

Stem cells from muscle tissue may hold key to cell therapies for neurodegenerative diseases

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Scientists at Wake Forest Baptist Medical Center have taken the first steps to create neural-like stem cells from muscle tissue in animals. Details of the work are published in two complementary studies published in the September online issues of the journals *Experimental Cell Research* and *Stem Cell Research*.

"Reversing brain degeneration and trauma lesions will depend on cell therapy, but we can't harvest [neural stem cells](#) from the brain or spinal cord without harming the donor," said Osvaldo Delbono, M.D., Ph.D., professor of internal medicine at Wake Forest Baptist and lead author of the studies.

"[Skeletal muscle tissue](#), which makes up 50 percent of the body, is easily accessible and biopsies of muscle are relatively harmless to the donor, so we think it may be an alternative source of neural-like cells that potentially could be used to treat brain or spinal cord injury, neurodegenerative disorders, [brain tumors](#) and other diseases, although more studies are needed."

In an earlier study, the Wake Forest Baptist team isolated neural precursor cells derived from skeletal muscle of adult [transgenic mice](#) (*PLOS One*, Feb.3, 2011).

In the current research, the team isolated neural [precursor cells](#) from in

vitro adult skeletal muscle of various species including non-human primates and aging mice, and showed that these cells not only survived in the brain, but also migrated to the area of the brain where neural stem cells originate.

Another issue the researchers investigated was whether these neural-like cells would form tumors, a characteristic of many types of stem cells. To test this, the team injected the cells below the skin and in the brains of mice, and after one month, no tumors were found.

"Right now, patients with glioblastomas or other brain tumors have very poor outcomes and relatively few treatment options," said Alexander Birbrair, a doctoral student in Delbono's lab and first author of these studies. "Because our cells survived and migrated in the brain, we may be able to use them as drug-delivery vehicles in the future, not only for brain tumors but also for other central nervous system diseases."

In addition, the Wake Forest Baptist team is now conducting research to determine if these neural-like cells also have the capability to become functioning neurons in the central nervous system.

Provided by Wake Forest University Baptist Medical Center

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