

quency of “acute mountain sickness” at a sea-level summer camp).<sup>2</sup> Finally, headache associated with tadalafil is one reason why we consider phosphodiesterase-5 inhibitors as second-line drugs to the calcium-channel blocker nifedipine, which is cheaper and better evaluated for the prevention and treatment of high-altitude pulmonary edema.

We did not mention high-altitude retinal hemorrhages because, as Colombo and Hoffman state, they usually do not pose a health problem for climbers and their occurrence is not influenced by preventive measures for acute high-altitude illnesses. We agree with their recommendation for mountaineers, who have an acute loss of visual acuity at high altitudes.

The studies on acetazolamide cited by Basnyat do not address the situation of climbing rapidly to areas with very high altitudes such as Mount Kilimanjaro, since the final altitude in these studies was at most 4392 m. Two studies cited in

our review showed no correlation between maximal oxygen uptake and the development of acute mountain sickness; this suggests that other factors account for the anecdotal observations in climbers who are physically fit at sea level.

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Since publication of their article, the authors report no further potential conflict of interest.

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## Deficiency in Complement Factor B

**TO THE EDITOR:** The alternative complement pathway is essential for defense against infection by polysaccharide-encapsulated bacteria. Factor B, factor D, and properdin are required to stably initiate the process.<sup>1</sup> Deficiencies of factor D and properdin have been described in humans.<sup>2-4</sup> Here, we describe a 32-year-old woman with recurrent pneumococcal and meningococcal infection in whom factor B deficiency was detected.

The patient had nonconsanguineous parents of English and Scottish heritage. Her medical history revealed four clinically significant infections dating from childhood. At 2 years of age, she had primary pneumococcal peritonitis. Two years later, she was treated for community-acquired pneumonia. At 15 years of age, meningitis (caused by *Neisseria meningitidis*, serogroup Y) developed. At age 30 years, pneumococcal pneumonia complicated by a unilateral empyema developed. She required prolonged admission to the intensive care unit for type 1 respiratory failure that prompted suspicion of an immunodeficiency, and she underwent a thoracotomy to drain the empyema.

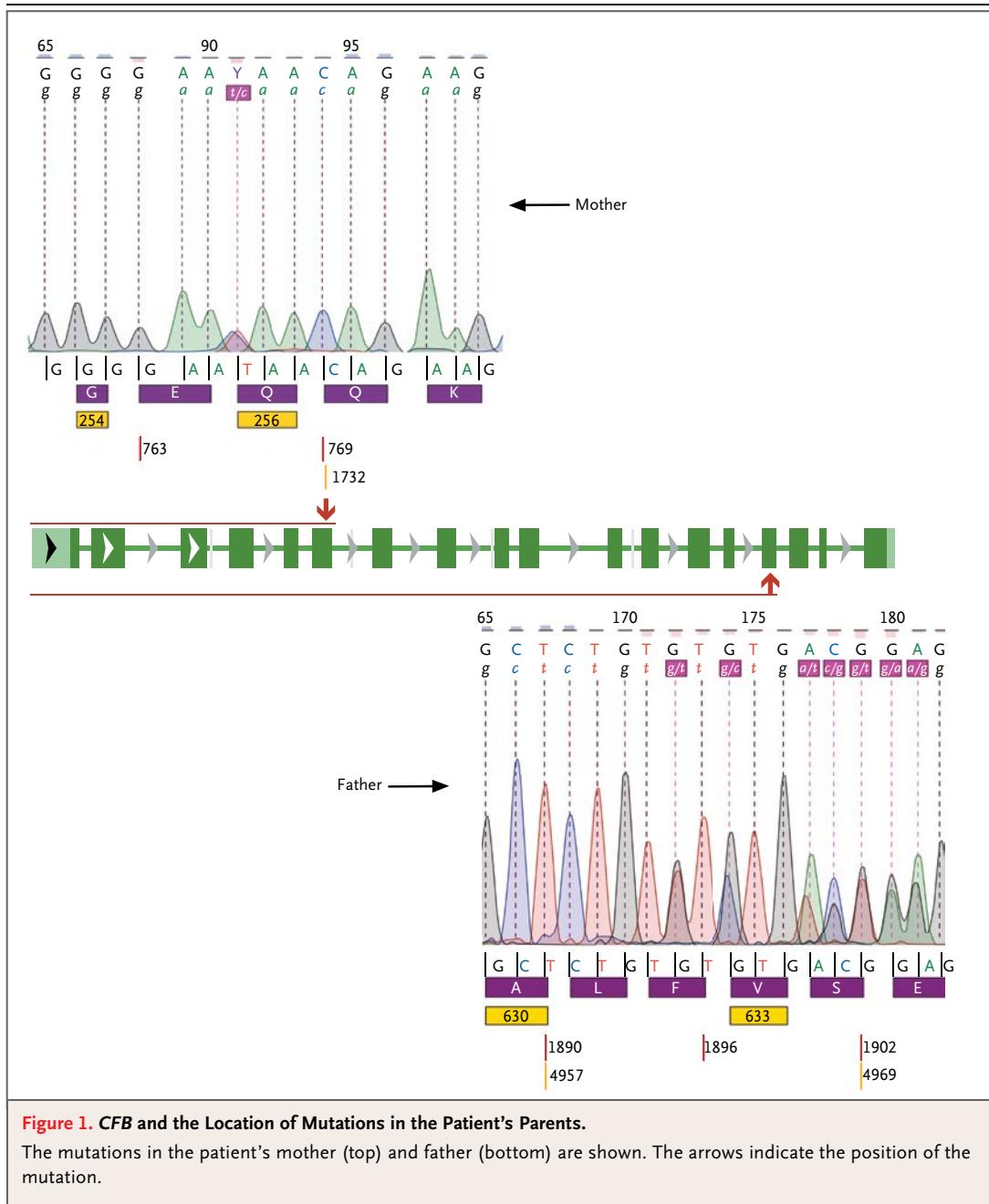
Screening tests revealed normal immunoglobulins and lymphocyte subsets. Classical comple-

