Researchers identify new genetic immune disorder

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Researchers funded by the National Institutes of Health (NIH) have identified a new immune disorder—DOCK2 deficiency—named after the mutated gene responsible for the disease. An international team of collaborators studied five children, four boys and one girl, from different ethnic backgrounds who had experienced debilitating infections early in life. The children were diagnosed with combined immunodeficiency (CID), which refers to a group of inherited disorders distinguished by defects in immune system cells called T cells. CIDs also may affect other cells of the immune system, including B cells.

By sequencing the children's genomes, the researchers discovered that mutations in a gene called *DOCK2* ultimately cause this particular CID. In laboratory tests, T cells and B cells from the five children had impaired ability to move in response to infection-related stimuli, and anti-viral responses were impaired in many cell types. These observations highlight the importance of *DOCK2* in a healthy immune system, and understanding its role may inform the study of more common immune system disorders and the body's response to infection, according to the study investigators.

Three of the children were successfully treated with bone marrow transplants, which replaced the defective immune cells with those of a healthy donor. This finding demonstrates that early screening for CID to identify patients with DOCK2 deficiency can potentially prevent life-threatening infection early in life, as it did for one of these children, who was screened for severe combined immune deficiency (SCID) at birth. Furthermore, identifying causative genes underlying CIDs, such as *DOCK2*, may enable researchers to develop targeted therapies.

More information: Dobbs K, Conde CD, Zhang SY, Parolini S et al. Inherited DOCK2 Deficiency in Patients with Early-Onset Invasive Infections. *New England Journal of Medicine* DOI: 10.1056/NEJMoa1413462 (2015).

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