Some researchers have found higher-than-normal levels of cytokines, chemical messengers of the immune system, in people with psychosis. The mechanism through which these molecules might contribute to psychiatric symptoms remains an open question, but at least two potential pathways have been proposed: one in which cytokines act via connections with the peripheral nervous system A and another in which the molecules enter the brain by penetrating the blood-brain barrier B.

A NEURAL PATHWAY
Cytokines in the body’s periphery may activate the vagus nerve, a large, multi-branched cluster of neurons that carries signals from the brain to various organs and vice versa. This may, in turn, trigger immune cells and chemical messengers in the brain that alter neurotransmission.

B HUMORAL PATHWAY
Inflammation may cause the blood-brain barrier to become “leaky” and allow immune cells and molecules such as cytokines to enter the surrounding brain tissue.

Other groups have investigated immune system dysfunction by focusing on molecules such as cytokines, which, unlike antibodies, don’t have a specific target. Rather, they function as part of more-generic immune responses like inflammation. Sophie Erhardt, a professor of experimental psychiatry at the Karolinska Institutet in Sweden, says that the benefit of targeting cytokines is that they provide a “snapshot of what the immune activation is right now.” The downside, however, is that it’s not easy to interpret why, exactly, cytokines usually show neurological symptoms such as seizures or movement abnormalities in addition to psychiatric symptoms such as hallucinations and delusions. “I think in the unlikely scenario that there are only psychiatric symptoms, these are very, very, very rare cases, which I have not been able to identify myself,” Martinez Martinez says. However, she adds, “I do think that in the future we might be able to identify other antibodies that may [cause] symptoms that at the moment we cannot separate from [psychiatric disorders].”