A Message From the Chair

Dear Governor Murphy,

On behalf of the Governor's Council for Medical Research and Treatment of Autism (Council), It gives me great pleasure to report on our activities over the past year for the 2021 Annual Report.

The New Jersey Infantile Autism Biomedical Research Act in 1999 (P.L.1999, c.105, s.1) established the Governor's Council for Medical Research and Treatment of Infantile Autism in the University of Medicine and Dentistry of New Jersey. The Act was amended (P.L.1999, c.105, s.1; amended P.L.2007, c.168, s.1) and reestablished in the Department of Health and Senior Services (Department of Health) as the Governor's Council for Medical Research and Treatment of Autism (Council). Since that time, the Council has awarded more than $32 million of peer reviewed autism research grants and student fellowships.

The Mission of the Council is to advance the understanding, treatment, and management of Autism Spectrum Disorder (ASD) through a comprehensive and coordinated program of biomedical research, clinical innovation, and professional training in New Jersey. Although calendar year 2021 posed challenges in the research field due to the COVID-19 pandemic, and the number of grant awards for 2021 was substantially reduced, the Council was able to award a total $1.6 million to 13 autism research projects which included 4 Concept Projects, 9 Fellowship grant awards, and continued funding to the New Jersey Autism Center for Excellence (NJACE), all of which ensured alignment with our mission to advance the understanding and management of ASD for New Jersey's autism community.

We have an amazing group of dedicated volunteer members that serve on the Governor's Council for Medical Research and Treatment of Autism. Our Council members are engaged in autism activities throughout the great state of New Jersey ensuring that we have representation from the field of academia research, healthcare, non-profits, education, advocacy, and the autism family community. We also note and thank the many individuals and their affiliated organizations for their outstanding ASD research projects, described in detail beginning on page 16.

It is an honor to serve the citizens of New Jersey by being both a member of the Council and the Chairperson. As one of the eight members volunteering their time to serve on the Council, I wish to thank you for your support of our work. We look forward with optimism and hope to exciting research projects, enthusiastic researchers, and to the heightened awareness and understanding of our New Jersey autistic community.

Sincerely,

Michael Aquino

Michael Aquino, MD, F.A.C.G.
Chair, Governor's Council for Medical Research and Treatment of Autism

The Mission of the Council is to advance the understanding, treatment, and management of Autism Spectrum Disorder (ASD) through a comprehensive and coordinated program of biomedical research, clinical innovation, and professional training in New Jersey.

Table of Contents

Did You Know 2

Executive Summary 4

Overview of Autism Spectrum Disorder 6

Structure of the Council 7

2021 Council Member Highlights 8

Scientific Advisory Committee 12

New Jersey Autism Center of Excellence 13

2021 Grant Award Recipients 16

Financial Statement 21

Staff Contact Information 22

Did you know[1]

- Autism spectrum disorder (ASD) is a developmental disability that can cause significant social, communication and behavioral challenges.
- ASD occurs in all racial, ethnic, and socioeconomic groups, but is about four times more common among boys than among girls.
- The Autism and Developmental Disabilities Monitoring (ADDM) Network collects data to better understand the number and characteristics of children with ASD and other disabilities living in different areas of the US.
- About 1 in 44 (2.3%) of 8-year-old children were identified with ASD in 2018, based on tracking in multiple areas of the US. (This estimate is based on 8-year-old children living in 11 communities and does not represent the entire population of children in the US.)
- New Jersey is one of the 11 states participating in the ADDM Network.
- ASD occurs among all racial, ethnic, and socioeconomic groups. The ADDM Network found no overall difference in the percentage of Black, White, Hispanic, and Asian/Pacific Islander 8-year-old children identified with ASD. However, at several sites, the percentage of Hispanic children identified with ASD was lower compared to White or Black children.
- Autism prevalence was 3.6% in New Jersey overall, but higher in one region (5.4%) and in multiple areas approach 7.0%. Significant variation in ASD prevalence by race/ethnicity, socioeconomic status and school district size was identified. Prevalence among Hispanic children was lower than expected, indicating a disparity in identification.[2]

1. National Center on Birth Defects and Developmental Disabilities, Center for Disease Control and Prevention. https://www.cdc.gov/ncbddd/autism/materials/addm-factsheet.html Autism Spectrum Disorder (ASD). Page last reviewed: January 14, 2022.
2. Shenouda, J., Barrett, E., Davidow, A. L., Halperin, W., Silenzio, V. M. B.,& Zahorodny, W. (2021). Prevalence of autism spectrum disorder in a large, diverse metropolitan area: Variation by sociodemographic factors. Autism Research, 1–10. https://doi.org/10.1002/aur.2628

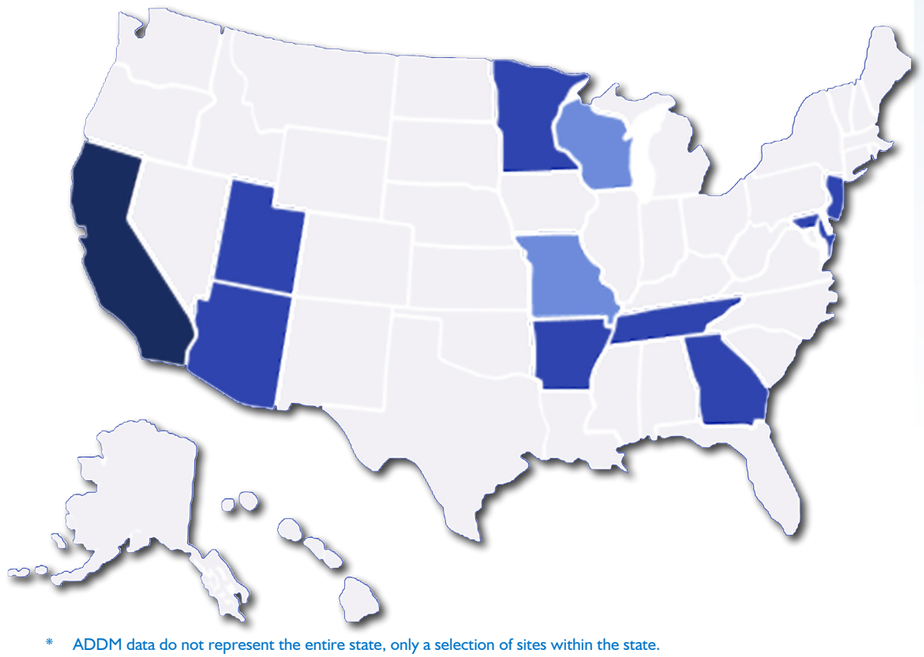
Reported Prevalence Varies by Geographic Location

ASD prevalence varies widely across geographic areas. Currently, no research has shown that living in certain communities increases the chance that a child will have ASD. Geographic variation could, however, be related to differences in how children with ASD are identified and/or served in their local communities and how this information is collected and reported. See the data source below to see prevalence estimates by geographic area. Also, please see https://www.cdc.gov/ncbddd/autism/data/index.html.

Prevalence Estimates by Geographic Area

*Using data set ADDM Network from 2018**

Prevalence by State



* ADDM data do not represent the entire state, only a selection of sites within the state.

\+ If NSCH 2020 data are selected, combined 2016-2020 estimates are shown.

\++ For NSCH data, data are suppressed when the width of the confidence interval exceeds 1.2 times the point estimate. This is the same approach that is recommended by NSCH here.

Did you know[1]

Executive Summary

The New Jersey Infantile Autism Biomedical Research Act in 1999 (P.L.1999, c.105, s.1) was signed into law by Governor Christie Whitman and established the Governor's Council for Medical Research and Treatment of Infantile Autism in the University of Medicine and Dentistry of New Jersey. The Act was amended in 2007 (P.L.1999, c.105, s.1); (P.L.2007, c.168, s.1) and established the Governor's Council for Medical Research and Treatment of Autism (Council) in the Department of Health and Senior Services (Department of Health). The Autism Medical Research and Treatment Fund was established, under the same act, in the Department of the Treasury as a non-lapsing fund as *The Fund* representing a repository for moneys provided and deposited in the Fund, and any interest earned thereon, to be allocated to the Governor's Council for Medical Research and Treatment of Autism to support grants and contracts (P.L.2007, c.174).

The Council has awarded research grants through the moneys allocated to *The Fund* since 2008. The awarding of an autism grant means a qualified research proposal has undergone a rigorous peer review process with final proposal selections judged strictly on scientific and technical merit, relevancy to the Interagency Autism Coordinating Committee (IACC), the Council's mission, and public health. Utilizing a three-tier review process, an independent scientific merit review panel is selected and matched, per the scope of the proposal, to review and score research projects individually after which the panel assigns a final group score in accordance with the National Institute of Health's (NIH) scoring system. Upon completion of all scoring, the panels' final reviews and scores are shared with our Scientific Advisory Committee (SAC). During the 2021 reporting year, grant awards were made to the Student Fellowship Program and the Novel Concept Project Program *(See grant workflow diagram on page 5)*.

We are fortunate to have the advice and guidance of a SAC throughout the grant award process. The SAC is represented by three biomedical researchers and two clinicians forming a distinguished group of nationally renowned experts from the ASD field. The SAC's final review and scoring results are sent to the Council for a final review and decision to determine the recipients for grant funding. The Council has used this process since 2008 to issue grants and to fund the New Jersey Autism Center of Excellence (NJACE).

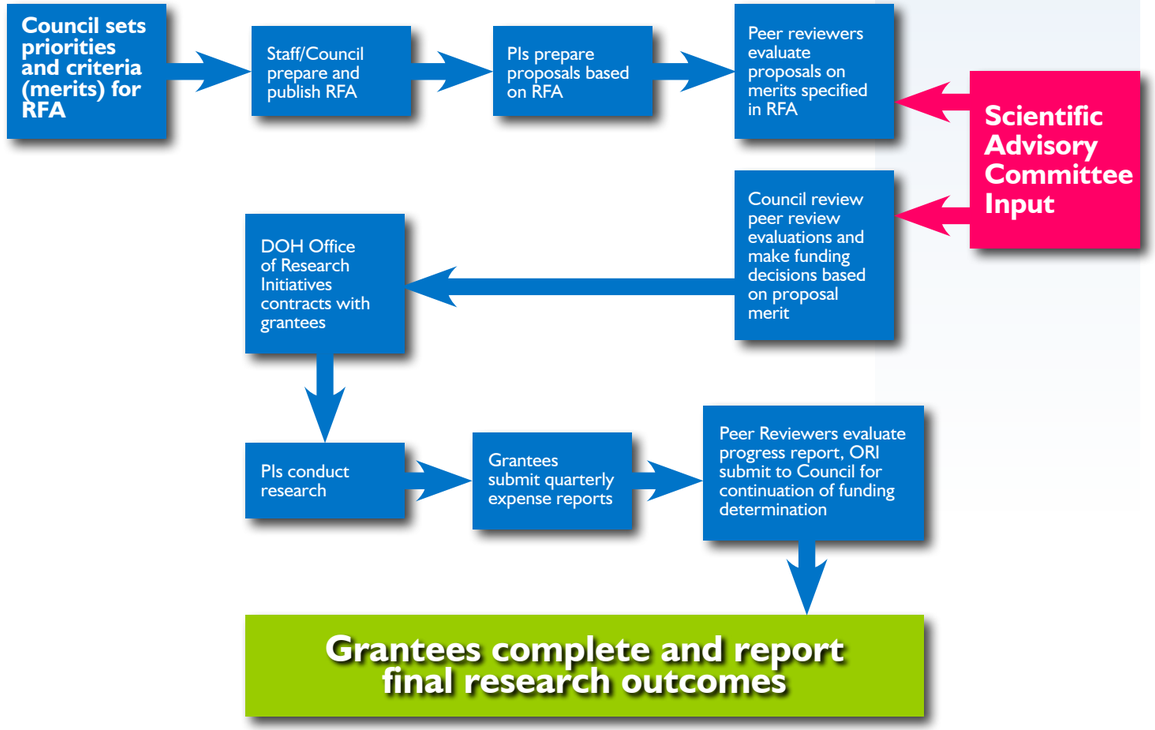
For the second time since 2013 while under the auspices of the Department of Health, the Council has funded the NJACE as a statewide initiative through a 5-year grant. The NJACE grant (2018 -2023) was awarded to Rutgers University. Rutgers partnered with the Children's Specialized Hospital (CSH) to bring together researchers, health professionals and families to stimulate cutting edge autism spectrum disorder (ASD) research and improve the clinical care of children, adolescents, and adults with ASD. The NJACE continued its outreach in 2021 to the community with many new and exciting initiatives. *(See details on page 13)*.

Executive Summary

We have a wonderful group of dedicated volunteer Council members that are very involved, both statewide and nationally in autism activities ensuring that we have representation from the field of research academia, healthcare, non-profits, education, advocacy, and the autism family community.

Due to the financial disruption and other interruptions to research caused by the COVID-19 pandemic, the Council was not able to fund any new research projects in calendar year 2020. However, we were able, to continue funding previously awarded grants from 2019 and award research grants in 2021. With approximately half of our projected dollars refueled through *The Fund* in calendar year 2021, we provided $1.6 million in research grants to our novel Concept Project, Student Fellowship grant programs, and the NJACE.

Grants Management Workflow



Overview of Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a developmental disability that can cause significant social, communication and behavioral challenges.[4] People with ASD may communicate, interact, behave, and learn in ways that are different from most other people. The learning, thinking, and problem-solving abilities of people with ASD can range from gifted to severely challenged. Some people with ASD need a lot of help in their daily lives; others need less.

A diagnosis of ASD now includes several conditions that used to be diagnosed separately: Autistic Disorder, Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS), and Asperger Syndrome. These conditions are now all called ASD.

Diagnosis

Diagnosing ASD can be difficult since there is no medical test, like a blood test, to diagnose the disorders. Doctors look at the child's behavior and development to make a diagnosis[5]. ASD can sometimes be detected at 18 months or younger. By age 2, a diagnosis by an experienced professional can be considered very reliable. However, many children do not receive a final diagnosis until much older. This delay means that children with ASD might not get the early help they need.

Treatment

There is currently no cure for ASD. However, research shows that early intervention treatment services can improve a child's development.[6] Early intervention services help children from birth to 3 years old (36 months) learn important skills. Services can include therapy to help the child talk, walk, and interact with others. Therefore, it is important to talk to your child's doctor as soon as possible if you think your child has ASD or other developmental delays.

Early Intervention

In addition to supporting autism research, the New Jersey Department of Health provides Early Intervention Programs (EIP) to connect families affected by autism to programs and services. For more information, please visit http://nj.gov/health/fhs/eis/index.shtml.

4. National Center on Birth Defects and Developmental Disabilities. Ibid. https://www.cdc.gov/ncbddd/autism/facts.html
5. Ibid
6. Ibid

Structure of the Council

To advance and disseminate the understanding, treatment, and management of ASD by means of a coordinated program of biomedical research, clinical innovation, and professional training in New Jersey, the Councils' vision is to enhance the lives of individuals with ASD across their lifespan.

Council Structure

Per the legislation (P.L. 2017, c.168, s.7; NJSA 30:6D-59), the Council was established in the Department of Health as the "Governor's Council for Medical Research and Treatment of Autism" to be composed of 14 members as follows: seven persons appointed by the Governor, two of whom shall be members of the public who do not occupy leadership positions in any of the organizations represented on the Council, of which two members one shall be a person with a diagnosis of autism or autism spectrum disorder or the family member of such a person, four of whom shall be appointed in consultation with the presidents of academic institutions in this State that are engaged in autism research and one of whom shall be a representative of a health care organization with demonstrated clinical expertise in the evaluation and treatment of autism spectrum disorders; one person to be appointed by the President of the Senate and one person to be appointed by the Speaker of the General Assembly; one person to be appointed by the Commissioner of Health; and four persons, also to be appointed by the Governor, who represent autism organizations in New Jersey, each of whom shall represent no more than one such organization. Currently, the Council has 6 vacancies and need the following positions filled: 1 Academic Institution Representative, one Member with diagnosis of Autism/ASD, or family member, one Health Care Organization Representative, two Autism Organization Representatives, and one Appointee from the DOH Commissioner. New Jersey residents may apply for a position by contacting the Governor's Office of Appointments online.

New Jersey residents wishing to be considered for appointment may submit her/his name to the Governor's Office of Appointments. Information on how to apply can be found at: https://www.nj.gov/governor/admin/bca.

2021 Council Member Highlights

2021 Council Member Highlights

Michael P Aquino, MD F.A.C.G.
Senate President Appointee

Council Chair
Cofounder, Pathology Solutions
Founder A2Z Diagnostics

Dr. Aquino graduated from Albany Medical College in 1990. He was a past partner of Shore Gastroenterology Associates. Dr. Aquino also served as past Board Member and Chairman of Autism New Jersey. He currently serves as Chief Operating Officer of A2Z Diagnostics.

Cheryl F. Dreyfus, Ph.D.
Academic Institution Representative
Professor and Chair, Department of Neuroscience and Cell Biology, Rutgers University, Robert Wood Johnson Medical School

Dr. Dreyfus graduated from the Cornell University Graduate School of Medical Sciences and is the Distinguished Professor and Chair of the Department of Neuroscience and Cell Biology at the Robert Wood Johnson Medical School-Rutgers. Her research centers on the development and degeneration of the brain and how to alter these processes. Her most recent publications include:

- Saitta KS, Lercher LD, Sainato DM, Patel A, Huang Y, McAuliffe G, Dreyfus CF. (2021) CHPG enhances BDNF and myelination in cuprizone-treated mice through astrocytic metabotropic glutamate receptor.
- Huang Y., Song, Y.J., Isaac, M., Miretzkty, S., Patel, A., McAuliffe, G.W., Dreyfus, C.F. (2020) Tropomyosin receptor kinase B expressed in oligodendrocyte lineage cells functions to promote myelin following a demyelinating lesion.
- Planas-Fontanez, TM.; Dreyfus, CF.; Saitta, KS (2020) Reactive astrocytes as therapeutic targets for brain degenerative diseases: Roles played by metabotropic glutamate receptors.

Wilma Judith Friedman, Ph.D.
Academic Institution Representative
Professor and Chair, Department of Biological Sciences Rutgers University

Dr. Friedman has been a member of the Department of Biological Sciences at Rutgers University in Newark since 2001. She has been involved in neurobiological research for more than 30 years and has published more than 70 papers on neural development and neurodegeneration. She has been associated with several prestigious institutions including Columbia University, the University of Medicine and Dentistry of New Jersey, Karolinska Institute in Sweden, and The Rockefeller University in New York. She is a graduate of The Rockefeller University (Ph.D.) and Oberlin College (B.A.).

B. Madeleine Goldfarb, M.A., CFM, MSW
Autism Organization Representative
Founder/Director of the Noah's Ark Institute

Ms. Goldfarb joined BPA as the Reasonable Accommodation Coordinator in February of 2021. She has long been an advocate for people with disabilities and her work has focused on the development, implementation, and oversight of community-based programs. Her compassion for this program has been primarily shaped by her personal experiences with helping people with autism. Prior to joining BPA, Ms. Goldfarb was a Lead Disability Integration Advisor for Federal Emergency Management Agency. In this role, she participated in many disaster missions including Hurricane Sandy and Hurricane Maria, among many other disaster missions. Madeleine's tenure in this position started in 2013.

Before working with FEMA, Ms. Goldfarb was the Director of Outreach and Education for the Autism Center, New Jersey Medical School. Madeleine managed the Autism Center outreach and educational programs 2000-2012, and with a team of researchers they completed the PDQ-1, which is an early identification tool for the very early diagnosis of an autism spectrum disorders. The article can be found in the Journal of Developmental & Behavioral Pediatrics. 39 (3):183-191, April 2018.

Ms. Goldfarb is the founder of the Noah's Ark Institute, which is dedicated to providing information and resources to support families which children and adults on the autism spectrum.

Madeleine is a Certified American with Disabilities Act Coordinator ACTCP.

Thomas V. Macchiaverna, M.A.
Public Member Representative
Special Education Teacher

Thomas Macchiaverna is a Special Education Teacher at the Woodrow Wilson Middle School in Edison, New Jersey. He is dedicated to helping students with special needs as they progress into functional young adults. He has been recognized by parents and teachers for the special impact that he has had on the lives of his students. He was the teacher of the year in Edison district 2013 because of his ability to teach based on the student's unique special needs. He has helped his students to transition to the district's LLD High school program.

Michele Sorvino
Speaker of the General Assembly Appointee
Executive Director, Golden Door International Film Festival of Jersey City
Sonographer, Morristown Memorial Hospital

Ms. Sorvino, is the Executive Director for the Golden Door Film festival and holds distinction for introducing the first film festival to raise awareness for ASD,

2021 Council Member Highlights

The Council's mission is to advance and disseminate the understanding, treatment, and management of autism spectrum disorder.

2021 Council Member Highlights

2021 Council Member Highlights

opening the door and serving as the inspiration for numerous other Autism film festivals to follow. Ms. Sorvino has enabled more than 1,000 films to be screened with representation from 92 countries through her ability to secure funding. She is also recognized for boosting the first autism film festival attendance by leveraging her network to draw highly recognizable celebrity appearances, to sponsored events, like Tommy Hilfiger who is the parent of an autistic.

Her autism advocacy career is notable as she has received distinguished honors for her accomplishments. She has also fostered mutually beneficial partnerships with the NJ Film Commission, Fort Lee Film Commission, Hudson County School of Technology, McNair High School, Bloomfield College, Jersey City Arts Council, St. Peter's University, and Bethune Community Center to name a few, as she maintained her focus on raising awareness about ASD. She has received distinguished awards related to her work in the field of autism as her advocacy has connected her with various organizations focused on autism such as Autism Speaks and Autism One where she has received distinguished awards. Ms. Sorvino is a Committee Member of Autism Speaks where she has been recognized as a past honoree of the Autism Speaks NJ chapter and she participates in the annual fundraising gala.

Samuel Sheng-Hung Wang, Ph.D.

Academic Institution Representative

Professor, Department of Molecular Biology and Princeton Neuroscience Institute, Princeton University

Dr. Wang is a professor of neuroscience at Princeton University. His research laboratory investigates how brains learn from sensory experience, in adulthood and development, with relevance for autism. A particular focus is the cerebellum, a brain region that uses sensory and brain-generated information to guide movement, cognition, and development. He is also the author of two popular books, ***Welcome to Your Brain: Why You Lose Your Car Keys But Never Forget How to Drive and Other Puzzles of Everyday Life***, which was named Young Adult Science Book of the Year by the American Association for the Advancement of Science, and ***Welcome to Your Child's Brain: How the Mind Grows from Conception to College***. The two books are available in over 20 languages. His most recent publications include:

- T.J. Pisano, Z.M. Dhanerawala, M. Kislin, D. Bakshinskaya, E. Engel, J. Lee, N.L. de Oude, K.U. Venkataraju, J.L. Verpeut, H.-J. Boele, and S.S.-H. Wang (2021) Parallel organization of cerebellar pathways to sensorimotor, associative, and modulatory forebrain.
- G.J. Broussard, M. Kislin, C. Jung, and S.S.-H. Wang (2022) A flexible platform for monitoring cerebellum-dependent sensory associative learning.
- U. Klibaite, M. Kislin, J.L. Verpeut, S. Bergeler, X. Sun, J.W. Shaevitz, and S.S.-H. Wang (2022) Deep phenotyping reveals movement phenotypes in mouse neurodevelopmental models.
- X. Chen, Y. Du, G.J. Broussard, M. Kislin, C.M. Yuede, S. Zhang, S. Dietmann, H. Gabel, G. Zhao, S.S.-H. Wang, X. Zhang, and A. Bonni (2022) Mapping of single nuclear transcriptomic responses in the cerebellar cortex uncovers plasticity of a subpopulation of Purkinje neurons in motor learning.

Gary Weitzen, B.A.

Autism Organization Representative

Executive Director of POAC Autism Services

Mr. Weitzen is the Executive Director of POAC Autism services. He is a certified law enforcement instructor with the New Jersey Police Training Commission, a member of the National Association of Search and Rescue and member of his local EMS squad. He is a dedicated advocate to the autism community and continues to work tirelessly to improve the quality of life for the autistic and family members. His recent publications include:

- Internet Safety for Children with ASD (May 6, 2020)
- COVID-19 and Patients with Autism (April 20m, 2020)

2021 Council Member Highlights

In addition to supporting autism research, the New Jersey Department of Health provides Early Intervention Programs (EIP) to connect families affected by autism to programs and services.

Scientific Advisory Committee (SAC)

The Councils' Executive Director is responsible to establish and maintain a five-member Scientific Advisory Committee (SAC) per the enabling statutes (P.L.1999, c.105, s.5; amended P.L.2007, c.168, s.5. 30:6D-61). Members of the SAC serve at the pleasure of the Council. The Council's SAC members are nationally renowned experts in autism; three biomedical research scientists with demonstrated achievements in biomedical research and two medical clinicians whose practice is primarily devoted to the treatment of individuals with autism. The role of the SAC is vital to the grant awards process as it makes recommendations to the Council, through the Executive Director, that are intended to guide the deliberations of the Council as the body responsible to make grant funding award decisions.

The role of the SAC is vital to the grant awards process as it makes recommendations to the Council.

2021 SAC Members

Ted Abel, Ph.D.
Director, Iowa Neuroscience Institute
Professor, Departments of Molecular Physiology and Biophysics, Psychiatry, and Biochemistry
University of Iowa Carver College of Medicine
Iowa City, IA

Susan L. Hyman, M.D.
Professor of Pediatrics
Division Chief, Neurodevelopmental & Behavioral Pediatrics
Golisano Children's Hospital
University of Rochester Medical Center
Rochester, NY

Eric M. Morrow, M.D., Ph.D.
Mencoff Family Professor of Biology
Director, Center for Translational Neuroscience
Carney Institute for Brain Science
Brown University
Providence, RI

Alex Paciorkowski, M.D.
Assistant Professor
Department of Neurology
University of Rochester Medical Center
Rochester, NY

Louis Reichardt, Ph.D.
Professor Emeritus
Departments of Physiology and Biochemistry & Biophysics
University of California San Francisco
Past Director, Simons Foundation Autism Research Initiative
San Francisco, CA

New Jersey Autism Center of Excellence (NJACE)

The NJACE is a statewide organization funded by the Council and located at the Rutgers University. The Rutgers NJACE has partnered with the Children's Specialized Hospital (CSH) since the inception of the current 5-year grant award (April 2, 2018 - March 31, 2023) and has provided stimulating cutting-edge ASD research to improve the clinical care of children, adolescents, and adults with ASD.

The interdisciplinary, collaborative network created by the NJACE builds on existing programs and leverages its extensive contacts to launch and disseminate innovate initiatives for research, education and service to autistics across their lifespan. The autism community informs the work of the NJACE through its newly formed Community Advisory Board comprised of professionals and community members through focus groups, brain-storming sessions, community education and events for families.

NJACE provides stimulating cutting edge ASD research to improve the clinical care of children, adolescents, and adults with ASD.

A sample of the NJACE accomplishments are listed below:

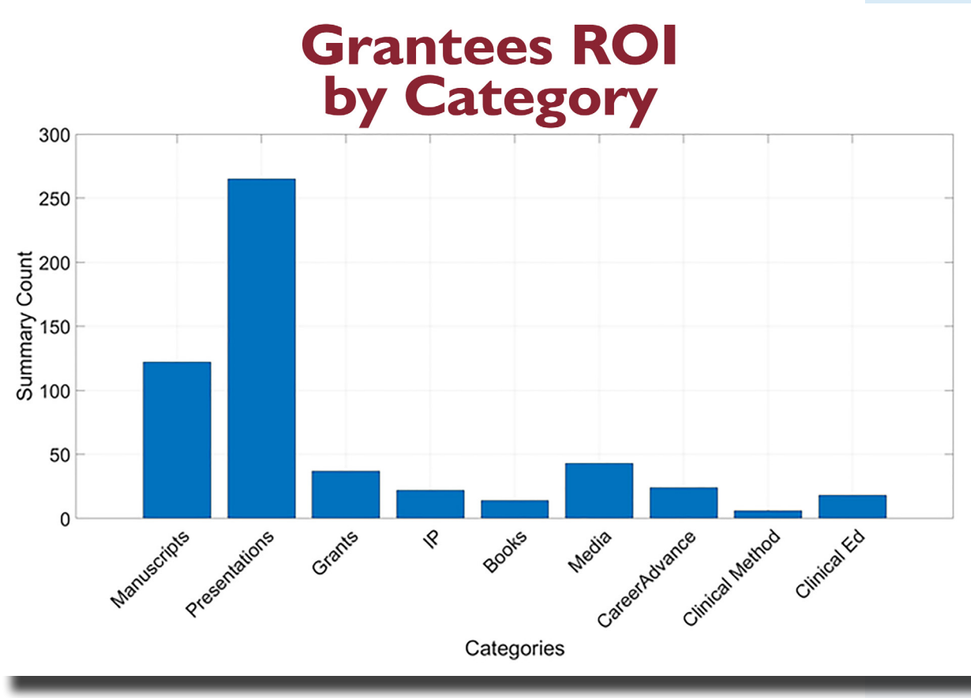
- Revamped NJACE website and resources https://www.njace.us/
- Surveyed and polled the community to provide a series of webinars and podcasts informed by community needs.
- Translated Webinars to Spanish to engage the Hispanic population.
- Created a Language guide with input from autistics.
- Surveyed schools, teachers, and parents to understand issues with Zoom fatigue (pros and cons of the new home-based schooling).
- Created a new sports-based platform (NJ Devils and NY Jets) to educate the community on somatic-sensory-motor issues in autism and fun ways to interact.
- Engaged a production company (tinydocs.co) to use animation to tell a story providing a voice to the autistic community.
- Worked with Horticulture program for adults in collaboration with JoyDew-day program for adults with autism https://joydew.com.
- Partnered with Animation World Network (AWN) https://www.awn.com to create podcasts and webinars.
- Collaborated with Academic Autism Spectrum Partnership in Research and Education to help disseminate information about autistic burnout and information for doctors.

New Jersey Autism Center of Excellence (NJACE)

- Assisted grantees with recruitment (contacted Ripple Science to help recruitment and retention during COVID-19 pandemic) https://www.ripplescience.com.
- Attained a grant with SPAN Parent Advocacy network, https://spanadvocacy.org, to investigate autism prevalence and Early Intervention in underserved communities of Newark.
- Collaborated with Occupational Therapists (OT), Speech Therapists, Augmentative Communication for non-speaking autistics approved by Children's Specialized Hospital (CSH) for 2021.
- CSH OT department partnered with NJACE to create resources for families during the pandemic to improve understanding sensory integration, motor issues, research participation.
- Through partnership with CSH, deployed an online education training session "Understanding the Nervous Systems of Autistics" for clinicians.
- Compiled a return on investments (ROI) report requested by the Council. As reported, 121 former grantees were contacted and asked to respond to a survey, of which 64 completed. Of the 64 surveys completed, 25 met the criteria of ROI during years 2000 – 2020. *(See chart page 15)*.
- Leveraged social media platforms to reach a wider audience *(See diagram on page 15)*.

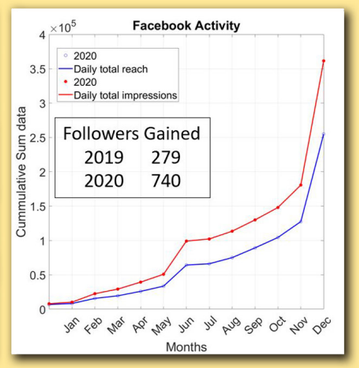
NJACE Website comprehensive overview may be found at https://njace.us and represent events during calendar years 2020 – 2021.

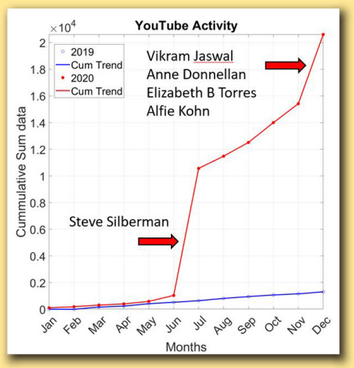
ROI and Social Media Graphs



Strong Growth in Social Media Community Engagement

Year	2019	2020	% Change
New Subscribers Gained	21	333	1,485.71
Total Watch Time (Hours)	112	3,455	2,984.82
Total Views	1,305	20,609	1,479.32
Live Viewers	160	755	371.88
Total Live Watch Time (Hours)	71	408	474.65





2021 Grant Award Recipients

As the COVID-19 pandemic negatively influenced all aspects of research and recruitment *The Fund* was also severely impacted, which prevented the Council's ability to award grants for new research projects until calendar year 2021. During 2021, the Council was able to utilize its limited funds to award a reduced number of research grants. Awards were made to the student Fellowship Program and the novel Concept Project. Reporting year 2021 marked the first time Council funded the Concept Project program which aims to encourage scientific and technical innovation in areas specific to ASD. Principal Investigators and research project abstracts for the Fellowship Grants and Concept Project Grants awarded in 2021 are listed below.

Vanessa Bal, Ph.D., *Principal Investigator*
Rutgers University
$50,000 (1 year)
Many autistic people also suffer from depression, yet there are few treatments that have been established as appropriate for treating depression in adults on the autism spectrum. The long-term goal of this project is to expand the availability of programs to treat depression in autistic adults with and without intellectual disability (ID). To do this, this project focuses on adapting a program called *BeatIt*, a 12-week therapy designed to treat depression in adults with mild to moderate ID. Data from this study will be used to inform adaptation of the *BeatIt* protocol for autistic adults and inform future studies to study the utility of this program for treating depression in autistic adults with and without ID.

Jack DeLucia, *Principal Investigator*
Rutgers University
$60,000 (2 year total)
Consistent with the prevailing hypothesis of imbalance in excitatory/inhibitory synaptic connections in specific brain regions, abnormalities in the neuronal morphologies, connections and functions of the striatum, a structure in the basal ganglia, are associated with the development of ASD. Previously, work from our group and others have demonstrated that the cell surface receptor, Neuropilin-2 (Nrp2), which binds the family of semaphorin guidance molecules, is a key player in regulating the development of excitatory and inhibitory neuronal connections, and polymorphism mutations identified in this gene locus are associated with higher incidences in individuals diagnosed with ASD. This study will focus on the role of Nrp2 in the development of both inhibitory primary (medium spiny neurons) and interneurons in the mouse striatum as it pertains to ASD-like behaviors. Using sophisticated mouse genetics, cellular and behavioral approaches, we will investigate changes in the excitatory/inhibitory balance of the striatal circuitry and will assess how the loss of Nrp2 in specific striatal neuronal populations affects autism-relevant behaviors. Our anticipated results from this study will provide a better understanding of the molecular mechanisms involved in regulating inhibitory neuron development, synapse organization and behavioral output pertaining to ASD.

Cecilia Feeley, Ph.D., *Principal Investigator*
Rutgers University
$50,000 (1 year)
Young adults with ASD often seek a driver's license to help pursue life experiences, new opportunities and meet the myriad of transportation needs they currently face and will continue to face post-high school. These transportation needs may include employment, continuing education, daily living, healthcare, and recreational/social trips. While the demand to obtain a driver's license among the New Jersey population with ASD may be high, actual obtainment of a driver's license remains an elusive goal for many. The project will gather information through five different tasks to generate new knowledge via the development of an easily accessible, searchable, and actionable guidebook on the topic of inclusive New Jersey driver education programs that will serve as a valuable resource for adolescents with ASD, their families/guardians, educators, and policymakers. Further, the information will be made available to inform and facilitate policymakers, self-advocates, and other interested stakeholders seeking to improve and expand driver education opportunities in New Jersey for persons with ASD.

SungWoo Kahng, Ph.D., *Principal Investigator*
Rutgers University
$50,000 (1 year)
One of the most important transitions for young adults with autism spectrum disorder (ASD) is from school to work. Despite the inevitability of this transition, young adults with ASD consistently have difficulty securing preferred and meaningful employment. One of the barriers to obtaining employment is successfully completing job interviews, which often serve as the "gateway" to a job. This project will evaluate an individualized training program to teach college students with ASD to successfully complete job interviews. This project will be the first step in the development of a comprehensive training program to teach college students with ASD (and other young adults with ASD) to search for and obtain preferred and meaningful employment.

Harumi Jyonouchi, Ph.D., *Principal Investigator*
Saint Peter's University Hospital
$50,000 (1 year)
Individuals with autism spectrum disorders (ASD) frequently suffer from multiple co-morbid conditions that are implicated with immune mediated inflammation not associated with specific environmental factors. Recent discovery of innate

2021 Grant Award Recipients

The awarding of an autism grant means a qualified research proposal has undergone a rigorous peer review process with final proposal selections judged strictly on scientific and technical merit.

2021 Grant Award Recipients

2021 Grant Award Recipients

immune memory (IIM) which is generated by metabolic and epigenetic changes and not restricted to specific stimuli, sheds a light on neuroinflammation triggered by multiple environmental stimuli in ASD. The central hypothesis of this proposal is that mal-adapted IIM in ASD results in dysregulated non-specific innate immune responses to unrelated environmental factors, resulting in fluctuating behavioral symptoms and multiple co-morbid conditions. In selected ASD subjects with or without evidence of maladapted IIM, we proposed to address epigenetic changes through H3K27ac Chip sequencing; H3K27ac is a universal marker of chromatin remodeling for enhanced transcription. This analysis will allow us to address the master regulators of epigenetic changes associated with maladapted IIM in ASD.

Courtney R. McDermott, *Principal Investigator*
Rutgers University
$60,000 (2 year total)
Autism spectrum disorder (ASD) is a prevalent neurodevelopmental disorder that is typically detected in childhood and persists throughout life. Although the causes of ASD are unknown, extensive research suggests the combination of genetic vulnerability and environmental factors likely contribute to ASD. This proposal aims to provide an in-depth exploration of how cephalosporin antibiotics, environmental factors associated with increased ASD risk, cause microbiome dysbiosis and co-occurring brain alterations in the 16p11.2 microdeletion mouse model. We will examine the effects of early life antibiotic exposure on developmental neurogenesis, neural gene expression, behavior, and microbial community composition. What we discover will have significance to the autism community, given the common use of antibiotics in childhood and strong association of the 16p11.2 microdeletion with ASD.

James Millonig, Ph.D., *Principal Investigator*
Rutgers University
$50,000 (1 year)
Autism is defined by common abnormalities (limited sociability; repetitive behaviors and interests); yet the disorder is characterized by a vast amount of individual clinical and genetic heterogeneity. Do the commonalities suggest shared pathogenic mechanisms? Or does the heterogeneity imply individual, personalized signatures? Remarkably, using stem cell derived neurons from individuals with autism, DiCicco-Bloom and Millonig labs have uncovered shared neurodevelopmental phenotypes (reduced neuronal processes called neurites and decreased neuronal migration) and altered signaling in a key neurodevelopmental pathway (mTOR) across two different genetic forms of ASD. The proposed study will further investigate if these shared phenotypes are observed in five additional types of autism. The data generated from these results will determine whether these developmental abnormalities unite different genetic forms of autism, which could have therapeutic implications.

Iva Salamon, *Principal Investigator*
Rutgers University
$60,000 (2 year total)
Autism spectrum disorder (ASD) is a group of neurodevelopmental disorders with underlying synaptic dysfunction; human genetic and imaging studies have linked the developing cortex and impaired prenatal connectivity with ASD. The earliest born neurons that form different types of synapses are located in the evolutionarily conserved transient fetal zone, called the subplate which shows prolonged prenatal development in both rodents and humans and mysteriously disappears at early postnatal stages; a fact which makes this region historically difficult to study. mRNA translation (protein synthesis), regulated by RNA binding proteins (RBPs) at the post-transcriptional level, might be one potential mechanism which could explain how these early synapses are formed during the earliest stages of brain development and what their connection is to ASD-related changes. One important RBP, which is also an ASD high confidence gene, is CUGBP Elav-Like Family Member 4 (Celf4); our preliminary data show that Celf4 is found in the SP and that it regulates mRNAs and synapse development. We hypothesize that Celf4 regulates the balance of synaptic subtypes in SP via mRNA translation regulation.

Christina Simmons, Ph.D., *Principal Investigator*
Rowan University
$50,000 (1 year)
Children with autism spectrum disorder (ASD) frequently engage in severe destructive behavior (e.g., self-injury, aggression, property destruction) that presents significant risks to themselves and others, poses substantial barriers to community integration, and results in high familial and societal financial burden. Despite the efficacy of parent training on behavior analytic interventions for destructive behavior in children with ASD, in-person training barriers include access to sufficient training and quality of training. To address these barriers, the current study will (1) develop a prototype of an individualized virtual reality (VR) training tool to be used by parents at home to learn and practice behavioral strategies for managing their child's severe behavior and (2) assess the feasibility, acceptability, and fidelity of a VR training tool with parents (N=15) and clinicians (N=15). In addition to measuring perceived acceptability and feasibility, the current study will focus on the accuracy of the technology at capturing treatment fidelity by comparing interobserver agreement between the VR technology and video recordings of user behavior. The proposed VR technology is individualized, realistic, flexible, safe, and has the potential to be highly impactful for improving child outcomes of behavioral treatment in the home environment.

2021 Grant Award Recipients

Given COVID-19-related impacts, the Council was able to award its limited funds to a reduced number of research grants in 2021.

2021 Grant Award Recipients

Fernando Velloso, Ph.D., *Principal Investigator*
Rutgers University
$130,000 (2 year total)
The incidence of Autism Spectrum Disorders (ASD) has been steadily increasing for decades and New Jersey has almost double the national rate. Epidemiological and animal studies have established a strong association between infections and other environmental factors that cause inflammation during pregnancy with an increased risk for ASD in the offspring. A central pro-inflammatory cytokine, interleukin-6 (IL-6), is increased both in animal models and in the blood of children with ASD. Our preliminary data show that transiently increasing systemic IL-6 in newborn mice induces acute neuroinflammation, changes the proliferation of specific subsets of progenitors within the subventricular zone and promotes enduring anti-social and repetitive behaviors. The goals of my fellowship are to establish how transiently increasing IL-6 affects the migration of immune cells into the brain to create a neuroinflammatory state and to investigate the signature transcriptomic changes that occur within the progenitors of the subventricular zone induced by IL- 6 that, in turn, affect how the neurons and glial cells of the brain develop.

Harvey R. Weiss, Ph.D., *Principal Investigator*
Rutgers University
$50,000 (1 year)
There is an important link between the mTOR (mammalian target of rapamycin) signaling pathway and autism spectrum disorders (ASD). In fact, inhibiting mTOR with rapamycin (a powerful chemotherapeutic agent) has been proposed to be of benefit in the treatment of ASD. We will use the Eker rat model of tuberous sclerosis-ASD to study this relationship. We will examine which parts of the mTOR signaling system will normalize brain metabolism in this ASD model. We will stimulate and block different portions of the mTOR pathway to determine the critical portion of this system in ASD. This should allow the development of new specific drug treatments for ASD that will be effective and have few side effects.

Damiano Zanotto, Ph.D., *Principal Investigator*
Stevens Institute of Technology
$50,000 (1 year)
This project proposes an innovative and scalable approach to objectively identifying signature motor patterns in autism spectrum disorder (ASD) and their relation to clinical scales of ASD severity, using affordable wearable sensors and simple walking tests to assess symptomatic severity in children and adolescents with ASD by characterizing the noise (from walking) captured by the sensors.

Financial Statement

	SFY 2020 Actual	SFY 2021 Actual
Opening Fund Balance	**$946,999**	**$441,736**
Revenues		
Assessments	$2,931,052	$2,094,458
State Appropriated Funds	$500,000	$492,000
Total Revenue:	$3,878,051	$2,586,458
Total Funds Available	**$4,825,050**	**$3,028,194**
Disbursements and Expenses		
Spending Plan Reduction		
Disbursements to Grantees	$2,816,168	$802,240
Total disbursements	$2,816,168	$802,240
Expenses		
Administrative & Office expense	$371,803	$398,499
Professional Review Panel	$87,200	$ 92,719
Autism Registry	$500,000	$500,000
Autism New Jersey	$250,000	$250,000
Total expenses	$1,209,003	$1,241,218
Total Disbursements and Expenses	**$4,025,171**	**$2,043,458**
Closing Fund Balance (June 30)	**$799,879**	**$984,736**

Staff Contact Information

New Jersey Governor's Council for Medical Research and Treatment of Autism

Office of Research Initiatives

New Jersey Department of Health

PO Box 360
Trenton, NJ 08625-0360
www.nj.gov/health/autism
NJGCA@doh.nj.gov

M. Carolyn Daniels, D.H.Sc., M.Ed., M.A.T.S.(c)
Senior Executive Services Director
Office of Research Initiatives
Executive Director
New Jersey Governor's Council for Autism
Office of Population Health
Office of the Commissioner
New Jersey Department of Health
(609) 913-5009
Carolyn.Daniels@doh.nj.gov

Taina Sampeur, M.S.H.A.
Autism Program Manager
Executive Assistant 2
Office of Research Initiatives
NJ Governor's Council for Autism
(609) 913-5002
Taina.Sampeur@doh.nj.gov

Trischa Zumbach
Contract Administrator
Office of Research Initiatives
NJ Governor's Council for Autism
609) 913-5001
Trischa.Zumbach@doh.nj.gov