LA JOLIA, June 9 -- The U.S. Food and Drug Administration has approved for sale the first synthetic-peptide diagnostic medical product, a six-minute test for infectious mononucleosis developed at the Research Institute of Scripps Clinic and Johnson & Johnson.

The assay uses a man-made peptide to detect antibodies to the Epstein-Barr virus, the cause of infectious mononucleosis. The peptide is a sequence of 19 amino acids, identical to a sequence found in an Epstein-Barr viral protein.

"The ability to detect viral infection, especially commercially, with only a small synthetic piece of the virus, with such a short stretch of amino acids, is a significant achievement," said Dr. William Beers, associate director of the Research Institute.

The technology can be used in the diagnosis of other viral infections, bacterial infections and autoimmune diseases, and, eventually, in treatment by synthetic vaccines, said Dr. Elliot Parks, diagnostic programs director at the J&J Biotechnology Center in Sorrento Valley.

(More)
Indeed, several more Johnson & Johnson diagnostic products using Scripps Clinic technology are being developed and may be given FDA approval this year, Parks said.

Research Institute investigators identified the amino acid sequence in 1983, constructed the synthetic peptide, and licensed the technology to Johnson & Johnson. The peptide was developed as a commercial test by the J&J Biotechnology Center.

Research Institute investigators involved in the project include Drs. Dennis Carson, Gary Rhodes and John Vaughan, basic and clinical research department, and Dr. Richard Houghten, molecular biology department.

The researchers, when studying the possible role of the Epstein-Barr virus in rheumatoid arthritis, noticed an unusual sequence of amino acids in the viral protein. While most proteins have sequences containing several of the approximately 20 varieties of amino acids, the Epstein-Barr protein has a 19-amino-acid sequence with only two different amino acids.

"We looked for antibodies that responded to that sequence of 19 amino acids," said Rhodes. "Those antibodies were those the body produces to fight off the Epstein-Barr virus."

The synthetic peptide binds to and detects two antibodies: IgM, or acute antibodies, that are the first to appear after infection; and IgG, or convalescent antibodies, that appear later and may last the patient's lifetime.
If the assay shows a greater response by IgM antibodies than by IgG antibodies, the patient has mononucleosis. If the IgG antibody response is greater, the patient has had previous exposure to the Epstein-Barr virus and is probably immune from contracting mononucleosis if re-exposed.

The assay - known as Ortho Monolert and marketed by Ortho Diagnostic Systems, a Johnson & Johnson subsidiary based in Raritan, N.J. - is the first product to reach the market as a result of a 1983 agreement between Scripps Clinic and Johnson & Johnson.

Under this agreement, the pharmaceutical company funds basic investigations in return for first-refusal rights on commercial applications of technology developed at the Research Institute.

Advantages of the assay over existing tests are that it is significantly more sensitive, especially in children, has a shelf life of two years, rather than a few weeks, and it gives patients more-conclusive evidence that they don't have hepatitis or leukemia, two diseases with symptoms similar to those of mononucleosis.

In clinical trials of 299 specimens, Monolert proved 98.8 percent sensitive on confirmed cases of mononucleosis, while the traditional test gave false negative results on 15 percent of confirmed cases, according to Ortho Diagnostics.

About 10 percent to 20 percent of the U.S. population aged 15 to 21 contracts infectious mononucleosis, "the kissing disease," marked by high fever, sore throat and swelling of the lymph nodes. More than 90 percent of U.S. adults have been exposed to the Epstein-Barr virus, and therefore have detectible antibodies.

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