SUPPLEMENTARY TABLES AND FIGURES

Supplementary file 1a: Cell line characteristics

Name	Species	Type	Genome size (Gbp)	Reference
HeLa K	Homo sapiens	Cervical adenocarcinoma	9.682±0.002	(Erfle et al., 2007)
HeLa K GFP-PCNA	Homo sapiens	Cervical adenocarcinoma	9.682±0.002	(Chagin et al., 2016)
HeLa K GFP-RPA34	Homo sapiens	Cervical adenocarcinoma	9.682±0.002	This study
HeLa K FRTLacZ	Homo sapiens	Cervical adenocarcinoma	9.682±0.002	(Chagin et al., 2016)
IMR90	Homo sapiens	Fibroblasts from lung tissue	6.37	(Nichols et al., 1977)

Supplementary file 1b: Plasmid characteristics

Name	pc number	Fluorophore	Protein of Interest	Promoter	References
pmiRFP670-PCNA	3385	miRFP670	Human PCNA	CMV	(Rausch et al., 2021)
pFRT-B-GRPA	1232	GFP	Human RPA34	EF1α	This study
pFRT-B-GPCNA	1274	GFP	Human PCNA	EF1α	(Chagin et al., 2016)

* pc: plasmid collection.

Supplementary file 1c: Nucleotide and chemical characteristics

Name	Application	Detection	Cat #	Company
Cy3-dUTP	Replication labeling (Labeling of nascent DNA)	-	ENZ-42501	Enzo life sciences, Farmingdale, NY, USA
Aphidicolin	Replisome disruption by polymerase inhibition	-	A0781-1MG	Sigma-Aldrich, St Louis, MO, USA
5-ethynyl-2'-deoxyuridine (EdU)	Labeling of nascent DNA in pulse (chase) experiments	ClickIT chemistry	E10415	Thermo Fisher Scientific, Waltham, MA, USA

Supplementary file 1d: Primary and secondary antibody characteristics

Reactivity	Host	Clonality	Dilution	Application	Cat / Clone#	Company / References
anti RPA34	Mouse	Monoclonal	1:2	IF, WB	9H8H4#	Gift from Mark Kenny/J. Hurwitz (Kenny et al., 1990)
anti RPA70A	Mouse	Monoclonal	1:2	IF, WB	7G9E3#	Gift from Mark Kenny/J. Hurwitz (Kenny et al., 1990)
Anti MCM2	Rabbit	Monoclonal	1:5000 IF, 1:10000 WB	IF, WB	ab 108935/ EPR4120	Abcam, Cambridge, United Kingdom
anti MCM2pS108	Rabbit	Monoclonal	1:1000	IF,WB	3267-1	Epitomics, Burlingame, CA, United States
anti pol Alpha	Mouse	Monoclonal	Undiluted	IF,WB	SJK-287-38#	ATCC (Tanaka et al., 1982)
anti pol Delta	Mouse	Monoclonal	1:500	IF,WB	610972	BD biosciences, New Jersey, USA (Li et al., 2016)
anti pol Epsilon	Rabbit	Polyclonal	1:500	IF, WB	GTX132100	GeneTex, Irvine, California, United States
anti PCNA	Mouse	Monoclonal	1:100	IF*,WB	M0879 / PC10#	Dako, Hamburg, Germany (Waseem and Lane, 1990)
anti Histone H3	Rat	Monoclonal	1:250	WB	61647/ 1C8B2#	Active Motif, California, USA
anti MacroH2A1	Rabbit	Polyclonal	1:1000	WB	07-219	Active Motif, California, USA
anti GFP	Rat	Monoclonal	1:1000	WB	3H9#	Chromotek 3H9, Planegg-Martinsried, Germany
Anti tubulin alpha	Mouse	Monoclonal	1:5000	WB	clone DM1A#/ T9026	Sigma, Missouri, United States
anti-mouse IgG Cy3	Donkey	Polyclonal	1:800	IF (fluorescent secondary)	715-165-151	The Jackson Laboratory, Bar Harbor, ME, USA

