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RECOMBINANT HUMAN RAD51

Dr Luca Pellegrini and colleagues at Cambridge University have developed a method for preparing large quantities of purified recombinant full length human RAD51 which is available for licensing.

Potential uses of recombinant human RAD51

Biochemical and biological assays:

- For DNA strand exchange
- Protein-protein/protein-DNA interaction studies *in vitro* and *in vivo*
- Western blots

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Background

RAD51 is a 339 amino acid protein that is a critical component of the double-stranded break pathway of DNA repair by homologous recombination. Its important biological role derives from its enzymatic ability to form nucleoprotein filaments on single-stranded DNA that perform the strand-exchange reactions of homologous recombination. RAD51 is highly conserved in most eukaryotes and is an essential protein in vertebrates. Knockout mice are embryonic lethal and cells lacking functional RAD51 suffer chromosome loss.

Technology

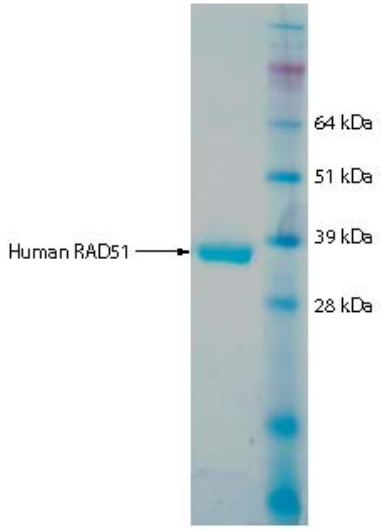
Dr Luca Pellegrini and colleagues in the Department of Biochemistry at the University of Cambridge have developed a method for rapidly preparing recombinant full length human RAD51 from bacteria. This enables the team to produce large amounts of soluble, highly pure human RAD51 (Figure 1). The team can typically produce between 5 and 10 milligrams of pure RAD51 in one litre of bacterial culture using no protein tags such as His-tag, GST or MBP for the purification process.

The recombinant human RAD51 produced by this method can be used in biochemical and biological assays for example for research into DNA repair by homologous recombination by performing DNA strand-exchange assays for which RAD51 is an essential reagent. The RAD51 protein may also used in protein-protein and protein-DNA interaction studies both *in vitro* (Figure 2) and *in vivo*, as well as for use as a control in western blots.

Commercialisation

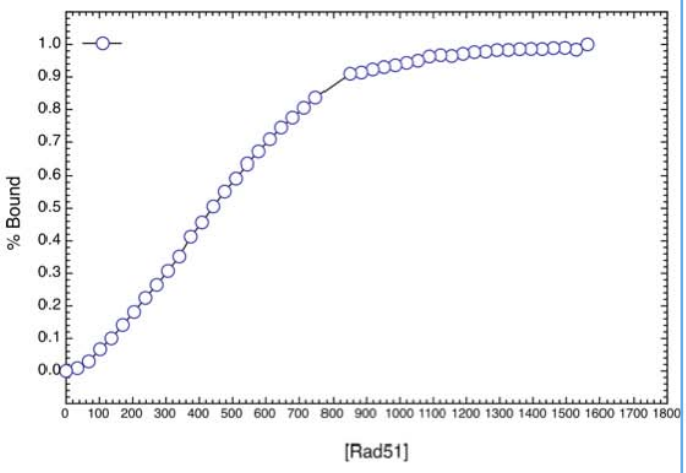
We are seeking commercial partners for licensing soluble recombinant human RAD51 protein.

Figure 1: Recombinant human RAD51



SDS-PAGE analysis of purified, recombinant human RAD51

Figure 2: DNA-binding activity of recombinant human RAD51



DNA binding of RAD51 as shown by the change in fluorescence anisotropy of an Alexa488-labelled DNA molecule in the presence of increasing amounts of RAD51

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