

“Code Biology Database – A List of Biological Codes”

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Number	Code Name	Descriptive Name(s)	Full Citation(s), Hyperlinked to Source
1	Acoustic code	The Acoustic Codes	Farina, A. and N. Pieretti (2014). "Acoustic Codes in Action in a Soundscape Context." <i>Biosemiotics</i> 7(2): 321-328. Malavasi, R., K. Kull and A. Farina (2014). "The Acoustic Codes: How Animal Sign Processes Create Sound-Topes and Consortia via Conflict Avoidance." <i>Biosemiotics</i> 7(1): 89-95. Farina, A. (2019). "Acoustic codes from a rural sanctuary: How ecoacoustic events operate across a landscape scale." <i>Biosystems</i> 183: 103986.
2	Actin code	The Actin Code SEE also Cytoskeleton Code	Vedula, P. and A. Kashina (2018). "The makings of the 'actin code': regulation of actin's biological function at the amino acid and nucleotide level." <i>J Cell Sci</i> 131(9).
3	Adenylation code	The Adenylation Code	Stachelhaus, T., H. D. Mootz and M. A. Marahiel (1999). "The specificity-conferring code of adenylation domains in nonribosomal peptide synthetases." <i>Chem Biol</i> 6(8): 493-505. Davis, R. and Y. Shi (2014). "The polyadenylation code: a unified model for the regulation of mRNA alternative polyadenylation." <i>J Zhejiang UnivSci B</i> 15(5): 429-437. Zhang, F., Y. Wang, Q. Jiang, Q. Chen, L. Karthik, Y.-L. Zhao and Z. Li (2018). "Substrate selection of adenylation domains for nonribosomal peptide synthetase (NRPS) in

			bacillamide C biosynthesis by marine Bacillus atrophaeus C89." Journal of Industrial Microbiology & Biotechnology 45(5): 335-344.
4	Adhesion code	The Adhesion Code SEE also Synaptic code(s) SEE also Cadherin code(s)	<p>Redies, C. and M. Takeichi (1996). "Cadherins in the developing central nervous system: an adhesive code for segmental and functional subdivisions." Dev Biol 180(2): 413-423.</p> <p>Shapiro, L. and D. R. Colman (1999). "The diversity of cadherins and implications for a synaptic adhesive code in the CNS." Neuron 23(3): 427-430.</p> <p>Faria, M. (2018). "Aggregating, polarizing, networking – The evolution of cell adhesion codes." Biosystems 164: 60-67.</p> <p>Tsai, T. Y., M. Sikora, P. Xia, T. Colak-Champollion, H. Knaut, C. P. Heisenberg and S. G. Megason (2020). "An adhesion code ensures robust pattern formation during tissue morphogenesis." Science 370(6512): 113-116.</p>
5	Allosteric code	The Allosteric Code	<p>Daugherty, M. A., M. A. Shea, J. A. Johnson, V. J. LiCata, G. J. Turner and G. K. Ackers (1991). "Identification of the intermediate allosteric species in human hemoglobin reveals a molecular code for cooperative switching." Proc Natl Acad Sci U S A 88(4): 1110-1114.</p> <p>Goldbeck, R. A., R. M. Esquerra, D. S. Kliger, J. M. Holt and G. K. Ackers (2004). "The molecular code for hemoglobin allostery revealed by linking the thermodynamics and kinetics of quaternary structural change. 2. Cooperative free energies of (alphaFeCObetaFe)2 and (alphaFebetaFeCO)2 T-state tetramers." Biochemistry 43(38): 12065-12080.</p> <p>Armour-Garb, I., I. S. M. Han, B. S. Cowan and K. M. Thayer (2022). "Variable Regions of p53 Isoforms Allosterically Hard Code DNA Interaction." J Phys Chem B.</p>
6	Angiotensin code	The Angiotensin Receptor Code	Sadybekov, A. and V. Katritch (2020). "Breaking the Enigma Code of Angiotensin II Type 2 Receptor Signaling." Structure 28(4): 390-392.
7	Antibiotic resistance code	The Antibiotic Resistance Codes	Lo, S. W., N. Kumar and N. E. Wheeler (2018). "Breaking the code of antibiotic resistance." Nat Rev Microbiol 16(5): 262.
8	Apoptosis code	The Apoptosis Code	Basañez, G. and J. M. Hardwick (2008). "Unravelling the bcl-2 apoptosis code with a simple model system." PLoSBiol 6(6): e154.

