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► **COVER:** 'Trafficking' by Neil Smith, inspired by the Review on p602.



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**N**umerous mechanisms for increasing the diversity and complexity of vertebrate immune systems have been assembled during evolution and this has been crucial to our ability to cope with an increasing array of pathogenic insults.

For example, B and T cells have evolved mechanisms for deriving almost limitless variation in their antigen receptors from a very few genes. But does diversification come at a price? Are there risks to weigh up against the benefits? Two articles in this issue illustrate how the evolution of diverse mechanisms in mammalian systems can have unwelcome consequences.

One of the mechanisms for creating a diverse repertoire of high-affinity B-cell receptors is somatic hypermutation, which introduces mutations in the variable region of immunoglobulin genes at an impressive rate. On page 573, Valerie Odegard and David Schatz highlight the importance of accurate targeting of somatic hypermutation to the immunoglobulin genes to ensure genomic integrity and avoid the development of B-cell malignancies that can arise from mistargeted mutations. The ways in which this is achieved is a matter of continued debate and intense research.

On page 584, Ashley Moffett and Charlie Loke describe the rarely appreciated diversity and complexity of placentation and its implications for studying the immunology of pregnancy. They describe how placental strategies differ remarkably between species, in particular with regard to the extent of invasion of the maternal uterine tissue by placental trophoblast cells. The placental strategy affects the type of immune response that is generated by the mother. Humans have evolved with the most invasive form of placentation, and this can be seen as a trade-off between an efficient way of obtaining nutrients from the mother and an increased risk of adverse immunological reactions and possibly pregnancy failure.

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