

**Collocational Analysis of Life Science English (5)**  
— Lists of common collocates of *act, action, activate,*  
*activation, active, activity* —

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**Introduction**

This is the fifth in a series of reports that focus on how certain English words are typically used in the life sciences and whose purpose is to help Japanese researchers who use English in their work to gain insight into the common collocates for each word. Traditionally, language learners have been advised to refer to grammar books and dictionaries in order to improve their language skills, but this has not always helped to raise their level of proficiency. The former bias toward grammar has led to the belief that natural sentences can be created solely on the basis of syntax and arbitrary vocabulary selections. As a result, learners have tended to focus their attention on acquiring as many independent words as possible without regard for their typical patterns and collocations. This traditional perspective, however, has been discredited by more recent research in the field of second language learning which has shown, on the basis of empirical evidence, that words do not function in isolation but are co-selected with other words to produce meaning (Howarth, 1998; Hunston & Francis, 1998; Partington, 1998; Sinclair, 1991; Stubbs, 2001). There is therefore a need to provide nonnative writers with detailed information on the key lexical items and common collocational patterns that are typical of their field of research and that they require when writing their academic research papers (Ohtake & Morren, 2001, 2003).

In this respect, the use of corpora and concordance techniques may provide more accessible information on collocations and the selection restrictions that govern them. Nonnative writers may thereby come to avoid collocational mismatches by being

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exposed to multiple examples of words that tend to co-occur. Through such exposure to regularly recurring patterns, they may become more sensitive to the ways in which words combine with other words to produce particular meanings. Certainly, statistical analyses showing the frequency and collocational patterns of any given word used in life-science papers would be very useful for Japanese researchers when writing academic reports. In particular, they may realize the importance of referring to corpus evidence for guidance and no longer rely simply on dictionaries and reference grammars. They can thereby expand their search for appropriate forms of expression by examining and interpreting the immense amount of useful data that corpora provide.

### **Data Collection and Corpus Analysis**

In 1993, we embarked on a project – the Life Science Dictionary Project (LSD Project) – in which English abstracts appearing in international medical research journals were collected through the publicly available on-line MEDLINE database. The initial aim of the collection was to compile a genre-specific English corpus (LSD Corpus) and then to create an electronic bilingual dictionary (English-Japanese and Japanese-English) with a particular emphasis on frequently appearing general and technical terms in life-science fields. The LSD Corpus now contains approximately 303,000 abstracts published in distinguished life-science related journals around the world and consists of over 60 million running words. This corpus can be regarded as a valid source of authentic English materials because the articles and abstracts published in such eminent journals as *Nature* and *Science* are known to have undergone a rigorous review prior to publication with regard to both content and language.

The collected data have been recorded in a versatile relational database and subjected to statistical analysis. This has led to the compilation of an electronic English-Japanese/Japanese-English dictionary, WebLSD, which is available to the public on the Internet (<http://lsd.pharm.kyoto-u.ac.jp/>). The up-dated version of the electronic dictionary currently contains 72,995 English terms with Japanese translations and definitions, 83,060 Japanese to English translations, 26,000 sample sentences for 5,100 English words, and retrievable concordances for any given word on demand.

Some of the most frequently used words in the LSD Corpus have been selected for inclusion in this paper. The particular words taken up here are *act*, *action*, *activate*,

*activation, active, activity*. For each word, we have provided a list of common collocations that includes information about the frequency, a Japanese translation, and a sample sentence when it is considered useful and relevant. The collocational patterns introduced here are noteworthy in that most of them cannot be classified simply as an idiomatic expression or set phrase, so that they provide language learners with information not usually found in marketed dictionaries. On the surface, the list may just look like a miscellaneous assortment of arbitrary word patterns, but a closer look will reveal that it is a very useful collection of information concerning the lexical items (verbs, nouns, adjectives, prepositions) with which a given word commonly collocates and, in the case of a noun, which article is commonly used or which of the two forms, plural or singular, appears more often. This kind of information is particularly important for Japanese learners of English because they are often confused about how to properly use articles, singular/plural forms, or how to find common collocates or natural expressions.

Owing to the nature of the computer analysis, related items sharing the same form are classified as one word, so that no distinction is made between the verb form and the noun form of a given word. In addition, homographs are not differentiated and are treated as one word. However, in some cases, the collocates shown in the tables should provide some information concerning the part of speech of a given item, which may help in the identification of any homographs that appear. Furthermore, some of the data shown in the tables may look redundant, but we believe that such redundancy will not be a hindrance in the exploration of the meaning of a particular lexical item. Instead, it may help language learners to deepen their understanding. For example, in the case of articles and prepositions, which habitually present great problems for nonnative writers in terms of their interpretation and use, grammatical explanations are often inadequate in helping them to avoid erroneous decisions in the selection of a correct article or appropriate preposition in their writing. We have therefore intentionally included instances of articles and prepositions with each entry word. By examining the various samples of articles and prepositions appearing in the tables, language learners may come to recognize their proper uses and confirm their understanding.

## How to Read the List

The format is explained by using the following sample list:

	English	Japanese	Frq.	PubM_ID	Sample
	implication*	意味	2,854		
	implication	意味	152		
	implications	意味	2,702		
<b>Note</b>	複数形で使われることが圧倒的に多い。訳語は便宜上「意味」を使用...				
1	the implications	意味	414		
2	an implication	意味	8		
3	implications for	～のための意味	1,599	11499504	This approach should have significant future <implications for> dental research.
4	implications for the development of	～の開発のための意味	59	10725728	This neonatal immune bias has important <implications for the development of> vaccine ...
:	:	:	:	:	:
17	have @2 implications for	～のための意味を持つ	918	10199733	The findings <have potential implications for> islet transplantation as well as ...

**1st Column: (Note)** The information given here is based on the analysis of the LSD Corpus and collocational patterns of the entry word, and is expected to help learners of English to gain insight into a given word. This is meant primarily for Japanese learners and is therefore written in Japanese in order to make it more accessible for them.

**1st Column: (1, 2, 3 ...)** A number is given to each entry in sequence.

**2nd Column: (English)** In the uppermost line(s) above **Note**, a head word and its related form(s) of word(s) are given. The asterisk mark (\*) stands for a lemma, or a head word. The at-mark sign (@) followed by a number stands for the maximum number of words that can be inserted.

**3rd Column: (Japanese)** The Japanese equivalent or translation is given.

**4th Column: (Frq.)** Frq. stands for the frequency of each entry.

**5th Column: (PubM\_ID)** PubM\_ID stands for the ID number of the accompanying sample sentence, by means of which the original abstract can be identified on the PubMed (<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=PubMed>).

**6th Column: (Sample)** This column shows a sample sentence for the entry collocation. In some cases, no samples are shown when a similar entry contains a sample sentence from which readers can easily infer a sentence or expression containing the entry collocation.

It is hoped that the following statistical analysis of the LSD corpus will assist Japanese researchers in gaining further information concerning common collocations for frequently used words in the life sciences. Furthermore, crude as the information listed in the tables may appear at first glance, we trust that this paper will be well received by Japanese researchers because of its special distinction in providing information on word frequencies relating to words appearing immediately before or after a given lexical item. In this paper, we present the statistical data as they are, hoping that such first-hand information will help to facilitate the acquisition of common expressions relating to each word.

From the initial stages of data collection, we have aimed at making the best use of corpus analysis to help Japanese researchers in writing academic papers in English. So far, we have succeeded in producing the previously mentioned electronic dictionary as well as gathering useful sample sentences and concordances. Because of space limitations, we are unable to include in this particular paper each and every word we have analyzed. We are, however, planning to publish further reports in the same format as part of an ongoing series.

In the meantime, we hope that the lists of collocations introduced here in this paper will help bring about better technical English writing among Japanese researchers, and ultimately pave the way to the publication of an innovative and practical book on common collocational patterns in English after all the lists have been unified and completed. Finally, in providing a Japanese translation for each English word or expression, we have made every possible effort to ensure accuracy. However, we cannot be certain that the translations are completely free from error because of the specialized character and complexity of the various life science disciplines. There may therefore be some minor discrepancies that evaded our scrutiny and in such cases we sincerely ask for our readers' indulgence, and would be grateful if they would inform us of any shortcomings that they may find.

	English	Japanese	Frq.	PubM_ID	Sample
	act*	作用する / 働く	9,968		
	act	作用する / 働く	3,941		
	acts	作用する / 働く	3,120		
	acting	作用する / 働く	2,542		
	acted	作用した / 働いた	365		
<b>Note</b>	自動詞として使われる。act asの用例が多い。				
1	act as	～として作用する	1,592	11036064	
2	act as a	～として作用する	625	10021456	Our previous studies suggest that surfactant protein A (SP-A) can <b>&lt;act as a&gt;</b> ligand in the attachment of M. tuberculosis to AMs.
3	act as an	～として作用する	141	9701817	One of the ToxRS-regulated genes is the ompU gene, which encodes a porin that may also <b>&lt;act as an&gt;</b> adhesin.
4	act in	～において作用する	396	10196143	We show that these mutants <b>&lt;act in&gt;</b> a dominant negative manner by blocking endogenous STAT3 tyrosine phosphorylation or STAT3 DNA binding.
5	act in concert	協調して作用する	81	10359597	Thus, R-Ras and Ras may <b>&lt;act in concert&gt;</b> to regulate integrin affinity via the activation of distinct downstream effectors.
6	act in concert to	～するために協調して作用する	40	10645926	Growth factors and metalloproteinases (MMPs) <b>&lt;act in concert to&gt;</b> promote neointima formation.
7	act in concert with	～と協調して作用する	29	10460151	Alternatively or in addition, M(C) may <b>&lt;act in concert with&gt;</b> an additional metal ion to coordinate and activate the 3'-OH of G.
8	act to	～するように作用する	205	11402208	In catalyzing the removal of a 5' phosphate from second messenger substrates, 5PTases can <b>&lt;act to&gt;</b> terminate signal transduction events.
9	act on	～において作用する	191	9520449	Therefore, the inflammatory cytokines probably <b>&lt;act on&gt;</b> T cells in vivo via an intermediary factor.
10	act by	～によって作用する	165	11784719	6m-hIGFBP-3 only can <b>&lt;act by&gt;</b> IGF-independent mechanisms since it is unable to form complexes with the IGFs that inhibit their action.
11	act by *ing	～することによって作用する	120	10756196	These drugs <b>&lt;act by increasing&gt;</b> levels of topoisomerase II-mediated DNA cleavage.
12	act through	～を経て作用する	108	11063620	Their potency is similar to that of dexamethasone although they do not <b>&lt;act through&gt;</b> the glucocorticoid receptor.
13	act at	～において作用する	103	10369761	The synopsis of DNA sites is a prerequisite for the reactions of many proteins that <b>&lt;act at&gt;</b> specific DNA sequences.
14	act synergistically	相乗的に作用する	95	10388819	We show that both mechanisms of xol-1 repression are essential and <b>&lt;act synergistically&gt;</b> to keep xol-1 levels low in XX animals.
15	act directly	直接的に作用する	71	12547727	Further, regulatory T cells may <b>&lt;act directly&gt;</b> on the innate immune system to reduce or prevent disease.
16	act independently	独立に作用する	60	11067843	Like AD2, the newly discovered AD1 can <b>&lt;act independently&gt;</b> as an activation domain in both yeast and human cells.

	English	Japanese	Frq.	PubM_ID	Sample
17	act together	共に作用する	52	12388759	Furthermore, if SNX1 and SNX2 belong to such complexes, it is not known whether they <b>&lt;act together&gt;</b> or separately.
18	act via	～を経て作用する	50	12526812	Thus, SLPI/elastase <b>&lt;act via&gt;</b> PEPI/EPIs to operate a switch at the interface between innate immunity and wound healing.
19	act cooperatively	協調的に作用する	28	10428861	Our data suggest that in the absence of heme, Hap1 exists as a dimer, and the two subunits <b>&lt;act cooperatively&gt;</b> in DNA binding.
20	to act	作用する～	697		
21	to act as	～として作用する～	393	11145644	Glycosphingolipid-enriched domains (GEDs) are believed <b>&lt;to act as&gt;</b> platforms for transduction of B cell Ag receptor (BCR)-induced signals from the cell surface.
22	to act in	～において作用する	60	11238631	This mechanism may explain at least in part the reported ability of NO <b>&lt;to act in&gt;</b> both a pro- and anti-inflammatory manner.
23	appears to act	作用するように思われる	65	11820811	Furthermore, Shh <b>&lt;appears to act&gt;</b> as a permissive, rather than an inductive, signal for slow MyHC expression in myoblasts.
24	shown to act	作用することが示される	62	11433302	FRPs, Cerberus and WIF have all been <b>&lt;shown to act&gt;</b> by binding and sequestering Wnt.
25	appear to act	作用するように思われる	50	10930360	The two polymorphisms <b>&lt;appear to act&gt;</b> without a multiplicative interaction.
26	thought to act	作用するように考えられる	46	10488330	Fluoxetine (Prozac) is an antidepressant that is <b>&lt;thought to act&gt;</b> by blocking presynaptic reuptake of the neurotransmitter serotonin.
27	proposed to act	作用することがされ提唱される	37	11927540	The Disabled-2 (Dab2) gene has been <b>&lt;proposed to act&gt;</b> as a tumor suppressor.
28	may act	作用するかもしれない	506	9512554	DSE1 cruciform <b>&lt;may act&gt;</b> as a target site for activator (BAMC cells) and repressor (TE671) proteins.
29	may act as	～として作用するかもしれない	254	11390646	These studies suggest that IRF-3a <b>&lt;may act as&gt;</b> a modulator of IRF-3.
30	can act	作用しうる	384	11042171	This suggests RGS18 <b>&lt;can act&gt;</b> on G(q)-mediated signaling pathways in vivo.
31	can act as	～として作用しうる	234	10963676	Transmembrane protein tyrosine phosphatases, such as CD45, <b>&lt;can act as&gt;</b> both positive and negative regulators of cellular signaling.
32	that act	作用する～	266		
33	that act as	～として作用する～	77	10341246	Mechanisms that direct neuronal migration may include molecules <b>&lt;that act as&gt;</b> chemoattractants.
34	which act	そして、それは作用する	95	12654246	This targeting step is regulated by three G proteins, SRP54, SRalpha, and SRbeta, <b>&lt;which act&gt;</b> in concert.
35	not act	作用しない	106		
36	does not act	作用しない	60	10339465	We show here that SLC is a potent chemokine for mature DC but <b>&lt;does not act&gt;</b> on immature DC.

