Magellan BioScience

Oceans of Possibilities...

RESEACH OPPORTUNITY

Industry: **Oil Field Services**

Technology: **Novel Enzymes for Fracturing**

Marine microorganisms represent an untapped source of novel enzymes that have not been evaluated for use in oilfield service applications such as fracturing. Hydraulic fracturing, is a process that utilizes a thickened aqueous fluid along with a proppant (e.g., grains of sand, ceramic or other hardened materials) that is pumped into the formation under high hydraulic pressure to fracture the formation. The proppant once in place keeps the fracture from closing after the fracturing fluid is either degraded or physically removed. Once the fracturing fluid is removed, so too the oil from the fractured bedrock.

Fracturing fluid is thickened with polymers (polysaccharides) such as guar and its derivatives or xanthan and including, in some cases, a cross-linker that cross links the polymer to provide increased proppant-carrying capabilities. Enzymes are incorporated into the fluid to degrade the polymer ("break' the viscosity) and allow the resulting thin fluid to be pumped from the formation. As wells get deeper and therefore hotter, current enzyme systems are not effective so there is a need for enzymes that will effectively break guar and its derivatives and xanthan at higher temperatures. Marine microorganisms produce enzymes that will degrade polysaccharides such as alginate and agar but no studies have been done relating to guar or xanthan. The use of marine microorganisms to produce novel enzymes for use in oil field service represents a unique opportunity.

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