UMDNJ
UNIVERSITY OF MEDICINE & DENTISTRY OF NEW JERSEY

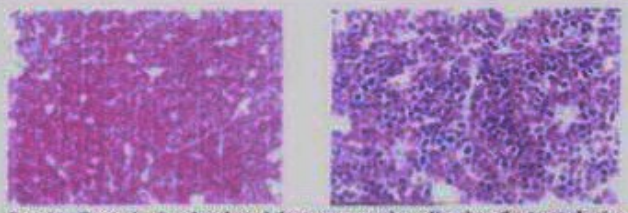
Effect of Human Umbilical Cord Blood Mononuclear Cells on Preclinical Prostate Cancer Mice "Tramp"

Norman Ende, MD and Ruifeng Chen, MD
Dept. of Pathology & Lab Medicine New Jersey Medical School, Newark, NJ 07103

Abstract:

Prostate cancer is almost exclusively a malignancy of men in late adulthood and in elderly men. Recently, an animal preclinical model has been developed of this disease. The mouse model "Tramp" [(C57BlJ6 TgN) ("Tramp") 9247 NG] spontaneously develops cancer that can metastasize and, according to the developers, survives 252 to 280 days and occasionally, 364 days. There is significant evidence that the human immune system deteriorates with age. The possibility that this deterioration may have a significant role in developing cancer of the prostate has been suggested frequently. Having demonstrated that a chimera can be produced in mice with the use of large doses of human umbilical cord blood (HUCB) mononuclear cells, we attempted to determine the effect of large doses of these cells on this transgenic mouse model of prostate cancer. Twenty Tramp mice were divided into 2 groups, 10 mice given 20Oxl06 HUCB mononuclear cells and 10 control mice. The presence of neoplasm initially was demonstrated by palpation and biopsy. When 4 of the 10 control mice developed a palpable mass, those 4 animals also received 200x106 HUCB mononuclear cells. Of the 10 mice treated with HUCB,-2-survived for 470 days and were killed. One of these 2 mice had a neoplasm involved the seminal vesicle; and 1 had no evidence of neoplasm. The average life span of the 6 untreated mice were 254 days. The 10 animals treated with HUCB lived an average of372 days, and 2 animals were living at the termination of the experiments ($P < .001$).The average life span of the 4 animals treated after determination of a palpable mass was 337 days ($P < 05$).HUCB mononuclear cells had a significant effect on delaying the onset and the growth of prostate cancer, and extending the life of the preclinical animal mouse model "Tramp".

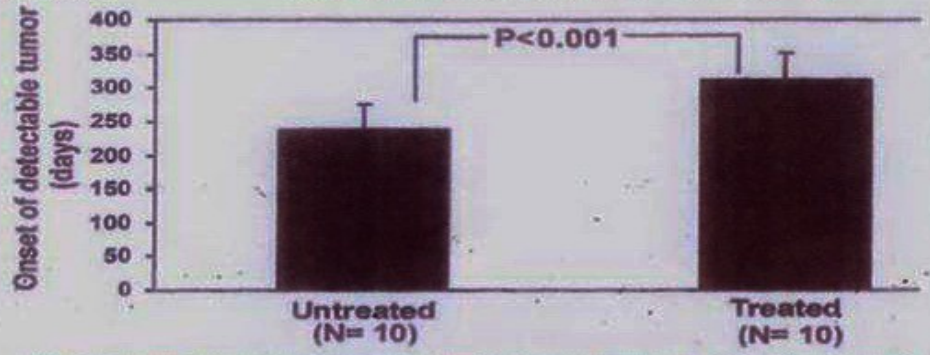
Histology of Prostate Cancer in Mouse Model "Tramp"



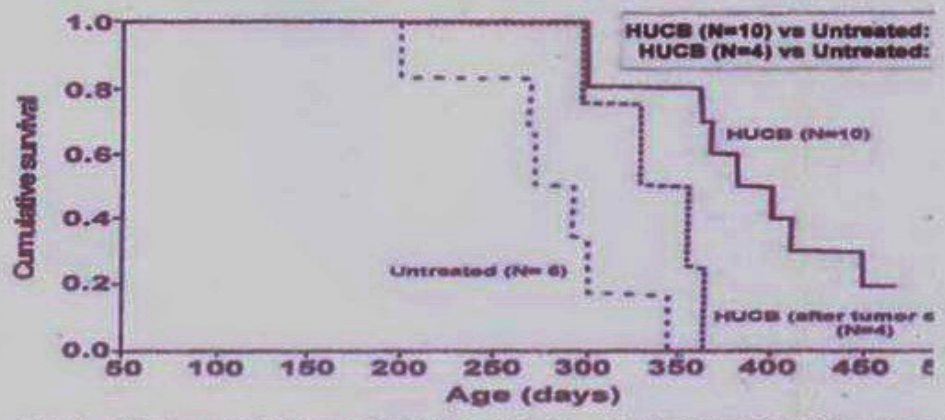
Results: Control mice developed the tumor much earlier than the treated mice (control vs treated: 238± 38 vs 311± 40 days; $p<0.001$). Transplantation of HUCB cells either before or after the development of tumor significantly increased the life span compared to that of control mice. Persistence of human RNA was associated with prolonged survival. No graft vs host disease was observed in any of the mice. One animal having continuous evidence of human DNA had no evidence of neoplasm when sacrificed.

Conclusion: Transplantation of HUCB mononuclear cells via intravenous administration into TRAMP mice without immunosuppression retards not only the development of prostate cancer but also increases the lifespan of these mice. There was no

Supported by
Abraham S. Ende
Research
Foundation



Age of transgenic mouse (TRAMP) when tumor was detected. Each bar represent means ± SD



Kaplan-Merier survival curves for untreated mice and mice treated with human u cord blood cells (HUCB)

Kaplan-Meier Survival Curve