anti-rabbit IgG Cy3	Donkey	Polyclonal	1:800	IF (fluorescent secondary)	711-165-152	The Jackson Laboratory, Bar Harbor, ME, USA
anti-mouse IgG Cy5	Donkey	Polyclonal	1:800	F (fluorescent secondary)	715-175-150	The Jackson Laboratory, Bar Harbor, ME, USA
anti-rabbit IgG Cy5	Donkey	Polyclonal	1:800	F (fluorescent secondary)	711-175-152	The Jackson Laboratory, Bar Harbor, ME, USA
anti-mouse IgG AF488	Goat	Polyclonal	1:800	IF (fluorescent secondary)	2120125	Invitrogen, Waltham, Massachusetts, USA
anti-rabbit IgG AF488	Donkey	Polyclonal	1:800	IF (fluorescent secondary)	A11034	Invitrogen, Waltham, Massachusetts, USA
anti rat IgG HRP	Goat	Polyclonal	1:5000	WB (HRP secondary)	112-035-068	The Jackson Laboratory, Bar Harbor, ME, USA
anti mouse IgG HRP	Sheep	Polyclonal	1:5000	WB (HRP secondary)	NA931	Amersham pharmacia, Amersham, United Kingdom

*****Methanol treatment required #Clone number

Supplementary file 1e: Imaging systems characteristics

Microscope/ Company	Lasers/lamps	Filters (ex. & em. [nm])*	Objectives/ lenses	Detection system	Incubation system	Application
Ultra-View VoX spinning disk microscope/ PerkinElmer Life Sciences, UK	solid state diode lasers (405 nm, 488 nm, 561 nm, 640 nm)	405/488/568/640** 405: 415–475 488: 505–549 561: 580–650 640: 664–754	oil immersion 60x Plan-Apochromat (NA 1.45)	cooled 14-bit Hamamatsu® C9100-50 EMCCD	closed live-cell microscopy chamber (ACU control, Olympus) for time-lapse microscopy	time-lapse microscopy & confocal z-stack imaging
Widefield microscope Axiovert 200 /Zeiss, Germany	HBO100 mercury lamp	488: 473-491 & 506-534 561: 550-580 & 590-650 640: 590-650 & 663-738	oil immersion 63x Plan-Apochromat (NA 1.4)	12-bit AxioCam mRM	-	Multi channel wide-field imaging

Leica SP5 II confocal microscope /Wetzlar, Germany	405 nm diode 488 nm Argon, 561 nm DPSS, 633 nm HeNe	AOBS beam splitter	HCX PL APO 63x / 1.4-0.6 oil lambda blue & HCX PL APO 100x (NA 1.44) oil Corr CS	2 HyD Hybrid Detectors	-	confocal z-stack imaging
Amersham AI600 imager	Chemiluminescence, UV transillumination	-	large aperture FUJINON™ f/0.85 43 mm	16-bit Peltier cooled Fujifilm Super CCD	-	Western blots and DNA agarose gels
Operetta high throughput imaging/ PerkinElmer Life Sciences, UK	Xenon fiber-optic light source, 300 W, 360 – 640 nm continuous spectrum LED light source for transmission mode	ex:360/400, 460/490, 560/580 em: 410/480, 500/550, 560/630	20x or 40x air (0.45 NA and 0.95 NA) long WD***	14 bit Jenoptik firecamj203 Sony Chip ICX285 cooled 20°C below environment	-	high throughput, high content imaging and image analysis
Nikon TiE2 inverted with crest spinning disk unit/ Nikon, Japan	SPECTRA X light engine 395/25 nm with 295 mW 440/20 nm with 256 mW 470/24 nm with 196 mW 510/25 nm with 62 mW 540/30 nm with 231 mW 550/15 nm with 260 mW 575/25 nm with 310 mW	LED-DA/FI/TR/Cy5-4X-B Quadbandpasse x:390/18, 475/35, 535/50 em:460/60, 530/43, 580LP	40x air (0.95 NA) & 250 µm WD***	Cooled Nikon Qi2 camera and 16.25 megapixel sCMOS sensor. readout noise is: 2.2. electron	-	high throughput, high content imaging and image analysis

* ex.: excitation & em.: emission, ** dichroic specification, *** WD: working distance.

