Autism and Stem Cell Research

By Amy Bentley

Dr. Philip Schwartz
CHOC Biologist and Stem Cell Research Expert

Dr. Schwartz is the director/supervisor and a senior scientist at the National Human Neural Stem Cell Resource in the Center for Translational Research at the CHOC Children's Research Institute in Orange. He is also an associate research biologist at the Developmental Biology Center at UC Irvine's School of Biological Sciences, and he is on the adjunct research faculty in the Department of Biological Sciences, College of Natural Sciences and Mathematics, at California State University, Fullerton. Nationally recognized for his work in the stem cell field, Dr. Schwartz's research focuses on the use of stem cells to understand the neurobiological causes of autism and other neurodevelopmental disorders.

EDUCATION:
Ph.D. in neuroscience with a minor in pharmacology
Brain Research Institute, School of Medicine, UCLA
B.S in biology and B.S. in chemistry
Seattle University

DIAGNOSING AUTISM

Autism Spectrum Disorders (ASDs) are typically diagnosed in toddlers or young children based on certain behavioral patterns; there is no medical diagnostic test. "There are changes in three areas of behavior that lead to a diagnosis," Dr. Philip Schwartz, senior scientist at the CHOC Children's Research Institute in Orange, explains. "One is communication and the others are sociability and repetitive behaviors, where the child does the same thing over and over. These children have trouble communicating. They don't make that connection. There's little eye contact or emotional content in their interactions with other people, including their parents."

UNLOCKING THE MYSTERY

"The causes are generally unknown. We think it has to do with the way the brain cells communicate with each other. There is a strong genetic predisposition to autism although influences during pregnancy cannot be ruled out," explains Dr. Schwartz. "Scientists are working to find a biological cause so we can have a diagnostic tool that is not just behavioral, like a blood test. With that knowledge, we can also develop new therapies and drugs." There is currently no cure for autism but behavioral therapy can help if started early.

AUTISM AND STEM CELLS

"Scientists at CHOC are growing brain cells from skin cells. This lets us analyze in a dish in a laboratory how the brain cells communicate with each other," says Dr. Schwartz. "We can't analyze that in a living child. The best way to do this is to make the cells in a dish the laboratory equivalent of a brain," he says. "This will tell us what parts of the cells' communications are not working properly. Understanding this will give us targets for therapy." Dr. Schwartz expects some key findings in the next couple of years.

1 in 252
PREVALENCE OF AUTISM SPECTRUM DISORDERS (ASDs) IN GIRLS

1 in 54
PREVALENCE OF ASDs IN BOYS

WHAT ARE STEM CELLS AND WHAT ARE THEY USED FOR IN RESEARCH?

A stem cell is an immature cell that can be made from any part of the body, like the skin, and that scientists can make into a mature cell in a lab. In research, stem cells are being used to study a host of diseases in children and adults, including brain diseases like autism, childhood metabolic diseases, Parkinson's disease and Alzheimer's disease.

Experts in: **Research** **Visit choc.org/health to learn more about autism.**

CHOC Children's

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At the forefront of diagnosis and treatment, our multidisciplinary teams care for patients with all pediatric neurological disorders, from headaches to the most complex neurosurgical cases.

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choc.org/neuroscience

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