			<p>Füllgrabe, J., N. Hajji and B. Joseph (2010). "Cracking the death code: apoptosis-related histone modifications." Cell Death Differ 17(8): 1238-1243.</p> <p>Biermann, M., C. Maueröder, J. M. Brauner, R. Chaurio, C. Janko, M. Herrmann and L. E. Muñoz (2013). "Surface code--biophysical signals for apoptotic cell clearance." Phys Biol 10(6): 065007.</p> <p>Shih, H. C., M. El-Shazly, Y. S. Juan, C. Y. Chang, J. H. Su, Y. C. Chen, S. P. Shih, H. M. Chen, Y. C. Wu and M. C. Lu (2014). "Cracking the cytotoxicity code: apoptotic induction of 10-acetylirciformonin B is mediated through ROS generation and mitochondrial dysfunction." Mar Drugs 12(5): 3072-3090.</p> <p>Wook Choi, D. and C. Yong Choi (2014). "HIPK2 modification code for cell death and survival." Mol Cell Oncol 1(2): e955999.</p> <p>Jiang, S., Y. Liu, B. Xu, Y. Zhang and M. Yang (2020). "Noncoding RNAs: New regulatory code in chondrocyte apoptosis and autophagy." Wiley Interdiscip Rev RNA 11(4): e1584.</p> <p>Rothlin, C. V. and S. Ghosh (2020). "Cracking the Cell Death Code." Cold Spring Harb Perspect Biol 12(5).</p>
9	Archetype codes	The Archetype Codes	Major, J. C. (2021). "Archetypes and code biology." Biosystems 208: 104501.
10	Area code	The Area / Cell Recognition Code	<p>Hood, L., H. V. Huang and W. J. Dreyer (1977). "The area-code hypothesis: The immune system provides clues to understanding the genetic and molecular basis of cell recognition during development." Journal of Supramolecular Structure 7(3-4): 531-559.</p> <p>Springer, T. A. (1993). "Signals on endothelium for lymphocyte recirculation and leukocyte emigration: the area code paradigm." Harvey Lect 89: 53-103.</p> <p>Dreyer, W. J. (1998). "The area code hypothesis revisited: olfactory receptors and other related transmembrane receptors may function as the last digits in a cell surface code for assembling embryos." Proc Natl Acad Sci U S A 95(16): 9072-9077.</p> <p>Liu, C. Y. (2020). "β7 Gives Tregs a Gut Area Code." Cell Mol Gastroenterol Hepatol 9(3): 543-544.</p>
11	Arrestin code	The Arrestin Receptor Code	Draper-Joyce, C. J. and A. Christopoulos (2018). "Strength in numbers-an arrestin interaction code." Nat Struct Mol Biol 25(6): 437-439.

12	Assembly code	The Assembly Code	Shelton, C. L., D. G. Conrady and A. B. Herr (2017). "Functional consequences of B-repeat sequence variation in the staphylococcal biofilm protein Aap: deciphering the assembly code." Biochem J 474(3): 427-443.
13	Auxin code	The Auxin Metabolism Code	Campos, M. L. (2021). "Breaking the code of auxin metabolism: an additional role for DIOXYGENASE FOR AUXIN OXIDATION 1." Plant Physiol 187(1): 7-8.
14	Axon guidance code	The Axon Guidance Codes	<p>Goodhill, G. J. (2003). "A theoretical model of axon guidance by the Robo code." Neural Comput 15(3): 549-564.</p> <p>Kinrade, E. F. and A. Hidalgo (2004). "Lateral neuron--glia interactions steer the response of axons to the Robo code." Neuron Glia Biol 1(2): 101-112.</p> <p>Shirasaki, R., J. W. Lewcock, K. Lettieri and S. L. Pfaff (2006). "FGF as a target-derived chemoattractant for developing motor axons genetically programmed by the LIM code." Neuron 50(6): 841-853.</p> <p>Zarin, A. A., A. C. Daly, J. Hülsmeier, J. Asadzadeh and J. P. Labrador (2012). "A GATA/homeodomain transcriptional code regulates axon guidance through the Unc-5 receptor." Development 139(10): 1798-1805.</p> <p>Kohl, A., T. Marquardt, A. Klar and D. Sela-Donenfeld (2015). "Control of axon guidance and neurotransmitter phenotype of dB1 hindbrain interneurons by Lim-HD code." J Neurosci 35(6): 2596-2611.</p>
15	BAFF code	The BAFF Immune Code	Mackay, F. and P. Schneider (2009). "Cracking the BAFF code." Nat Rev Immunol 9(7): 491-502.
16	Bile code	The Bile Acid Code	Gadaleta, R. M., M. Cariello, L. Crudele and A. Moschetta (2022). "Bile Salt Hydrolase-Competent Probiotics in the Management of IBD: Unlocking the "Bile Acid Code"." Nutrients 14(15).
17	Binaural code	The Binaural Code	Encke, J. and M. Dietz (2022). "A hemispheric two-channel code accounts for binaural unmasking in humans." CommunBiol 5(1): 1122.
18	Bioelectric code	The Bioelectric Code	<p>Tseng, A. and M. Levin (2013). "Cracking the bioelectric code: Probing endogenous ionic controls of pattern formation." Commun Integr Biol 6(1): e22595.</p> <p>Levin, M. and C. J. Martyniuk (2018). "The bioelectric code: An ancient computational medium for dynamic control of growth and form." Biosystems 164: 76-93.</p>