Supplementary file 1f: Data description for DNA quantification

Name	Cell stage	DAPI SUM	Correction factor (C)	Corrected genome size (GSxC) Gbp
Cell1_crop_DAPI_Cy3dUTP_HeLa	SE	6.55E+08	1.05	10.185
Cell2_crop_DAPI_Cy3dUTP_HeLa	SE	8.49E+08	1.05	10.185
Cell3_crop_DAPI_Cy3dUTP_HeLa	SE	9.68E+08	1.05	10.185
Cell4_crop_DAPI_Cy3dUTP_HeLa	SM	1.14E+09	1.25	12.125
Cell5_crop_DAPI_Cy3dUTP_HeLa	SL	1.15E+09	1.77	17.169
Cell6_crop_DAPI_Cy3dUTP_HeLa	SE	8.29E+08	1.05	10.185
Cell7_crop_DAPI_Cy3dUTP_HeLa	SE	9.49E+08	1.05	10.185
Cell8_crop_DAPI_Cy3dUTP_HeLa	SM	1.01E+09	1.25	12.125
Cell9_crop_DAPI_Cy3dUTP_HeLa	SM	1.17E+09	1.25	12.125
Cell10_crop_DAPI_Cy3dUTP_HeLa	SM	1.00E+09	1.25	12.125
Cell11_crop_DAPI_Cy3dUTP_HeLa	SL	1.34E+09	1.77	17.169
Cell12_crop_DAPI_Cy3dUTP_HeLa	SM	1.06E+09	1.25	12.125
Cell13_crop_DAPI_Cy3dUTP_HeLa	SL	1.49E+09	1.77	17.169
Cell14_crop_DAPI_Cy3dUTP_HeLa	SE	8.71E+08	1.05	10.185
Cell15_crop_DAPI_Cy3dUTP_HeLa	SL	1.18E+09	1.77	17.169
Cell16_crop_DAPI_Cy3dUTP_HeLa	SL	1.48E+09	1.77	17.169
Cell17_crop_DAPI_Cy3dUTP_HeLa	SL	1.09E+09	1.77	17.169
Cell18_crop_DAPI_Cy3dUTP_HeLa	SL	1.07E+09	1.77	17.169

Cell19_crop_DAPI_Cy3dUTP_HeLa	SL	1.17E+09	1.77	17.169
Cell20_crop_DAPI_Cy3dUTP_HeLa	SM	1.09E+09	1.25	12.125
Cell21_crop_DAPI_Cy3dUTP_HeLa	SL	1.02E+09	1.77	17.169
Cell22_crop_DAPI_Cy3dUTP_HeLa	SL	1.02E+09	1.77	17.169
Cell23_crop_DAPI_Cy3dUTP_HeLa	SE	9.33E+08	1.05	10.185
Cell24_crop_DAPI_Cy3dUTP_HeLa	SE	8.90E+08	1.05	10.185
Cell25_crop_DAPI_Cy3dUTP_HeLa	SE	7.67E+08	1.05	10.185
Cell26_crop_DAPI_Cy3dUTP_HeLa	SE	8.39E+08	1.05	10.185
Cell27_crop_DAPI_Cy3dUTP_HeLa	SM	1.04E+09	1.25	12.125
Cell28_crop_DAPI_Cy3dUTP_HeLa	SM	1.01E+09	1.25	12.125
Cell29_crop_DAPI_Cy3dUTP_HeLa	SM	1.05E+09	1.25	12.125
Cell30_crop_DAPI_Cy3dUTP_HeLa	SM	1.02E+09	1.25	12.125
Cell1_DAPI_Cy3dUTP_IMR90	-	1.08E+09	-	6.37
Cell2_DAPI_Cy3dUTP_IMR90	-	5.04E+08	-	6.37
Cell3_DAPI_Cy3dUTP_IMR90	-	1.09E+09	-	6.37
Cell4_DAPI_Cy3dUTP_IMR90	-	8.72E+08	-	6.37
Cell5_DAPI_Cy3dUTP_IMR90	-	1.08E+09	-	6.37
Cell6_DAPI_Cy3dUTP_IMR90	-	5.39E+08	-	6.37
Cell7_DAPI_Cy3dUTP_IMR90	-	6.33E+08	-	6.37
Cell8_DAPI_Cy3dUTP_IMR90	-	5.52E+08	-	6.37

Cell9_DAPI_Cy3dUTP_IMR90	-	6.20E+08	-	6.37
Cell10_DAPI_Cy3dUTP_IMR90	-	6.68E+08	-	6.37
Cell13_DAPI_Cy3dUTP_IMR90	-	7.43E+08	-	6.37
Cell14_DAPI_Cy3dUTP_IMR90	-	6.53E+08	-	6.37
Cell15_DAPI_Cy3dUTP_IMR90	-	7.25E+08	-	6.37
Cell16_DAPI_Cy3dUTP_IMR90	-	4.41E+08	-	6.37
Cell17_DAPI_Cy3dUTP_IMR90	-	1.29E+09	-	6.37
Cell18_DAPI_Cy3dUTP_IMR90	-	7.51E+08	-	6.37

