The eukaryotic chromosomes are composed of two layers of nucleosomes and DNA is disposed between them in the zig-zag-like ribbon. Bogdan Kurchii. Biochemistry of Photosynthesis, Plant Physiology and Genetics, 31/17 Vasylkivska, Kiev, 03022, Ukraine

In accordance to earlier described of a chromatin packing model [Kurchii, 1998] each chromosome of eukaryotic cells is composed of two layers of nucleosomes. Between these two layers of nucleosomes is disposed DNA in the zig-zag-like ribbon. During DNA replication the parental nucleosomes are not destroying and are constantly conjugated with a DNA ribbon. Semiconservative formation of chromosomes take place immediately after the DNA replication. During S phase each layer of parental nucleosomes is bound to one strand (to the edge of a ribbon) of parental DNA. After the synthesis of daughter DNA strands newly synthesized nucleosomes join to the newly synthesized DNA strands. Thus, the novo nucleosome assembly take place insight the parental chromosome. An external half of newly synthesized sister chromosomes are formed by parental DNA and nucleosomes, and adjacent (neighboring) sides of sister chromosomes are formed by newly synthesized DNA strands and the layers of nucleosomes. Hence, each chromosome in S phase is divided by a replication fork into two equivalent parts, and then each part is completed by novel DNA strand and the layer of novel nucleosomes. In the frame of this model the synthesis of RNA does not occur on the native DNA strands. RNA is synthesized into two steps. Firstly is synthesized DNA which is pushed out then from the body of a chromosome. Further DNA is transformed into RNA by the RNA-polymerase within the space of nucleus, i.e. outside the chromosome.