			Silver, B. B. and C. M. Nelson (2018). "The Bioelectric Code: Reprogramming Cancer and Aging From the Interface of Mechanical and Chemical Microenvironments." Front Cell Dev Biol 6: 21.
19	Biosynthetic code	The Biosynthetic Code	Xu, Z., M. Baunach, L. Ding, H. Peng, J. Franke and C. Hertweck (2014). "Biosynthetic code for divergolide assembly in a bacterial mangrove endophyte." Chembiochem 15(9): 1274-1279.
20	Body plan code	The (Epigenetic) Body Plan Code	Elder D (1979) An epigenetic code. Differentiation, 14, 119-122.
21	Brain code	The Universal Brain Code	Rosenberg, R. N. (2021). "The universal brain code a genetic mechanism for memory." J Neurol Sci 429: 118073.
22	Cadherin code	The Cadherin Neuronal Code	Pearson, Caroline A., Samantha J. Butler and Bennett G. Novitch (2014). "Neuronal Organization: Unsticking the Cadherin Code." Current Biology 24(23): R1127-R1129. Canzio, D. and T. Maniatis (2019). "The generation of a protocadherin cell-surface recognition code for neural circuit assembly." Curr Opin Neurobiol 59: 213-220. Bao, M., J. Cornwall-Scoones, E. Sanchez-Vasquez, D. Y. Chen, J. De Jonghe, S. Shadkhoo, F. Hollfelder, M. Thomson, D. M. Glover and M. Zernicka-Goetz (2022). "Stem cell-derived synthetic embryos self-assemble by exploiting cadherin codes and cortical tension." Nat Cell Biol 24(9): 1341-1349.
23	Calcium code	The Calcium Code	Thomine, S. (2001). "Cracking the calcium code." Trends Plant Sci 6(11): 501. Allen, G. J. and J. I. Schroeder (2001). "Combining genetics and cell biology to crack the code of plant cell calcium signaling." Sci STKE 2001(102): re13. Mauro, T. (2003). "'The discovery channel': CRAC'king the code of calcium influx." J Invest Dermatol 121(1): 1x-x. Parekh, A. B. (2006). "Cell biology: cracking the calcium entry code." Nature 441(7090): 163-165. DeFalco, T. A., K. W. Bender and W. A. Snedden (2009). "Breaking the code: Ca²⁺ sensors in plant signalling." Biochem J 425(1): 27-40. Haiech, J. and M. Moreau (2011). "The calcium signal: a universal carrier to code, decode and transduce information." Biochimie 93(12): v.

			Covelo, A., A. Badoual and A. Denizot (2022). "Reinforcing Interdisciplinary Collaborations to Unravel the Astrocyte "Calcium Code"." J Mol Neurosci 72(7): 1443-1455.
24	Cancer code	The Epigenetic Cancer Code	<p>Altarc, S. (1993). "Numerical quadruplet code of human cervical carcinoma tissue proteins." Acta Med Croatica 47(2): 85-87.</p> <p>Smith, L. T., G. A. Otterson and C. Plass (2007). "Unraveling the epigenetic code of cancer for therapy." Trends Genet 23(9): 449-456.</p> <p>Ozawa, M. G., M. Cardó-Vila, P. J. Mintz, W. Arap and R. Pasqualini (2010). "Cracking the code for compartment-specific dual functionality proteins in cancer: the case for CRKL." Cell Cycle 9(1): 8-9</p> <p>Brower, V. (2011). "Epigenetics: Unravelling the cancer code." Nature 471(7339): S12-13.</p> <p>New, M., H. Olzscha and N. B. La Thangue (2012). "HDAC inhibitor-based therapies: can we interpret the code?" Mol Oncol 6(6): 637-656.</p> <p>Blancafort, P., J. Jin and S. Frye (2013). "Writing and rewriting the epigenetic code of cancer cells: from engineered proteins to small molecules." Mol Pharmacol 83(3): 563-576.</p> <p>Karpathakis, A., H. Dibra and C. Thirlwell (2013). "Neuroendocrine tumours: cracking the epigenetic code." Endocr Relat Cancer 20(3): R65-82.</p> <p>Sato, K., T. Hara and M. Ohya (2013). "The code structure of the p53 DNA-binding domain and the prognosis of breast cancer patients." Bioinformatics 29(22): 2822-2825.</p> <p>Kulkarni, R. A. and J. L. Meier (2014). "Chemical cryptology of cancer's histone code." Chem Biol 21(11): 1419-1421.</p> <p>Lomberk, G. A. and R. Urrutia (2015). "The Triple-Code Model for Pancreatic Cancer: Cross Talk Among Genetics, Epigenetics, and Nuclear Structure." Surg Clin North Am 95(5): 935-952.</p> <p>Roschewski, M. and W. H. Wilson (2015). "Cracking the diverse biologic code of diffuse large B-cell lymphoma." Semin Hematol 52(2): 55-56</p>

			<p>Bonci, D., V. Coppola, M. Patrizii, A. Addario, A. Cannistraci, F. Francescangeli, R. Pecci, G. Muto, D. Collura, R. Bedini, A. Zeuner, M. Valtieri, S. Sentinelli, M. S. Benassi, M. Gallucci, P. Carlini, S. Piccolo and R. De Maria (2016). "A microRNA code for prostate cancer metastasis." <i>Oncogene</i> 35(9): 1180-1192.</p> <p>Qiao, H. and C. M. Lovly (2016). "Cracking the Code of Resistance across Multiple Lines of ALK Inhibitor Therapy in Lung Cancer." <i>Cancer Discov</i> 6(10): 1084-1086.</p> <p>Søreide, K., M. M. Watson and H. R. Hagland (2016). "Deciphering the Molecular Code to Colorectal Liver Metastasis Biology Through Microsatellite Alterations and Allelic Loss: The Good, the Bad, and the Ugly." <i>Gastroenterology</i> 150(4): 811-814.</p> <p>Lucas, C. (2017). "Cracking the cancer code: a personalised genomic approach." <i>Lancet Oncol</i> 18(6): 717.</p> <p>Yotsukura, S., M. Karasuyama, I. Takigawa and H. Mamitsuka (2017). "Exploring phenotype patterns of breast cancer within somatic mutations: a modicum in the intrinsic code." <i>Brief Bioinform</i> 18(4): 619-633.</p> <p>Rodríguez, E., S. T. T. Schetters and Y. van Kooyk (2018). "The tumour glyco-code as a novel immune checkpoint for immunotherapy." <i>Nat Rev Immunol</i> 18(3): 204-211.</p> <p>Lopes, N., V. G. Correia, A. S. Palma and C. Brito (2021). "Cracking the Breast Cancer Glyco-Code through Glycan-Lectin Interactions: Targeting Immunosuppressive Macrophages." <i>Int J Mol Sci</i> 22(4).</p> <p>Xia, Z., N. Kon, A. P. Gu, O. Tavana and W. Gu (2022). "Deciphering the acetylation code of p53 in transcription regulation and tumor suppression." <i>Oncogene</i> 41(22): 3039-3050.</p>
25	Cell access code	The Cell Access Code	Zengel, J. and J. E. Carette (2020). "Cracking the cell access code for the deadly virus VEEV." <i>Nature</i> 588(7837): 223-224.
26	Cell surface code	The Cell Surface Recognition Code	Mountoufaris, G., D. Canzio, C. L. Nwakeze, W. V. Chen and T. Maniatis (2018). "Writing, Reading, and Translating the Clustered Protocadherin Cell Surface Recognition Code for Neural Circuit Assembly." <i>Annu Rev Cell Dev Biol</i> 34: 471-493.
27	Cell wall code	The Plant Cell Wall Code	Tavares, E. Q. and M. S. Buckeridge (2015). "Do plant cell walls have a code?" <i>Plant Sci</i> 241: 286-294.

28	Cerebral resistance code	The Cerebral Resistance Code	Sharma, A. and R. Goyal (2016). "Cross tolerance: a tread to decipher the code of endogenous global cerebral resistance." Neural Regen Res 11(5): 719-720.
29	Chaperone code	The Chaperone Code	<p>Cloutier, P. and B. Coulombe (2013). "Regulation of molecular chaperones through post-translational modifications: decrypting the chaperone code." Biochim Biophys Acta 1829(5): 443-454.</p> <p>Nitika and A. W. Truman (2017). "Cracking the Chaperone Code: Cellular Roles for Hsp70 Phosphorylation." Trends Biochem Sci 42(12): 932-935.</p> <p>Backe, S. J., R. A. Sager, M. R. Woodford, A. M. Makedon and M. Mollapour (2020). "Post-translational modifications of Hsp90 and translating the chaperone code." J Biol Chem 295(32): 11099-11117.</p> <p>Nitika, C. M. Porter, A. W. Truman and M. C. Truttmann (2020). "Post-translational modifications of Hsp70 family proteins: Expanding the chaperone code." J Biol Chem 295(31): 10689-10708.</p> <p>Truman, A. W., D. Bourboulia and M. Mollapour (2021). "Decrypting the chaperone code." J Biol Chem 296: 100293.</p> <p>Woodford, M. R., S. J. Backe, L. A. Wengert, D. M. Dunn, D. Bourboulia and M. Mollapour (2021). "Hsp90 chaperone code and the tumor suppressor VHL cooperatively regulate the mitotic checkpoint." Cell Stress Chaperones 26(6): 965-971.</p>
30	Checkpoint code	The Checkpoint Codes SEE also Immune Code	Zeng, P., J. Ma, R. Yang and Y. C. Liu (2017). "Immune Regulation by Ubiquitin Tagging as Checkpoint Code." Curr Top Microbiol Immunol 410: 215-248.
31	Chitin code	The Chitin (Defense) Code	Khokhani, D., C. Carrera Carriel, S. Vayla, T. B. Irving, C. Stonoha-Arther, N. P. Keller and J. M. Ané (2021). "Deciphering the Chitin Code in Plant Symbiosis, Defense, and Microbial Networks." Annu Rev Microbiol 75: 583-607.
32	Chromosome code	The Chromosome Codes	<p>Artandi, S. E. and J. P. Cooper (2009). "Reverse transcribing the code for chromosome stability." Mol Cell 36(5): 715-719.</p> <p>Kiyomitsu, T. and I. M. Cheeseman (2012). "Chromosome- and spindle-pole-derived signals generate an intrinsic code for spindle position and orientation." Nat Cell Biol 14(3): 311-317.</p>

			Podgornaya, O., E. Gavrilova, V. Stephanova, S. Demin and A. Komissarov (2013). "Large tandem repeats make up the chromosome bar code: a hypothesis." Adv Protein Chem Struct Biol 90: 1-30.
33	Circadian codes	The Circadian Rhythm Codes	<p>Arjona, A. and D. K. Sarkar (2008). "Are Circadian Rhythms the Code of Hypothalamic-Immune Communication? Insights from Natural Killer Cells." Neurochemical Research 33(4): 708-718.</p> <p>He, W., K. Kraus, D. Druzd, A. de Juan, L. Ince, C.-S. Chen and C. Scheiermann (2017). "A circadian zip code determines rhythmic leukocyte trafficking to tissues." The FASEB Journal 31(S1): 55.54-55.54.</p> <p>Wang, B., A. N. Kettenbach, X. Zhou, J. J. Loros and J. C. Dunlap (2019). "The Phospho-Code Determining Circadian Feedback Loop Closure and Output in Neurospora." Molecular Cell 74(4): 771-784.e773.</p>
34	Circular ribosome code	The Circular Motif (Ribosome) Code	<p>Pirillo, G. and M. A. Pirillo (2005). "Growth function of self-complementary circular codes." Rivista di biologia 98(1): 97-110.</p> <p>El Soufi, K. and C. J. Michel (2014). "Circular code motifs in the ribosome decoding center." ComputBiol Chem 52: 9-17.</p> <p>Dila, G., R. Ripp, C. Mayer, O. Poch, C. J. Michel and J. D. Thompson (2019). "Circular code motifs in the ribosome: a missing link in the evolution of translation?" Rna 25(12): 1714-1730.</p> <p>Thompson, J. D., R. Ripp, C. Mayer, O. Poch and C. J. Michel (2021). "Potential role of the X circular code in the regulation of gene expression." Biosystems 203: 104368.</p>
35	Cis-regulatory transcription code	The Transcriptional Cis-Regulatory Code	<p>Istrail, S. and E. H. Davidson (2005). "Logic functions of the genomic cis-regulatory code." Proceedings of the National Academy of Sciences 102(14): 4954-4959.</p> <p>Ochoa-Espinosa, A. and S. Small (2006). "Developmental mechanisms and cis-regulatory codes." Current Opinion in Genetics & Development 16(2): 165-170.</p> <p>Conte, I. and P. Bovolenta (2007). "Comprehensive characterization of the cis-regulatory code responsible for the spatio-temporal expression of oSix3.2 in the developing medaka forebrain." Genome Biol 8(7): R137.</p>

