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New model for studying germ cell tumors in testes enlists embryonic stem cells

Peer-Reviewed Publication

CELL TRANSPLANTATION CENTER OF EXCELLENCE FOR AGING AND BRAIN REPAIR

Tampa, Fla. (July 11, 2011) – A team of researchers from Spain and Switzerland have developed a new model for studying the development of testicular germ cell tumors by transplanting embryonic stem cells into the seminiferous tubules in mouse models, resulting in the development of testicular germ cell tumors (TGCT) that mimic the early stages of TGCT development. The study, published in *Cell Transplantation* (20:5), is now freely available on-line at http://www.ingentaconnect.com/content/cog/ct/.

"Over the last fifteen years, cell transplantation into seminiferous tubules has become a valuable tool for studying germinal cell biology," said the study's corresponding author Dr. Juan Arechaga of the University of Basque Country, Spain. "The blood-testes permeability barrier establishes a sealed compartment that protects against influences such as immunological rejection. Thus, our lab has developed a tumor assay to study the cancer invasion process in testicular germ cell tumors using embryonic stem cells injected into the seminiferous tubules."

According to Dr. Arechaga, the tumors generated by the transplantation of early embryos possess gene expressions and differentiation patterns similar to those in testicular germ cell tumors.

The researchers point out that testicular germ cell tumors are uncommon in non-human animals, so there have been no previously suitable animal models for study. However these tumors appear to be genetically regulated and the specific genes related to the development of this kind of tumor have been identified.

"Embryonic stem cell transplantation into mouse seminiferous tubules represents a model with very valuable potential applications because it mimics the pre-invasive state of TGCTs," said Dr. Arechaga. "Donor cells can be transfected with different transgenes before transplantation to evaluate certain genes during the invasive process."

The authors also note that the approach could also be useful in screening novel therapeutic drugs, including inhibitors of angiogenesis and metastasis, to potentially treat TGCTs.

"This study demonstrates the development of an animal model of testicular germ cell tumor formation" said Dr. David Eve, associate editor of *Cell Transplantation* and Instructor at the Center of Excellence for Aging and Brain Repair, University of South Florida. "Study of this model will further our understanding of how testicular cancers arise and potential ways to treat it."

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Contact: Dr. Juan Arechaga, Department of Cell Biology and Histology, Faculty of Medicine and Dentistry, University of the Basque Country, E-48940 Leioa, Vizcaya, Spain.
Tel. + 34-94-601-2883
Fax. +34-94-601-2883
Email juan.arechaga@ehu.es

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The editorial offices for *Cell Transplantation* are at the Center of Excellence for Aging and Brain Repair, College of Medicine, the University of South Florida and the Diabetes Research Institute, University of Miami Miller School of Medicine. Contact, David Eve, PhD. at celltransplantation@gmail.com or Camillo Ricordi, MD at ricordi@miami.edu

News release by Randolph Fillmore, Florida Science Communications, www.sciencescribe.net

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Media Contact

David Eve

deve@health.usf.edu
Office: 813-974-6169