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## Millionaires from antibody research

**Lisa Melton finds how a Manchester husband and wife team are tackling infectious diseases, including the superbug MRSA**

Ruth Matthews and James Burnie - a husband and wife academic team - have developed a novel antibody-based therapy to combat potentially lethal microbes, including the MRSA superbug. Their unorthodox approach to treating life-threatening infections has also made them millionaires.

The couple, both professors and medical doctors, started out at the University of Manchester 26 years ago. Their quest was to decipher why some people are more susceptible than others to infections.

"We looked at the blood of people who survived infectious disease and those who didn't," says Burnie, chief executive of NeuTec Pharma, the biotechnology pharmaceuticals company set up by the couple. "What we found is that those who live have antibodies against a protein called heat shock protein 90, those who die, don't have the antibody."

It soon became clear that the university professors were onto a finding of enormous potential value. Their discovery may signal a new era in the treatment of infectious diseases. To take their idea to market, the researchers became entrepreneurs and set up NeuTec in 1997.

Their strategy relied on identifying those naturally occurring antibodies from patients who recover from an infection. Those antibodies, part of the body's immune defence mechanisms, served as the blueprint for Matthews and Burnie to generate "genetically recombinant antibodies", known as grabs.

Next they asked whether those grabs could help infected patients become survivors. The work progressed well. A pivotal clinical trial showed that the drug Mycograb, designed to target fungal candida infections, when combined with a conventional antifungal treatment, dramatically cut the number of deaths from yeast infections. With conventional therapy for systemic candidiasis, one in five patients die; adding the grab antibodies reduced deaths to one in 25. "It's a big difference. That's what makes it such an attractive drug," says Burnie.

The yeast candida albicans is the most common species in the human gut. Most of the time, it is usually harmless but it can cause a range of trivial infections, including vaginitis.

But if this organism invades the blood, the infection can be deadly. Patients with compromised immune systems, such as those with HIV/ Aids or undergoing organ transplants are especially at risk, as are babies born severely under weight.

Yeast can be difficult to treat. "Fungal infections are quite frequent in intensive care units. Existing treatments are effective but can be very toxic," says Professor Tom Evans, an infectious disease specialist at the University of Glasgow. "Mycograb is targeting a genuine problem. Their product shows promise."

Interest in NeuTec's antibody-therapy soared and the company was floated on the stock market.

Last summer Novartis, the Swiss pharmaceutical multinational, bought the start-up company for £304 million, earning the investigators a £21 windfall and £13 million for the University of Manchester, which helped Matthews and Burnie to commercialise their research. The company is also developing Aurograb, a grab aimed at the MRSA superbug. This strain of bacteria has become endemic in hospitals around the world and blood-stream infections often have proved lethal. The need for more effective therapies to tackle deadly infections, such as MRSA, is urgent, but it can take years to develop new antibiotics.

The hope is that NeuTec's novel pharmaceuticals may avert the impending threat.

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