Supplementary file 1g: Data description for 2D confocal fixed images

Name	Cell stage	Time (s)	Channels*	Pixel size (nm)	frame rate (ms)
Cell1_HeLa_fixedcells.tif	SE	40	3	120	500
Cell2_HeLa_fixedcells.tif	SE	40	3	120	500
Cell3_HeLa_fixedcells.tif	SE	40	3	120	500
Cell4_HeLa_fixedcells.tif	SM	40	3	120	500
Cell5_HeLa_fixedcells.tif	SM	40	3	120	500
Cell6_HeLa_fixedcells.tif	SM	40	3	120	500
Cell7_HeLa_fixedcells.tif	SM	40	3	120	500
Cell8_HeLa_fixedcells.tif	SL	40	3	120	500

Cell9_HeLa_fixedcells.tif	SL	40	3	120	500
Cell10_HeLa_fixedcells.tif	SL	40	3	120	500
Cell11_HeLa_fixedcells.tif	SE	40	3	120	500
Cell12_HeLa_fixedcells.tif	SE	40	3	120	500
Cell13_HeLa_fixedcells.tif	SE	40	3	120	500
Cell14_HeLa_fixedcells.tif	SL	40	3	120	500
Cell15_HeLa_fixedcells.tif	SE	40	3	120	500
Cell16_HeLa_fixedcells.tif	SE	40	3	120	500
Cell17_HeLa_fixedcells.tif	SL	40	3	120	500
Cell18_HeLa_fixedcells.tif	G2	40	3	120	500
Cell19_HeLa_fixedcells.tif	G1	40	3	120	500
Cell20_HeLa_fixedcells.tif	SM	40	3	120	500
Cell21_HeLa_fixedcells.tif	SE	40	3	120	500
Cell22_HeLa_fixedcells.tif	SE	40	3	120	500
Cell23_HeLa_fixedcells.tif	SL	40	3	120	500
Cell24_HeLa_fixedcells.tif	SM	40	3	120	500
Cell25_HeLa_fixedcells.tif	SM	40	3	120	500
Cell26_HeLa_fixedcells.tif	SE	40	3	120	500
Cell27_HeLa_fixedcells.tif	SE	40	3	120	500
Cell28_HeLa_fixedcells.tif	SE	40	3	120	500

Cell29_HeLa_fixedcells.tif	SM	40	3	120	500
Cell30_HeLa_fixedcells.tif	SE	40	3	120	500
Cell31_HeLa_fixedcells.tif	SL	40	3	120	500
Cell32_HeLa_fixedcells.tif	SE	40	3	120	500
Cell33_HeLa_fixedcells.tif	SE	40	3	120	500
Cell34_HeLa_fixedcells.tif	SE	40	3	120	500
Cell35_HeLa_fixedcells.tif	SE	40	3	120	500
Cell1_IMR90_fixed.tif	-	40	3	120	500
Cell2_IMR90_fixed.tif	-	40	3	120	500
Cell3_IMR90_fixed.tif	-	40	3	120	500
Cell4_IMR90_fixed.tif	-	40	3	120	500
Cell5_IMR90_fixed.tif	-	40	3	120	500
Cell6_IMR90_fixed.tif	-	40	3	120	500
Cell7_IMR90_fixed.tif	-	40	3	120	500
Cell8_IMR90_fixed.tif	-	40	3	120	500
Cell9_IMR90_fixed.tif	-	40	3	120	500
Cell10_IMR90_fixed.tif	-	40	3	120	500
Cell11_IMR90_fixed.tif	-	40	3	120	500
Cell12_IMR90_fixed.tif	-	40	3	120	500
Cell13_IMR90_fixed.tif	-	40	3	120	500

Cell14_IMR90_fixed.tif	-	40	3	120	500
Cell15_IMR90_fixed.tif	-	40	3	120	500
Cell16_IMR90_fixed.tif	-	40	3	120	500
Cell17_IMR90_fixed.tif	-	40	3	120	500
Cell18_IMR90_fixed.tif	-	40	3	120	500

