Supplementary Table. Factors influencing rRNA synthesis by pol I[a]

Factor[b]	Target[c]	Effect[d]	Refs
Actin-nuclear myosin	Associates with pol I and rDNA	↑	[1,2]
Angiogenin	Accumulates in the nucleolus and binds to DNA	↑	[3]
Basonuclin	Binds rDNA promoter	↑	[4]
Cdc2-cyclin B	Inactivates SL1 and TTF-I in mitosis	↓	[5,6]
Cdk-cyclin complexes (G1-specific)	Activation of UBF	↑	[7,8]
CSB	In a complex that contains pol I, TFIIH and XPG	↑	[9]
DNA–PK	Phosphorylated Ku protein competes with SL1 for binding to the rDNA promoter and prevents PIC formation	↓	[10]
HBV X protein	Increases TBP levels (via Ras)	↑	[11]
HCV core protein	Associates with SL1; hyperphosphorylation of UBF	↑	[12]
IRS-1	Interacts with UBF, and targets the p110 subunit of PI3K to phosphorylate UBF	↑	[13,14]
Large T antigen	Interacts with SL1; induces an increase in UBF phosphorylation	↑	[15]
MAPK (Ras- and ERK-signalling)	ERK activation of UBF and/or TIF-IA (RRN3); Ras signals to elevate TBP expression	↑	[16–18]
mTOR	Activation of TIF-IA (RRN3) and/or UBF (involving p70 S6K); increased TBP levels	↑	[19,20]
Myc/MAD1	Activation or repression of UBF gene expression	↑↓	[21]
ncl-1or brat	Loss of function mutants of ncl-1 (*C. elegans*) (or *Drosophila* homologue brat, for brain tumour) have enlarged nucleoli	↓	[22,23]
Net1 (in yeast RENT complex)	Binds pol I	↑	[24]
NoRC	TTF-I recruits HDAC1 and DNA methyltransferase via a subunit of NoRC	↓	[25,26]
Nopp140	Interacts with pol I and mislocalises pol I	↓	[27]
Nucleolin	Affects the transcription machinery or the rDNA promoter (reduces the level of 40S pre-rRNA in Xenopus oocytes)	↓	[28]
p204 (interferon-inducible)	Interacts with UBF	↓	[29]
p300/CBP	Acetylation of UBF	↑	[30]
p53	Binds primarily to SL1 subunits TBP and TAF_I110 and prevents the interaction of SL1 with UBF *in vitro*	↓	[31,32]
P/CAF	Interacts with TTF-I, acetylates TAF_I68 in TIF-IB (SL1) and enhances DNA binding of this TAF_I	↑	[33]
PI3K	UBF phosphorylation	↑	[14,34]
RB	Binds UBF and either prevents UBF binding to rDNA or prevents the interaction of UBF with SL1	↓	[35–38]
TAF1 ($TAF_{II}250$)	Interacts with UBF	↑	[39]
TFIIH	Associates with subpopulations of both pol I and TIF-IB or SL1; required for productive but not abortive rDNA transcription	↑	[40]
TFIIS	Can stimulate elongation by pol I	↑	[41]
Tip60 acetyltransferase subunit	Acetylates UBF	↑	[42]
Topoisomerase I/II	Stimulates elongation by pol I	↑	[43]
Treacle (Treacher Collins syndrome)	Interacts with UBF	↑	[44]
USF1/USF2	Modulate pol I transcription: as an activator (heterodimer) or repressor (homodimer)	↑↓	[45]
WRN (RecQ DNA helicase)/yeast DNA helicases SGS1 and SRS2	WRN interacts with pol I	↑	[46,47]

[a]Abbreviations: CBP, CREB (calcium response element binding protein)-binding protein; Cdc, cell-division cycle; Cdk, cyclin-dependent kinase; CSB, Cockayne's syndrome B; DNA-PK, DNA-dependent protein kinase; ERK, extracellular-signal regulated kinase; HBV, hepatitis B virus; HCV, hepatitis C virus; HDAC, histone deacetylase; IRS, insulin receptor substrate; MAPK, mitogen-activated protein kinase; mTOR, mammalian target of rapamycin; NoRC, nucleolar remodelling complex; p70 S6K, ribosomal protein S6 kinase 70 kDa; P/CAF, p300/CBP-associated factor; PIC, pre-initiation complex; PI3K, phosphatidyl inositol-3 kinase; pol I, RNA polymerase I; RB, retinoblastoma tumour-suppressor protein; RENT, regulator of nucleolar silencing and telophase exit; RRN3, ribosomal RNA polymerase I complementation group 3; SL1, Selectivity factor 1; TAF_I, TBP-associated factor for pol I transcription; TBP, TATA-box binding protein; TFIIH, transcription factor H for pol II transcription; TIF-IA or B, transcription initiation factor for pol I A (RRN3) or B (SL1); TTF-I, transcription terminaton factor I; UBF, upstream binding factor; USF, upstream stimulatory factor; WRN, Werner's syndrome protein; XPG, Xeroderma pigmentosum group G.

[b]Primarily including factors described in the last ~5 years.

[c]The targets might not be known.

[d]The effect might be direct or indirect and increase (↑) and/or decrease (↓) rRNA synthesis by pol I transcription.

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