ment pathway activity was normal, but according to the results of a functional enzyme-linked immunosorbent assay (ELISA) (Wieslab, Euro Diagnostica), the alternative pathway was inactive.

Complement-mixing studies showed that the activity of the alternative pathway was restored to the patient's serum by properdin-deficient serum but not when the patient's serum was mixed with commercially sourced factor B–depleted serum. Factor B was undetectable by means of radial immunodiffusion (Binding Site) and ELISA (<36 g per liter; reference range, 119 to 245).

Genome sequencing of all 18 coding exons of the CFB gene (transcript NM\_001710.5) revealed compound heterozygous mutations that resulted in premature stop codons (protein truncation): a nonsense mutation (p.Q256X, c.766C→T) in exon 6 and a frameshift mutation (p.F632CfsX8, c.1894\_1897delTTTG) in exon 15 (Fig. 1).

The patient's father was found to carry the c.1894\_1897delTTTG mutation in exon 15. Her mother and sister carried the c.766C→T mutation in exon 6. Her two children were both in excellent health; testing to ascertain which of the patient's mutations had been inherited by the children was deferred until they are older. Results of



functional complement testing revealed normal activity of the alternative complement pathway in both the patient's parents and her sister; the level of activity detected in a functional ELISA was 96% in her father, 111% in her mother, and 101% in her sister (normal reference value, >65%).

The patient received the tetravalent meningococcal vaccine and the 23-valent pneumococcal

polysaccharide vaccine, as well as continuous prophylactic amoxicillin, and she has not had any further severe infections.

This novel case of factor B deficiency confirms the crucial role of factor B in activation of the alternative complement pathway and in protection against infection by encapsulated organisms.

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Disclosure forms provided by the authors are available with the full text of this letter at NEJM.org.

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Contact Dr. Suzanne Lennard, International Making Cities Livable Conferences, 1030 NW Johnson St., #501, Portland, OR 97209; or call (503) 208-2817; or e-mail [suzanne.lennard@livablecities.org](mailto:suzanne.lennard@livablecities.org); or see <http://www.livablecities.org/conferences/51st-conference-portland/call-papers>.

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Contact Baptist Health South Florida, CME Department, 8900 N. Kendall Drive, Miami, FL 33176; or call (786) 596-2398; or e-mail [cme@baptisthealth.net](mailto:cme@baptisthealth.net).

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