

Creating Neural Stem Cells to Overcome Autism



Emanuel DiCicco-Bloom
M.D. Professor, Neuroscience & Cell Biology/Pediatrics

CURRENT RESEARCH

Leveraging stem cells to define molecular mechanisms of autism

In 2014, the Centers for Disease Control and Prevention identified 1 in 68 children (1 in 42 boys and 1 in 89 girls) as having autism spectrum disorder (ASD), a condition that affects social interactions, motor behaviors and brain development. Autism is a uniquely human disorder that does not occur in other mammals and primates. Therefore, using animal models to study its causes have inevitable limitations. Autism affects brain development and as a consequence it is almost impossible to obtain human cellular samples to understand its neurobiological basis, which is necessary to develop new therapies.

To circumvent these difficulties, Drs. Emanuel DiCicco-Bloom, a practicing Child Neurologist, and James Millonig, an Associate Professor of Neuroscience & Cell Biology, at Robert Wood Johnson Medical School of Rutgers University are leveraging scientific advances that were only created in 2007. They are generating stem cells (induced pluripotent stem cells or iPSCs) from individuals with autism. From these stem cells they produce human neurons and for the first time they are able to watch how autism neurons develop and identify what neurobiological processes are abnormal. Drs. DiCicco-Bloom and Millonig work as a team to determine whether the basic processes involved in making a brain—including cell proliferation, survival, and differentiation—occur normally in cells derived from people with autism. Since non-genetic environmental factors also contribute to autism risk, they are also investigating whether or not affected individuals are more sensitive to certain factors that may worsen the neurobiological phenotypes.

Autism is also a very heterogeneous disorder, making it very difficult to...

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AFFILIATION



EDUCATION

- A.B. in Biology 1973, Princeton University
- M.D. in Medicine, 1977, Cornell University Medical College
- Intern/Resident in Pediatric Neurology 1985, New York Hospital-Cornell Medical Center

AWARDS

- MD Clinical Investigator Award, NINDS, 1985-1988
- Scientific Service Award, National Alliance for Autism Research, 2005
- Elected member, Dana Foundation, 2013
- Councilor, Society for Neuroscience, 2013-2017

RESEARCH AREAS

Life Science, Neurological / Cognitive, Genomics / Congenital

FUNDING REQUEST

Your contributions will support Drs. Emanuel DiCicco-Bloom and James Millonig at Rutgers University as they examine the molecular and cellular basis of autism using human neurons. Donations will help fund the \$400K/year shared laboratory expenses that support graduate students and senior scientists to perform multidisciplinary stem cell studies. This money will also help train the next generation of autism scientists. Help understand autism by funding Drs. DiCicco-Bloom and Millonig!