

## **Innovative screening of the subsurface genome**

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The recent discovery of microbial communities in extreme environments such as the deep subsurface has led to the exploration and characterization of these communities<sup>1</sup>. The discovery of novel microorganisms from deep accessible subsurface habitats has provided opportunities for the discovery of new pharmaceutical products, processes for biochemical and chiral-specific synthesis, as well as environmental remediation applications and energy production. The pursuit for the isolation and exploitation of novel gene sequences and secondary products from unculturable microorganisms has fueled the development of new technologies. The polymerase chain reaction (PCR) is one of the most powerful techniques at our disposal to access this rich microbial diversity of both culturable and unculturable micro-organisms and has been used with great success<sup>2</sup>.

The aim of this study was to try and obtain novel enzymes from uncharacterized deep subsurface microorganisms as well as from other extremophiles that were of industrial importance and value. The organisms were selected so as to represent wide temperature, metabolic and growth condition ranges. Many enzymes were screened for in each individual organism. Degenerate primers were designed so as to access the various genes contained within the organisms. Some organisms did indeed indicate the possible presence of the enzymes of interest. Bands of 500 bp or less were visualized on an agarose gel. These bands were then sequenced to determine whether indeed we had found new enzymes.

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2. Huber, H., Hohn, M.J., Rachel, R., Fuchs, T., Wimmer, V.C., and Stetter, K.O., (2002). *Nature.*, 417, pp.6367.