Supplementary file 1h: Data description for 2D confocal live images

Name	Cell stage	Time (s)	Exposure time (ms)	Channels*	Frame rate (ms)
n001_G_Aph_4_AT_c01.tif	G1	40	300	1	500
n001_G_Aph_4_AT_c02.tif	G1	-	500	3	-
n001_G_Aph_4_BT_c01.tif	G1	40	300	1	500
n001_G_Aph_4_BT_c02.tif	G1	-	500	3	-
n002_G_Aph_4_AT_c01.tif	G2	40	300	1	500
n002_G_Aph_4_AT_c02.tif	G2	-	500	3	-
n002_G_Aph_4_BT_c01.tif	G2	40	300	1	500
n002_G_Aph_4_BT_c02.tif	G2	-	500	3	-
n003_G_Aph_5_AT_c01.tif	G2	40	300	1	500
n003_G_Aph_5_AT_c02.tif	G2	-	500	3	-
n003_G_Aph_5_BT_c01.tif	G2	40	300	1	500

n003_G_Aph_5_BT_c02.tif	G2	-	500	3	-
n004_G_Aph_5_AT_c01.tif	G2	40	300	1	500
n004_G_Aph_5_AT_c02.tif	G2	-	500	3	-
n004_G_Aph_5_BT_c01.tif	G2	40	300	1	500
n004_G_Aph_5_BT_c02.tif	G2	-	500	3	-
n005_G_Aph_5_AT_c01.tif	G1	40	300	1	500
n005_G_Aph_5_AT_c02.tif	G1	-	500	3	-
n005_G_Aph_5_BT_c01.tif	G1	40	300	1	500
n005_G_Aph_5_BT_c02.tif	G1	-	500	3	-
n006_G_Aph_6_AT_c01.tif	G2	40	300	1	500
n006_G_Aph_6_AT_c02.tif	G2	-	500	3	-
n006_G_Aph_6_BT_c01.tif	G2	40	300	1	500
n006_G_Aph_6_BT_c02.tif	G2	-	500	3	-
n007_G_Aph_10_AT_c01.tif	G1	40	300	1	500
n007_G_Aph_10_AT_c02.tif	G1	-	500	3	-
n007_G_Aph_10_BT_c01.tif	G1	40	300	1	500
n007_G_Aph_10_BT_c02.tif	G1	-	500	3	-
n008_G_Aph_10_AT_c01.tif	G1	40	300	1	500
n008_G_Aph_10_AT_c02.tif	G1	-	500	3	-
n008_G_Aph_10_BT_c01.tif	G1	40	300	1	500

n008_G_Aph_10_BT_c02.tif	G1	-	500	3	-
n009_G_Aph_10_AT_c01.tif	G1	40	300	1	500
n009_G_Aph_10_AT_c02.tif	G1	-	500	3	-
n009_G_Aph_10_BT_c01.tif	G1	40	300	1	500
n009_G_Aph_10_BT_c02.tif	G1	-	500	3	-
n0012_G_Aph_11_AT_c01.tif	G2	40	300	1	500
n0012_G_Aph_11_AT_c02.tif	G2	-	500	3	-
n0012_G_Aph_11_BT_c01.tif	G2	40	300	1	500
n0012_G_Aph_11_BT_c02.tif	G2	-	500	3	-
n0013_G_Aph_11_AT_c01.tif	G2	40	300	1	500
n0013_G_Aph_11_AT_c02.tif	G2	-	500	3	-
n0013_G_Aph_11_BT_c01.tif	G2	40	300	1	500
n0013_G_Aph_11_BT_c02.tif	G2	-	500	3	-
n0015_G_Aph_15_AT_c01.tif	G1	40	300	1	500
n0015_G_Aph_15_AT_c02.tif	G1	-	500	3	-
n0015_G_Aph_15_BT_c01.tif	G1	40	300	1	500
n0015_G_Aph_15_BT_c02.tif	G1	-	500	3	-
n0017_G_Aph_16_AT_c01.tif	G1	40	300	1	500
n0017_G_Aph_16_AT_c02.tif	G1	-	500	3	-
n0017_G_Aph_16_BT_c01.tif	G1	40	300	1	500

