



# Dr Daniela Reisz

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## Autoimmune encephalitis and psychiatric disorders

### Research Objectives

Daniela Reisz studies the human mind from neurological, psychiatric, and philosophical perspectives, including brain-derived functions like morals, thinking, behaviour and cognition. Here, through the study of a rare case of autoimmune encephalitis, she develops a broader approach to psychiatric disorders including their biological causes.

### Detail

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#### Bio

Daniela Reisz (MD PhD) is a neurology lecturer at the Victor Babes University of Medicine and Pharmacy, Timisoara, Romania, and a primary neurologist at Spitalul Clinic Județean de Urgență. She has a master's degree in philosophy (phenomenology and philosophical hermeneutics of religiosity) and published *The Ethics, the Neuroethics and the Kantian Moral Imperative* in 2019.

#### Collaborators

Dr Reisz thanks Dr Iulia Gramescu and Dr Andrei Muset for their devotion to the care of the patient.

### References

- Reisz, D, et al, (2022) NMDA autoimmune encephalitis and severe persistent hypokalemia in a pregnant woman. *Brain Sciences*, 12, 221.
- Nakazawa, K, Sapkota, K, (2020) The origin of NMDA receptor hypofunction in schizophrenia. *Pharmacology & Therapeutics*, 205, 107426.
- Valdivielso, JM, et al, (2020) Glutamate-gated NMDA receptors: insights into the function and signaling in the kidney. *Biomolecules*, 10, 1051.

### Personal Response

#### **How would you approach testing your three hypotheses on how anti-NMDAR antibodies act against various organs?**

// First of all, I think that many cases remain underdiagnosed. To find how anti-NMDAR antibodies act on other organs, we must increase our database of cases and related information. In the COVID-19 era we are witnessing a plethora of autoimmune disturbances, including encephalitis, cognitive decline, Guillain-Barré Syndrome, peripheral neuropathy, some salt-losing nephropathy, movement disorder, myositis, or epilepsy and so on. I think that COVID-19 was also a sad opportunity to acknowledge inflammation and immune responses, to find new receptors for inflammation and to study new immune entities in depth. Now 'brain fog' affects people and puts responsibility on medical teams to find solutions for this too. Sodium (sodium) imbalance is present in some autoimmune encephalitis, though not necessarily NMDAR type, and is present in COVID-19 infections and in salt-losing nephropathy. On the other hand, potassium imbalance was observed in some schizophrenia patients. I think it is just a matter of time until we discover the link between them and the underlying substrate.

Our colleagues from the University of Medicine and Pharmacy Iuliu Hațiegan Cluj-Napoca have started the Romanian Association for Autoimmune Encephalitis (AREA – <https://ar-earo/>) of which we are a part. AREA aims to fight against autoimmune encephalitis by offering access to information, trained doctors, and increased awareness of the disease. //

# Autoimmune encephalitis and psychiatric disorders

*Despite the latest advances in medical research, the causes of psychiatric conditions such as schizophrenia (a long-term illness that affects the person's perception of reality) remain a puzzle for researchers and doctors around the world. Unlocking the mechanisms behind these diseases is paramount for effectively treating or even preventing them. Through her study of an uncommon case of autoimmune encephalitis, Dr Daniela Reisz at the Victor Babeş University of Medicine and Pharmacy, Romania, aims to develop a broader approach to psychiatric disorders including a more detailed investigation of underlying biological causes.*

Psychosis is an altered mental state in which a person loses contact with reality and hallucinates – they see, hear, or feel things that are not present – or becomes delusional, when they believe in something that is not true. A few diseases or triggers have been associated with psychosis, such as schizophrenia, severe depression, certain medications, substance abuse, Alzheimer's disease, Parkinson's disease, and certain infections; however, the causes and the actual mechanisms that lead to the condition are multiple and not always clear.

More recently, autoimmune encephalitis has been identified as another cause of psychosis. Autoimmune encephalitis describes a group of diseases that happen when the body's immune system falsely attacks healthy brain

nerve cells or neurons, causing inflammation of the brain and severe disruption of its functions.

## NMDAR AUTOIMMUNE ENCEPHALITIS

N-methyl D-aspartate receptor (NMDAR) encephalitis is the most common autoimmune encephalitis. It is caused when the body produces antibodies against the protein NMDAR on the surface of the neurons. NMDAR is responsible for controlling vital brain functions such as thinking, moving, and mood regulation, so the body's attack on NMDAR can affect all these functions.

