

A catalog of DNA replication proteins

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DNA, which has a double-helix structure, can have many genetic mutations and variations. Credit: NIH

Maintenance of genome integrity—and prevention of diseases such as cancer—requires complete and faithful replication of the genome every cell division cycle.

To fully understand how genome integrity is maintained, David Cortez,



Ph.D., and colleagues have generated a "catalog" of the proteins present at sites of DNA duplication (replication forks) and chromatin packaging of newly synthesized DNA.

The <u>investigators</u> used a method they developed called iPOND (isolation of proteins on nascent DNA) combined with quantitative mass spectrometry in multiple <u>cell types</u> to identify 593 proteins that are enriched at replication forks and nascent chromatin. Using loss-offunction <u>genetic analyses</u> and a review of existing studies, they found that 85% of the proteins had activities consistent with a function in DNA and chromatin replication or replication stress responses.

They demonstrated the value of their catalog by identifying a role for BET family proteins in controlling DNA replication. The resource was published in the Sept. 24 issue of *Cell Reports*.

More information: Sarah R. Wessel et al. Functional Analysis of the Replication Fork Proteome Identifies BET Proteins as PCNA Regulators, *Cell Reports* (2019). DOI: 10.1016/j.celrep.2019.08.051

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