

Research Using Human Stem Cells

A core element of the Alzheimer's Association's mission is to eliminate Alzheimer's disease through the advancement of research. The Association is committed to discovery of the causes, better and earlier diagnosis, more effective treatments, prevention strategies and ultimately a cure for Alzheimer's.

The Alzheimer's Association policy supports and encourages any legitimate scientific avenue that offers the potential to advance this goal, including human embryonic stem cell research; and, we oppose any restriction or limitation on research, provided that appropriate scientific review, and ethical and oversight guidelines and compliance are in place.

The possibility of using stem cells to create and replace brain cells destroyed by Alzheimer's gives us hope that we can develop a cure for this devastating disease – and it provides several pathways for this critical research:

- **Therapy development:** Scientists envision that treatments that are currently being developed to reduce the brain cell death in Alzheimer's – thus creating a healthier environment within the brain – may be used in conjunction with future stem cell-based therapies to not only stop the disease but also possibly restore once-lost functioning.
- **Research into the causes of Alzheimer's:** Despite the creation of valuable animal models of Alzheimer's from which we have learned a great deal, it is only humans that fully develop the classic features of Alzheimer's disease. The ability of human embryonic stem cells to form any other type of human cell makes them perfect candidates for scientists to create better models of the healthy or diseased human brain for testing ideas, theories, therapies, etc.
- It is now possible to create stem cell lines from the skin cells of individual Alzheimer patients and cause them to become neurons or other brain cells. Through examining these cells we may be able to identify patient-specific processes that cause or contribute to the development of Alzheimer's, and identify genes that can delay or prevent the disease. This process may enable us to create entirely new, targeted therapies.

Alzheimer's poses unique challenges because it affects many types of brain cells in multiple brain regions. At this time, it is unclear if stem cells can form all these different cell types. We also don't yet know if the brain cells created by the stem cells would effectively repair the extensive network of cell-to-cell connections that are broken when brain cells die in Alzheimer's. Finally, and perhaps most importantly, until we can stop the progression of Alzheimer's disease in the brain, any new brain cells created by a stem cell-based therapy would be exposed to the same hostile environment that destroyed the original brain cells, which may undermine the success of any potential new therapy.

These discoveries to date point to the intense need for more and continued Alzheimer research in every area to drive us closer to the Association's goal of a world without Alzheimer's disease.

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