n0017_G_Aph_16_BT_c02.tif	G1	-	500	3	-
n0018_G_Aph_18_AT_c01.tif	G1	40	300	1	500
n0018_G_Aph_18_AT_c02.tif	G1	-	500	3	-
n0018_G_Aph_18_BT_c01.tif	G1	40	300	1	500
n0018_G_Aph_18_BT_c02.tif	G1	-	500	3	-
n0020_G_Aph_21_AT_c01.tif	G2	40	300	1	500
n0020_G_Aph_21_AT_c02.tif	G2	-	500	3	-
n0020_G_Aph_21_BT_c01.tif	G2	40	300	1	500
n0020_G_Aph_21_BT_c02.tif	G2	-	500	3	-
n001_S_Aph_1_AT_c01.tif	S	40	300	1	500
n001_S_Aph_1_AT_c02.tif	S	-	500	3	-
n001_S_Aph_1_BT_c01.tif	S	40	300	1	500
n001_S_Aph_1_BT_c02.tif	S	-	500	3	-
n002_S_Aph_1_AT_c01.tif	S	40	300	1	500
n002_S_Aph_1_AT_c02.tif	S	-	500	3	-
n002_S_Aph_1_BT_c01.tif	S	40	300	1	500
n002_S_Aph_1_BT_c02.tif	S	-	500	3	-
n004_S_Aph_1_AT_c01.tif	S	40	300	1	500
n004_S_Aph_1_AT_c02.tif	S	-	500	3	-
n004_S_Aph_1_BT_c01.tif	S	40	300	1	500

n004_S_Aph_1_BT_c02.tif	S	-	500	3	-
n006_S_Aph_2_AT_c01.tif	S	40	300	1	500
n006_S_Aph_2_AT_c02.tif	S	-	500	3	-
n006_S_Aph_2_BT_c01.tif	S	40	300	1	500
n006_S_Aph_2_BT_c02.tif	S	-	500	3	-
n008_S_Aph_4_AT_c01.tif	S	40	300	1	500
n008_S_Aph_4_AT_c02.tif	S	-	500	3	-
n008_S_Aph_4_BT_c01.tif	S	40	300	1	500
n008_S_Aph_4_BT_c02.tif	S	-	500	3	-
n009_S_Aph_5_AT_c01.tif	S	40	300	1	500
n009_S_Aph_5_AT_c02.tif	S	-	500	3	-
n009_S_Aph_5_BT_c01.tif	S	40	300	1	500
n009_S_Aph_5_BT_c02.tif	S	-	500	3	-
n0012_S_Aph_6_AT_c01.tif	S	40	300	1	500
n0012_S_Aph_6_AT_c02.tif	S	-	500	3	-
n0012_S_Aph_6_BT_c01.tif	S	40	300	1	500
n0012_S_Aph_6_BT_c02.tif	S	-	500	3	-
n0013_S_Aph_7_AT_c01.tif	S	40	300	1	500
n0013_S_Aph_7_AT_c02.tif	S	-	500	3	-
n0013_S_Aph_7_BT_c01.tif	S	40	300	1	500

n0013_S_Aph_7_BT_c02.tif	S	-	500	3	-
n0014_S_Aph_7_AT_c01.tif	S	40	300	1	500
n0014_S_Aph_7_AT_c02.tif	S	-	500	3	-
n0014_S_Aph_7_BT_c01.tif	S	40	300	1	500
n0014_S_Aph_7_BT_c02.tif	S	-	500	3	-
n0015_S_Aph_8_AT_c01.tif	S	40	300	1	500
n0015_S_Aph_8_AT_c02.tif	S	-	500	3	-
n0015_S_Aph_8_BT_c01.tif	S	40	300	1	500
n0015_S_Aph_8_BT_c02.tif	S	-	500	3	-
n0016_S_Aph_8_AT_c01.tif	S	40	300	1	500
n0016_S_Aph_8_AT_c02.tif	S	-	500	3	-
n0016_S_Aph_8_BT_c01.tif	S	-	500	3	500
n0016_S_Aph_8_BT_c02.tif	S	40	300	1	-
n0017_S_Aph_8_AT_c01.tif	S	-	500	3	500
n0017_S_Aph_8_AT_c02.tif	S	40	300	1	-
n0017_S_Aph_8_BT_c01.tif	S	-	500	3	500
n0017_S_Aph_8_BT_c02.tif	S	40	300	1	-
n0018_S_Aph_8_AT_c01.tif	S	-	500	3	500
n0018_S_Aph_8_AT_c02.tif	S	40	300	1	-
n0018_S_Aph_8_BT_c01.tif	S	-	500	3	500

