

Debug info for gene: ul1

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2775753/>

immediate-early:

['later', 'genes', 'lowest', 'r', 'i-paa', 'values', 'one', 'us1', 't', 'genes', 'hsv', 'ul16', 'ul1', 'ul38', 'strong', 'inhibitory', 'effect', 'paa', 'us1', 'expression', 'surprising', 'ie', 'gene', 'hsv']

Debug info for gene: ul12

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4807356/>

early:

['hcmv', 'hsv-1', 'encodes', 'mitochondrially', 'targeted', 'nuclease', 'ul12', 'degrades', 'mtdna', 'early', 'hsv-1', 'infection']

Debug info for gene: us4

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4339549/>

early:

['different', 'immediate', 'early', 'early', 'genes', 'fig', 'several', 'late', 'genes', 'appear', 'nucleosomes', 'covering', 'us8a', 'us4', 'us50', 'ul44', 'us11', 'ul55', 'ul11', 'ul1', 'short', 'genes', 'however', 'fact', 'nucleosomes', 'present']

late:

['genes', 'fig', 'several', 'late', 'genes', 'appear', 'nucleosomes', 'covering', 'us8a', 'us4', 'us50', 'ul44', 'us11', 'ul55', 'ul11', 'ul1', 'short', 'genes']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4148446/>

early:

['simian', 'virus', 'sv40', 'early', 'promoter-driven', 'green', 'fluorescent', 'protein', 'gfp', 'gene', 'place', 'viral', 'us4', 'x02013', 'us6', 'region', 'dispensable', 'viral', 'replication', 'hffs', 'ad', 'dd', 'ul79', 'derived']

Debug info for gene: ul17

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2775753/>

early:

['parallel', 'separated', 'divergent', 'early', 'ul50', 'gene', 'furthermore', 'ul15', 'ul17', 'convergent', 'adjacent', 'gene', 'pair', 'genes', 'similar', 'expression']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4132744/>

early:

['dna', 'packaging', 'hypothesis', 'supported', 'observations', 'ul17', 'required', 'early', 'stage', 'dna']

Debug info for gene: us9

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2763221/>

early:

['consequently', 'onset', 'elevated', 'firing', 'delayed', 'tested', 'prediction', 'infecting', 'neurons', 'prv', 'ge', 'gi', 'us9', 'deletion', 'prv', 'bartha', 'replaced', 'prv', 'becker', 'dna', 'observed', 'early', 'firing', 'phenotype']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3640521/>

late:

['prv', 'overall', 'results', 'imply', 'ge', 'gi', 'us9', 'distinct', 'functions', 'mediating', 'anterograde', 'transneuronal', 'spread', 'us9', 'small', 'amino', 'acid', 'type', 'ii', 'tail-anchored', 'membrane', 'protein', 'expressed', 'late', 'kinetics', 'enriched']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3602541/>

early:

['prv', 'becker', 'equivalent', 'early', 'timepoints', 'table', 'later', 'timepoints', 'vivo', 'serine', 'mutant', 'us9', 'facilitate', 'anterograde', 'spread', 'suggesting', 'phosphorylation', 'may', 'affect', 'efficiency', 'transport', 'findings']

['wild-type', 'prv', 'equivalent', 'early', 'time', 'points', 'however', 'later', 'time', 'point', 'vivo', 'diserine', 'mutant', 'us9', 'found', 'undergo', 'anterograde', 'spread', 'suggesting', 'kinetic', 'defect', 'efficiency', 'transport', 'work', 'live', 'cell']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5679760/>

early:

['catenin-downregulation', 'results', 'activity', 'early', 'glycoproteins', 'us9', 'cadherins', 'conclusion', 'tems', 'linked']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6212889/>

late:

['targeting', 'sting-mediated', 'signaling', 'late', 'stages', 'hcmv', 'infection', 'evade', 'host', 'innate', 'antiviral', 'responses', 'us9', 'expression', 'abrogated', 'sting-mediated', 'irf3', 'nuclear', 'translocation', 'altering', 'sting', 'oligomerization', 'sting', 'tbk1']

Debug info for gene: r11

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3192842/>

early:

['hsv-1', 'strain', 'caused', 'early', 'struggles', 'recognizing', 'icp34', 'r11', 'valid', 'gene', 'c', 'x02192', 'c', 'deletion']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4918397/>

late:

['combined', 'r3616', 'r11', 'deletion', 'hrr3', 'lacz', 'inactivating', 'insertion', 'ul39', 'r11', 'deletion', 'mutants', 'pkr', 'inhibits', 'expression', 'late', 'viral', 'genes']

['pkr', 'inhibits', 'expression', 'late', 'viral', 'genes', 'including', 'unique', 'short', 'us', 'passaging', 'r11', 'deletion', 'mutant', 'non-permissive', 'cells', 'leads', 'natural', 'generation', 'mutant', 'known', 'sup']

['genome', 'strongly', 'inhibits', 'late', 'gene', 'expression', 'eg', 'glycoproteins', 'synco-2', 'derived', 'baco-1', 'utilized', 'r11', 'deletion', 'genome', 'insert', 'modified', 'gibbon', 'ape', 'leukemia', 'virus', 'glycoprotein', 'constitutively', 'fusogenic']

['g207', 'sup', 'patton', 'r11', 'us11', 'us12', 'r11', 'replaced', 'x003b2', 'glucuronidase', 'control', 'r11', 'promoter', 'deletion', 'within', 'us12', 'places', 'expression', 'normally', 'late', 'us11', 'gene']

['places', 'expression', 'normally', 'late', 'us11', 'gene', 'immediate', 'early', 'us12', 'promoter', 'g47', 'x00394', 'g207', 'r11', 'ul39', 'us11', 'us12', 'deletion', 'overlapping', 'us11', 'promoter', 'us12', 'region', 'putting', 'expression', 'normally']

['baco-1', 'r11', 'packaging', 'signal', 'r11', 'deleted', 'dna', 'packaging', 'signal', 'restored', 'synco-2', 'baco-1', 'r11', 'packaging', 'signal', 'gibbon', 'ape', 'leukemia', 'virus', 'fusogenic', 'glycoprotein', 'late', 'ul38', 'promoter']

['virus', 'fusogenic', 'glycoprotein', 'late', 'ul38', 'promoter', 'inserted', 'synco-2d', 'baco-1', 'r11', 'packaging', 'signal', 'g', 'lycoprotein', 'essentially', 'synco-2', 'fu-10', 'glycoprotein']

immediate-early:

['us11', 'gene', 'immediate', 'early', 'us12', 'promoter', 'g47', 'x00394', 'g207', 'r11', 'ul39', 'us11', 'us12', 'deletion', 'overlapping', 'us11', 'promoter', 'us12']

Debug info for gene: ul4

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC489598/>

early:

[transcription, human, cytomegalovirus, early, ul4, promoter, ets, transcription]

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4110040/>

immediate-early:

[egc, contains, hcmv, ie, promoter, driving, egfp-cre, fusion, intergenic, region, between, ul3, ul4, mice, infected, x000d7, pfu, via, flank, scarification, previously, described, single, cell]

Debug info for gene: ul14

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4919851/>

immediate-early:

[via, phosphorylating, histone, deacetylase, hdac-1, hdac-2, studies, demonstrated, ul14, could, indirectly, modulate, immediate, early, gene, transcription]