The disease often starts as a common viral infection, with flu-like symptoms such as fever and headaches. A few weeks later, psychiatric or neurological signs start to arise, including strange behaviour, loss of memory, impaired speech, seizures, and difficulty moving. The presentation often resembles the onset of schizophrenia, and it's not uncommon for people suffering from NMDAR autoimmune encephalitis to be admitted to psychiatric wards. The diagnosis of the disease can be challenging and requires special tests to look for markers of inflammation and specific (anti-NMDAR) antibodies in the blood and the cerebrospinal fluid, which surrounds the brain and the spinal cord. Treatment usually consists of steroids and immunotherapy, both of which suppress the immune system and prevent it from attacking its own cells.

After having extensively studied an unusual case of a pregnant woman with NMDAR autoimmune encephalitis, Dr Daniela Reisz and her team at the Victor Babeş University, Romania, have started looking for anti-NMDAR antibodies in psychiatric patients with the hope that their research could lead to a

novel approach to understanding and managing newly diagnosed psychosis.

## PUZZLING NEW FINDINGS

A 31-year-old pregnant woman was referred to the department of neurology after having unsuccessfully been treated for a new episode of depression and psychosis. Her illness began with a mild viral infection, including a low fever, headaches, and dizziness. A few days later she had more severe symptoms such as confusion, depression, anxiety, inability to talk and move properly, refusing to eat, and strange behaviour. During the day she was in a catatonic state, withdrawn and immobile, but she moved around during the night. These symptoms led to her admission to the psychiatric hospital where she was given anti-psychotic medications that did not improve her condition at all. At the neurology department she was further tested for any underlying causes of her condition. A magnetic resonance imaging (MRI) scan of her head, and all her initial blood and cerebrospinal fluid tests, were normal except for one finding: low blood potassium levels (hypokalaemia/hypopotaemia). All potential causes of hypokalaemia including ones related to pregnancy were ruled out, and although she was given potassium-replacement treatment, the repeat blood tests did not show any rise in potassium levels. Eventually she also started having seizures and her blood tests began to show low calcium levels (hypocalcaemia), a finding that puzzled the treating team even further. The autoimmune encephalitis diagnosis was eventually established after she tested positive for anti-NMDAR antibodies in her cerebrospinal fluid and blood.

Unfortunately, the patient developed an infection secondary to the medical interventions, which eventually led to pregnancy complications and a miscarriage. After she had been treated with antibiotics, her symptoms improved and eventually her psychotic issues resolved, although a few mobility issues and strange behaviours remained at the time of her follow-up.

## DO ANTI-NMDAR ANTIBODIES ATTACK ELSEWHERE?

The findings of unexplained hypokalaemia and hypocalcaemia,



Reisz's study focused on a pregnant woman whose symptoms initially led to her being admitted to a psychiatric hospital.



Among other results, tests revealed the patient being studied had low blood potassium levels; potassium-replacement treatment had no effect.

in combination with low levels of parathyroid hormones (which regulate the amount of calcium in the body), suggest that the anti-NMDAR antibodies don't only attack the brain cells, but also other areas of the body that are involved in the distribution and use of potassium and calcium, such as the kidneys, bones, parathyroid glands, and the heart.

## The diagnosis of NMDAR autoimmune encephalitis requires special tests to look for markers of inflammation and specific antibodies.

Based on their observations and previous studies that have already shown a connection between the NMDA receptors and kidney function and the presence of NMDARs in other organs, Reisz and her team have come up with three theories that could explain their findings: the existence of one type of anti-NMDAR antibody that works against multiple organs; different types of anti-NMDAR antibody that each attack a different organ; or the existence

of one type of anti-NMDAR antibody that acts against various organs when specific genetic criteria are met. These theories remain to be tested.

## LOOKING FOR UNDERLYING CAUSES

Given the difficulty of diagnosis, it's no surprise that this clinical presentation is often missed by doctors. 'Because the antibodies act on the cell's surface, the neuronal cell is not necessarily destroyed and the brain MRI images are normal in half of the patients,' says Reisz. Since an initial diagnosis of schizophrenia is considered in many cases of autoimmune encephalitis, as it was with this one, finding a way to tell these two conditions apart is of great importance, especially since their treatment is entirely different. The confusion between the two diagnoses was made even greater by recent findings suggesting that NMDARs

play a key role in the mechanisms of schizophrenia, especially since blocking the NMDA receptors seems to be leading to a similar schizophrenia-like presentation. These new discoveries underline the need for further research on NMDARs and for a more thorough investigation of potential underlying conditions every time a patient presents with a first episode of psychosis, not least to protect mother and baby in cases that arise during pregnancy.



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