n0018_S_Aph_8_BT_c02.tif	S	40	300	1	-
n0019_S_Aph_9_AT_c01.tif	S	-	500	3	500
n0019_S_Aph_9_AT_c02.tif	S	40	300	1	-
n0019_S_Aph_9_BT_c01.tif	S	-	500	3	500
n0019_S_Aph_9_BT_c02.tif	S	-	500	3	-
n0020_S_Aph_9_AT_c01.tif	S	40	300	1	500
n0020_S_Aph_9_AT_c02.tif	S	-	500	3	-
n0020_S_Aph_9_BT_c01.tif	S	40	300	1	500
n0020_S_Aph_9_BT_c02.tif	S	-	500	3	-
n0021_S_Aph_1_0_AT_c01.tif	S	40	300	1	500
n0021_S_Aph_1_0_AT_c02.tif	S	-	500	3	-
n0021_S_Aph_1_0_BT_c01.tif	S	40	300	1	500
n0021_S_Aph_1_0_BT_c02.tif	S	-	500	3	-
n0022_S_Aph_1_2_AT_c01.tif	S	40	300	1	500
n0022_S_Aph_1_2_AT_c02.tif	S	-	500	3	-
n0022_S_Aph_1_2_BT_c01.tif	S	40	300	1	500
n0022_S_Aph_1_2_BT_c02.tif	S	-	500	3	-
n0023_S_Aph_1_3_AT_c01.tif	S	40	300	1	500
n0023_S_Aph_1_3_AT_c02.tif	S	-	500	3	-
n0023_S_Aph_1_3_BT_c01.tif	S	40	300	1	500

n0023_S_Aph_1_3_BT_c02.tif	S	-	500	3	-
n0024_S_Aph_1_4_AT_c01.tif	S	40	300	1	500
n0024_S_Aph_1_4_AT_c02.tif	S	-	500	3	-
n0024_S_Aph_1_4_BT_c01.tif	S	40	300	1	500
n0024_S_Aph_1_4_BT_c02.tif	S	-	500	3	-
n0025_S_Aph_1_7_AT_c01.tif	S	40	300	1	500
n0025_S_Aph_1_7_AT_c02.tif	S	-	500	3	-
n0025_S_Aph_1_7_BT_c01.tif	S	40	300	1	500
n0025_S_Aph_1_7_BT_c02.tif	S	-	500	3	-
n0026_S_Aph_1_7_AT_c01.tif	S	40	300	1	500
n0026_S_Aph_1_7_AT_c02.tif	S	-	500	3	-
n0026_S_Aph_1_7_BT_c01.tif	S	40	300	1	500
n0026_S_Aph_1_7_BT_c02.tif	S	-	500	3	-
n0027_S_Aph_21_AT_c01.tif	S	40	300	1	500
n0027_S_Aph_21_AT_c02.tif	S	-	500	3	-
n0027_S_Aph_21_BT_c01.tif	S	40	300	1	500
n0027_S_Aph_21_BT_c02.tif	S	-	500	3	-
n0028_S_Aph_21_AT_c01.tif	S	40	300	1	500
n0028_S_Aph_21_AT_c02.tif	S	-	500	3	-
n0028_S_Aph_21_BT_c01.tif	S	40	300	1	500

n0028_S_Aph_21_BT_c02.tif	S	-	500	3	-
n0001_coloc_c02.tif	S	40	300	2	500
n0002_coloc_c02.tif	S	40	300	2	500
n0003_coloc_c02.tif	S	40	300	2	500
n0004_coloc_c02.tif	S	40	300	2	500
n0005_coloc_c02.tif	S	40	300	2	500
n0006_coloc_c02.tif	S	40	300	2	500
n0007_coloc_c02.tif	S	40	300	2	500
n0008_coloc_c02.tif	S	40	300	2	500
n0009_coloc_c02.tif	S	40	300	2	500
n0010_coloc_c02.tif	S	40	300	2	500
n0011_coloc_c02.tif	S	40	300	2	500
n0012_coloc_c02.tif	S	40	300	2	500
n0013_coloc_c02.tif	S	40	300	2	500
n0014_coloc_c02.tif	S	40	300	2	500
n0015_coloc_c02.tif	S	40	300	2	500
n0016_coloc_c02.tif	S	40	300	2	500
n0017_coloc_c02.tif	S	40	300	2	500
n0018_coloc_c02.tif	S	40	300	2	500
n0019_coloc_c02.tif	S	40	300	2	500