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3157456/>

immediate-early:

[tegument, protein, vp16, immediate-early, phase, infection, yamauchi, et, al, ul14, herpes, simplex, virus, type, exhibits, multiple, functions, yamauchi]
[phase, infection, rather, ie, phase, infection, results, construction, ul14, mutant, viruses, amino, acid, substitutions, analyze, functions]

late:

[proteins, cellular, morphology, late, phase, ul14d-vp16gfp, ul14, 3p, -vp16gfp, viruses, led, formation]
[established, core, gene, dispensable, viral, replication, vitro, ul14, 32-kda, protein, expressed, late, phase, viral]
[important, viral, replication, late, phase, infection, rather, ie, phase, infection, results, construction, ul14, mutant, viruses, amino, acid, substitutions, analyze, functions, ul14, tegument, protein, constructed]
[require, functional, pqc, machinery, could, viral, cellular, origin, thus, hypothesize, loss, ul14, function, increases, amount, misfolded, insoluble, proteins, cytoplasm, late, proteins, particular]
[insoluble, proteins, cytoplasm, late, proteins, particular, vp16, ul46, require, chaperone-like, activity, ul14, mature, properly, localize, within, cell, conclusions, speculate, charged, residues, present]

early:

[virus, present, study, wished, determine, whether, hsp-like, sequence, ul14, mediated, nuclear, transport, vp16, early, phase, infection]
[infection-including, growth, delay, early, alteration, cell, morphology, aggresome, formation--were, clearly, observed, cells, infected, ul14, 3p, -vp16gfp, mutant, virus, phenotypes, observed, cells, infected, ul14, k51m, -vp16gfp, virus]

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4859980/>

late:

[lymphocytes, grb-mediated, apoptosis, late, gene, ul14, product, shown, inhibit, apoptosis]
[lymphocytes, grb-mediated, apoptosis, late, gene, ul14, product, shown, inhibit, apoptosis, hsv-1, ul14, protein, deletion, virus, strain, exerted, decreased, suppression, apoptosis, compared, rescued]

Debug info for gene: us6

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6213986/>

early:

[two, important, delayed, early, genes, hsv-1, genome, us6, late, hsv-1, gene, suppressed, alkaloids, extracted]

late:

[early, genes, hsv-1, genome, us6, late, hsv-1, gene]

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6168178/>

immediate-early:

[icp22, ul54, icp27, ie, x003b1, ul23, tk, ul29, icp8, e, x003b2, ul44, gc, us6, gd, T, x003b3, analyzed, actin, gene, analyzed, control, means, three, independent, experiments]

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC283275/>

early:

[fig, x000a0, hcmv, early, protein, us6, inhibits, peptide, transport, endoplasmic]

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3276581/>

early:

[detect, ul5, gene, early, gene, hsv-2, encoding, helicase-primase, helicase, subunit, late, gene, us6, encodes, viral, envelope, glycoprotein, gd, demonstrated, ul5, us6, mrnas, began, express]
[hsv-2, immediate, early, early, late, genes, mrna, hsv-2-infected, bcbl-1, cells, hsv-2, ul48, ul5, us6, mrna, expression, bcbl-1, cells, infected, mock, hsv-2, hours, detected, rt-pcr, x003b2, -actin]

late:

[helicase-primase, helicase, subunit, late, gene, us6, encodes, viral, envelope, glycoprotein]
[helicase-primase, helicase, subunit, late, gene, us6, encodes, viral, envelope, glycoprotein, gd, demonstrated, ul5, us6, mrnas, began, express, hours, pi, gradually, increased, time, going, fig, lb, finally]
[immediate, early, early, late, genes, mrna, hsv-2-infected, bcbl-1, cells, hsv-2, ul48, ul5, us6, mrna, expression, bcbl-1, cells, infected, mock, hsv-2, hours, detected, rt-pcr, x003b2]

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4399834/>

early:

[hosts, including, mcmv, rat, cmv, rcmv, thus, seems, us6, gene, family, probably, evolved, early, primate, evolution]

Debug info for gene: ul49

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5769551/>

late:

[vhs-mase, regulated, vp13, late, infection, vhs-mase, activity, neutralized, vp16, vp22, encoded, ul48, ul49, genes, respectively, vhs, functions, bhv-1, bv, ehv-1, may, serve, purpose, mechanisms]

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2775753/>

early:

[oriented, third, member, ul9, group, m1, ul7, ul8, convergent, gene, pair, ul49, ul51, T, genes, oriented, parallel, separated, divergent, early, ul50, gene]

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2335119/>

immediate-early:

[observed, h, pi, us1, ul29, encoding, two, non, structural, proteins, rsp40, icp8, respectively, ul49, encoding, virion, envelope, glycoprotein, gn, however, ie180, encoding, immediate, early, protein, iep]

early:

[early, h, pi, early, genes, appeared, differentially, expressed, later, interestingly, ul49, probe, corresponding, gn, protein, responsible, tap, inhibition, differentially, expressed]
[us1, ul29, detected, early, h, pi, early, genes, appeared, differentially, expressed, later, interestingly, ul49, probe, corresponding, gn, protein, responsible, tap, inhibition, differentially, expressed, h, pi, even]

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4076306/>

early:

['icp4', 'icp27', 'icp22', 'early', 'antigens', 'ul23', 'ul29', 'ul39', 'ul50', 'early-late', 'antigens', 'ul18', 'ul19', 'ul49', 'ul55', 'us8', 'dominant', 'targets', 'cd8', 't-cell', 'response', 'hsv-2-infected', 'individuals', 'x02013', 'show', 'immunization']

early-late:

['ul29', 'ul39', 'ul50', 'early-late', 'antigens', 'ul18', 'ul19', 'ul49', 'ul55', 'us8', 'dominant', 'targets', 'cd8', 't-cell']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4816761/>

immediate-early:

['express', 'hsv-1', 'us11', 'ie', 'gene', 'produce', 'bhv-1', 'ul49', 'tap', 'inhibitor', 'fig', 'bv49', 'importantly', 'x00394']

['us11', 'immediate', 'early', 'ie', 'gene', 'tap', 'inhibitor', 'encoded', 'bovine', 'herpesvirus', 'ul49', 'gene', 'expressed', 'human', 'cytomegalovirus', 'hcmv', 'promoter', 'recombinant', 'bv49', '5-fs']

['hsv-1', 'us11', 'immediate', 'early', 'ie', 'gene', 'tap', 'inhibitor', 'encoded', 'bovine', 'herpesvirus', 'ul49', 'gene', 'expressed', 'human', 'cytomegalovirus', 'hcmv', 'promoter', 'recombinant', 'bv49', '5-fs', 'identical']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4399834/>

late:

['expression', 'context', 'viral', 'infection', 'appearance', 'ul49', 'preceding', 'late', 'protein', 'gm']

['appearance', 'ul49', 'preceding', 'late', 'protein', 'gm', 'provides', 'ul49', 'opportunity', 'exert', 'immune', 'evasive', 'effect', 'early']

['times', 'infection', 'ebv-encoded', 'immune', 'evasive', 'molecules', 'effective', 'similarly', 'bohv-1', 'ul49', 'expressed', 'early', 'kinetics', 'remains', 'present', 'late', 'stage', 'infection']

