

# World Congress on Breast Cancer

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### HER-2/neu as a target for *Listeria*-based cancer immunotherapy for breast cancer

We have been developing novel, live, highly attenuated bacterial vectors based on *Listeria monocytogenes* (*Lm*), bioengineered to secrete tumor-associated antigens and to present them to the immune system in a particularly immunogenic manner. The *Lm* vector itself, in addition to its major virulence factor listeriolysin O (LLO), serves as its own adjuvant and is phagocytized by APC where it presents antigens through both MHC class I and II pathways, resulting in specific T-cell immunity to tumors. We have conducted extensive pre-clinical studies to determine the mechanism of action of *Lm* as an immunotherapeutic and its efficacy in numerous mouse models of cancer. Here we will describe the advancement of *Lm*-LLO immunotherapy into the clinic for HER-2/neu over expressing tumors, such as breast cancer. *Lm*-LLO-cHER-2/neu, is an *Lm*-LLO immunotherapy bioengineered to secrete a chimeric polypeptide consisting of three regions of HER-2/neu known to contain most human HLA epitopes. This polypeptide, comprising 419 residues, about one third of the intact HER-2/neu molecule was fused to a truncated form of LLO for expression by *Lm*. *Lm*-LLO-cHER-2/neu has proven to be effective at limiting tumor growth in pre-clinical mouse models of cancer.

### Biography

Yvonne Paterson is Professor of Microbiology in the Perelman School of Medicine at the University of Pennsylvania, USA. As a Professor of Microbiology, Paterson is an active educator and trainer and is the PI of several training grants and programs. Her research is in the field of cancer vaccines where she was the first investigator to use *Listeria monocytogenes*, as a vector to target tumor-associated antigens to the immune system. She has pioneered the application of this organism in vaccine development for over 20 years. Her laboratory was the first to show that this bacterium could be genetically engineered to target antigens to the MHC class I pathway for antigen processing with the induction of cytotoxic T cells, the first to show that it could provide protective immunity against viral challenge and the first to apply the technology for the immunotherapy of cancer. In partnership with Advaxis Inc., a company she founded in 2002, the *Listeria* based technology is now in a number of clinical trials. Overall, these trials have shown that *Listeria* based immunotherapeutics are safe to use in humans and result in significantly prolonged survival and, in some cases, complete and partial remissions.

### Notes: