



המרכז הלאומי לחקר אוטיזם
AUTISM RESEARCH ISRAEL



אוניברסיטת בן-גוריון בנגב
Ben-Gurion University of the Negev



**The National
Autism Research Center**
at Ben-Gurion University of the Negev

The Negev Autism Center was chosen to become the National Autism Research Center of Israel. As such, it will coordinate multidisciplinary research at multiple institutions and establish a national database, revolutionizing the field and enabling an explosion of translational research with direct clinical impact.

Approximately one percent of children in the western world are today diagnosed with autism – a fiftyfold increase compared to 30 years ago. The tremendous increase in the prevalence of autism has turned it into one of humanity's biggest social and financial challenges.

In order to treat autism more effectively, we must better understand the biological mechanisms that cause it and develop novel medical treatments that target the underlying biology.

Autism is a developmental disorder which is diagnosed according to behavior: clinicians examine children for signs of impaired social communication and the presence of restricted interests and repetitive behaviors. Current interventions are based on behavioral therapies and debilitating symptoms typically continue throughout life.

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Scientists around the world have come to the consensus that autism is not one disorder, but rather a family of distinct disorders with different, mostly unknown, causes (i.e., there are different sub-types of autism). Characterizing specific sub-types of autism is difficult, because it requires the collection of a variety of data such as birth records, MRI scans, EEG exams, and genetics from a large number of children. However, such research is critical for identifying the optimal treatments for each sub-type.





With this in mind scientists from Ben-Gurion University of the Negev (BGU) and physicians from Soroka University Medical Center (SUMC, located across the street) formed **the Negev Autism Center in 2015**. Its goal is to facilitate unique collaborations between scientific research and clinical care, which focuses on translational research for improving the diagnosis and treatment of autism. The Center brings together faculty who diagnose, treat, and study autism from different perspectives, including Psychiatry, Neurology, Pediatrics, Genetics, Neuroscience, Molecular Biology, Developmental Psychology, and Bio-Medical Engineering.

Members of the Center work with data that is collected from the hundreds of children who are diagnosed with autism at SUMC annually. Since its establishment the Center has built a regional autism database with data from over 900 children with autism and their families. This enables researchers at BGU to “connect the dots” and determine, for example, how the genetics of specific children with autism are related to their brain MRI scans. A major emphasis of the center is on studying the earliest stages of autism development, where intervention is likely to be most effective. Annual follow-ups at SUMC enable the researchers to study the development of individual children and assess the clinical efficacy of existing and novel therapies, medications, and technological aids.

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In October 2018 the Negev Autism Center was selected by the Israeli Ministry of Science to become the National Autism Research Center of Israel.

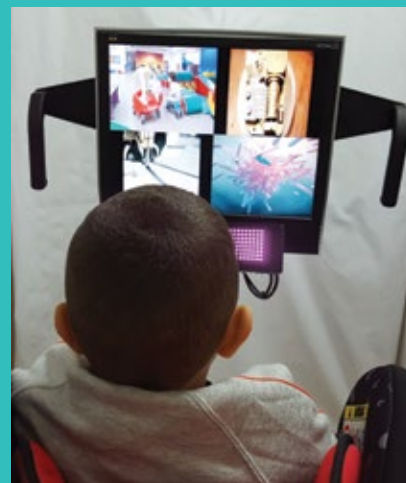


The National Autism Research Center of Israel will expand upon the successful model of the Negev Autism Center at BGU/SUMC through collaboration with additional universities and medical centers in Israel. We will transform the regional database into a national autism database that will be freely available to all clinicians and researchers in Israel and boost national autism research capabilities by several orders of magnitude.

Our vision is to develop the National Autism Research Center in the following areas:

- 1. A national center for coordinating and managing clinical studies of new treatments.** Clinical studies of children with autism are currently very limited in Israel due to a lack of infrastructure and standardized manner of collecting data for such studies. The development of the national autism database along with facilities and technology for assessment of symptoms (see below), will enable a fertile environment for testing new treatments on specific sub-groups of children who are likely to benefit from them.
- 2. A national genetics database.** While genetic research into autism has developed rapidly in the U.S. and Europe, we are currently the only center in Israel that is actively collecting genetic samples for whole exome sequencing from children with autism and their parents. We currently have an initial genetics database with data from 200 families and plan to expand this effort to a national scale. Studying the genetics of autism cases in Israel is critical, because the Israeli population has distinct genetics, making it very likely that we will identify unique genetic autism risk factors that are relevant to specific ethnic groups.
- 3. A national biobank.** Critical information regarding each child's biology and development are available in blood, urine, stool, and hair samples. These samples enable assessment of hormone and metabolite levels, as well as toxins and parasites. We expect to identify specific types of autism that may benefit from specific medical treatments based on this information.
- 4. Technological solutions for early detection of autism symptoms and for assessment of treatment efficacy.** We are developing a family of computerized systems that can identify and quantify the behavioral symptoms of children with autism through video, audio, motion-capture, eye tracking, and sleep recordings. An important feature of these automated systems is their ability to assess the severity of symptoms over time in order to determine whether treatments are working. This is essential for identifying optimal treatments for different children. We plan to test and distribute these systems widely in kindergartens and clinical centers throughout Israel.

These fields of endeavor will be developed through partnerships with researchers and clinicians in other universities and medical centers, the Ministries of Health and Education, and major national autism care organizations (such as ALUT and Children at Risk).



The National Autism Research Center of Israel, a center with coordinated clinical/research sites throughout the country and a shared database, will revolutionize Israeli autism research and enable an explosion of translational research with direct clinical impact.



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