['kinetics', 'remains', 'present', 'late', 'stage', 'infection', 'prolonged', 'expression', 'explained', 'dual', 'role', 'ul49', 'plays', 'viral', 'replication', 'early', 'infection', 'absence', 'gm', 'acts', 'tap', 'inhibitor']

early:

['viral', 'infection', 'appearance', 'ul49', 'preceding', 'late', 'protein', 'gm', 'provides', 'ul49', 'opportunity', 'exert', 'immune', 'evasive', 'effect', 'early', 'infection', 'conservation']

['immune', 'evasive', 'effect', 'early', 'infection', 'conservation', 'ul49', 'gm', 'family', 'herpesviridae', 'indicates', 'original']

['immune', 'evasive', 'effect', 'early', 'infection', 'conservation', 'ul49', 'gm', 'family', 'herpesviridae', 'indicates', 'original', 'role', 'ul49', 'gm', 'chaperone', 'tap', 'inhibition', 'protein', 'evolved', 'later', 'within', 'varicellovirus', 'subfamily', 'possibly', 'bohv-1']

['evasive', 'molecules', 'effective', 'similarly', 'bohv-1', 'ul49', 'expressed', 'early', 'kinetics', 'remains']

['stage', 'infection', 'prolonged', 'expression', 'explained', 'dual', 'role', 'ul49', 'plays', 'viral', 'replication', 'early', 'infection', 'absence']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5462769/>

early:

['hsv-1', 'us6', 'human', 'cytomegalovirus', 'hcmv', 'x02013', 'bnlf2a', 'epstein-barr', 'virus', 'ebv', 'ul49', 'varicelloviruses', 'cpxv12', 'poxvirus', 'initially', 'observed', 'hsv-1', 'early', 'gene', 'product']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2386557/>

early-late:

['transport', 'tap', 'bhv-1-infected', 'cells', 'may', 'explained', 'fact', 'ul49', 'expressed', 'prior', 'excess', 'early-late', 'gm', 'interference']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4098945/>

late:

['newly', 'identified', 'true', 'late', 'protein', 'hsv-1', 'possibly', 'encoded', 'ul49', 'j', 'biomed', 'lab', 'sci', 'yang', 'cc', 'yang']

Debug info for gene: ul41

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3125357/>

immediate-early:

['affects', 'expression', 'host', 'cell', 'genes', 'hsv', 'genome', 'encodes', 'virion-associated', 'endonuclease', 'ul41', 'degrades', 'viral', 'cellular', 'mrna', 'early', 'infection', 'ie', 'protein', 'icp27']

early:

['host', 'cell', 'genes', 'hsv', 'genome', 'encodes', 'virion-associated', 'endonuclease', 'ul41', 'degrades', 'viral', 'cellular', 'mrna', 'early', 'infection', 'ie']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5769551/>

late:

['shutoff', 'vhs', 'protein', 'late', 'x003b3', 'tegument', 'protein', 'encoded', 'ul41', 'gene', 'packaged', 'virion', 'essential', 'viral', 'infection', 'x02013']

['using', 'imagej', 'software', 'dev', 'ul41', 'late', 'gene', 'treated']

immediate-early:

['total', 'rna', 'extracted', 'hpi', 'trizol', 'subsequently', 'reverse', 'transcribed', 'cdna', 'pcr', 'conducted', 'using', 'primers', 'ul41', 'p', 'p', 'x003b2', '-actin', 'p', 'p', 'confirmed', 'agarose', 'gel', 'immediate-early', 'ie', 'gene']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2647735/>

immediate-early:

['host', 'cellular', 'environment', 'immediate-early', 'phase', 'infection', 'like', 'virion', 'host', 'shutoff', 'protein', 'ul41', 'hsv-1', 'degrades', 'host', 'mrna', 'shuts', 'host', 'translation', 'program', 'second', 'play']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6090798/>

early:

['vhs', 'activity', 'vitro', 'js-2012', 'showed', 'significantly', 'weaker', 'vhs', 'activity', 'european-american', 'strains', 'addition', 'ul41', 'null', 'virus', 'also', 'significantly', 'decrease', 'expression', 'host', 'genes', 'early', 'period', 'infection']

['vhs', 'activity', 'vitro', 'js-2012', 'showed', 'significantly', 'weaker', 'vhs', 'activity', 'european-american', 'strains', 'addition', 'ul41', 'null', 'virus', 'also', 'significantly', 'decrease', 'expression', 'host', 'genes', 'early', 'period', 'infection']

['upregulated', 'several', 'folds', 'without', 'chx', 'treatment', 'fig', '8d', 'hence', 'seemed', 'ul41', 'protein', 'prv', 'variant', 'little', 'host', 'shutoff', 'early', 'period', 'virus']

['genes', 'x02019', 'expression', 'early', 'infection', 'virus', 'fig', 'suggesting', 'ul41', 'protein', 'js-2012', 'weak', 'vhs', 'activity', 'early', 'period']

['host', 'genes', 'x02019', 'expression', 'early', 'infection', 'virus', 'fig', 'suggesting', 'ul41', 'protein', 'js-2012', 'weak', 'vhs', 'activity', 'early', 'period', 'virus']

['genes', 'x02019', 'expression', 'early', 'infection', 'virus', 'due', 'residue', 'differences', 'ul41', 'proteins', 'genotype-specific', 'strains', 'ul41', 'protein', 'prv', 'variant', 'showed']

['genes', 'x02019', 'expression', 'early', 'infection', 'virus', 'due', 'residue', 'differences', 'ul41', 'proteins', 'genotype-specific', 'strains', 'ul41', 'protein', 'prv', 'sc', 'european-american-like', 'strain']

immediate-early:

['expression', 'caused', 'virus', 'infection', 'contrast', 'strong', 'inhibition', 'ul41', 'transcription', 'chx', 'treatment', 'immediate-early', 'gene', 'ie180']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5606624/>

immediate-early:

['regulatory', 'proteins', 'bcp4', 'ie', 'transactivator', 'protein', 'transcriptional', 'regulator', 'afv53424', 'ul41', 'virion', 'host', 'shutoff', 'protein', 'vhs', 'cellular', 'mrna', 'degradation']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2832755/>

late:

['x003b1', '-herpesviruses', 'host-shutoff', 'function', 'mediated', 'separate', 'protein', 'typified', 'ul41', 'vhs', 'protein', 'hsv-1', 'expressed', 'late', 'lytic', 'cycle']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3817196/>

immediate-early:

['including', 'icp4', 'immediate', 'early', 'gene', 'whose', 'expression', 'essential', 'virus', 'replication', 'ul41', 'locus', 'encoding', 'virion', 'host', 'shutoff', 'protein', 'causes', 'destabilization', 'degradation']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3175012/>

immediate-early:

['hsv', 'icp0', 'immediate', 'early', 'promoter', 'ul41', 'locus', 'hsv', 'recombinant', 'defective']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4810271/>

early:

['j', 'r', 'identification', 'characterization', 'virion-induced', 'host', 'shutoff', 'product', 'herpes', 'simplex', 'virus', 'gene', 'ul41', 'j', 'gen', 'virol', 'pt', '0022-1317-73-2-467', 'fenwick', 't', 'mcmenamin', 'early', 'virion-associated', 'suppression']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3235436/>

late:

['protein', 'encoded', 'hsv', 'late', 'gene', 'ul41', 'enhances', 'turnover', 'kinetics', 'viral']

immediate-early:

['tegument', 'contains', 'less-abundant', 'virus', 'particle', 'host', 'shutoff', 'vhs', 'protein', 'encoded', 'hsv', 'late', 'gene', 'ul41', 'enhances', 'turnover', 'kinetics', 'viral', 'mrna', 'likely', 'important', 'increased', 'removal', 'immediate-early', 'early', 'viral']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4824655/>

immediate-early:

['human', 'cytomegalovirus', 'immediate', 'early', 'promoter', 'hcmv', 'iep', 'ul41', 'locus', 'hsv', 'recombinant', 'defective', 'hsv', 'genes']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3894220/>

early:

['partly', 'mediated', 'activities', 'kshv', 'orf36', 'homologs', 'inhibit', 'type', 'ifn', 'response', 'well', 'hsv-1', 'ul41', 'downregulates', 'mhci', 'cell', 'surface', 'tegument', 'proteins', 'involved', 'augmenting', 'early', 'viral', 'gene']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4102458/>

immediate-early:

['control', 'icp0', 'immediate', 'early', 'promoter', 'hsv', 'inserted', 'ul41', 'gene', 'hsv1', 'next', 'hsv1-tat', 'recombinant', 'virus']

Debug info for gene: ul6

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2335119/>

early:

['even', 'gene', 'described', 'early', 'gene', 'synthesis', 'late', 'proteins', 'capsid', 'ul6', 'ul18', 'ul19', 'ul25', 'ul35', 'ul38', 'tegument', 'ul11', 'ul13']

['gk', 'reported', 'occur', 'prv', 'replication', 'cycle', 'study', 'two', 'late', 'transcripts', 'ul6', 'ul22', 'encoding', 'gh', 'protein', 'differentially', 'expressed', 'early', 'h', 'pi']

late:

['early', 'gene', 'synthesis', 'late', 'proteins', 'capsid', 'ul6', 'ul18', 'ul19', 'ul25', 'ul35', 'ul38']

['cycle', 'study', 'two', 'late', 'transcripts', 'ul6', 'ul22', 'encoding', 'gh', 'protein']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4339549/>

late:

['high', 'numbers', 'nucleosomes', 'ul56', 'ul', 'ul26', 'ul6', 'genes', 'expressed', 'late', 'infectious', 'cycle']

['viral', 'gene', 'expression', 'late', 'genes', 'high', 'numbers', 'nucleosomes', 'ul56', 'ul', 'ul26', 'ul6', 'genes', 'expressed', 'late', 'infectious', 'cycle', 'many', 'stable', 'nucleosomes', 'covering', '6h']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5663069/>

late:

['non-functional', 'protein', 'assay', 'late', 'genes', 'ul6', 'ul56', 'consequently', 'accumulated', 'slowly']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3744444/>

early:

['allele', 'immediate', 'early', 'early', 'late', 'tg1', 'na', 'na', 'ul6', 'protein', 'tg1', 'na', 'na', 'gb', 'tg2', 'icp0']

immediate-early:

['hla', 'allele', 'immediate', 'early', 'early', 'late', 'tg1', 'na', 'na', 'ul6', 'protein', 'tg1', 'na', 'na', 'gb', 'tg2', 'icp0', 'aa']

late:

['immediate', 'early', 'early', 'late', 'tg1', 'na', 'na', 'ul6', 'protein', 'tg1', 'na', 'na', 'gb', 'tg2']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6179306/>

late:

['8-fold', 'mmm', 'among', 'late', 'promoters', 'rl6', 'ul6', 'ul76', 'us29', 'promoters', 'considerably', 'suppressed']

Debug info for gene: ul46

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2867803/>

immediate-early:

['lag', 'behind', 'members', 'herpesviridae', 'family', 'reports', 'published', 'concerning', 'dpv', 'gene', 'ul46', 'dpv', 'gene', 'transcription', 'classified', 'types', 'immediate-early', 'ie', 'early', 'e']

['behind', 'members', 'herpesviridae', 'family', 'reports', 'published', 'concerning', 'dpv', 'gene', 'ul46', 'dpv', 'gene', 'transcription', 'classified', 'types', 'immediate-early', 'ie', 'early']

['classified', 'types', 'immediate-early', 'ie', 'early', 'e', 'late', 't', 'ul46', 'essential', 'virus', 'replication', 'late', 'transcription', 'gene', 'herpesviruses']

['transcription', 'classified', 'types', 'immediate-early', 'ie', 'early', 'e', 'late', 't', 'ul46', 'essential', 'virus', 'replication', 'late', 'transcription', 'gene', 'herpesviruses', 'phosphorylated']

early:

['dpv', 'lag', 'behind', 'members', 'herpesviridae', 'family', 'reports', 'published', 'concerning', 'dpv', 'gene', 'ul46', 'dpv', 'gene', 'transcription', 'classified', 'types', 'immediate-early', 'ie', 'early', 'e', 'late']

['types', 'immediate-early', 'ie', 'early', 'e', 'late', 't', 'ul46', 'essential', 'virus', 'replication', 'late', 'transcription', 'gene']

late:

['nucleotide', 'sequence', 'dpv', 'lag', 'behind', 'members', 'herpesviridae', 'family', 'reports', 'published', 'concerning', 'dpv', 'gene', 'ul46', 'dpv', 'gene', 'transcription', 'classified', 'types', 'immediate-early', 'ie', 'early', 'e', 'late', 't', 'ul46']

['ie', 'early', 'e', 'late', 't', 'ul46', 'essential', 'virus', 'replication', 'late']

['types', 'immediate-early', 'ie', 'early', 'e', 'late', 't', 'ul46', 'essential', 'virus', 'replication', 'late', 'transcription', 'gene']

['essential', 'virus', 'replication', 'late', 'transcription', 'gene', 'herpesviruses', 'phosphorylated', 'product', 'ul46', 'translation', 'ul46', 'protein', 'vp11', 'plays', 'important', 'role', 'enhancing']

['essential', 'virus', 'replication', 'late', 'transcription', 'gene', 'herpesviruses', 'phosphorylated', 'product', 'ul46', 'translation', 'ul46', 'protein', 'vp11', 'plays', 'important', 'role', 'enhancing', 'efficiency', 'x003b1', 'tif', 'vp16']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3349744/>

immediate-early:

['contribute', 'insufficiency', 'transactivation', 'ie', 'gene', 'expression', 'axonally-infected', 'neurons', 'tegument', 'proteins', 'ul46', 'ul47', 'reportedly', 'increase', 'activity', 'vp16', 'predominantly', 'lost', 'capsids', 'retrograde']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3157456/>

early:

[cells', 'however', 'h', 'p', 'dotted', 'distribution', 'pattern', 'ul46', 'ul14d-vp16gfp-infected', 'cells', 'seen', 'early', 'infection', 'changed']
[ul14d-vp16gfp-infected', 'cells', 'seen', 'early', 'infection', 'changed', 'ul46', 'became', 'aggregated', 'perinuclear', 'cytoplasmic', 'space']
[ul14', 'altered', 'intracellular', 'compartmentalization', 'hsv-1', 'tegument', 'proteins', 'induced', 'formation', 'aggresomes', 'included', 'vp16', 'ul46', 'late', 'phase', 'infection', 'characteristics', 'ul14d-vp16gfp', 'infection—including', 'growth', 'delay', 'early', 'alteration', 'cell']

late:

[formation', 'aggresomes', 'included', 'vp16', 'ul46', 'late', 'phase', 'infection']
[insoluble', 'proteins', 'cytoplasm', 'late', 'proteins', 'particular', 'vp16', 'ul46', 'require', 'chaperone-like', 'activity', 'ul14', 'mature', 'properly']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5370143/>

early-late:

['x000a0', 'expression', 'kinetics', 'early-late', 'gene', 'related', 'function', 'csw-1', 'v1-99', 'ul46', 'x000a0', 'ga', 'arg', 'r', 'g', 'ga', 'gly', 'g']

Debug info for gene: ul26

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4391941/>

early:

['x003b1', 'production', 'recently', 'early', 'gene', 'ul26', 'also', 'described', 'antagonise', 'nf']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1557838/>

immediate-early:

['x003b1', 'x003b2', 'receptor-null', 'hsv-1', 'recombinant', 'virus', 'kos-gfp', 'contains', 'kbp', 'insertion', 'intergenic', 'region', 'ul26', 'ul27', 'genes', 'hsv-1', 'strain', 'kos', 'contains', 'cytomegalovirus', 'cmv', 'ie', 'promoter', 'driving']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4339549/>

late:

[late', 'genes', 'high', 'numbers', 'nucleosomes', 'ul56', 'ul', 'ul26', 'ul6', 'genes', 'expressed', 'late', 'infectious', 'cycle']
[viral', 'gene', 'expression', 'late', 'genes', 'high', 'numbers', 'nucleosomes', 'ul56', 'ul', 'ul26', 'ul6', 'genes', 'expressed', 'late', 'infectious', 'cycle', 'many', 'stable', 'nucleosomes']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5469499/>

early:

[nf-', 'x003ba', 'b', 'signaling', 'ul26', 'early', 'viral', 'protein']
[involved', 'regulation', 'x02013', 'recently', 'ul26', 'early', 'protein', 'found']
[stages', 'infection', 'viral', 'early', 'late', 'proteins', 'appear', 'involved', 'regulation', 'x02013', 'recently', 'ul26', 'early', 'protein', 'found', 'inhibit', 'nf-', 'x003ba', 'b', 'activation', 'attenuating', 'ikk']

late:

[infection', 'confirmed', 'believed', 'late', 'virus', 'functions', 'critical', 'suppress', 'nf-', 'x003ba', 'b', 'signaling', 'ul26', 'early', 'viral', 'protein', 'initially', 'localizes', 'nucleus', 'becomes', 'cytoplasmic', 'infection', 'progresses', 'eventually']
[infection', 'viral', 'early', 'late', 'proteins', 'appear', 'involved', 'regulation', 'x02013', 'recently', 'ul26', 'early', 'protein', 'found', 'inhibit', 'nf-', 'x003ba', 'b', 'activation', 'attenuating']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2895648/>

immediate-early:

[protein', 'unknown', 'function', 'ul51', 'orf33', 'major', 'capsid', 'scaffold', 'protein', 'ul26', 'orf10', 'r', 'tegument', 'protein', 'transactivator', 'ie', 'genes', 'ul48']
[tegument', 'protein', 'transactivator', 'ie', 'genes', 'ul48', 'orf33', 'minor', 'capsid', 'scaffold', 'protein', 'ul26', 'orf14', 'glycoprotein', 'gc', 'ul44', 'orf34', 'dna', 'packaging', 'protein', 'ul25', 'orf47']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1238742/>

immediate-early:

[driven', 'hcmv', 'immediate', 'early', 'promoter', 'inserted', 'ul26', 'ul27', 'virus', 'demonstrated', 'x00025', 'increase']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5001722/>

immediate-early:

[amounts', 'viral', 'major', 'ie', 'ie1', 'ie2', 'ul26', 'proteins', 'progeny', 'virions', 'fig', '5h']

late:

[ie1-deleted', 'mutant', 'virus', 'late', 'times', 'fig', '2b', 'ul26', 'deletion', 'mutant', 'virus', 'shows', 'moderate', 'growth']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5411103/>

late:

[glycoprotein', 'control', 'hsv', 'late', 'promoter', 'ul26', 'one', 'passage', 'infected', 'cells']

Debug info for gene: ul13

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5105669/>

late:

[kinases', 'hsv-1', 'tegument', 'includes', 'least', 'three', 'components', 'protein', 'kinases', 'encoded', 'ul13', 'ul23', 'us3', 'genes', 'ul37', 'protein', 'expressed', 'late', 'infection', 'cycle']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5769551/>

immediate-early:

[agarose', 'gel', 'immediate-early', 'ie', 'gene', 'ul54', 'p', 'p', 'early', 'e', 'gene', 'ul13', 'p', 'p', 'late', 'T', 'gene', 'us2', 'p', 'p', 'detected', 'experimental']
[confirmed', 'agarose', 'gel', 'immediate-early', 'ie', 'gene', 'ul54', 'p', 'p', 'early', 'e', 'gene', 'ul13', 'p', 'p', 'late', 'T', 'gene', 'us2', 'p', 'p', 'detected', 'experimental', 'controls']
[chx', 'correct', 'bands', 'ie', 'gene', 'ul54', 'e', 'gene', 'ul13', 'T', 'gene', 'us2', 'shown', 'fig', 'x000a0', '3a']
[def', 'cells', 'dev', 'ie', 'gene', 'ul54', 'x000a0', 'bp', 'e', 'gene', 'ul13', 'x000a0', 'bp', 'T', 'gene', 'us2', 'x000a0', 'bp', 'shown', 'respectively']

early:

[ul54', 'p', 'p', 'early', 'e', 'gene', 'ul13', 'p', 'p', 'late', 'T', 'gene']

late:

[ul54', 'p', 'p', 'early', 'e', 'gene', 'ul13', 'p', 'p', 'late', 'T', 'gene']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4063868/>

immediate-early:

[respectively', 'table', 'amplification', 'products', 'inserted', 'pgemt-easy', 'cloning', 'vector', 'promega', 'ul37', 'ul13', 'us3', 'genes', 'sub-cloned', 'control', 'cytomegalovirus', 'immediate', 'early', 'promoter', 'pcdna3']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6220328/>

early:

[duck', 'enteritis', 'virus', 'early', 'protein', 'ul13', 'found', 'nu-cleus', 'cytoplasm', 'influences']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4919851/>

early:

['vp16', 'entry', 'nucleus', 'early', 'stages', 'infection', 'vitro', 'cell', 'culture', 'assay', 'revealed', 'infection', 'ul13', 'deletion', 'mutant', 'viral', 'strain', 'cells', 'could', 'lead', 'decrease', 'expression', 'levels', 'icp0']
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4482649/>

late:

['attenuation', 'viral', 'spread', 'infectious', 'virion', 'release', 'data', 'show', 'ul13', 'kinase', 'plays', 'important', 'role', 'late', 'phase', 'hsv-1']
['hsv-1', 'dna', 'accumulation', 'affected', 'absence', 'ul13', 'us3', 'kinases', 'number', 'published', 'hypotheses', 'suggest', 'ul13', 'us3', 'kinases', 'play', 'important', 'roles', 'immediate-early', 'early', 'phase', 'late', 'phase', 'hsv-1']
['kinetics', 'hsv-1', 'dna', 'accumulation', 'virus-infected', 'cells', 'null', 'hypothesis', 'correct', 'would', 'suggest', 'x00394', 'ul13', 'x00394', 'us3', 'mutant', 'micro-plaque', 'phenotype', 'likely', 'due', 'defects', 'late', 'stages', 'hsv-1']
['replication', 'implying', 'defect', 'virus', 'spread', 'cells', 'infected', 'hsv-1', 'x00394', 'ul13', 'x00394', 'us3', 'mutant', 'fig', 'occurs', 'late', 'phase', 'hsv-1']
['mutant', 'fig', 'occurs', 'late', 'phase', 'hsv-1', 'replication', 'absence', 'ul13', 'kinase', 'alters', 'accumulation', 'hsv-1', 'glycoproteins', 'c', 'verify']
['glycoproteins', 'c', 'verify', 'effects', 'loss', 'us3', 'ul13', 'kinases', 'early', 'late', 'stages', 'hsv-1']

early:

['accumulation', 'affected', 'absence', 'ul13', 'us3', 'kinases', 'number', 'published', 'hypotheses', 'suggest', 'ul13', 'us3', 'kinases', 'play', 'important', 'roles', 'immediate-early', 'early', 'phase', 'late']
['dna', 'synthesis', 'contrast', 'significant', 'changes', 'hsv-1', 'dna', 'accumulation', 'would', 'suggest', 'ul13', 'us3', 'protein', 'kinases', 'play', 'role', 'immediate-early', 'early', 'phases', 'hsv-1']
['dna', 'accumulation', 'relative', 'vero', 'cells', 'infected', 'wild-type', 'hsv-1', 'therefore', 'ul13', 'us3', 'kinases', 'appear', 'dispensable', 'immediate-early', 'early', 'phases', 'hsv-1']
['c', 'verify', 'effects', 'loss', 'us3', 'ul13', 'kinases', 'early', 'late', 'stages']
['ul13', 'x00394', 'us3', 'mutant', 'study', 'demonstrated', 'neither', 'us3', 'kinase', 'ul13', 'kinase', 'plays', 'significant', 'role', 'regulation', 'early', 'stages', 'hsv-1']
['simplex', 'virus', 'icp0', 'early', 'infection', 'defined', 'ring', 'finger', 'ul13', 'protein', 'kinase', 'j', 'viro', 'x02013', 'doi', 'jvi']

immediate-early:

['affected', 'absence', 'ul13', 'us3', 'kinases', 'number', 'published', 'hypotheses', 'suggest', 'ul13', 'us3', 'kinases', 'play', 'important', 'roles', 'immediate-early', 'early', 'phase']
['synthesis', 'contrast', 'significant', 'changes', 'hsv-1', 'dna', 'accumulation', 'would', 'suggest', 'ul13', 'us3', 'protein', 'kinases', 'play', 'role', 'immediate-early', 'early', 'phases']
['accumulation', 'relative', 'vero', 'cells', 'infected', 'wild-type', 'hsv-1', 'therefore', 'ul13', 'us3', 'kinases', 'appear', 'dispensable', 'immediate-early', 'early', 'phases']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5840427/>

early:

['duck', 'enteritis', 'virus', 'early', 'protein', 'ul13', 'found', 'nucleus', 'cytoplasm', 'influences']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4314066/>

late:

['expression', 'levels', 'viral', 'late', 'genes', 'gb', 'gc', 'gd', 'ge', 'gh', 'ul13', 'downregulated', 'presence', 'hcw', 's3', 'fig', 'journal', 'pone', 'g005', 'figure']

Debug info for gene: ul56

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4339549/>

late:

['viral', 'gene', 'expression', 'late', 'genes', 'high', 'numbers', 'nucleosomes', 'ul56', 'ul', 'ul26', 'ul6', 'genes', 'expressed', 'late', 'infectious']
['individual', 'viral', 'gene', 'expression', 'late', 'genes', 'high', 'numbers', 'nucleosomes', 'ul56', 'ul', 'ul26', 'ul6', 'genes', 'expressed', 'late', 'infectious', 'cycle']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2770495/>

early:

['nedd4', 'distribution', 'ul56', 'ul56ay-expressing', 'cells', 'immunofluorescence', 'analysis', 'fixed', 'cells', 'ul56', 'localizes', 'golgi', 'complex', 'trans-golgi', 'network', 'early', 'endosomes', 'cells']
['complex', 'trans-golgi', 'network', 'early', 'endosomes', 'cells', 'transiently', 'expressing', 'ul56', 'next', 'sought', 'determine', 'detailed', 'intracellular', 'localization', 'ul56']
['suggesting', 'ul56', 'localizes', 'endosomal', 'compartment', 'well', 'tgn', 'expected', 'ul56', 'partially', 'colocalized', 'eea1', 'marker', 'early', 'endosomes', 'ul56']
['colocalized', 'eea1', 'marker', 'early', 'endosomes', 'ul56', 'colocalize', 'rab7', 'marker', 'late']
['colocalize', 'rab7', 'marker', 'late', 'endosomes', 'cd63', 'marker', 'late', 'endosomes', 'mvbs', 'data', 'suggest', 'ul56', 'expressed', 'alone', 'predominantly', 'present', 'tgn', 'partially', 'golgi', 'complex', 'early', 'endosomes', 'figure']
['partially', 'golgi', 'complex', 'early', 'endosomes', 'figure', 'ul56', 'localizes', 'cytoplasmic', 'vesicular', 'structures', 'transiently']
['proteins', 'golgi58k', 'gm130', 'early', 'endosomes', 'eea1', 'shown', 'red', 'little', 'overlap', 'detected', 'ul56', 'either', 'rab7', 'cd63', 'scale', 'bars', 'x003bc', 'ul56', 'localizes', 'predominantly', 'trans-golgi']
['cd63', 'h', 'h', 'postinfection', 'data', 'shown', 'observations', 'demonstrate', 'infected', 'cells', 'ul56', 'localized', 'predominantly', 'tgn', 'partially', 'golgi', 'complex', 'early', 'endosomes', 'late']
['partially', 'golgi', 'complex', 'early', 'endosomes', 'late', 'endosomes', 'mvbs', 'nedd4', 'ul56', 'colocalizes', 'predominantly', 'trans-golgi', 'network', 'hsv-2', 'infected', 'cells', 'determined']
['p', 'x0003c', 'two-tailed', 't-test', 'discussion', 'present', 'study', 'demonstrates', 'hsv-2', 'tegument', 'protein', 'ul56', 'distributed', 'cytoplasmic', 'vesicles', 'primarily', 'tgn', 'partially', 'golgi', 'early', 'endosomes', 'trafficked']
['tgn', 'partially', 'golgi', 'early', 'endosomes', 'trafficked', 'actively', 'throughout', 'cytoplasm', 'moreover', 'ul56', 'relocalized', 'e3', 'ligase', 'nedd4', 'vesicles', 'cells', 'transiently', 'expressing', 'ul56']

late:

['ul56', 'partially', 'colocalized', 'eea1', 'marker', 'early', 'endosomes', 'ul56', 'colocalize', 'rab7', 'marker', 'late', 'endosomes', 'cd63']
['compartment', 'well', 'tgn', 'expected', 'ul56', 'partially', 'colocalized', 'eea1', 'marker', 'early', 'endosomes', 'ul56', 'colocalize', 'rab7', 'marker', 'late', 'endosomes', 'cd63', 'marker', 'late', 'endosomes', 'mvbs']
['endosomes', 'cd63', 'marker', 'late', 'endosomes', 'mvbs', 'data', 'suggest', 'ul56', 'expressed', 'alone', 'predominantly', 'present', 'tgn', 'partially', 'golgi']
['colocalize', 'rab7', 'marker', 'late', 'endosomes', 'cd63', 'marker', 'late', 'endosomes', 'mvbs', 'data', 'suggest', 'ul56', 'expressed', 'alone', 'predominantly', 'present', 'tgn', 'partially', 'golgi', 'complex', 'early', 'endosomes', 'figure']
['also', 'seen', 'x003b3', '-adaptin', 'x003b4', '-adaptin', 'eea1', 'whereas', 'ul56', 'showed', 'little', 'colocalization', 'markers', 'late', 'endosomes', 'ul56']
['little', 'colocalization', 'markers', 'late', 'endosomes', 'ul56', 'rab7', 'colocalize', 'either', 'h']
['little', 'colocalization', 'markers', 'late', 'endosomes', 'ul56', 'rab7', 'colocalize', 'either', 'h', 'h', 'postinfection', 'overlap', 'ul56', 'cd63', 'detected', 'h', 'postinfection', 'detected', 'vesicles', 'around', 'perinuclear', 'region', 'h', 'postinfection', 'hsv-2']
['protein', 'colocalized', 'cd63', 'h', 'h', 'postinfection', 'data', 'shown', 'observations', 'demonstrate', 'infected', 'cells', 'ul56', 'localized', 'predominantly', 'tgn', 'partially', 'golgi', 'complex', 'early', 'endosomes', 'late', 'endosomes', 'mvbs']
['complex', 'early', 'endosomes', 'late', 'endosomes', 'mvbs', 'nedd4', 'ul56', 'colocalizes', 'predominantly', 'trans-golgi', 'network', 'hsv-2', 'infected']
['hsv-2', 'exploited', 'mvbs', 'late', 'endosomes', 'assembly', 'release', 'virions', 'nedd4', 'ul56', 'involved', 'process', 'greater', 'amount', 'nedd4', 'ul56', 'colocalize', 'cd63']
['although', 'ndfip', 'involved', 'membrane', 'trafficking', 'mvb', 'machinery', 'ul56', 'showed', 'apparent', 'localization', 'late', 'endosomes', 'mvbs']
['shown', 'facilitate', 'hsv-1', 'final', 'envelopment', 'present', 'study', 'either', 'ul56', 'gg', 'showed', 'little', 'localization', 'late', 'endosome', 'mvbs']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5663069/>

late:

['non-functional', 'protein', 'assay', 'late', 'genes', 'ul6', 'ul56', 'consequently', 'accumulated', 'slowly', 'icp0', 'deletion']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2922189/>

early:

['activates', 'transcription', 'immediately', 'early', 'gene', 'one', 'motif', 'icp0', 'promiscuous', 'transactivator', 'one', 'motif', 'ul56', 'tegument', 'protein', 'three', 'motifs', 'none', 'three', 'viral', 'proteins', 'one', 'py', 'motif']
['itch', 'degradation', 'study', 'revealed', 'ul56', 'ndfip', 'proteins', 'similar', 'subcellular', 'localization', 'co-expressing', 'cells', 'ul56', 'ndfip', 'proteins', 'colocalized', 'vesicles', 'ul56', 'localized', 'primarily', 'tgn', 'early', 'endosomes', 'ndfip']
['co-expressing', 'cells', 'ul56', 'ndfip', 'proteins', 'colocalized', 'vesicles', 'ul56', 'localized', 'primarily', 'tgn', 'early', 'endosomes', 'ndfip']
['ul56', 'ndfip', 'proteins', 'similar', 'subcellular', 'localization', 'co-expressing', 'cells', 'ul56', 'ndfip', 'proteins', 'colocalized', 'vesicles', 'ul56', 'localized', 'primarily', 'tgn', 'early', 'endosomes', 'ndfip', 'proteins', 'localized', 'tgn', 'early', 'endosomes', 'late']
['proteins', 'localized', 'tgn', 'early', 'endosomes', 'late', 'endosomes', 'multi', 'vesicular', 'bodies', 'partial', 'colocalization', 'ul56', 'either', 'ndfip-1', '-2', 'infected', 'cells', 'suggests', 'ul56', 'ndfip', 'proteins', 'behave', 'similarly']

immediate-early:

['proteins', 'py', 'motif', 'ul56', 'vp16', 'detected', 'itch-immunoprecipitates', 'albeit', 'much', 'lower', 'level', 'ul56', 'vp16', 'tegument', 'protein', 'activates', 'viral', 'transcription', 'immediate', 'early', 'genes', 'infection']

late:

['tgn', 'early', 'endosomes', 'late', 'endosomes', 'multi', 'vesicular', 'bodies', 'partial', 'colocalization', 'ul56', 'either', 'ndfip-1', '-2', 'infected', 'cells', 'suggests', 'ul56', 'ndfip', 'proteins']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4786273/>

immediate-early:

['snps', 'surrounding', 'genes', 'features', 'mapping', 'ul56', 'icp4', 'ie', 'promoters', 'also']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4918384/>

early:

['tumors', 'including', 'hnc', 'hf10', 'spontaneously', 'occurring', 'mutant', 'form', 'hsv-1', 'virus', 'lacking', 'ul56', 'protein', 'thought', 'important', 'cytoplasmic', 'transport', 'release', 'virions', 'early', 'proof', 'principle']

Debug info for gene: ul15

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2775753/>

early:

['parallel', 'separated', 'divergent', 'early', 'ul50', 'gene', 'furthermore', 'ul15', 'ul17', 'convergent', 'adjacent', 'gene', 'pair', 'genes']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3079670/>

late:

['orf', 'encodes', 'kda', 'product', 'also', 'demonstrated', 'ul15', 'gene', 'belonged', 'late', 'kinetic', 'class']
['ul15', 'gene', 'belonged', 'late', 'kinetic', 'class', 'expression', 'sensitive', 'cycloheximide', 'phosphonoacetic', 'acid', 'ul15', 'highly', 'conserved', 'within', 'herpesviridae', 'contains', 'walker', 'b', 'motifs', 'homologous', 'catalytic']
['products', 'encoded', 'kb', 'transcripts', 'respectively', 'ul15', 'expressed', 'late', 'infection', 'coding']
['respectively', 'ul15', 'expressed', 'late', 'infection', 'coding', 'sequences', 'dev', 'ul15', 'similar', 'alphaherpesviruses', 'similar', 'genus', 'mardivirus', 'ul15', 'ul15']
['expressed', 'late', 'infection', 'coding', 'sequences', 'dev', 'ul15', 'similar', 'alphaherpesviruses', 'similar', 'genus', 'mardivirus', 'ul15', 'ul15', 'accumulate', 'cytoplasm', 'early', 'times', 'post-infection', 'translocated', 'nucleus', 'late', 'times', 'background']
['infection', 'coding', 'sequences', 'dev', 'ul15', 'similar', 'alphaherpesviruses', 'similar', 'genus', 'mardivirus', 'ul15', 'ul15', 'accumulate', 'cytoplasm', 'early', 'times', 'post-infection', 'translocated', 'nucleus', 'late', 'times', 'background']
['within', 'herpesviridae', 'genera', 'within', 'alphaherpesvirinae', 'ul15', 'expressed', 'late', 'infection', 'determine']
['alphaherpesvirinae', 'ul15', 'expressed', 'late', 'infection', 'determine', 'kinetic', 'class', 'ul15', 'gene', 'belongs', 'rt-pcr', 'performed', 'detect', 'ul15', 'chicken']
['blot', 'figure', '5b', 'taken', 'whole', 'treatment', 'chx', 'paa', 'inhibited', 'transcription', 'expression', 'ul15', 'infected', 'cells', 'suggesting', 'ul15', 'gene', 'transcribed', 'expressed', 'late', 'gene', 'dev']
['inhibited', 'transcription', 'expression', 'ul15', 'infected', 'cells', 'suggesting', 'ul15', 'gene', 'transcribed', 'expressed', 'late', 'gene', 'dev']
['products', 'encoded', 'kb', 'transcripts', 'respectively', 'ul15', 'expressed', 'late', 'infection', 'dev']
['respectively', 'ul15', 'expressed', 'late', 'infection', 'dev', 'ul15', 'coding', 'sequences', 'similar', 'alphaherpesviruses', 'similar']
['expressed', 'late', 'infection', 'dev', 'ul15', 'coding', 'sequences', 'similar', 'alphaherpesviruses', 'similar', 'genus', 'mardivirus', 'ul15', 'ul15', 'accumulate', 'cytoplasm', 'early', 'times', 'post-infection', 'translocated', 'nucleus', 'late', 'times', 'methods']
['infection', 'dev', 'ul15', 'coding', 'sequences', 'similar', 'alphaherpesviruses', 'similar', 'genus', 'mardivirus', 'ul15', 'ul15', 'accumulate', 'cytoplasm', 'early', 'times', 'post-infection', 'translocated', 'nucleus', 'late', 'times', 'methods']

early:

['two', 'products', 'encoded', 'kb', 'transcripts', 'respectively', 'ul15', 'expressed', 'late', 'infection', 'coding', 'sequences', 'dev', 'ul15', 'similar', 'alphaherpesviruses', 'similar', 'genus', 'mardivirus', 'ul15', 'ul15', 'accumulate', 'cytoplasm', 'early', 'times', 'post-infection']
['dev', 'ul15', 'similar', 'alphaherpesviruses', 'similar', 'genus', 'mardivirus', 'ul15', 'ul15', 'accumulate', 'cytoplasm', 'early', 'times', 'post-infection']
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['similar', 'alphaherpesviruses', 'similar', 'genus', 'mardivirus', 'ul15', 'ul15', 'accumulate', 'cytoplasm', 'early', 'times', 'post-infection']

Debug info for gene: ul16

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2775753/>

immediate-early:

['phenomenon', 'discussed', 'later', 'genes', 'lowest', 'r', 'i-paa', 'values', 'one', 'us1', 'T', 'genes', 'hsv', 'ul16', 'ul1', 'ul38', 'strong', 'inhibitory', 'effect', 'paa', 'us1', 'expression', 'surprising', 'ie', 'gene', 'hsv']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3560188/>

late:

['result', 'conclusions', 'results', 'provided', 'first', 'evidence', 'kinetics', 'dev', 'ul16', 'gene', 'dev', 'ul16', 'gene', 'late', 'gene', 'dependent']
['kinetics', 'dev', 'ul16', 'gene', 'dev', 'ul16', 'gene', 'late', 'gene', 'dependent']
['x003bc', 'g', 'ml', 'ma', 'extracted', 'inversed', 'transcribed', 'cdna', 'pcr', 'performed', 'result', 'showed', 'ul16', 'x02019', 'detected', 'presence', 'acv', 'figure', 'indicating', 'ul16', 'true', 'late', 'gene', 'acv']
['detected', 'presence', 'acv', 'figure', 'indicating', 'ul16', 'true', 'late', 'gene', 'acv']
['inhibitor', 'viral', 'dna', 'synthesis', 'hence', 'concluded', 'dev', 'ul16', 'gene', 'may', 'true', 'late', 'gene', 'ul16']
['gene', 'may', 'true', 'late', 'gene', 'ul16', 'protein', 'synthesis', 'highly', 'dependent']
['mrna', 'translated', 'protein', 'hence', 'highest', 'level', 'ul16', 'protein', 'expression', 'came', 'peak', 'dev', 'ul16', 'mrna', 'previous', 'researches', 'reported', 'ul16', 'homologous-specific', 'transcripts', 'detected', 'late', 'times', 'infection']
['peak', 'dev', 'ul16', 'mrna', 'previous', 'researches', 'reported', 'ul16', 'homologous-specific', 'transcripts', 'detected', 'late', 'times', 'infection']
['homologous-specific', 'transcripts', 'detected', 'late', 'times', 'infection', 'indicating', 'ul16', 'regulated', 'x003b3', 'gene', 'ul16', 'genes', 'conserved']
['homologous-specific', 'transcripts', 'detected', 'late', 'times', 'infection', 'indicating', 'ul16', 'regulated', 'x003b3', 'gene', 'ul16', 'genes', 'conserved', 'whole', 'herpes', 'virus', 'family', 'function', 'ul16', 'gene', 'may']
['structural', 'proteins', 'encoded', 'late', 'genes', 'could', 'inferred', 'dev', 'ul16', 'protein', 'may', 'structural', 'protein', 'confirm', 'hypothesis', 'studies']
['protein', 'h', 'onward', 'following', 'infection', 'work', 'firstly', 'presented', 'kinetics', 'dev', 'ul16', 'gene', 'productions', 'dev', 'ul16', 'gene', 'accumulated', 'late', 'times', 'infection']
['kinetics', 'dev', 'ul16', 'gene', 'productions', 'dev', 'ul16', 'gene', 'accumulated', 'late', 'times', 'infection']
['ul16', 'gene', 'accumulated', 'late', 'times', 'infection', 'x02019', 'detected', 'presence', 'acv', 'suggesting', 'ul16', 'gene', 'belonged', 'x003b3', 'gene', 'might', 'encode', 'structural', 'protein', 'takes', 'part']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3399383/>

early:

['bind', 'nkg2d', 'include', 'mhc-i-like', 'molecules', 'mhc-class-i-polypeptide-related', 'sequence', 'mica', 'b', 'micb', 'ul16', 'binding', 'proteins', 'ulbp1', 'x02013', 'retinoic', 'acid', 'early', 'transcript', '1g']

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3179959/>

early:

['found', 'primarily', 'nuclear', 'early', 'times', 'postinfection', 'localization', 'ul16', 'changes', 'mostly', 'punctate', 'perinuclear', 'region', 'cytoplasm']
