleukin-1 receptor/resistance adaptor protein called Trif. On the basis of this and additional findings, the researchers conclude

that Trif is a key component of TLR3-mediated and TLR4-mediated signalling pathways. "Our results suggest that the LPS signalling pathway has just two branches from TLR4, one of which requires Trif", says Beutler. "Mutations in either branch might enhance susceptibility to infection."

"It is critically important for us to understand the innate immune response if we are to improve treatment for human sepsis", comments Steven Opal (Brown University Medical School, Providence, RI, USA). The Trif adaptor, he suggests, could provide a target for small molecule inhibitors to block sepsis. And, say both Opal and Beutler, Trif inhibitors could also be useful when a viral infection causes overwhelming inflammation, as for example in severe acute respiratory syndrome.

Jane Bradbury