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Granulocyte infusion therapy for cancer

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Granulocyte infusion therapy for cancer is a new line of cancer treatment based on novel research in cancer-resistant humans and mice and on exceptional therapeutic outcomes of preclinical studies. Over 10 years ago, my lab serendipitously found a unique mouse that was apparently resistant to an array of highly aggressive marine cancer cell lines that would otherwise kill normal mice uniformly. Further studies revealed that this profound cancer-resistance was inheritable in a dominant manner and mediated primarily by the leukocytes of the innate cellular immune system, namely granulocytes and macrophages. The cancer-resistance is naturally-existing without having to be manipulated or stimulated. Upon exposure to cancer cells, effector cells of cancer-resistant mice were rapidly mobilized to migrate to the site of lesion, make tight surface contacts with cancer cells and induce rapid cytolysis of target cells without harming normal tissues or cells. Based on this profound phenotype of cancer-resistance, we developed an *in vitro* assay that can accurately recapitulate the *in vivo* phenotype. This assay measured the normalized ability of effector cells for killing cancer cells and was termed as cancer killing activity or CKA. Using this *in vitro* assay, we were able to find CKA primarily in the granulocyte fraction of white blood cells in some young healthy humans. Based on these observations, we developed a novel therapeutic concept named granulocyte infusion therapy which consists of using CKA assay to identify and to select healthy donors of granulocytes, using apheresis to collect highly purified granulocytes from donors and infusing systemically the freshly collected granulocytes into cancer patients with measurable diseases. Preclinical studies showed that infusion of leukocytes from cancer-resistant donors cured the mice with advanced malignant disease that could not be treated by any other existing cancer therapies. Clinical trials are now underway to evaluate the safety and efficacy of this new therapy in humans.

Biography

Professor Zheng Cui finished his medical degree from China in 1979, his PhD from UMASS at Amherst in 1987 and his postdoctoral training from Harvard Medical School in 1990. He is now a tenured faculty member of Section of Tumor Biology in Department of Pathology, of Department of Cancer Biology, of Institute of Regenerative Medicine, of Programs of Molecular Genetics, of Programs of Molecular Medicine and a member of the Comprehensive Cancer Center of Wake Forest University. He is also an adjunct professor and associate director of Institute of Nanomedicine of Tongji University in Shanghai, China. Professor Cui's work has gained worldwide attention since his first publication on cancer-resistant mice in PNAS in 2003.