D-loop formation mediated by PALB2, BRCA2 and RAD51

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Introduction

Reactome is open-source, open access, manually curated and peer-reviewed pathway database. Pathway annotations are authored by expert biologists, in collaboration with Reactome editorial staff and cross-referenced to many bioinformatics databases. A system of evidence tracking ensures that all assertions are backed up by the primary literature. Reactome is used by clinicians, geneticists, genomics researchers, and molecular biologists to interpret the results of high-throughput experimental studies, by bioinformaticians seeking to develop novel algorithms for mining knowledge from genomic studies, and by systems biologists building predictive models of normal and disease variant pathways.

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Literature references

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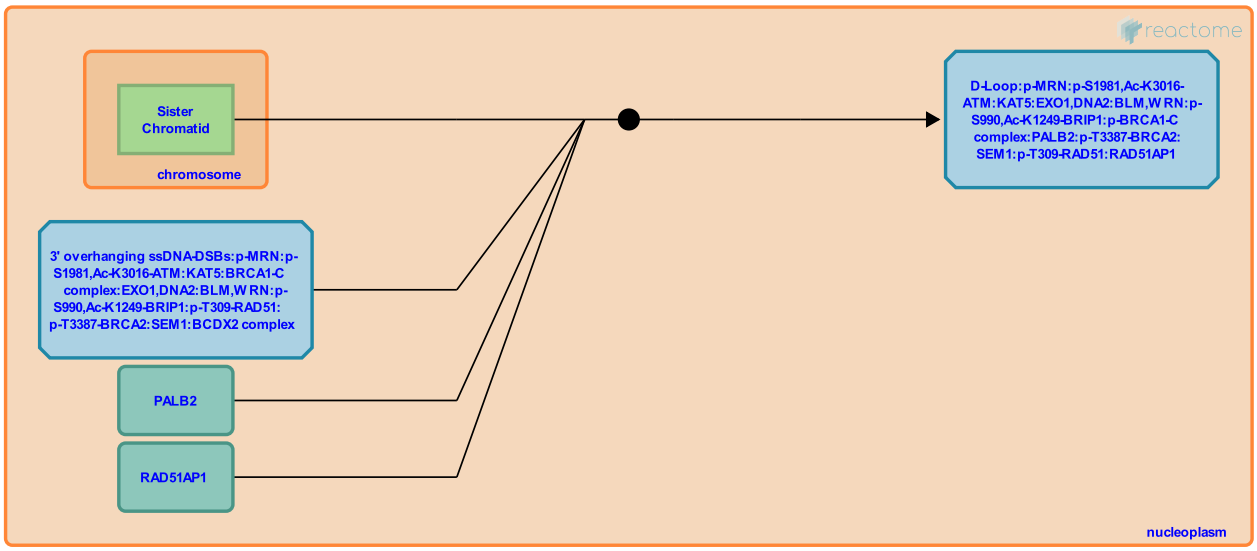
Stable identifier: R-HSA-5693620

Type: binding

Compartments: nucleoplasm, chromosome



A D-loop structure is formed when complementary duplex DNA (sister chromatid) is progressively invaded by the RAD51 nucleoprotein filament, with base pairing of the invading ssDNA and the complementary sister chromatid DNA strand (Sung et al. 2003). PALB2, RAD54, RAD51 paralogs (RAD51B, RAD51C, RAD51D, XRCC2, XRCC3), and RAD51AP1 synergistically stimulate RAD51 recombinase activity, thus enhancing RAD51-mediated strand exchange and promoting the formation of D-loop structures. PALB2 simultaneously interacts with RAD51, BRCA2 and RAD51AP1 (Modesti et al. 2007, Wiese et al. 2007, Buisson et al. 2010, Dray et al. 2010). The direct BRCA1 interaction with PALB2 helps to fine-tune the localization of BRCA2 and RAD51 at DNA double-strand breaks (DSBs) (Zhang et al. 2009, Sy et al. 2009). Phosphorylation of PALB2 by ATR on serine residue S59 promotes BRCA1-PALB2 interaction and the localization of PALB2 to DNA damage sites (Buisson et al. 2017).

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Editions

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