

P069 Rapid chromatin immunoprecipitation from a low number of cells with LowCell# ChIP kit

Juana Magdalena, Jonathan Frampton

Diagenode SA, Liege, Belgium

Interaction between proteins and DNA is essential for many cellular functions such as DNA replication, DNA repair, maintenance of genomic stability and regulation of gene expression. Transcription is controlled by the association of epigenetically modified histone proteins, chromatin modifiers and transcription factors with target DNA sequences. Chromatin Immunoprecipitation (ChIP) has become a prominent technique to analyze protein association with specific DNA sequences in cells in the context of development, differentiation, aging and disease. In the ChIP assay, proteins and DNA are reversibly cross-linked, chromatin is sheared and the protein of interest is selectively immunoprecipitated using specific antibodies. The immunoprecipitated DNA is analyzed for the presence of particular sequences by quantitative polymerase chain reaction (qPCR), hybridization to microarrays (ChIP-on-chip) or direct sequencing³ (ChIP-seq). Enrichment of specific sequences in the precipitate indicates that these sequences are associated with the protein of interest *in vivo*. Conventional ChIP assays require large numbers of cells (in the multi-million range), which excludes small and precious cell samples from such analyses. Recent development in the ChIP field has led to the emergence of protocols aiming at reducing cell numbers. We have optimized ChIP to allow immunoprecipitations from chromatin prepared from as few as 1,000 cells in a day's work. Reproducibility of ChIP results between large-scale ChIP and low cell number ChIP assays is compared.