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A better way to copy DNA

Scientists have developed a new method for DNA amplification that could replace the polymerase chain reaction (PCR). In the August issue of EMBO reports, Huimin Kong and colleagues at New England Biolabs (Beverly, MA, USA) describe a way to copy mass amounts of DNA that has significant advantages over PCR. The new technique is called HDA (helicase-dependent amplification).

Scientists have developed a new method for DNA amplification that could replace the polymerase chain reaction (PCR), a technique that is invaluable for both medical diagnostics and basic research but which is confined to the laboratory. In the August issue of EMBO reports, Huimin Kong and colleagues at New England Biolabs (Beverly, MA, USA) describe a way to copy mass amounts of DNA that overcomes some of the limitations of this earlier technique.

The new technique is called HDA (helicase-dependent amplification). HDA is as simple as PCR, but has significant advantages. PCR requires thermocycling to heat and cool a sample of DNA, to allow denaturation (separating DNA into single strands) and synthesis (copying single strands to create new double-stranded DNA). HDA instead mimics nature's method of replicating DNA by using a helicase enzyme to denature the DNA. As a result, the entire HDA reaction can be performed at one temperature that is optimized for synthesis, eliminating the need for an expensive and power-hungry thermocycler.

HDA could expand the application of DNA amplification to situations in which the requirements for PCR have made it prohibitive. The costs are likely to be more modest and, most importantly, the simplicity of HDA makes it suitable for the development of hand-held DNA diagnostic devices that could be used to detect pathogens at the point-of-care or in the field.

Source:

EMBO Reports (Nature Publishing Group)

"Helicase-dependent isothermal DNA amplification"

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