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Teaching self-destructing *Salmonella* new tricks to fight cancer

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Cancer is one of the leading causes of death in the world. A major challenge in treating cancer is the difficulty of bringing therapy to poorly perfused areas of solid tumors. Motile Salmonella Typhimurium exist as facultative anaerobes, allowing them to survive in both oxygenated and hypoxic conditions. *S. Typhimurium* was shown not only to colonize large established tumors but also exhibit the property to invade and affect metastases. We have constructed attenuated hyper-invasive *S. Typhimurium* strains that are attenuated, yet capable of synthesizing a selected protein and/or harboring an improved DNA vaccine vector. The programmed self-destructing features designed into these *S. Typhimurium* strains allow release of the cell contents by cell lysis after bacteria accumulate in host tissues. To turn self-destructing *Salmonella* into anti-cancer therapy agent, these strains have been genetically engineered to exhibit diminished toxicity of lipid A to lessen inflammatory responses; to rapid release of vacuolar *Salmonella* from the endosome to increase the efficacy of delivery and expression of a DNA vaccine; and to allow in vivo maximized *Salmonella* localization in tumors. These *S. Typhimurium* strains are able to in vivo selectively colonize in tumor and successfully inhibit tumor growth. The success of our efforts would ensure the development of a safe, inexpensive, rapidly manipulatable, and efficient universal *Salmonella* delivery platform to facilitate cancer therapies and anti-cancer agent delivery.

Biography

Wei Kong received her PhD degree in Bacterial Genetics from Kyushu University, Japan. She was then mentored by Dr. Roy Curtiss III as a Postdoctoral Associate working on the projects of vaccine development at Washington University in St. Louis, USA. She currently is a Research Assistant Professor of Arizona State University. Her research interest is to develop a universal protective antigen and DNA vaccine delivery platform using self-destructing *Salmonella* for the prevention and treatment of infectious and non-infectious diseases including *Pneumonia*, influenza, *Eimeria*, and Cancer.

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