

### **Structure and Mechanism of RecBCD**

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Double strand breaks in bacterial cells can result from a variety of things including collapsed replication forks or other DNA damage. One mechanism for repair of breaks involves the multifunctional enzyme complex, RecBCD. RecBCD comprises two distinct DNA helicase subunits, a number of differentially regulated nuclease activities, and the ability to recognise a recombinational hotspot called Chi. In order to understand more about the molecular basis of these activities we have determined the crystal structure of RecBCD complexed with DNA. The structure reveals the basis for the two different helicase activities and explains the regulation of nuclease digestion. The structure also suggests how the enzyme might be able to scan DNA for Chi sequences as the DNA passes through the protein complex.

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