	English	Japanese	Frq.	PubM_ID	Sample
37	acts as	～として作用する	1,284	11260715	We conclude that Tsg <b>&lt;acts as&gt;</b> a cofactor in chordin's antagonism of BMP signalling.
38	acts as a	～として作用する	978	12048186	The combination of Bfa1 and Bub2 <b>&lt;acts as a&gt;</b> two-component GTPase-activating protein for Tem1.
39	acts as a negative	負の～として作用する	49	11877467	Myostatin is a TGF-beta family member that <b>&lt;acts as a negative&gt;</b> regulator of muscle growth.
40	acts as a negative regulator	負の調節因子として作用する	37	11847343	Thus, BIN2 <b>&lt;acts as a negative regulator&gt;</b> to control steroid signaling in plants.
41	acts as a dominant	優位な～として作用する	46	12524540	We have further shown that 53BP2, which corresponds to a C-terminal fragment of ASPP2, <b>&lt;acts as a dominant&gt;</b> negative inhibitor of p53.
42	acts as a dominant negative	ドミナントネガティブな～として作用する	39	10958668	One of these (alpha1(312)) acts as a constitutively active kinase, while the other (alpha1DN) <b>&lt;acts as a dominant negative&gt;</b> inhibitor of endogenous AMPK.
43	acts as a transcriptional	転写の～として作用する	37	11722747	We present evidence that IdeR not only <b>&lt;acts as a transcriptional&gt;</b> repressor but also functions as an activator of bfrA.
44	acts as a potent	強力な～として作用する	35	10097187	Vitamin C (L-ascorbic acid; AsA) <b>&lt;acts as a potent&gt;</b> antioxidant and cellular reductant in plants and animals.
45	acts as an	～として作用する	221	10447896	MecA therefore <b>&lt;acts as an&gt;</b> adapter protein recruiting a regulatory protein for proteolysis.
46	that acts as	～として作用する～	96	12200427	Complexin, also known as synaphin, is a neuronal cytosolic protein <b>&lt;that acts as&gt;</b> a positive regulator of synaptic vesicle exocytosis.
47	acts in	～において作用する	293	10393176	ORS cells produce fibroblast growth factor-5 (FGF-5), which <b>&lt;acts in&gt;</b> a paracrine fashion to terminate precursor cell division during anagen.
48	acts to	～するために作用する	260	11992003	One class of these membrane proteins apparently <b>&lt;acts to&gt;</b> allow HCMV to escape detection by the immune system.
49	acts on	～において作用する	153	11538237	To determine whether SHAM <b>&lt;acts on&gt;</b> the embryo or the endosperm, we investigated separately effects of SHAM on growth potential of isolated embryos as well as on endosperm strength.
50	acts by	～によって作用する	123	12386162	AT <b>&lt;acts by&gt;</b> inhibiting the tryptophan-activated trp RNA-binding attenuation protein (TRAP).
51	acts by *ing	～することによって作用する	92	10786797	A third pathway, the autonomous pathway, probably <b>&lt;acts by modulating&gt;</b> the other two pathways.
52	acts through	～を経て作用する	107	9827801	Functional experiments suggest the two receptors have different ligands: DPP <b>&lt;acts through&gt;</b> TKV, and SCW acts through SAX.
53	acts at	～において作用する	101	10702234	Clamping intracellular Ca(2+) at high or low values abolished sensitivity to external Ca(2+), suggesting that Ca(2+) <b>&lt;acts at&gt;</b> an internal site.
54	acts via	～を経て作用する	46	11517281	Thus, Noc <b>&lt;acts via&gt;</b> multiple mechanisms to reduce excitation in CA3.

	English	Japanese	Frq.	PubM_ID	Sample
55	acts downstream of	～の下流で作用する	90	9735361	These results suggest that Bix1 <b>&lt;acts downstream of&gt;</b> both VegT and Xbra to induce formation of mesoderm and endoderm.
56	acts upstream of	～の上流で作用する	56	10715329	Genetic epistasis analysis indicated that RAN1 <b>&lt;acts upstream of&gt;</b> mutations in the ethylene receptor gene family.
57	acts directly	直接に作用する	56	12586066	EGF signaling <b>&lt;acts directly&gt;</b> on the epidermis and is independent of BMP signaling.
58	acts directly on	～に直接に作用する	33	12208756	These findings therefore demonstrate that PTK787 both <b>&lt;acts directly on&gt;</b> MM cells and inhibits paracrine IL-6-mediated MM cell growth in the bone marrow milieu.
59	that acts	作用する～	258	9973614	Branch migration by RuvAB is mediated by RuvB, a hexameric ring protein <b>&lt;that acts&gt;</b> as an ATP-driven molecular pump.
60	that acts as	～として作用する～	96		
61	which acts	そして、それは作用する	133	9888840	SAH 51-641 (1) is a potent hypoglycemic agent, <b>&lt;which acts&gt;</b> by inhibiting hepatic gluconeogenesis.
62	it acts	それは、作用する	118	10334301	Leptin, the ob gene product, is produced by adipocytes, and <b>&lt;it acts&gt;</b> to decrease caloric intake and increase energy expenditure.
63	acting as	～として作用する～	358	11986332	It is not known, however, whether integrins, <b>&lt;acting as&gt;</b> mechanoreceptors, regulate cell survival via the PI3K/Akt pathway.
64	acting as a	～として作用する～	198	9794753	RNA polymerase (RNAP) moves along DNA while carrying out transcription, <b>&lt;acting as a&gt;</b> molecular motor.
65	by acting as	～として作用することによって	95	10982330	Retroviruses are believed to induce tumors <b>&lt;by acting as&gt;</b> insertional mutagens that activate expression of cellular protooncogenes.
66	acting on	～において作用する	199	12598606	Changes in pH can affect neuronal excitability by <b>&lt;acting on&gt;</b> ligand-gated channels, including those gated by glutamate.
67	acting through	～を経て作用する	150	12493763	Eukaryotic genes are under the control of regulatory complexes <b>&lt;acting through&gt;</b> chromatin structure to control gene expression.
68	acting in	～において作用する	122	10913112	Factor XIII zymogen activation is a complex series of events that involve fibrinogen <b>&lt;acting in&gt;</b> several different roles.
69	acting at	～において作用する	101	12442323	Thus, somatostatin <b>&lt;acting at&gt;</b> SSTR2 receptors on NOS neurons might modulate descending relaxation.
70	acting via	～を経て作用する	71	11157090	Taken together, these results indicate a role for nerve growth factor <b>&lt;acting via&gt;</b> the TrkA receptor on ChAT and VAcHT proteins in contextual memory consolidation.
71	cis-acting	シス作動性の	687	10748133	The results show that E10 contains a complex array of both enhancer and inhibitor <b>&lt;cis-acting&gt;</b> elements that modulate usage of a weak 5' splice site.
72	cis-acting elements	シス作動性の	175	9680219	Regulation of nrd expression in Escherichia coli by <b>&lt;cis-acting elements&gt;</b> was found to be more complex than previously reported.
73	cis-acting element	シス作動性のエレメント	86		

	English	Japanese	Frq.	PubM_ID	Sample
74	cis-acting sequences	シス作動性の配列	62	9621007	A minimal vector containing only these two elements could be successfully delivered by helper HFV, confirming that all essential <b>&lt;cis-acting sequences&gt;</b> were present.
75	cis-acting regulatory	シス作動性の調節 ~	46	9636087	Thus, it is unlikely that Pax proteins regulate Wnt-1 by direct interactions with this <b>&lt;cis-acting regulatory&gt;</b> region.
76	the cis-acting	シス作動性の ~	105	9621062	This is the first report of a functional mapping of <b>&lt;the cis-acting&gt;</b> elements of a virus of the HTLV/BLV group.
77	a cis-acting	シス作動性の ~	103	11511538	Here we show that the direction of replication at mat1 is controlled by <b>&lt;a cis-acting&gt;</b> polar terminator of replication (RTS1).
78	trans-acting	トランス作動性の	270	12399373	To help identify <b>&lt;trans-acting&gt;</b> modifiers, a screen was performed to find yeast mutants with altered CTG.CAG repeat mutation frequencies.
79	trans-acting factors	トランス作動性の因子	113	11073994	In <i>Saccharomyces cerevisiae</i> , three <b>&lt;trans-acting factors&gt;</b> (Upf1p to Upf3p) are required for NMD.
80	by acting	作用することによって	204	12196601	Such memories could be used to control vocal output <b>&lt;by acting&gt;</b> as fixed models of song to which ongoing vocalizations are matched.
81	by acting as	~として作用することによって	95		
82	by acting on	~において作用することによって	41	10366694	Progesterone can exert cellular effects <b>&lt;by acting on&gt;</b> membrane receptors or by acting on intracellular receptors.
83	acted as	~として作用した	142	10711678	Unwounded endothelium <b>&lt;acted as&gt;</b> a negative control.
84	acted synergistically	相乗的に作用した	45	10811736	ATP and tamoxifen <b>&lt;acted synergistically&gt;</b> to shrink PE cells.

	English	Japanese	Frq.	PubM_ID	Sample
	action*	作用	8,714		
	action	作用	6,675		
	actions	作用	2,039		
<b>Note</b>	action of が多い。				
1	the action	作用	1,542	11279220	Thus, <b>&lt;the action&gt;</b> of Rho on a transcript does not depend on the availability of a free 5' terminus.
2	action of	～の作用	3,431	10050009	These effects strongly suggest a presynaptic, excitatory <b>&lt;action of&gt;</b> adenosine on type I cells of the carotid body.
3	action of the	～の作用	295	10733496	Thus, VEGF is a synergistic enhancer for the BMP-4-dependent differentiation processes, and it seems to be achieved by the ordered <b>&lt;action of the&gt;</b> 2 factors.
4	action of these	これらの～の作用	84		
5	action of insulin	インシュリンの作用	40	11334436	A major <b>&lt;action of insulin&gt;</b> is to regulate the transcription rate of specific genes.
6	the action of	～の作用	947	11389831	Embryos have evolved various strategies to confine <b>&lt;the action of&gt;</b> secreted signals.
7	by the action of	～の作用によって～	109	11831906	Compound 5e was converted to beta-glucuronic acid conjugate 6e <b>&lt;by the action of&gt;</b> pig liver esterase (PLE).
8	through the action of	～の作用によって～	88	10373350	Levels of free iron are strictly limited in human serum, largely <b>&lt;through the action of&gt;</b> the iron-binding protein transferrin.
9	to the action of	～の作用へ～(に)	59	12514211	Neurotransmitter-induced mobilization of Ca(2+) is generally ascribed <b>&lt;to the action of&gt;</b> inositol 1,4,5-triphosphate (IP(3)) in neurons.
10	for the action of	～の作用にとって～	51	12473657	Results of DNA cleavage and ligation assays support a two-drug model <b>&lt;for the action of&gt;</b> etoposide against human topoisomerase IIalpha.
11	to the action of	～の作用へ～	59	10473613	The sensitivity <b>&lt;to the action of&gt;</b> clostridial toxin indicates the docking-fusion complex is a part of the exocytotic mechanism of the proton pump.
12	for the action of	～の作用にとって～	51		
13	action in	～における作用	397	10642598	Type 2 diabetes is characterized by abnormalities of insulin <b>&lt;action in&gt;</b> muscle, adipose tissue, and liver and by altered beta-cell function.
14	action on	～における作用	382	11085520	However, the mechanism of bisphosphonate <b>&lt;action on&gt;</b> bone is not fully understood.
15	action at	～における作用	100	11931739	Finally, epistasis analysis indicates that Dliprin-alpha is required for Dlar's <b>&lt;action at&gt;</b> the synapse.
16	action for	～に対する作用	94	11069257	Inhibition of 1,6-beta-d-glucan synthesis may be an additional mechanism of <b>&lt;action for&gt;</b> pneumocandins.
17	of action	作用の～	1,521	10903761	Because it is unclear how CQ mediates these immunomodulatory effects, we set out to elucidate its mechanism <b>&lt;of action&gt;</b> .
18	of action of	～の作用の～	496	12055272	In this study we have examined the effect and mechanism <b>&lt;of action of&gt;</b> curcumin on the pathogenesis of CNS demyelination in EAE.

	English	Japanese	Frq.	PubM_ID	Sample
19	of action for	～に対する作用の～	72	10973319	These findings suggest a mechanism <of action for> metformin and identify novel therapeutic targets in insulin-resistant states.
20	of action in	～における作用の～	45	11157977	The molecular composition of the intact complex and its site <of action in> the cell are still not well understood.
21	mechanism of action	作用の機構	605	11023483	Thus, the antimicrobial <mechanism of action> affects macrophage inflammatory mediator production after stimulation with pneumococci.
22	mechanism of action of	～の作用の機構	270	12524421	To elucidate the <mechanism of action of> SB-247464, a series of cell-based and biochemical assays were performed.
23	mechanism of action is	作用の機構は、～である	68	11125002	Although nitrous oxide (N(2)O) has been used to facilitate surgery for >150 years, its molecular <mechanism of action is> not yet defined.
24	mechanism of action for	～に対する作用の機構	28	11788714	These results provide a possible <mechanism of action for> the BMP signaling pathway on the regulation of Dlx3.
25	the mechanism of action	作用の機構	261	11585752	However, little is known about <the mechanism of action> of these drugs in prostate cancer.
26	its mechanism of action	その作用の機構	68	12642584	For rational design of effective Pgp1 inhibitors, a clear understanding of <its mechanism of action> and functional regulation is essential.
27	their mechanism of action	それらの作用の機構	36	11425316	These results provide critical insight needed to design more potent inhibitors of Abeta toxicity and to elucidate <their mechanism of action>.
28	mechanisms of action	作用の機構	149	11790216	Their <mechanisms of action> are different, however, and as a result they appear to have distinct metabolic effects.
29	mode of action	作用の様式	176	10588632	They also suggest a potential additional antiinflammatory <mode of action> of these compounds through reduction of cell survival.
30	mode of action of	～の作用の様式	69	9799511	Both calcium and membrane binding affect the structure and the <mode of action of> L-1.
31	the mode of action	作用の様式	56	10744626	In this study we have assessed <the mode of action> of uric acid (UA), a purine metabolite and ONOO(-) scavenger, in the treatment of EAE.
32	site of action	作用の部位	131	12411529	5-HT(3) receptor antagonists reduce symptoms of IBS clinically, but their <site of action> is unclear and the potential for other therapeutic targets is unexplored.
33	sites of action	作用の部位	56	9869608	These studies indicate that the mechanisms and <sites of action> of OFQ are region specific.
34	duration of action	作用の持続時間	55	12574628	In cell and animal assays for erythropoiesis, SEP displayed potent biological activity and had significantly prolonged <duration of action> in vivo.
35	action by	～による作用	70	11553760	The <action by> Cel12A mimics some of the changes in wall rheology found after auxin-induced growth.
36	action by -ing	～することによる作用	26	10642801	We have investigated the mechanism of lin-4 RNA <action by examining> the fate of lin-14 mRNA in vivo during the time that lin-4 RNA is expressed.
37	action as	～としての作用	44	9553089	This altered conformation may account for VDR's <action as> a repressing rather than activating factor at this locus.

	English	Japanese	Frq.	PubM_ID	Sample
38	its action	その作用	153	11196645	ADP mediates platelet aggregation through <its action> on two G-protein-coupled receptor subtypes.
39	inhibitory action	抑制性の作用	151	11390449	The <inhibitory action> was dose dependent and was evident at concentrations higher than those necessary to inhibit PG synthesis.
40	direct action	直接作用	80	9763462	These kinetics are similar to GABAB-activated current and consistent with a <direct action> of G-protein on the channels.
41	biological action	生物学的作用	56	12138204	Furthermore, the <biological action> of R-Ras3 in PC12 cells was dependent on the mitogen-activated protein kinase (MAPK).
42	protective action	保護作用	34	9819372	This <protective action> is mediated by induction of hsp72, the major inducible heat shock protein in intestinal epithelial cells.
43	combined action	組み合わせの作用	65	9765474	The <combined action> of IkappaBM and Bcl-2 allowed for vector persistence in livers of C57BL/6 x C3H mice.
44	concerted action	協調作用	43	11257223	The Drosophila compound eye is specified by the <concerted action> of seven nuclear factors that include Eyeless/Pax6.
45	insulin action	インシュリン作用	208		
46	insulin action in	~におけるインシュリン作用	32	12006586	Insulin receptor substrate (IRS) proteins are important signaling molecules that mediate <insulin action in> insulin-sensitive cells.
47	actions of	~の作用	1,085	10084994	As enteric pathogens, Salmonella spp. are resistant to the <actions of> bile.
48	the actions of	~の作用	400	11102505	To this end, we used the tachykinin receptor antagonist Spantide I to eliminate <the actions of> CabTRP Ia.
49	of the actions of	~の作用の~	34	9651211	VIP6-28 was an effective antagonist <of the actions of> exogenous VIP on cAMP and VIP-PHI mRNA in neuron-enriched cultures.
50	actions on	~における作用	154	12042305	The mechanism of this effect has been attributed to its allosteric modulatory <actions on> glutamate- and gamma-aminobutyric acid-gated ion channels.
51	actions in	~における作用	107	10448190	Two distinct CRF receptor subtypes, CRFR1 and CRFR2, are thought to mediate CRF <actions in> the CNS.
52	action potential	活動電位	708	11566782	This simulation study investigated the effects of dynamic gap junctions on both the shape and conduction velocity of a propagating <action potential>.
53	action potential duration	活動電位持続時間	93	12676813	Peak Ca(2+) current (ICa) was slightly increased, and <action potential duration> was prolonged in TG versus WT.
54	the action potential	活動電位	126	11259781	PACAP did not affect the duration of <the action potential>.
55	of action potential	活動電位の~	71		
56	action potentials	活動電位	579	9787016	Bath application of DA (0.05-30 microM) produced a reversible decrease in the number of <action potentials> evoked by a given current step.
57	action potentials in	~における活動電位	66	9570783	In support of this hypothesis, we found that activation of either PKA or PKC significantly increased the amplitude of back-propagating <action potentials in> distal dendrites.
58	of action potentials	活動電位の~	140	10225974	The excitatory action consisted of depolarization of the membrane potential, decreased membrane conductance, and increased discharge <of action potentials>.

	English	Japanese	Frq.	PubM_ID	Sample
	activate*	活性化する	30,686		
	activated	活性化される	18,892		
	activate	活性化する	5,011		
	activating	活性化すること	3,611		
	activates	活性化する	3,172		
<b>Note</b>	activated by が多い。				
1	activated by	～によって活性化される	2,617	11910351	The results show that EGFR is <b>&lt;activated by&gt;</b> bile acids and functions to induce COX-2 expression by an MAPK cascade.
2	activated by the	～によって活性化される	286	11260478	The transcription of class III/IV flagellar genes is <b>&lt;activated by the&gt;</b> response regulator factor, FlbD.
3	activated by a	～によって活性化される	113	11086289	The region of climbing fibers <b>&lt;activated by a&gt;</b> localized peripheral stimulus is
4	activated by phosphorylation	リン酸化によって活性化される	32	12019172	p53 tumor suppressor is <b>&lt;activated by phosphorylation&gt;</b> and acetylation on DNA damage.
5	is activated by	～は、～によって活性化される	572	10788505	Human growth hormone gene (hGH-N) expression <b>&lt;is activated by&gt;</b> an LCR marked by a series of DNase I-hypersensitive sites (HSI-III and HSV) in pituitary chromatin.
6	are activated by	～は、～によって活性化される	310	12082106	The p38 and JNK mitogen-activated protein kinase cascades <b>&lt;are activated by&gt;</b> Ras via Raf-independent effector function.
7	can be activated by	～は、～によって活性化されるうる	131	11008984	Apoptosis is a cellular suicide program that <b>&lt;can be activated by&gt;</b> cell injury or stress.
8	to be activated by	～によって活性化される～	68	10393876	Protein kinase C is known <b>&lt;to be activated by&gt;</b> a variety of inflammatory mediators, including bradykinin, whereas extracellular acidification is characteristically produced by anoxia and inflammation.
9	was activated by	～は、～によって活性化された	128	11741977	Consequently, AP-1 luciferase reporter gene <b>&lt;was activated by&gt;</b> acidic pH.
10	were activated by	～は、～によって活性化された	100	9606186	In contrast, Ca <sup>2+</sup> influx was maximal when m3 mAChRs <b>&lt;were activated by&gt;</b> moderate doses (1-10 microM) of carbachol, but substantially reduced at higher agonist concentrations.
11	not activated by	～によって活性化されない	78	10801851	These data suggest that Lck is <b>&lt;not activated by&gt;</b> ultraviolet light irradiation, nor is it required for JNK activation in T cells by any of the stress stimuli we tested.
12	pathways activated by	～によって活性化される経路	51	11895790	We investigated the molecular <b>&lt;pathways activated by&gt;</b> VEGF on such leukemias, by performing a gene expression analysis of VEGF-treated and untreated HL-60 leukemic cells.
13	when activated by	～によって活性化された時	44	9973388	<b>&lt;When activated by&gt;</b> Ag, B10.D2 T cells express functional IL-12 receptors and maintain IL-12 responsiveness.
14	activated in	～において活性化される	809	10811605	In Chlamydomonas, Crd1 expression is <b>&lt;activated in&gt;</b> copper- or oxygen-deficient cells, and Crd1 function is required for adaptation to these conditions.

	English	Japanese	Frq.	PubM_ID	Sample
15	activated in response to	～に応答して活性化される	136	11847223	Thus, the phosphorylation of serine 59 is the result of two distinct signaling pathways, differentially <b>&lt;activated in response to&gt;</b> the physiological state of the T cell.
16	activated in the	～において活性化される	114	11585811	To test this hypothesis, FGFR1 signaling was <b>&lt;activated in the&gt;</b> growth plate in cells that normally express FGFR3.
17	activated in vitro	試験管内で活性化される	47	9670966	CD8+ T cells from melanoma patients were <b>&lt;activated in vitro&gt;</b> by coincubation with infected dendritic cells and tested for recognition of HLA-A-matched melanoma targets.
18	is activated in	～は、～において活性化される	194	12110596	These results suggest a molecular mechanism by which CPE- containing mRNA <b>&lt;is activated in&gt;</b> early development.
19	are activated in	～は、～において活性化される	84	12374812	Here we show that major UPR components <b>&lt;are activated in&gt;</b> B cells stimulated to secrete antibody.
20	was activated in	～は、～において活性化された	61	11157752	Surprisingly, PAK1 <b>&lt;was activated in&gt;</b> the absence of the transmembrane adaptor LAT while Rac1 was not.
21	constitutively activated in	～において構成的に活性化される	41	11803465	Stat3 is <b>&lt;constitutively activated in&gt;</b> many primary tumors and tumor cell lines, suggesting that signaling by this molecule may be important for cell transformation.
22	activated during	～の間に活性化される	188	10798649	These data indicate that EGFR was <b>&lt;activated during&gt;</b> corneal epithelial wound healing in vivo.
23	is activated during	～は、～の間に活性化される	44	10611160	Transcription of the lactase gene <b>&lt;is activated during&gt;</b> enterocyte differentiation.
24	activated with	～によって活性化される	123	10570280	These results suggest that LP T cells are differentiated effector cells that respond at high levels when <b>&lt;activated with&gt;</b> relatively low levels of Ag- and B7-mediated costimulation in vivo.
25	activated at	～において活性化される	117	9585407	Mitosis in human cells is initiated by the protein kinase Cdc2-cyclin B1, which is <b>&lt;activated at&gt;</b> the end of G2 by dephosphorylation of two inhibitory residues, Thr14 and Tyr15.
26	activated to	～するように活性化される	110	9770487	Cell cycle progression is monitored by highly coordinated checkpoint machinery, which is <b>&lt;activated to&gt;</b> induce cell cycle arrest until defects like DNA damage are corrected.
27	activated after	～の後に活性化される	64	12384514	Transforming growth factor (TGF)-beta1 is rapidly <b>&lt;activated after&gt;</b> ionizing radiation, but its specific role in cellular responses to DNA damage is not known.
28	activated upon	～するやいなや活性化される	51	11751924	Furthermore, c-Src was constitutively associated with PZR and was <b>&lt;activated upon&gt;</b> treatment of cells with ConA.
29	not activated	活性化されない	155	11704825	However, Western blot analysis revealed that caspases-1, -3, -6, -8, and -9 are <b>&lt;not activated&gt;</b> during beta(2)m-induced apoptosis in these cells.
30	constitutively activated	構成的に活性化される	276	10671555	The known ability of <b>&lt;constitutively activated&gt;</b> PI 3-K to induce anchorage-independent cell proliferation suggests a mechanism by which the mutant E5 proteins transform cells.

	English	Japanese	Frq.	PubM_ID	Sample
31	a constitutively activated	構成的に活性化された～	58	9671493	Moreover, reduction of DAB function attenuates signaling by <b>&lt;a constitutively activated&gt;</b> SEV.
32	of constitutively activated	構成的に活性化された～の～	39	10601018	In addition, expression <b>&lt;of constitutively activated&gt;</b> MEK1 or its downstream target Erk2 MAP kinase was sufficient to stimulate TGF-alpha shedding.
33	rapidly activated	急速に活性化される	78	10433995	Phosphoinositide 3-kinase was also <b>&lt;rapidly activated&gt;</b> by NGF.
34	strongly activated	強く活性化される	70	9482803	Area MT/V5 was also <b>&lt;strongly activated&gt;</b> by moving eyes and to a lesser extent by other moving stimuli.
35	directly activated	直接活性化される	60	9642257	The cardiac G protein-gated K+ channel, IKACH, is <b>&lt;directly activated&gt;</b> by G protein beta gamma subunits (Gbeta gamma).
36	specifically activated	特別に活性化される	52	10931297	The secretion of these enzymes is <b>&lt;specifically activated&gt;</b> in the presence of eukaryotic proteins such as alpha2-macroglobulin.
37	fully activated	完全に活性化される	48	12485993	However, CyaA is <b>&lt;fully activated&gt;</b> by CaM without the domain corresponding to the helical domain of EF.
38	selectively activated	選択的に活性化される	45	11935030	Immunoglobulin (Ig) loci are <b>&lt;selectively activated&gt;</b> for transcription and rearrangement during B lymphocyte development.
39	transcriptionally activated	転写レベルで活性化される	45	10490826	Two new genes, EB-1 and EB-2, as well as Caldesmon were <b>&lt;transcriptionally activated&gt;</b> in each of seven t(1;19) cell lines.
40	activated transcription	活性化された転写	229	10736222	The same mutants are defective in <b>&lt;activated transcription&gt;</b> and in forming an isomerised sigma-DNA complex on the early opened DNA.
41	activated transcription factor	活性化された転写因子	40	9880553	This region also contains a binding site for the stress- <b>&lt;activated transcription factor&gt;</b> HSF-1.
42	activated form of	～の活性化型	142	12070052	The <b>&lt;activated form of&gt;</b> prothrombin plays pivotal roles in the regulation of crucial coagulation, fibrinolytic, and cellular processes.
43	an activated form of	～の活性化型	56	12399305	Conversely, increasing the number of polar cells by expressing <b>&lt;an activated form of&gt;</b> the Notch receptor increases the number of border cells.
44	the activated form of	～の活性化型	46	9851689	Monoclonal antibodies specific for <b>&lt;the activated form of&gt;</b> human MMP-9 were raised by using a peptide corresponding to the N-terminus of the activated enzyme as immunogen.
45	activated macrophages	活性化されたマクロファージ	150	11500460	The generation of nitric oxide (NO) by <b>&lt;activated macrophages&gt;</b> is believed to control mycobacterial infection in the murine system.
46	activated platelets	活性化された血小板	121	9817767	P-selectin is an adhesion receptor for leukocytes expressed on <b>&lt;activated platelets&gt;</b> and endothelial cells.
47	activated state	活性化状態	78	9649378	To further investigate transitions after the initial <b>&lt;activated state&gt;</b> , we examined the temperature dependence of inactivation.
48	activated neutrophils	活性化された白血球	59	11714830	<b>&lt;Activated neutrophils&gt;</b> contribute to the development and severity of acute lung injury (ALI).
49	activated microglia	活性化された小膠細胞	58	10882783	Infiltrating leukocytes and <b>&lt;activated microglia&gt;</b> may release cytotoxic mediators contributing to secondary brain injury.

	English	Japanese	Frq.	PubM_ID	Sample
50	activated lymphocytes	活性化されたリンパ球	51	9834228	These results provide direct evidence that a population of <b>&lt;activated lymphocytes&gt;</b> with the memory phenotype lacking the costimulatory molecule CD28 are especially prone to undergo apoptosis.
51	the activated	活性化された ~	491	9553046	Expression of CF2 itself is negatively regulated by <b>&lt;the activated&gt;</b> Egr.
52	an activated	活性化された ~	320	11454764	Hh signaling blocks proteolysis and produces <b>&lt;an activated&gt;</b> Ci-155 transcriptional activator.
53	ligand-activated	リガンドで活性化された ~	97	11714715	Finally, PGC-1 and TIF2 synergistically enhance <b>&lt;ligand-activated&gt;</b> RXRalpha transcriptional activity.
54	ligand-activated transcription	リガンドで活性化された転写	37	9558089	TCDD is believed to exert its effects primarily through the <b>&lt;ligand-activated transcription&gt;</b> factor, the aryl hydrocarbon receptor (AhR).
55	hyperpolarization-activated	過分極で活性化された ~	83	10448214	This spatial normalization of temporal integration requires a dendritic <b>&lt;hyperpolarization-activated&gt;</b> current (I <sub>h</sub> ).
56	light-activated	光で活性化された ~	69	10542152	Phototropism of Arabidopsis thaliana seedlings in response to a blue light source is initiated by nonphototropic hypocotyl 1 (NPH1), a <b>&lt;light-activated&gt;</b> serine-threonine protein kinase.
57	pathways activated by	~によって活性化される経路	50	11160325	These data demonstrate that signaling <b>&lt;pathways activated by&gt;</b> IL-4 require different tyrosine kinases.
58	of activated	活性化された ~ の ~	1,051	12023371	A similar degree of lymphoid hyperplasia and percentage <b>&lt;of activated&gt;</b> B cells were observed in rotavirus-infected TCR knockout mice.
59	factor of activated	活性化された ~ の因子	133	12239209	Nuclear <b>&lt;factor of activated&gt;</b> T-cells (NFAT) and calcineurin are essential regulators of immune cell and mesenchymal cell differentiation.
60	expression of activated	活性化された ~ の発現	77	11703924	<b>&lt;Expression of activated&gt;</b> Rac induces phosphorylation and decreased association of merlin with the cytoskeleton.
61	presence of activated	活性化された ~ の存在	42	10415410	In animals with retinal degeneration, the <b>&lt;presence of activated&gt;</b> microglial cells in the outer retina during the early stages of injury suggests that they may be involved in the ensuing photoreceptor cell death.
62	levels of activated	活性化された ~ のレベル	42	10225979	Furthermore, epithelial <b>&lt;levels of activated&gt;</b> Stat1 correlated with levels of expression for epithelial ICAM-1, IRF-1, and Stat1, and in turn, ICAM-1 levels correlated with T-cell accumulation in tissue.
63	of the activated	活性化された ~ の ~	91	11313478	In addition, use <b>&lt;of the activated&gt;</b> mutant revealed a number of other important functions of this kinase that were not revealed by studying the wild-type kinase.
64	to the activated	活性化された ~ へ ~	45	10413468	Factor IXa binding <b>&lt;to the activated&gt;</b> platelet surface is required for efficient catalysis of factor X activation.
65	by activated	活性化された ~ によって	324	10438909	NKLAM is also selectively expressed <b>&lt;by activated&gt;</b> macrophages and CTL.
66	in activated	活性化された ~ において ~	266	11181801	The increase in DNA synthesis was first detected 12 h after the initial increase <b>&lt;in activated&gt;</b> c-MET levels.
67	with activated	活性化された ~ で ~	150	9927031	Nonneoplastic prostate tissue showed little or no staining <b>&lt;with activated&gt;</b> MAP kinase antiserum.

	English	Japanese	Frq.	PubM_ID	Sample
68	to activated	活性化された～へ～	149	11016919	Furthermore, Smurf2 exhibited higher binding affinity <b>&lt;to activated&gt;</b> Smad2 upon TGF-beta stimulation.
69	on activated	活性化された～において～	143	10770806	In a manner similar to leukocytes, platelets interact with selectins expressed <b>&lt;on activated&gt;</b> endothelium.
70	for activated	活性化された～にとって～	94	11239466	The alpha-helical orientation of L53 is required not for JAK2 activation but <b>&lt;for activated&gt;</b> JAK2 to induce phosphorylation of the erythropoietin receptor.
71	from activated	活性化された～から～	82	11801678	In this study, we report that 15-d-PGJ(2) induced a significant increase in both IL-8 mRNA and protein <b>&lt;from activated&gt;</b> human T lymphocytes.
72	phosphorylated and activated	リン酸化されそして活性化される	48	11313465	Fission yeast Cds1 is <b>&lt;phosphorylated and activated&gt;</b> when DNA replication is interrupted by nucleotide starvation or DNA damage.
73	when activated	活性化された時～	94	11934894	But even <b>&lt;when activated&gt;</b> , beta1 integrins did not contribute to melanoma cell arrest during flow.
74	activated when	～の時、活性化される	58	12486233	In the one-hybrid system, the reporter gene is <b>&lt;activated when&gt;</b> a Z-DNA-specific binding domain is fused with an activation domain and expressed in vivo.
75	activated following	～に引き続いて、活性化される	51	12626568	NF-kappaB is <b>&lt;activated following&gt;</b> B cell Ag receptor engagement and is associated with antiapoptosis; thus, it would seem a likely candidate to mediate transcriptional activation for inducible Fas resistance.
76	activate the	～を活性化する	932	10460151	Alternatively or in addition, M(C) may act in concert with an additional metal ion to coordinate and <b>&lt;activate the&gt;</b> 3'-OH of G.
77	activates the	～を活性化する	656		
78	activates the transcription	転写を活性化する	46	9774677	Heat shock transcription factor 1 (HSF-1) <b>&lt;activates the transcription&gt;</b> of heat shock genes in eukaryotes.
79	activate transcription	転写を活性化する	404	12048256	RU486 exhibits a differential ability to <b>&lt;activate transcription&gt;</b> within these two cell types.
80	activate transcription of	～の転写を活性化する	75	12535071	Our studies show that HilD and HilC <b>&lt;activate transcription of&gt;</b> invF from a promoter that is far upstream of its HilA-dependent promoter.
81	activate transcription in	～における転写を活性化する	57	11937630	This octamer element can be bound by either Oct-1 or Oct-2 but requires the expression of Oct-2 to <b>&lt;activate transcription in&gt;</b> B cells.
82	activate transcription from	～からの転写を活性化する	54	11803461	Tumor-derived p53 mutants <b>&lt;activate transcription from&gt;</b> promoters of various growth-related genes.
83	to activate transcription	転写を活性化するために～	219	11158580	Following receptor-induced activation, Smads move into the nucleus <b>&lt;to activate transcription&gt;</b> of a select set of target genes.
84	activates the expression	発現を活性化する	38	10500199	Here, we show that the E2A-Pbx1 fusion protein <b>&lt;activates the expression&gt;</b> of a novel WNT gene, WNT-16.
85	activate expression of	～の発現を活性化する	49	10871347	Repeats of this region are sufficient to <b>&lt;activate expression of&gt;</b> a heterologous promoter in CD43-positive cell lines.
86	activate gene	遺伝子～を活性化する	55	11301320	Promoter-bound steroid receptors <b>&lt;activate gene&gt;</b> expression by recruiting members of the p160 family of coactivators.

	English	Japanese	Frq.	PubM_ID	Sample
87	activate gene expression	遺伝子発現を活性化する	35	11238865	Herpes simplex virus (HSV) ICP0 can effectively <b>&lt;activate gene expression&gt;</b> from otherwise silent promoters contained on persisting viral genomes.
88	activates a	活性化する	190	11934902	Tyrosine-phosphorylated nuclear TFII-I <b>&lt;activates a&gt;</b> stably integrated c-fos reporter gene.
89	can activate	～を活性化できる	410	9657685	None of these mutants <b>&lt;can activate&gt;</b> the carbonyl of oxaloacetate by polarization.
90	bind and activate	結合しそして活性化する	38	10849431	Thrombospondin-1 (TSP-1) has been shown to <b>&lt;bind and activate&gt;</b> transforming growth factor-beta1 (TGF-beta1).
91	not activate	活性化しない	254	9490825	Inosine, the metabolite of Ado, did <b>&lt;not activate&gt;</b> any of eleven C fibres tested in six rats.
92	did not activate	活性化しなかった	123	11073967	Unlike Bcr-Abl, expression of DeltaTrkA <b>&lt;did not activate&gt;</b> Stat5 in these cells.
93	does not activate	活性化しない	86	12097408	Unlike ICAM-1, ICAM-2 <b>&lt;does not activate&gt;</b> RhoA or alter actin cytoskeletal organization.
94	that activate	～を活性化する～	251	10692474	Genome damaging events, such as gamma-irradiation exposure, result in the induction of pathways <b>&lt;that activate&gt;</b> DNA repair mechanisms, halt cell cycle progression, and/or trigger apoptosis.
95	that activates	～を活性化する～	219	10444598	Thus, the RecA nucleoprotein filament is a protein scaffold <b>&lt;that activates&gt;</b> dsDNA for strand exchange with ssDNA either within the filament or external to it.
96	, which activates	そしてそれは、～を活性化 する	139		
97	may activate	～を活性化するかもしれない	90	11489441	Such evidence suggests that LH neurons <b>&lt;may activate&gt;</b> A7 neurons to produce antinociception.
98	directly activate	直接に活性化する	52	11118002	Insulin secretion increased from 3 days of steroid exposure in vitro, suggesting that DHEAS did not <b>&lt;directly activate&gt;</b> the secretory processes.
99	to activate	活性化する～	2,099	9578554	Thus, the GalR1 receptor appears <b>&lt;to activate&gt;</b> only the Gi pathway.
100	ability to activate	活性化する能力	205	11970953	In contrast, platelets from mice that lack G(alpha)(q) show no decrease in the <b>&lt;ability to activate&gt;</b> Rap1 in response to epinephrine but show a partial reduction in ADP-stimulated Rap1 activation.
101	able to activate	活性化できる	104	10531384	Furthermore, all calmodulin isoforms were <b>&lt;able to activate&gt;</b> bovine calcium/calmodulin-dependent phosphodiesterase.
102	sufficient to activate	活性化するのに十分な	104	11114887	The C-terminal domain of FtsK is <b>&lt;sufficient to activate&gt;</b> the exchange of the second pair of strands by XerD, allowing both intra- and intermolecular recombination reactions to go to completion.
103	failed to activate	活性化できなかった	94	10455158	ANF treatment caused MEK phosphorylation and activation but <b>&lt;failed to activate&gt;</b> any of the Raf isoforms.

	English	Japanese	Frq.	PubM_ID	Sample
104	shown to activate	活性化すると示される	88	10555144	Here, the toxin is <b>&lt;shown to activate&gt;</b> the plasma membrane potassium channel of <i>S. cerevisiae</i> , TOK1.
105	known to activate	活性化すると知られる	71	12615923	Cytotoxic necrotizing factor 1 (CNF1) is a bacterial toxin <b>&lt;known to activate&gt;</b> Rho GTPases and induce host cell cytoskeleton rearrangements.
106	required to activate	活性化することを要求される	68	10545251	A rise in intracellular free Ca(2+) concentration ([Ca(2+)](i)) is <b>&lt;required to activate&gt;</b> sperm of all organisms studied.
107	unable to activate	活性化できない	61	12183457	Therefore the 2,7-DAM monoadducts were <b>&lt;unable to activate&gt;</b> the p53 pathway.
108	phosphorylates and activates	リン酸化し、そして活性化 する	36	10571182	Moreover, recombinant ZAK1 <b>&lt;phosphorylates and activates&gt;</b> GSK3 in vitro.
109	binds and activates	結合し、そして活性化 する	28	10591649	In vitro PA28 <b>&lt;binds and activates&gt;</b> proteasomes.
110	activating the	(~を)活性化すること	291	12034707	The neurotrophin nerve growth factor (NGF) supports neuronal survival by <b>&lt;activating the&gt;</b> transcription factor nuclear factor-kappaB (NF-kappaB).
111	activating mutations	活性化する変異	89	11074003	<b>&lt;Activating mutations&gt;</b> in the Hedgehog pathway are also implicated in basal cell carcinoma and medulloblastoma, a tumor of the cerebellum in humans.
112	activating mutations in	~における活性化変異	39	10702394	GISTs express the KIT receptor tyrosine kinase, and many cases have <b>&lt;activating mutations in&gt;</b> the KIT juxtamembrane region.
113	by activating	~を活性化することによっ て~	440	10436165	Thus, growth factors appear to prevent VSMC death <b>&lt;by activating&gt;</b> signal transduction pathways linked to apoptotic regulatory genes.
114	of activating	~を活性化することの~	203	10899156	Despite sequence variation, all AP-2 isotypes are capable <b>&lt;of activating&gt;</b> transcription, which indicates a functional conservation.
115	in activating	~を活性化することにおい て~	177	11123695	This level of ppGpp had no effect on growth rate, implying a causal role for ppGpp <b>&lt;in activating&gt;</b> actII-ORF4 transcription.
116	for activating	~を活性化することにとっ て~	81	11059774	In addition, sodium butyrate (given as a single i.p. dose) is effective <b>&lt;for activating&gt;</b> lytic viral infection in some EBV tumor types in SCID mice.
117	the activating	活性化する~	170	9811836	We find that, although certain cysteine substitutions diminish interaction with Gal80, those substitutions have little effect on <b>&lt;the activating&gt;</b> function in vivo and interaction with TATA box-binding protein (TBP) in vitro.
118	an activating	活性化する~	109	10925300	These observations indicate that E-selectin can transduce <b>&lt;an activating&gt;</b> stimulus via the MAPK cascade into the endothelial cell during leukocyte adhesion.

	English	Japanese	Frq.	PubM_ID	Sample
	activation*	活性化	42,920		
	activations	活性化	99		
<b>Note</b>	activation of の用例が多いが、後続の前置詞は多様である。				
1	the activation	活性化	4,560		
2	an activation	活性化	180		
3	activation of	～の活性化	17,871	11278468	<Activation of> vascular endothelial growth factor receptor-2 (VEGFR-2) plays a critical role in vasculogenesis and angiogenesis.
4	the activation of	～の活性化	3,421	11313966	<The activation of> JNK by PDTC, in the presence or absence of exogenous H(2)O(2), was dependent on its chelating ability to metal ions, most likely copper ions.
5	activation of NF-kappaB	NF-kappaBの活性化	468	10463612	In this study, the <activation of NF-kappaB> was examined as a mechanism through which Trx overexpression might promote anchorage-independent growth.
6	the activation of NF-kappaB	NF-kappaBの活性化	120	11606413	In this study, we report that indomethacin inhibited IR-induced <activation of NF-kappaB> and sensitized HeLa cells to IR-induced cytotoxicity at similar concentrations.
7	activation of caspase	カスパーゼの活性化	333	10514424	Therefore, these results indicate that beta-TrCP plays a critical role in <the activation of NF-kappaB> by assembling the ubiquitin ligase complex for both phosphorylated I kappa B alpha and I kappa B beta.
8	activation of protein kinase	プロテインキナーゼの活性化	209	10707086	Release of cytochrome c from mitochondria triggers <activation of caspase> proteases and death of a cell by apoptosis.
9	activation of PKC	プロテインキナーゼCの活性化	155	10514440	Direct <activation of protein kinase> C also rapidly increased RGS2 mRNA levels.
10	activation of T cells	T細胞の活性化	116	11160311	<Activation of T cells> usually requires two signals.
11	activation of transcription	転写の活性化	148	16061184	This modification is dynamic, as it increases during <activation of transcription> and is rapidly removed upon gene repression.
12	activation of ERK	細胞外シグナル制御キナーゼの活性化	139	15899894	AngII also stimulated the <activation of ERK> and protein kinase C, contributing to cardiac hypertrophy.
13	activation of MAPK	MAPキナーゼの活性化	105	15930390	<Activation of MAPK> was particularly evident in the nucleus and dendrites of granule cells.
14	activation of @2 by	～による～の活性化	1,135	10419452	Expression of chick Rap1GAP in PC-12 cells inhibited <activation of Rap1 by> forskolin.
15	activation of @1 in	～における～の活性化	355	11085506	Together, these data are consistent with the model that ATM directly phosphorylates Chk2 in vivo and that this event contributes to the <activation of Chk2 in> irradiated cells.

	English	Japanese	Frq.	PubM_ID	Sample
16	activation of @1 in @2 cells	～細胞における～の活性化	62	10497240	Leukemia inhibitory factor (LIF)-induced <b>&lt;activation of JunB in M1 cells&gt;</b> was also mediated via the -65/-52 IL-6RE.
17	activation by	～による活性化	2,078	10428028	LIM kinase activity is not essential for SRF <b>&lt;activation by&gt;</b> serum, but signals depend on alterations in actin dynamics.
18	activation in	～における活性化	1,785	12067995	Studies of Wnt <b>&lt;activation in&gt;</b> gastric cancer have yielded conflicting results.
19	activation with	～による活性化	233	10497186	Platelets undergo shape change upon <b>&lt;activation with&gt;</b> agonists.
20	activation at	～における活性化	167	10470075	These results indicate a role for Nef in lymphocyte recruitment and <b>&lt;activation at&gt;</b> sites of virus replication.
21	activation to	～にいたる～の活性化 / ～する活性化	153	11923440	High-resolution functional magnetic resonance imaging was used to define brain <b>&lt;activation to&gt;</b> painful heat stimulation applied to the hand of nine normal subjects within the periaqueductal gray region.
22	activation during	～の間の活性化	145	10666409	MAPKAPK2 <b>&lt;activation during&gt;</b> ischemia in hearts pretreated with anisomycin was blocked by genistein.
23	activation through	～を経た活性化	134	11110698	Lyn plays an additional role in inhibiting platelet <b>&lt;activation through&gt;</b> an uncharacterized inhibitory pathway.
24	activation on	～における活性化	132	9547251	With TMS, the threshold for muscle <b>&lt;activation on&gt;</b> the amputated side was lower than that of the intact side, but with transcranial electrical stimulation there was no difference in motor threshold between the two sides.
25	activation via	～を経た活性化	98	10224276	These data reveal a novel mechanism by which antigen-presenting cells can regulate T cell <b>&lt;activation via&gt;</b> tryptophan catabolism.
26	activation for	～のための活性化	80	11971707	The open coordination position allows rapid O(2) <b>&lt;activation for&gt;</b> the oxidation of both substrates.
27	of activation	活性化の～	831	9882738	Most mutations greatly accelerated the rate <b>&lt;of activation&gt;</b> .
28	of the activation	活性化の～	244	11961130	These results are discussed in terms of their support for a possible role <b>&lt;of the activation&gt;</b> of the JNK/Jun pathway in the pathophysiological effects of METH.
29	of activation of	～の活性化の～	223	9630713	Effects <b>&lt;of activation of&gt;</b> protein kinase C (PKC) on N-methyl-D-aspartate) NMDA receptor function were analyzed by quantitative autoradiography using [3H]MK-801 in rat brain slices.
30	of the activation of	～の活性化の～	77	11106579	Thus, prevention <b>&lt;of the activation of&gt;</b> calpain I reduces the development of acute and chronic inflammation.

	English	Japanese	Frq.	PubM_ID	Sample
31	mechanism of activation	活性化のメカニズム	70	11027329	The present study provides new insight into the <b>&lt;mechanism of activation&gt;</b> by showing that each of the CREB domains contributes to transcription initiation by stimulating sequential steps in the transcription reaction.
32	voltage dependence of activation	活性化の電圧依存性	51		
33	for activation	活性化にとって～	710	11466291	P(invF-1) contains a H1A binding site, termed a H1A box, that is necessary and sufficient <b>&lt;for activation&gt;</b> by H1A.
34	for the activation	活性化にとって～	270	11724824	This suggests that FGF and FR recognition of specific HS sulfation patterns is critical <b>&lt;for the activation&gt;</b> of FGF signaling, and that synthesis of these patterns is regulated during embryonic development.
35	for activation of	～の活性化にとって～	472	11283225	Our findings demonstrate that the cytoskeleton does not seem to regulate calcium influx and that functional InsP3 receptors are not required <b>&lt;for activation of&gt;</b> I(CRAC).
36	for the activation of	～の活性化にとって～	235		
37	required for activation	#活性化に必要な(である)以下同様	175	10438457	T cell receptor (TCR) cross-linking is in part <b>&lt;required for activation&gt;</b> of NF-kappaB, which is dependent on the phosphorylation and degradation of IkappaBalpha.
38	required for activation of	～の活性化に必要な	132	9730885	Transphosphorylation by Src family kinases is <b>&lt;required for the activation of&gt;</b> Bruton's tyrosine kinase (Btk).
39	required for the activation of	～の活性化に必要な	65		
40	for activation by	～による活性化にとって～	56	9874773	A different but overlapping Mediator subunit dependence was found <b>&lt;for activation by&gt;</b> Gcn4.
41	to activation	活性化に対する～	530	11118492	The cardiac isoform of NCX1 is more sensitive <b>&lt;to activation&gt;</b> by protein kinase A (PKA) than the renal isoform which may be explained by preferential phosphorylation.
42	to the activation	活性化に対する～	307	9573248	IL-12 also modestly contributes <b>&lt;to the activation&gt;</b> of cytotoxic T lymphocytes.
43	to activation of	～の活性化に対する～	384	9525930	We propose that PKA is an important contributor <b>&lt;to the activation&gt;</b> of ERK1 by NGF and is required for maximal induction of gene expression by NGF.
44	to the activation of	～の活性化に対する～	274		
45	leads to activation of	～の活性化に至る	95	9576960	We show that NMDA receptor stimulation <b>&lt;leads to activation of&gt;</b> p21(ras) (Ras) through generation of nitric oxide (NO) via neuronal NO synthase.
46	due to activation of	～の活性化ゆえに	42	10713700	The results demonstrate that the HGF-induced transcription of the c-met gene by HGF is, at least in part, <b>&lt;due to activation of&gt;</b> the AP-1 pathway.

	English	Japanese	Frq.	PubM_ID	Sample
47	to activation by	～による活性化に対する	50	10085291	Furthermore, the membrane-associated caspase-3 differed from cytosolic caspase-3 in its responsiveness <b>&lt;to activation by&gt;</b> exogenous cytochrome c.
48	in response to activation	活性化に応じて	45	11970967	Infection of primary murine T cells with a retrovirus encoding SOCS-3 blocks their IL-2 production <b>&lt;in response to activation&gt;</b> .
49	by activation	活性化によって～	449		
50	by the activation	活性化によって～	153		
51	by activation of	～の活性化によって～	412	12535784	COX-2 expression during acute ischemia is caused <b>&lt;by activation of&gt;</b> post-synaptic glutamate receptors, which occurs during spreading depression and ischemic depolarization.
52	by the activation of	～の活性化によって～	136	11859133	Macrophage activation is accompanied <b>&lt;by the activation of&gt;</b> a variety of proteases.
53	mediated by activation of	～の活性化によって仲介された	57	11239436	During this period, synaptic transmission was primarily <b>&lt;mediated by activation of&gt;</b> NMDA receptors, suggesting that most synapses were functionally silent.
54	in activation	活性化における～	410		
55	in the activation	活性化における～	650	11264351	Several mechanisms are involved <b>&lt;in the activation&gt;</b> of Cdk2.
56	in activation of	～の活性化における～	282	9521747	Although the two half-molecule domains of CaM each have two EF-hands and bind two calcium ions cooperatively, they have distinct roles <b>&lt;in activation of&gt;</b> some targets.
57	in the activation of	～の活性化における～	477		
58	results in activation of	～の活性化に帰結する	61	10788500	This mitogenic effect is dependent upon activation of a protein-tyrosine kinase cascade that <b>&lt;results in activation of&gt;</b> mitogen-activated protein kinase and phosphatidylinositol 3-kinase.
59	results in the activation of	～の活性化に帰結する	57	11278572	Fas-mediated apoptosis <b>&lt;results in the activation of&gt;</b> caspases, which subsequently cleave cellular substrates that are essential for normal cell viability.
60	in the activation loop	活性化ループにおける～	56	9566911	Many protein kinases are regulated by phosphorylation <b>&lt;in the activation loop&gt;</b> , which is required for enzymatic activity.
61	role in the activation	活性化における役割	64	10385619	These data suggest that changes in SR protein phosphorylation have a <b>&lt;role in the activation&gt;</b> of pre-mRNA splicing during early development.

	English	Japanese	Frq.	PubM_ID	Sample
62	involved in the activation	活性化に関わっている	54	11311165	We further show that separate elements are <b>&lt;involved in the activation&gt;</b> and maintenance of expression in the various precursor populations, reflecting the diversity of the signals that control myogenesis.
63	with activation	活性化と(で)～	241	10514426	Cells respond to environmental stress <b>&lt;with activation&gt;</b> of c-Jun N-terminal kinase (JNK) and p38.
64	with the activation	活性化と(で)～	131	9893997	Biological signal transduction starts <b>&lt;with the activation of&gt;</b> a receptor protein.
65	with activation of	～の活性化と(で)～	181		
66	with the activation of	～の活性化と(で)～	106		
67	associated with activation of	～の活性化に関係した	68	11073888	Increased resistance to myocardial ischemia in chronically hypoxic immature rabbit hearts is <b>&lt;associated with activation of&gt;</b> ATP-sensitive K(+) (K(ATP)) channels.
68	upon activation	活性化するやいなや	218	9649628	<b>&lt;Upon activation&gt;</b> of peripheral blood mononuclear cells, hnRNP C and nucleolin acquired APP mRNA binding activity, concurrent with APP mRNA stabilization.
69	upon activation of	～の活性化するやいなや	63	11056171	Increased acetylation of histones H3 and H4 is observed <b>&lt;upon activation of&gt;</b> these genes, but this increase is not dependent on transcription per se.
70	on activation	活性化対する～	187	10940295	Receptor-associated protein had no effect on apoJ levels or <b>&lt;on activation&gt;</b> by either dibutyryl cAMP or lipopolysaccharide.
71	on the activation	活性化に対する～	143	11032023	In the present studies, we have examined the effect of Sp1 <b>&lt;on the activation&gt;</b> of the human DNA polymerase beta (beta-pol), a TATA-less promoter.
72	on activation of	～の活性化に対する～	85	11055977	Activation of NF-kappaB is believed to be dependent <b>&lt;on activation of&gt;</b> the Rho family of GTPases.
73	on the activation of	～の活性化に対する～	113	10618376	IFNgamma's functions depend <b>&lt;on the activation of&gt;</b> STAT1, which stimulates transcription of IFNgamma-inducible genes through the GAS element.
74	dependent on activation of	～の活性化に依存した	44	11094078	The apoptotic response is <b>&lt;dependent on activation of&gt;</b> caspase 3.
75	after activation	活性化の後に～	176	10510367	To elucidate the basis of this effect, we surveyed cytokine RNA made by naive B cells <b>&lt;after activation&gt;</b> with anti-Ig and anti-CD40.
76	via activation of	～の活性化を経て	151	11994296	This finding raises the possibility that a number of the beneficial effects of the thiazolidinediones could be mediated <b>&lt;via activation of&gt;</b> AMPK.

	English	Japanese	Frq.	PubM_ID	Sample
77	during activation	活性化の間に～	85	12411317	Here we report that a dramatic down-regulation of CD43 mRNA levels occurs <b>&lt;during activation&gt;</b> of the leukocytic cell line K562.
78	from activation	活性化から～	60	11044391	Unlike these mutants, however, the defects in Gurken accumulation and karyosome formation do not result <b>&lt;from activation&gt;</b> of a meiotic checkpoint.
79	through activation	活性化を経て	256	12556381	These data suggest that both HGF and an EF augment the rate of CEC migration <b>&lt;through activation&gt;</b> of p42/44 MAPK.
80	through the activation	活性化を経て	122	10456945	We demonstrate that the induction of apoptosis by <i>L. pneumophila</i> in macrophages is mediated <b>&lt;through the activation of&gt;</b> caspase 3.
81	through the activation of	～の活性化を経て	113		
82	that the activation of	～の活性化が～であること	173	11431480	The results show <b>&lt;that the activation of&gt;</b> caspase-8, but not caspase-9, is necessary for Fas-induced apoptosis.
83	that activation of	～の活性化が～であること	763	10586054	Furthermore, we find <b>&lt;that activation of&gt;</b> the src-family tyrosine kinase, p56lck is an upstream mediator of lineage commitment.
84	suggest that activation of	～の活性化が～であることを示唆する	112	10661493	These data <b>&lt;suggest that activation of&gt;</b> M1 muscarinic receptors during an ischemic event may contribute to the development of subsequent pathology.
85	indicate that activation of	～の活性化が～であることを示す	78	9864180	These findings <b>&lt;indicate that activation of&gt;</b> the HIV-1 LTR in Jurkat T cells can be induced by H <sub>2</sub> O <sub>2</sub> released by neutrophils, particularly when PKC is concomitantly activated.
86	show that activation of	～の活性化が～であることを示す	64	11907212	In the work presented, we <b>&lt;show that activation of&gt;</b> the cellular kinase Akt alone can inhibit apoptosis in ts13 cells grown at the nonpermissive temperature.
87	demonstrate that activation of	～の活性化が～であると実証する	56	10779358	The latter observations <b>&lt;demonstrate that activation of&gt;</b> ARF6 down regulates Rho signaling.
88	requires activation	活性化を必要とする	70		
89	involves activation	活性化に関与する	68	11517280	Here we describe a third, independent pathway that <b>&lt;involves activation&gt;</b> of extracellular signal-regulated kinases (ERKs) 1 and 2.
90	inhibited the activation of	～の活性化を抑制した	55	11447088	Gadolinium <b>&lt;inhibited the activation of&gt;</b> HSF and decreased HSP72 mRNA level.
91	requires the activation of	～の活性化を必要とする	50	10786674	We now show that IL-6-induced AR-mediated gene activation <b>&lt;requires the activation of&gt;</b> STAT3 by IL-6 in LNCaP prostate cancer cells.
92	phosphorylation and activation of	～のリン酸化と活性化	142	11739517	PGN also induced <b>&lt;phosphorylation and activation of&gt;</b> Elk-1, a member of the Ets family of transcription factors.

	English	Japanese	Frq.	PubM_ID	Sample
93	activation is	活性化は、～である	938	10191326	The relationship between specific gustatory nerve activity and central patterns of taste-evoked neuronal <b>&lt;activation is&gt;</b> poorly understood.
94	activation was	活性化は、～であった	840	12034739	Furthermore, TGF-beta-induced Smad2 <b>&lt;activation was&gt;</b> unaffected by inhibition of hVPS34 activity with wortmannin or inhibitory anti-hVPS34 antibodies.
95	activation requires	活性化は、～を必要とする	109	10652090	Escape from these vacuoles is mediated in part by a bacterial phospholipase C (PC-PLC), whose <b>&lt;activation requires&gt;</b> cleavage of an N-terminal peptide.
96	activation occurs	活性化が起こる	67	10201991	In animals, T cells often die rapidly after activation, unless <b>&lt;activation occurs&gt;</b> in the presence of inflammatory factors.
97	activation domain	活性化ドメイン	544	9822634	Furthermore, a deletion mutant missing most of the <b>&lt;activation domain&gt;</b> is unable to inhibit CTD phosphatase activity.
98	activation domain of	～の活性化ドメイン	126	11160742	We show that dispersion of PML bodies by Z requires a portion of the transcriptional <b>&lt;activation domain of&gt;</b> Z but not the DNA-binding function.
99	transcriptional activation domain	転写活性化ドメイン	127	10758484	All three OBP proteins contain <b>&lt;transcriptional activation domains&gt;</b> in their C-terminal region.
100	the activation domain	活性化ドメイン	98		
101	activation loop	活性化ループ	257		
102	the activation loop	活性化ループ	149	9744865	Analysis of Kss1 mutants indicated that <b>&lt;the activation loop&gt;</b> of Kss1 controls binding to Ste12.
103	activation energy	活性化エネルギー	131	10611284	The <b>&lt;activation energy&gt;</b> for the 5, 6-shift is 2.5 kcal/mol lower than that for the 5,4-shift.
104	activation function	活性化機能	131	10986290	Here, we examine the contributions of ERalpha <b>&lt;activation functions&gt;</b> to the D351Y phenotype.
105	activation markers	活性化マーカー	101	11930312	Plasma levels of immune <b>&lt;activation markers&gt;</b> were elevated during the period of reduced plasma HIV RNA.
106	activation state	活性化状態	98	10358009	The <b>&lt;activation state&gt;</b> of beta-adrenergic receptors (beta-ARs) in vivo is an important determinant of hemodynamic status, cardiac performance, and metabolic rate.
107	activation mechanism	活性化メカニズム	87	9765268	This is the first evidence linking a structural domain of an integrin, in this case the I domain, with a particular <b>&lt;activation mechanism&gt;</b> .
108	activation pathway	活性化経路	73		
109	activation motif	活性化モチーフ	72		

	English	Japanese	Frq.	PubM_ID	Sample
110	activation that	～である活性化	116	10928995	Antibody-induced signal transduction by GPI-linked NS1 suggests a mechanism of cellular <b>&lt;activation that&gt;</b> may contribute to the pathogenesis of human dengue disease.
111	activation, which	活性化、そしてそれが～	114	10521445	These findings demonstrate for the first time that freshly fractured silica induces AP-1 <b>&lt;activation, which&gt;</b> may be mediated through p38 MAPK and ERK pathways.
112	activation-induced	活性化が誘導した～	265	10693762	We propose that CaMKII controls a distinct process of <b>&lt;activation-induced&gt;</b> cellular differentiation.
113	transcriptional activation	転写活性化	1,677	12529394	To dissect the precise role of nuclear factor 1 (NF1) in chromatin remodeling and <b>&lt;transcriptional activation&gt;</b> , we used linker-scanning mutants of transcription factor binding sites on the MMTV promoter.
114	the transcriptional activation	転写活性化	173		
115	transcriptional activation of	～の転写活性化	468		
116	the transcriptional activation of	～の転写活性化	92	11782467	The tumor suppressor p53 recruits the cellular coactivator CBP/p300 to mediate <b>&lt;the transcriptional activation of&gt;</b> target genes.
117	transcriptional activation by	～による転写活性化	197	12393887	<b>&lt;Transcriptional activation by&gt;</b> TFII-I was severely reduced by overexpression of HDAC3.
118	transcriptional activation in	～における転写活性化	87	10679065	The results implicate a p38 MAPK pathway in BCR-mediated CREB phosphorylation and junB <b>&lt;transcriptional activation in&gt;</b> B cell lymphomas.
119	transcriptional activation domain	転写活性化ドメイン	127	10758484	All three OBP proteins contain <b>&lt;transcriptional activation domains&gt;</b> in their C-terminal region.
120	-mediated transcriptional activation	～に仲介された転写活性化	104	11463377	Suppression of Fas expression by Stat3 and c-Jun is uncoupled from Stat3- <b>&lt;mediated transcriptional activation&gt;</b> .
121	-induced transcriptional activation	～に誘導された転写活性化	48	12419798	The cell-permeable calmodulin antagonist CGS9343B prevented estrogen- <b>&lt;induced transcriptional activation&gt;</b> by ER, without altering basal transcription.
122	-dependent transcriptional activation	～依存性の転写活性化	89	11694501	Expression of wild type or substrate-trapping mutant PTP1B inhibited interferon- <b>&lt;dependent transcriptional activation&gt;</b> .
123	in transcriptional activation	転写活性化における	92	11972789	The right promoter proximal arm also plays a role <b>&lt;in transcriptional activation&gt;</b> that is distinct from its role in AphB binding.
124	for transcriptional activation	転写活性化にとって	91	9499399	Here, we demonstrate that the HAT activity of Gcn5p is critical <b>&lt;for transcriptional activation&gt;</b> of target genes in vivo.

	English	Japanese	Frq.	PubM_ID	Sample
125	of transcriptional activation	転写活性化の～	64	10022878	The functional importance of tetramer formation is shown by the decreased levels <b>&lt;of transcriptional activation&gt;</b> associated with mutations in these residues.
126	cell activation	細胞活性化	1,234		
127	T cell activation	T細胞活性化	859	11733513	VHX expression was not induced by <b>&lt;T cell activation&gt;</b> , but decreased somewhat at later time points.
128	T cell activation in	～におけるT細胞活性化	62	9605117	Investigating very early <b>&lt;T cell activation in&gt;</b> mouse and human models of bacterial infection, we measured CD69 expression as an indicator of early cellular activation.
129	of T cell activation	T細胞活性化の～	106	12515820	Cytotoxic T lymphocyte-associated antigen 4 (CTLA-4) is an essential negative regulator <b>&lt;of T cell activation&gt;</b> .
130	in T cell activation	T細胞活性化における	83	9765301	These results support differential functions for PKCeta and PKCtheta <b>&lt;in T cell activation&gt;</b> .
131	for T cell activation	T細胞活性化にとって～	57	10662784	Calcium influx is critical <b>&lt;for T cell activation&gt;</b> .
132	B cell activation	B細胞活性化	84	11714772	<b>&lt;B cell activation&gt;</b> by the NK cell is contact-dependent and rapid, suggesting an autocrine B cell-regulated process.
133	endothelial cell activation	内皮細胞活性化	44	11330533	Passive transfer of IgG2b, but not IgG1 mAbs was associated with <b>&lt;endothelial cell activation&gt;</b> and plate.
134	NF-kappaB activation	NF-kappaBの活性化	919		
135	NF-kappaB activation in	～におけるNF-kappaBの活性化	106	11832459	These results help define the specific role of <b>&lt;NF-kappaB activation in&gt;</b> acute pancreatitis.
136	NF-kappaB activation by	～によるNF-kappaBの活性化	79	9751060	These subunits, IKK-alpha and IKK-beta, are protein kinases whose function is needed for <b>&lt;NF-kappaB activation by&gt;</b> pro-inflammatory stimuli.
137	-induced NF-kappaB activation	～に誘導されたNF-kappaBの活性化	158		
138	of NF-kappaB activation	NF-kappaBの活性化の～	97	10438474	Kinetic experiments determined that heat-induced inhibition <b>&lt;of NF-kappaB activation&gt;</b> in response to IR decayed within 5 h after heating.
139	receptor activation	受容体活性化	852	10601326	These results demonstrate that PRL <b>&lt;receptor activation&gt;</b> promotes the acute activation of PKC delta in luteinized rat granulosa cells.
140	NMDA receptor activation	NMDA受容体活性化	102	10393881	Downstream of <b>&lt;NMDA receptor activation&gt;</b> , spinal nitric oxide (NO.), protein kinase C, and other mediators have been implicated in maintaining such hyperalgesia.
141	of receptor activation	受容体活性化の～	61	9786899	The exodomain alone binds hormone with high affinity, whereas the endodomain is the site <b>&lt;of receptor activation&gt;</b> .

	English	Japanese	Frq.	PubM_ID	Sample
142	kinase activation	リン酸化酵素活性化	613	10786694	The inability of these mutant receptors to induce differentiation correlates with mitogen-activated protein <kinase activation>.
143	MAP kinase activation	MAPキナーゼ活性化	156	10871205	In turn, TGF-beta1 contributes to maintaining late p38 <MAP kinase activation>, which perpetuates fibronectin accumulation.
144	protein kinase activation	タンパク質リン酸化酵素活性化	107	10786694	The inability of these mutant receptors to induce differentiation correlates with mitogen-activated <protein kinase activation>.
145	ERK activation	細胞外シグナル制御キナーゼ活性化	477	11296227	In cells derived from both the raf-1(-/-) and raf-1(FF/FF) mice, <ERK activation> is normal.
146	caspase activation	カスパーゼ活性化	410	11099484	Our results suggest that HIV activates the p53 pathway, leading to cytochrome c and AIF release with ensuing <caspase activation>.
147	gene activation	遺伝子活性化	368	11118216	<Gene activation> in the pituitary is paralleled by acetylation of a 32 kb chromatin domain 5' to the cluster centered at HSI,II.
148	MAPK activation	MAPキナーゼ活性化	357	10601276	Inhibition of the <MAPK activation> by PD98059, however, did not affect IGF-I-stimulated IGFBP-5 expression.
149	transcription activation	転写活性化	252	11278661	<Transcription activation> by steroid hormone receptors, such as the androgen receptor, is mediated through interaction with cofactors.
150	platelet activation	血小板活性化	215	11110698	Lyn plays an additional role in inhibiting <platelet activation> through an uncharacterized inhibitory pathway.
151	channel activation	チャネル活性化	204	10623810	Neither phosphatase inhibitors nor nonhydrolyzable nucleotide analogues modified CRAC <channel activation>.
152	promoter activation	プロモータ活性化	181	10580007	However, methylation does not affect enhancer-mediated <promoter activation> over a distance of 150 bp.
153	trans-activation	トランス活性化	159	11314030	Deletion analysis of c-Crk II also revealed the presence of a C-terminal segment important for <trans-activation> of FAK.
154	G-protein activation	Gタンパク質活性化	123	10534074	This region of the FMLP receptor has recently been shown to play a role in ligand binding and <G-protein activation>.
155	PKC activation	プロテインキナーゼC活性化	155	11027216	With SERTs, <PKC activation> results in activity-dependent transporter phosphorylation and sequestration.
156	macrophage activation	マクロファージ活性化	111	11859133	<Macrophage activation> is accompanied by the activation of a variety of proteases.
157	integrin activation	インテグリン活性化	109	11304543	Previous evidence suggests that interactions between integrin cytoplasmic domains regulate <integrin activation>.
158	-induced activation	~に誘導された活性化	690		

	English	Japanese	Frq.	PubM_ID	Sample
159	-mediated activation	～に仲介された活性化	573		
160	sustained activation	持続性の活性化	127	10364425	These indications of deregulated signalling in the absence of tyrosine 118 were substantiated by <b>&lt;sustained activation&gt;</b> of STAT3.
161	-dependent activation	～依存性活性化	563		
162	constitutive activation	構成的活性化	292	11157491	However, the <b>&lt;constitutive activation&gt;</b> of ras and FGFR3 does not occur in the same myeloma cells.
163	cellular activation	細胞活性化	137	10559223	The data suggest a role for the native protein in <b>&lt;cellular activation&gt;</b> by these ligands.
164	specific activation	特異的活性化	108	11120746	IGF-I elicited IGF-I receptor tyrosine phosphorylation, resulting in the <b>&lt;specific activation&gt;</b> of G(i2).
165	immune activation	免疫活性化	104	10515800	Recent reports have demonstrated <b>&lt;immune activation&gt;</b> in dengue hemorrhagic fever (DHF) by cytokine and soluble receptor detection in blood.
166	maximal activation	最大活性化	95	11340081	All three Nck SH3 domains are required for <b>&lt;maximal activation&gt;</b> .
167	synergistic activation	相乗的活性化	87	11948188	Interestingly, co-transfection of either PITX2A or PITX2C with PITX2B results in a <b>&lt;synergistic activation&gt;</b> of the PLOD1 and Dlx2 promoters.
168	selective activation	選択的活性化	87	11102505	<b>&lt;Selective activation&gt;</b> of each projection neuron elicits different rhythms from the STG.
169	direct activation	直接的活性化	87	10514440	<b>&lt;Direct activation&gt;</b> of protein kinase C also rapidly increased RGS2 mRNA levels.
170	-independent activation	～非依存生活活性化	84		
171	full activation	完全な活性化	84	11085506	Furthermore, phosphorylation of T68 was required for <b>&lt;full activation&gt;</b> of Chk2 after IR.
172	transient activation	一過性の活性化	84	11856735	Irradiation stimulated a <b>&lt;transient activation&gt;</b> of NOS with maximal activity at 5 min of post-irradiation.
173	subsequent activation of	～の引き続いた活性化	88	12459015	Inhibition of antigen presentation, and the <b>&lt;subsequent activation of&gt;</b> T-cells, should, in theory, modulate the immune response.
174	rapid activation of	～の急速な活性化	78	11391526	Liver regeneration following 70% partial hepatectomy leads to <b>&lt;rapid activation of&gt;</b> genes in the remnant liver.
175	upon activation of	～の活性化するやいなや	63	11877449	GLM-R is specifically expressed on CD14-positive cells and is up-regulated more than 50-fold <b>&lt;upon activation of&gt;</b> those cells.

	English	Japanese	Frq.	PubM_ID	Sample
	active*	活性のある	16,810		
	active	活性のある	16,800		
	actives	活性のあるもの	10		
<b>Note</b>	直前に副詞を伴う用例が多い。				
1	active in	～において活性のある	774	10385623	The CTD phosphatase was found to be <active in> ternary elongation complexes.
2	active as	～としての活性のある	138	12004064	To be <active as> isomerases, DsbC and DsbG must be kept reduced.
3	as active as	～と同じぐらいの活性のある	50	11344567	Fc fragments of IgG were <as active as> IgG1, whereas Fab fragments were inactive.
4	active against	～に対する活性	136	11865402	Quinolones were <active against> the bacterial enteropathogens in the 3 sites.
5	active at	～における活性のある	125	11279010	This enzyme is not a lysosomal alpha-mannosidase because it is not <active at> acidic pH and it is localized in the Golgi apparatus.
6	active on	～において活性のある	84	12230583	Synthetic replicates of each novel bradykinin were found to be <active on> mammalian arterial and small intestinal smooth muscle preparations.
7	active during	～の間に活性のある	78	11222656	We hypothesized that orexin neurons should be relatively <active during> wakefulness and inactive during sleep.
8	active than	～よりも活性のある	195	10329122	In C6/36 cells, the actin 5C and hr5-ie1 promoters were significantly more <active than> the hsp70 promoter.
9	constitutively active	構成的に活性のある	1,147	12239304	Mutation of the ZV repressor sequence greatly increased the induction of the promoter but did not make it <constitutively active>.
10	biologically active	生物学的に活性のある	351	10051576	This approach provides a way to modulate the potency and specificity of <biologically active> compounds.
11	highly active	高度に活性のある	309	9880569	Bacterially expressed P69 was inactive whereas the same protein expressed in insect cells was <highly active>.
12	more active	もっと活性のある	279	11606654	OFF RGCs become spontaneously <more active> compared with ON cells, resulting in a decrease in synchronous activity between these cell types.
13	catalytically active	触媒的に活性のある	272	12379105	The transporter (GluT1.HA.H6) is expressed at the surface of both cell-types and is <catalytically active>.
14	transcriptionally active	転写的に活性のある	238	10485466	However, this vector-induced p53 is <transcriptionally active> and, therefore, p53 function is not inactivated by viral proteins.
15	most active	もっとも活性のある	176	11431361	Hyaluronan synthase 3 (HAS3) is responsible for the production of both secreted and cell-associated forms of hyaluronan and is the <most active> of the three isoforms of this enzyme in adults.
16	less active	より活性の無い	166	11970949	The hybrids were defective in transcriptional activator assembly and <less active> transcriptionally.
17	enzymatically active	酵素的に活性のある	144	11526108	As a result, none of the alternative transcripts encode an <enzymatically active> protein.
18	functionally active	機能的に活性のある	141	10713699	Furthermore, RNA levels for NF-kappa B-activated genes were analysed in order to determine if NF-kappa B is <functionally active> in human breast cancer.
19	fully active	十分に活性のある	136	11756449	The heme in the E375D mutant is only partially covalently bound, but exposure to H(2)O(2) results in complete covalent binding and a <fully active> protein.
20	of active	活性のある～の～	942	10442635	These structures are associated with sites <of active> matrix degradation.

	English	Japanese	Frq.	PubM ID	Sample
21	expression of active	活性のある～の発現	45	12464682	<Expression of active> C1beta3Gal-T in Hi-5 insect cells requires coexpression of Cosmc.
22	levels of active	活性のある～のレベル	42	10720419	In an effort to establish a causal role of TGF-beta(1) in this process, transgenic mice with elevated <levels of active> myocardial TGF-beta(1) were generated.
23	presence of active	活性のある～の存在	41	9566886	These results suggest that in the <presence of active> NER, TFIIH is preferentially mobilized from the basal transcription machinery for use in NER.
24	the number of active	活性のある～数	34	12588976	Genes encoding rRNA are multicopy and thus could be regulated by changing <the number of active> genes or by changing the transcription rate per gene.
25	with active	活性のある～と～(を持つ)	318	12508143	Absolute numbers of mDCs and pDCs were lower in HIV-1-infected subjects than in control subjects, most significantly in those <with active> HIV-1 replication.
26	patients with active	活性のある～を持つ患者	127	12032325	However, lack of skin induration to intradermal injection of PPD or PPD anergy is observed in a subset of <patients with active> tuberculosis (TB).
27	associated with active	活性のある～と関連する	27	10988099	In conclusion, eosinophilic bronchitis is <associated with active> airway inflammation with increased release of vasoactive and bronchoconstrictor mediators.
28	in active	活性のある～において	161	10079101	CXCR3, an IP-10/Mig receptor, was expressed on lymphocytic cells in virtually every perivascular inflammatory infiltrate <in active> MS lesions.
29	to active	活性のある～へ	125	9651171	Reduction of the carbonyl groups linking the first three residues of the tetrapeptide leads <to active> inhibitors which are chemically unstable.
30	for active	活性のある～にとって	116	11095598	Single-dose oral azithromycin was a more effective treatment <for active> trachoma than tetracycline ointment as applied by caregivers.
31	as active	活性のある～として	100	12618436	Homodimer formation may be necessary for ADAR to act <as active> deaminases.
32	as active as	～と同じぐらいの活性のある	51	12166940	Amides were <as active as> esters but were more toxic in tissue culture.
33	by active	活性のある～にとって	80	11854324	One notable difference from GN induced <by active> immunization was a T cell infiltration in the renal interstitium, which affected some tubules.
34	during active	活性のある～の間	71	10869419	<During active> exploration, hippocampal neurons exhibit nested rhythmic activity at theta ( approximately 8 Hz) and gamma ( approximately 40 Hz) frequencies.
35	is active	～は、活性がある	310	12023281	TGF-beta is up-regulated during liver regeneration, although it is not known whether it <is active> or latent.
36	are active	～は、活性がある	175	11226310	Interestingly, all strain-specific R-M genes <are active>, whereas most shared genes are inactive.
37	was active	～は、活性があった	141	12393668	The Flt-1 transgene <was active> in the endothelium of tumor xenografts, whereas the VWF promoter was not.
38	be active	～は、活性がある	99	12029058	To our knowledge, Amt proteins are the first hyperthermophilic membrane transport proteins shown to <be active> in a mesophilic bacterium.
39	were active	～は、活性があった	97	9860866	The refolded proteases <were active> and exhibited nearly identical enzymatic activities.
40	redox-active	酸化還元活性のある	169	9482863	Control experiments show that these oxidation reactions do not involve the <redox-active> tyrosines, D and Z.
41	its active	その活性	142	10446876	We evaluated all formulations of vitamin D, including <its active> metabolites and analogs.

	English	Japanese	Frq.	PubM ID	Sample
42	active site	活性部位	4,326	12519775	Within this domain, we have identified by sequence homology the critical <b>&lt;active site&gt;</b> cysteine predicted to be chemically modified as a formylglycine in vivo.
43	the active site	活性部位	2,497	9564029	Assembly of the dimer juxtaposes <b>&lt;the active site&gt;</b> clefts of the monomers, suggesting a functionally important interaction between the catalytic centers.
44	an active site	活性部位	215	11563923	This suggests that hydrophobic interactions with <b>&lt;an active site&gt;</b> on the channel are probably not the main determinants of activity.
45	of active site	活性部位の ~	90	12060740	A formamide molecule was modeled into the system to mimic the function <b>&lt;of active site&gt;</b> residue Asn-105.
46	enzyme active site	酵素の活性部位	94	10581550	In this structure a malate-like molecule is trapped in the <b>&lt;enzyme active site&gt;</b> .
47	active sites	活性部位	417	11148032	The <b>&lt;active sites&gt;</b> of Mg(II)-dependent nucleases feature a cluster of conserved charged residues which includes both acidic (Asp and Glu) and basic (Lys) side chains.
48	the active sites	活性部位	135	10926511	Overall, we find that expansion segments within the large subunit rRNA have been incorporated at positions distinct from <b>&lt;the active sites&gt;</b> for protein synthesis and translocation.
49	active form	活性型	403	10931345	Transfection of HeLa cells with a vector that produces a constitutively <b>&lt;active form&gt;</b> of RhoA (RhoA-V14) prevented the disruption of actin filaments and cell rounding by YopE.
50	the active form	活性型	107	10944122	These studies suggest that <b>&lt;the active form&gt;</b> of preprotein translocase is monomeric SecYEG.
51	an active form	活性型	45	11850846	<b>&lt;An active form&gt;</b> of PI3K promotes E2F transcriptional activity in lymphoblastoid cell lines.
52	active forms	活性型	103	10067990	In addition, the <b>&lt;active forms&gt;</b> of these enzymes were present in the membranes, whereas there was no detectable level of the active forms in normal retinas.
53	highly active antiretroviral therapy	高活性抗レトロウイルス療法	160	10491418	Therapeutic intervention with <b>&lt;highly active antiretroviral therapy&gt;</b> (HAART) can lead to suppression of HIV-1 plasma viremia to undetectable levels for 3 or more
54	active enzyme	活性酵素	145	9786849	Replacement of Ser-107 with alanine yielded an <b>&lt;active enzyme&gt;</b> with kinetic characteristics similar to those of wild-type APS kinase.
55	active conformation	活性のある高次構造	126	11118446	The <b>&lt;active conformation&gt;</b> of these enzymes has not yet been described.
56	the active conformation	活性のある高次構造	45	9705286	Agonists stabilize <b>&lt;the active conformation&gt;</b> , whereas antagonists stabilize the inactive conformation.
57	active center	活性中心	100	12408829	Each elementary step of transcription involves translocation of the 3' terminus of RNA in the RNA polymerase <b>&lt;active center&gt;</b> , followed by the entry of a nucleoside triphosphate.
58	the active center	活性中心	67	12426102	Furthermore, this study indicates that <b>&lt;the active center&gt;</b> of the Hermes transposase differs from the proposed DSE motif.
59	active mutant	活性のある変異体	97	11997521	The constitutively <b>&lt;active mutant&gt;</b> of SHP-2 induces hyper-tyrosyl phosphorylation of FRS-2 alpha but fails to stimulate or potentiate either FGF-2-induced Erk activation or Elk-1 transactivation.
60	active role	能動的な役割	88	11784052	However, little is known about the assembly of embryonic nicotinic receptor subunits into functional receptors or whether they play an <b>&lt;active role&gt;</b> in cortical development.

	English	Japanese	Frq.	PubM ID	Sample
61	an active role	能動的な役割	73	12538690	<An active role> of T regulatory cells (Treg) and tolerogenic dendritic cells (Tol-DC) is believed important for the induction and maintenance of transplantation tolerance.
62	active caspase	活性のあるカスパーゼ	82	11756504	<Active caspase>- 3 was subsequently increased, and 85% of the hippocampal CA1 neurons showed apoptotic DNA damage 3 d after ischemia.
63	active state	活性状態	78	10651639	The cooperative stimulation at low concentration indicated the presence of a time-dependent assembly step that preceded the <active state>.
64	active zone	活性領域	75	12441054	Docked vesicles were depleted 60%-80% regardless of their distance from the <active zone>.
65	active metabolite	活性のある代謝産物	66	10733585	Acetaldehyde, the major <active metabolite> of alcohol, is known to stimulate alpha(I) collagen production in HSC.
66	active transport	能動輸送	65	11781333	Thus, secretory vesicle polarization is achieved through <active transport> by a myosin-V, and the motor mechanism is consistent with the lever arm model.

	English	Japanese	Frq.	PubM_ID	Sample
	activity*	活性	68,567		
	activities	活性	6,694		
<b>Note</b>	不可算名詞としての用例が多いが、複数形の用例も少なくない。				
1	the activity	活性	4,222		
2	an activity	活性	176		
3	activity of	～の活性	10,197	9694794	Growth inhibitory <b>&lt;activity of&gt;</b> RB is attenuated by phosphorylation.
4	activities of	～の活性	1,955	12037665	In parallel, recombinant maspin did not directly regulate the proteolytic <b>&lt;activities of&gt;</b> either caspase-3 or caspase-8 in vitro.
5	the activity of	～の活性	3,094	9482897	Translation termination factor eRF3 enhances <b>&lt;the activity of&gt;</b> release factor eRF1 (Sup45p).
6	the activities of	～の活性	524	10807786	Interleukin (IL)-12 plays a critical role in modulating <b>&lt;the activities of&gt;</b> natural killer (NK) cells and T lymphocytes.
7	activity in	～における活性	5,895	11595805	When a detailed time-course analysis of BAMT <b>&lt;activity in&gt;</b> upper and lower petal lobes during a 48-hr period was performed, high BAMT activity was found at night as well as in continuous darkness, indicating that the BAMT activity is not an oscillation-determining factor.
8	activities in	～における活性	459	9657524	These results indicate that TR1 has broad biological <b>&lt;activities in&gt;</b> fibroblast growth and in osteoclast differentiation and its functions.
9	activity in @4 cells	～細胞における活性	877	11854406	We have developed an assay that directly measures Rad3 kinase <b>&lt;activity in cells&gt;</b> expressing physiological levels of the protein.
10	activity of @4 in	～の～における活性	1,096	11901234	Unexpectedly, this toxin was also shown to inhibit voltage-gated calcium channel <b>&lt;activity in mammalian cells&gt;</b> .
11	the activity of @4 in	～の～における活性	361	9671810	These results provide direct biochemical evidence for the catalytic <b>&lt;activity of the hairpin ribozyme in&gt;</b> a cellular environment, and indicate that self-processing ribozyme transcripts may be well suited for cellular RNA-inactivation experiments.
12	of activity in	～における～の活性	104	12388600	In this study, we used calcium imaging to evaluate patterns <b>&lt;of activity in&gt;</b> individual, embryonic, GnRH-1 neurons as well as population dynamics of GnRH-1 neurons in mouse nasal explants maintained for 1 versus 3 weeks.
13	activity by	～によって～活性を～した / ～倍(パーセント)～活性を～した	1,203	12576334	Our results indicate that inhibition of BCR/ABL tyrosine kinase <b>&lt;activity by&gt;</b> imatinib mesylate does not eliminate malignant primitive progenitors in CML patients.
14	activity against	～に対する活性	571	10727935	The rproRIP1 had no detectable enzymatic <b>&lt;activity against&gt;</b> ribosomes from any of the species assayed.
15	activity as	～としての活性	562	10562313	Treatment with MIF overcame p53 activity in three different biological assays, and suppressed its <b>&lt;activity as&gt;</b> a transcriptional activator.
16	activities as	～としての活性	51		
17	activity at	～における(温度、時間など)活性	471	10960102	GghA purified from <i>T. neapolitana</i> is a 52.5-kDa family 1 glycosyl hydrolase with optimal <b>&lt;activity at&gt;</b> pH 6.5 and 95 degrees C.

	English	Japanese	Frq.	PubM_ID	Sample
18	activity on	～に対する活性	444	9927729	These results provide in vitro evidence for a second function of XPG protein in DNA repair and a mechanistic basis for its stimulatory <b>&lt;activity on&gt;</b> HsNTH protein.
19	activities on	～に対する活性	51		
20	activity of @3 on	～の～に対する活性	137		
21	activity for	～にとっての活性 / ～の活性	434	11700989	This nonelectrophoretic technique is a rapid assay of DNA glycosylase <b>&lt;activity for&gt;</b> both purified proteins and crude extracts.
22	activities for	～にとっての活性 / ～の活性	56		
23	activity during	～の間の活性	338	11882899	Several reports have shown short-term changes in single hippocampal unit <b>&lt;activity during&gt;</b> memory and plasticity experiments, but there has been no experimental demonstration of long-term persistent changes in neuronal activity in any region except primary cortical areas.
24	activity toward	～に対する活性	228	11243793	Characterization of the H71A and H71Q mutants of EcoRV now demonstrates that these distal Mn(2+) sites significantly modulate <b>&lt;activity toward&gt;</b> both cognate and non-cognate DNA substrates.
25	activity from	～からの活性	206	10102266	Biochemical purification of the <b>&lt;activity from&gt;</b> calf brain extracts led to the identification of an amino-terminal fragment of Slit2 as the main active component and to the discovery of a distinct activity that potentiates its effects.
26	of activity	活性の～	842	12069614	None of the other subunits were modified more than 5% and could not account for the observed loss <b>&lt;of activity&gt;</b> .
27	of activity in	～における活性の～	104	10539739	The asymmetric pattern <b>&lt;of activity in&gt;</b> the dorsolateral prefrontal cortex and superior temporal gyrus may contribute to the taste perception of a liquid meal perceived as pleasant.
28	of activity of	～の活性の～	58	9557720	It is also one of the first in vivo demonstrations <b>&lt;of activity of&gt;</b> a retrovirus encoding an integrase chimera.
29	in activity	活性(における)の～	381	10809761	Top1N726S and Top1N726D mutant proteins were resistant to camptothecin, although the Ser mutant was distinguished by a lack of detectable changes <b>&lt;in activity&gt;</b> .
30	for activity	活性にとって～	331	11418565	Chemical modification of the wild-type enzyme by 2,3-butanedione and substrate protection by CoA indicated that at least one reactive arginine is in the active site and is important <b>&lt;for activity&gt;</b> .
31	activity that	～である活性	677	11799122	It has been proposed that EnvZ phosphatase is the <b>&lt;activity that&gt;</b> is regulated by osmolarity.
32	activity which	～である活性	350	11382407	H(2)O(2) also caused a time-dependent increase in HSF-1 DNA binding <b>&lt;activity which&gt;</b> was similar in all cell lines.
33	activity was	活性が～であった	3,238	10588869	The promoter <b>&lt;activity was&gt;</b> robust and consistent in independent transgenic lines.

