

**International Blood Group
Reference Laboratory**500 North Bristol Park
Northway
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BS34 7QH**Product** KNIR (Knops Inhibition Reagent)**Recombinant Protein** srCR1-LHR-C + srCR1-LHR-D**Product Code** 9497**Protein Development
and Production Unit****Tel:** +44 (0)117 921 7500**Fax:** +44 (0)117 912 5796**Website:** <http://ibgri.blood.co.uk>**Email:** enquiries.IBGRL@nhsbt.nhs.uk**Recombinant blood group proteins**

Detection and identification of clinically significant blood group specific antibodies in patients requiring blood transfusion can be difficult if clinically irrelevant antibodies to high frequency antigens are also present. Soluble recombinant (sr) proteins with blood group antigen activity can be used to inhibit haemagglutination by these 'nuisance' antibodies, allowing identification of underlying clinically significant antibodies^{1,2}. sr proteins are pre-incubated with patient serum or plasma before addition of the inhibited patient sample to panel red blood cells in either gel or tube Indirect Antiglobulin Tests (IAT).

Knops Inhibition Reagent (KNIR)

CR1 (complement receptor 1, CD35) is a complement regulatory glycoprotein of about 200 kDa present on red cells and a wide range of other blood cells and cell types^{3,4}. A soluble form of CR1 is present in plasma. The *CR1* gene is located on chromosome 1. The extracellular domain of the CR1 polypeptide is organised into 30 regions of amino acid homology called complement control protein (CCP) repeats, or short consensus repeats (SCRs). Each CCP domain has four cysteine residues and the conformation is maintained by two disulphide bonds. The 28 most N-terminal CCPs form four further structural domains called long homologous repeats (LHRs), each made up of seven CCPs. The Knops blood group system polymorphisms KN1/2 (Kn^{a/b}), KN3/6 (McC^{a/b}), KN4/7/8 (Sl^{1/2/3}), and KN5 (Yk^a) have been associated with single nucleotide polymorphisms in *CR1* and located to CCP 22 or 25 of LHR-D^{3,4}. Presumably due to homology between LHR-D and LHR-C, some Knops system antibodies react, to different extents, with both regions of the protein⁵. KNIR therefore contains a mixture of both srCR1-LHR-C and srCR1-LHR-D to ensure neutralisation of antibodies to high frequency Knops system antigens.

References

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5. Tamasauskas D, *et al* (2001) *Transfusion* 41:1397-404. Localisation of Knops system antibodies in the long homologous repeats of complement receptor 1.