



DNA

**BRCA1-BARD1**

**H4K20**

DNA (DSB) DNA  
DSB HR

NHEJ

H4K20(H4K20me0) DNA

HR

BRCA1-BARD1

H4K20me0

HR

<sup>1</sup>

CDK

S

HR

) ( )

DSB

H4K20me0

HR

<sup>2</sup>

H4K20me0

**DNA**

DNA

DNA

NCC<sup>3</sup>

SILAC-MS

( )

ATM

kinase

DNA

DNA

HR