	English	Japanese	Frq.	PubM_ID	Sample
34	activity was observed	活性が観察された	177	10542232	No agonistic <b>&lt;activity was observed&gt;</b> in breast cells, whereas all antiestrogens, particularly tamoxifen, exhibited agonistic effects in uterine cell lines.
35	activity was detected	活性が検出された	131	11607079	GUS <b>&lt;activity was detected&gt;</b> only in the phloem cells but not in any other cell types of vegetative tissues.
36	activity was inhibited	活性が抑制された	119	12417583	The enzyme <b>&lt;activity was inhibited&gt;</b> by the antibiotics, diumycin and moenomycin, but not by a number of other antibiotics or trehalose analogs.
37	activity was measured	活性が測定された	106	11375951	PKC-delta <b>&lt;activity was measured&gt;</b> in situ using a PKC-delta-specific substrate.
38	activity is	活性が～である	2,541	9708818	Lack of angiogenic <b>&lt;activity is&gt;</b> not due to an antiangiogenic factor(s) in the medium of these cells.
39	activity is required for	活性が～に必要とされる	151	10648598	These data suggest that TAF(II)250 acetyltransferase <b>&lt;activity is required for&gt;</b> cell cycle progression and regulates the expression of essential proliferative control genes.
40	activity is regulated	活性が調節される	111	11425317	This study was designed to test the hypothesis that MnSOD-BP <b>&lt;activity is regulated&gt;</b> by phosphorylation.
41	activity is essential for	活性が～に不可欠である	63	9891046	Therefore, tight control of PKR <b>&lt;activity is essential for&gt;</b> regulated cell growth.
42	activities were	活性が～であった	342	11581206	Enzymatic assays revealed that the distribution patterns of PP-1 and -2A <b>&lt;activities were&gt;</b> similar to those of PP-1cs and -2Acs proteins.
43	activities are	活性が～である	232	11948188	PITX2 isoform <b>&lt;activities are&gt;</b> both promoter- and cell-specific, and our data reveal new mechanisms for PITX2-regulated gene expression.
44	activity has been	活性が～ずっとである	129	11102492	In the motor cortex, oscillatory <b>&lt;activity has been&gt;</b> reported at a variety of frequencies between approximately 4 and approximately 60 Hz.
45	kinase activity	キナーゼ活性	2,839		
46	kinase activity of		264	10967116	The IR activators stimulated tyrosine <b>&lt;kinase activity of&gt;</b> partially purified native IR and recombinant IR tyrosine kinase domain.
47	kinase activity in	～におけるキナーゼ活性	219	10497214	Also, the PITSLRE protein <b>&lt;kinase activity in&gt;</b> A375 anti-Fas-treated cells preceded maximal levels of apoptosis.
48	kinase activity by		50	11731435	Inhibition of p38 <b>&lt;kinase activity by&gt;</b> the specific inhibitor SB203580 did not affect the induction of apoptosis by MX2870-1.
49	tyrosine kinase activity	チロシンキナーゼ活性	241	11673478	<b>&lt;Tyrosine kinase activity&gt;</b> is known to be important in neuronal growth cone guidance.
50	protein kinase activity	プロテインキナーゼ活性	214	10222008	An improved quantitative assay for measuring <b>&lt;protein kinase activity&gt;</b> is crucial to the detailed study of this important category of signaling proteins and their role in regulating cell behavior.
51	MAP kinase activity	MAPキナーゼ活性	93	9622158	<b>&lt;MAP kinase activity&gt;</b> was measured by in-gel kinase assays and Western blot analysis.
52	kinase activities	キナーゼ活性	159		

	English	Japanese	Frq.	PubM_ID	Sample
53	promoter activity	プロモータ活性	1,857		
54	promoter activity in	～におけるプロモータ活性	333	10497275	In contrast, replacement of the LBP1-like site increased activity only in fibroblasts, suggesting that this site is responsible in part for repression of <b>&lt;promoter activity in&gt;</b> fibroblasts.
55	promoter activity in @4 cell	～細胞におけるプロモータ活性	128	9545340	The <b>&lt;promoter activity in the corneal cells&gt;</b> was repressed when Sp1 was coexpressed.
56	promoter activity by	～によるプロモータ活性	99	10964912	Furthermore, expression of dominant negative Smad3 or Smad4 in cells decreased or abolished the stimulation of beta(5) <b>&lt;promoter activity by&gt;</b> TGF-beta.
57	promoter activity of	～のプロモータ活性	65	9593301	Deletion of these sites eliminated approximately 75% and 45% of the induced <b>&lt;promoter activity of&gt;</b> the phoA and pstS promoters respectively.
58	ATPase activity	ATP酵素活性	970		
59	ATPase activity of	～のATP酵素アーゼ活性	210		
60	the ATPase activity of	～のATP酵素アーゼ活性	145	11514555	We measured <b>&lt;the ATPase activity of&gt;</b> these isoforms expressed in Sf9 cells.
61	ATPase activity in	～におけるATP酵素アーゼ活性	62	11722737	Mutation of the N-terminal Walker A box (K214Q) caused a drastically decreased <b>&lt;ATPase activity in&gt;</b> vitro, but did not interfere with MecA binding.
62	enzyme activity	酵素活性	909		
63	enzyme activity in	～における酵素活性	69		
64	enzyme activities	酵素活性	132		
65	phosphatase activity	ホスファターゼ活性	493		
66	telomerase activity	テロメラーゼ活性	399	9546436	Variation in <b>&lt;telomerase activity&gt;</b> is correlated with cellular senescence and tumour progression.
67	binding activity	結合活性	1,797		
68	binding activity of	～の結合活性	334	11532945	Furthermore, FKBP25 can alter the DNA- <b>&lt;binding activity of&gt;</b> YY1.
69	binding activity in	～における結合活性	124		
70	DNA binding activity	DNA結合活性	777		
71	DNA binding activity of	～のDNA結合活性	165	12091392	Moreover, <b>&lt;DNA binding activity of&gt;</b> Bis IX was prevented by actinomycin D, suggesting that actinomycin D and Bis IX have similar mechanisms of interaction with DNA.
72	RNA binding activity	RNA結合活性	98		
73	binding activities	結合活性	172		
74	binding activities of	～の結合活性	53	10551840	Electrophoretic mobility shift assays showed that the <b>&lt;binding activities of&gt;</b> the transcription factor Egr-1, but not Sp1, were markedly elevated in response to these lipoproteins.
75	transcriptional activity	転写活性	1,348		
76	transcriptional activity of	～の転写活性	450		

	English	Japanese	Frq.	PubM_ID	Sample
77	the transcriptional activity of	～の転写活性	292	9660950	<The transcriptional activity of> NF-kappa B is stimulated upon phosphorylation of its p65 subunit on serine 276 by protein kinase A (PKA).
78	transcriptional activity in	～における転写活性	96		
79	transcriptional activities	転写活性	100		
80	transcriptional activities of	～の転写活性	51	9547335	Moreover, the <transcriptional activities of> these cytokine genes were severely reduced in FcepsilonRI-stimulated btk mutant mast cells.
81	catalytic activity	触媒活性	999		
82	catalytic activity of	～の触媒活性	283		
83	the catalytic activity of	～の触媒活性	202	10801853	However, inactivation of <the catalytic activity of> factor XIIa did not affect the inhibition of thrombin-induced platelet aggregation.
84	enzymatic activity	酵素活性	815		
85	enzymatic activity of	～の酵素活性	151	12454020	Cltx exerts a dual effect on MMP-2: it inhibits the <enzymatic activity of> MMP-2 and causes a reduction in the surface expression of MMP-2.
86	enzymatic activity in	～における酵素活性	50		
87	enzymatic activities	酵素活性	145		
88	biological activity	生物学的活性	511		
89	biological activity of	～の生物学的な活性	166		
90	the biological activity of	～の生物学的な活性	105	11929540	To study <the biological activity of> the ShdA protein, we examined its expression and binding activity.
91	biological activities	生物学的活性	239		
92	biological activities of	～の生物学的活性	84	9927187	These <biological activities of> NDF and its stimulation of cell proliferation are blocked by a specific inhibitor of COX-2.
93	specific activity	比活性	478		
94	specific activity of	～の比活性	160	11872720	The <specific activity of> this enzyme increased with increasing oxygen tension.
95	specific activities	比活性	110		
96	specific activities of	～の比活性	45	12234469	The <specific activities of> BCAT in homogenates of selected rat tissues obtained by this method are comparable to those obtained previously by the radiochemical procedure.
97	inhibitory activity	抑制活性	496		
98	inhibitory activity of	～の抑制活性	140		
99	channel activity	チャネル活性	521	10727240	The <inhibitory activity of> IRI was prevented by pretreatment with aryl sulfatase, suggesting the presence of a critical sulfo ester in IRI.
100	channel activity in	～におけるチャネル活性	73	9851975	These relationships led us to investigate the possibility of defective ion <channel activity in> AT cells.
101	physical activity	身体活動性	491	11509056	<Physical activity> appears to decrease the risk of pancreatic cancer, especially among those who are overweight.
102	neuronal activity	ニューロンの活性	358	12458206	These data demonstrate that the Na,K-ATPase alpha2 isoform could be important in the modulation of <neuronal activity> in the neonate.

	English	Japanese	Frq.	PubM_ID	Sample
103	reduced @2 activity	～活性を低下させた / 低下した～活性	714		
104	reduced @2 activity of	～の～活性を低下させた / 低下した～の～活性	105	10806201	This increase may be an attempt to compensate for <b>&lt;reduced activity of&gt;</b> the pathway with age.
105	reduced @2 activity in	～における～活性を低下させた / ～における低下した～活性	86	10523626	Mutants in this region have <b>&lt;reduced activity in&gt;</b> transcription, but none are inactive.
106	decreased @2 activity	～活性を低下させた / 低下した～活性	405		
107	decreased @2 activity of	～の～活性を低下させた / 低下した～の～活性	64	9662337	The <b>&lt;decreased activity of&gt;</b> the c-fos promoter in tumorigenic 1170I cells appeared to involve suppression through a CRE site and reduced activation by JNK-dependent pathways.
108	decreased @2 activity in	～における～活性を低下させた / ～における低下した～活性	49		
109	enhanced @2 activity	～活性を増強した / 増強された～活性	410		
110	enhanced @2 activity of	～の～活性を増強した / 増強された～の～活性	91		
111	elevated @2 activity	～活性を上昇させた / 上昇した～活性	142	9915795	GATA-6 strongly <b>&lt;enhanced activity of&gt;</b> the human TTF-1 gene promoter in vitro.
112	stimulated @2 activity	刺激された～活性	506	11486011	Together, these findings indicate that the inositol auxotrophy of snf1Delta strains arises in part from <b>&lt;elevated Acc1 activity&gt;</b> and that a reduction in this activity restores INO1 expression in these strains.
113	stimulated @2 activity of	刺激された～の～活性	77	11371635	Despite its obvious importance for carcinogenesis, the role of Gln-61 in the GAP- <b>&lt;stimulated GTPase activity of&gt;</b> Ras has remained a mystery.
114	stimulated @2 activity in	刺激された～における～活性	76	10864938	AC8 KO mice demonstrate a compromise in calcium- <b>&lt;stimulated AC activity in&gt;</b> the hippocampus, hypothalamus, thalamus, and brainstem.
115	induced @2 activity	誘導された～活性	486		
116	induced @2 activity of	誘導された～の～活性	59	11579107	In contrast to Dictyostelium MIHCK, however, Ca(2+)-calmodulin also inhibits Rac- <b>&lt;induced activity of&gt;</b> Acanthamoeba MIHCK.
117	induced @2 activity in	誘導された～における～活性	58	11283230	In conclusion, somatostatin can inhibit glucose- <b>&lt;induced electrical activity in&gt;</b> MIN-6 cells by the combined activation of K-ATP and GIRK channels.
118	mediated @2 activity	仲介された～活性	203	12114525	Of these receptors, CAR substantially inhibited ER- <b>&lt;mediated transcriptional activity&gt;</b> of the vitellogenin B1 promoter as well as a synthetic estrogen responsive element (ERE)-containing promoter.
119	showed @2 activity	～活性を示した	345		

	English	Japanese	Frq.	PubM_ID	Sample
120	showed @2 activity in	～における～活性を示した	66	11278322	None of these PCs <showed activity in> the processing of the lefty polypeptide to the 28-kDa lefty form.
121	inhibited @2 activity	～活性を抑制した	344		
122	inhibited @2 activity of	～の～活性を抑制した	91	12482958	Recombinant Pdc4 specifically <inhibited the helicase activity of> eIF4A and eIF4F.
123	inhibited @2 activity in	～における～活性を抑制した	52	10330182	In contrast, Sp100 fused to the GAL4 DNA-binding domain <inhibited CAT activity in> transfected mammalian cells.
124	demonstrated @2 activity	～活性を実証した	163	11500513	Cell adhesion assays also <demonstrated enhanced functional activity> of constructs containing FIII8.
125	associated @2 activity	～と関係した～活性	285	11695910	The human endonuclease III (hNTH1) is an important DNA glycosylase with <associated abasic lyase activity>.
126	associated with @2 activity	～活性と関連がある	130		
127	required for @2 activity	～活性を必要とする	438		
128	required for @2 activity of	～の～活性を必要とする	67	9774673	Studies of loss-of-function mutations in ct and dri demonstrate that both genes are <required for the activity of> the AT2 site.

## Note

1. As the number (5) in the title “Collocational Analysis of Life Science English (5)” indicates, this paper is the fifth report of the series. In order to avoid redundancy, the introductory part of the current article is a much more concise version of the one appearing in the first report in this series. To obtain more detailed information on pedagogical aspects and practical applications, it is recommended that readers refer to the first report (Kawamoto et al., 2004).
2. In the first report (Kawamoto et al., 2004), the list includes *possibility, probability, implication, involvement, absence, presence, evidence*.
3. In the second report (Kawamoto et al., 2005), the list includes *carry, confer, contribute, detect, elucidate, give, know, obtain, raise, understand*.
4. In the third report (Ohtake et al., 2006), the list includes *addition, analysis, hypothesis, identification, level, production, risk*.
5. In the fourth report (Ohtake et al., 2007), the list includes *affinity, aim, difference, growth, importance, knowledge, observation, understanding*.

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