n0020_coloc_c02.tif	S	40	300	2	500
n0021_coloc_c02.tif	S	40	300	2	500
n0022_coloc_c02.tif	S	40	300	2	500
n0023_coloc_c02.tif	S	40	300	2	500
n0024_coloc_c02.tif	S	40	300	2	500
n0025_coloc_c02.tif	S	40	300	2	500
n0026_coloc_c02.tif	S	40	300	2	500
n0027_coloc_c02.tif	S	40	300	2	500
n0028_coloc_c02.tif	S	40	300	2	500
n0029_coloc_c02.tif	S	40	300	2	500
n0030_coloc_c02.tif	S	40	300	2	500
n0031_coloc_c02.tif	S	40	300	2	500
n0032_coloc_c02.tif	S	40	300	2	500
n0033_coloc_c02.tif	S	40	300	2	500
n001_G1_IMR90_PCNA_Cy3 dUTP_60x.tif	G1	40	300	2	500
n002_G1_IMR90_PCNA_Cy3 dUTP_60x.tif	G1	40	300	2	500
n003_G1_IMR90_PCNA_Cy3 dUTP_60x.tif	G1	40	300	2	500
n004_G1_IMR90_PCNA_Cy3 dUTP_60x.tif	G1	40	300	2	500
n005_G1_IMR90_PCNA_Cy3 dUTP_60x.tif	G1	40	300	2	500
n006_G1_IMR90_PCNA_Cy3 dUTP_60x.tif	G1	40	300	2	500

n007_G1_IMR90_PCNA_Cy3 dUTP_60x.tif	G1	40	300	2	500
n008_G1_IMR90_PCNA_Cy3 dUTP_60x.tif	G1	40	300	2	500
n009_G1_IMR90_PCNA_Cy3 dUTP_60x.tif	G1	40	300	2	500
n010_G1_IMR90_PCNA_Cy3 dUTP_60x.tif	G1	40	300	2	500
n011_G1_IMR90_PCNA_Cy3 dUTP_60x.tif	G1	40	300	2	500
n012_G1_IMR90_PCNA_Cy3 dUTP_60x.tif	G1	40	300	2	500
n013_G1_IMR90_PCNA_Cy3 dUTP_60x.tif	G1	40	300	2	500
n014_G1_IMR90_PCNA_Cy3 dUTP_60x.tif	G1	40	300	2	500
n001_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500
n002_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500
n003_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500
n004_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500
n005_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500
n006_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500
n007_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500
n008_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500
n009_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500
n010_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500
n011_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500
n012_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500

n013_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500
n014_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500
n015_G2_IMR90_PCNA_Cy3 dUTP_60x.tif	G2	40	300	2	500
n001_S_IMR90_PCNA_Cy3d UTP_60x.tif	S	40	300	2	500
n002_S_IMR90_PCNA_Cy3d UTP_60x.tif	S	40	300	2	500
n003_S_IMR90_PCNA_Cy3d UTP_60x.tif	S	40	300	2	500
n004_S_IMR90_PCNA_Cy3d UTP_60x.tif	S	40	300	2	500
n005_S_IMR90_PCNA_Cy3d UTP_60x.tif	S	40	300	2	500
n006_S_IMR90_PCNA_Cy3d UTP_60x.tif	S	40	300	2	500
n007_S_IMR90_PCNA_Cy3d UTP_60x.tif	S	40	300	2	500
n008_S_IMR90_PCNA_Cy3d UTP_60x.tif	S	40	300	2	500
n009_S_IMR90_PCNA_Cy3d UTP_60x.tif	S	40	300	2	500
n010_S_IMR90_PCNA_Cy3d UTP_60x.tif	S	40	300	2	500
n011_S_IMR90_PCNA_Cy3d UTP_60x.tif	S	40	300	2	500
n012_S_IMR90_PCNA_Cy3d UTP_60x.tif	S	40	300	2	500
n0013_S_IMR90_PCNA_Cy3 dUTP_60x.tif	S	40	300	2	500
n0014_S_IMR90_PCNA_Cy3 dUTP_60x.tif	S	40	300	2	500

Supplementary file 1i: Software and macros

Name	Version	Website	Company/University	Application
Volocity	6.3	-	PerkinElmer, USA	Acquiring live cell time lapses
ImageJ	1.53c	https://imagej.nih.gov/ij/	Wayne Rasband, National Institutes of Health, USA	Image processing and image analysis
RStudio	1.1.447-1.2.5033	https://rstudio.com/	RStudio	Statistical analysis and plotting
Harmony	3.5.1	https://www.perkinelmer.com/product/harmony-4-8-office-hh17000001	PerkinElmer, USA	High content microscopy imaging and analysis
KNIME Analytics Platform	3.5.2	https://www.knime.com/knime-analytics-platform	KNIME AG, Switzerland	High content microscopy image processing and analysis
Adobe Illustrator CS6	16	https://www.adobe.com/	Adobe, USA	Graphical sketch and figures arrangement

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