			<p>Zou, C., K. Sun, J. D. Mackaluso, A. E. Seddon, R. Jin, M. F. Thomashow and S. H. Shiu (2011). "Cis-regulatory code of stress-responsive transcription in Arabidopsis thaliana." Proc Natl Acad Sci U S A 108(36): 14992-14997.</p> <p>Sorge, S., N. Ha, M. Polychronidou, J. Friedrich, D. Bezdán, P. Kaspar, M. H. Schaefer, S. Ossowski, S. R. Henz, J. Mundorf, J. Rätzer, F. Papagiannouli and I. Lohmann (2012). "The cis-regulatory code of Hox function in Drosophila." Embo j 31(15): 3323-3333.</p> <p>Doglio, L., D. K. Goode, M. C. Pelleri, S. Pauls, F. Frabetti, S. M. Shimeld, T. Vavouri and G. Elgar (2013). "Parallel evolution of chordate cis-regulatory code for development." PLoS Genet 9(11): e1003904.</p> <p>Yáñez-Cuna, J. O., E. Z. Kvon and A. Stark (2013). "Deciphering the transcriptional cis-regulatory code." Trends Genet 29(1): 11-22.</p> <p>Dresch, J. M. and D. N. Arnosti (2015). "The Wisdom of Crowds: Can Mathematical Models Crack the cis Regulatory Code?" Cell Syst 1(6): 379-380.</p> <p>Mancino, A., A. Termanini, I. Barozzi, S. Ghisletti, R. Ostuni, E. Prosperini, K. Ozato and G. Natoli (2015). "A dual cis-regulatory code links IRF8 to constitutive and inducible gene expression in macrophages." Genes Dev 29(4): 394-408.</p> <p>Uygun, S., C. B. Azodi and S. H. Shiu (2019). "Cis-Regulatory Code for Predicting Plant Cell-Type Transcriptional Response to High Salinity." Plant Physiol 181(4): 1739-1751.</p> <p>Coppola, U., A. K. Kamal, A. Stolfi and F. Ristatore (2020). "The Cis-Regulatory Code for Kelch-like 21/30 Specific Expression in Ciona robusta Sensory Organs." Front Cell Dev Biol 8: 569601.</p> <p>Novikova, D. D., P. A. Cherenkov, Y. G. Sizentsova and V. V. Mironova (2020). "metaRE R Package for Meta-Analysis of Transcriptome Data to Identify the cis-Regulatory Code behind the Transcriptional Reprogramming." Genes (Basel) 11(6).</p> <p>Zeitlinger, J. (2020). "Seven myths of how transcription factors read the cis-regulatory code." Curr Opin Syst Biol 23: 22-31.</p> <p>Chatterjee, S., K. M. Karasaki, L. E. Fries, A. Kapoor and A. Chakravarti (2021). "A multi-enhancer RET regulatory code is disrupted in Hirschsprung disease." Genome Res 31(12): 2199-2208.</p>
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			<p>Tokuhiro, S. and Y. Satou (2021). "Cis-regulatory code for determining the action of Foxd as both an activator and a repressor in ascidian embryos." Dev Biol 476: 11-17.</p> <p>Zemlyanskaya, E. V., V. A. Dolgikh, V. G. Levitsky and V. Mironova (2021). "Transcriptional regulation in plants: Using omics data to crack the cis-regulatory code." Curr Opin Plant Biol 63: 102058.</p> <p>Benoit, M. (2022). "Hot 'n cold: Applying the cis-regulatory code to predict heat and cold stress response in maize." Plant Cell 34(1): 497-498.</p>
36	CKD code	The Chronic Kidney Disease Code	<p>O'Toole, J. F. and J. R. Sedor (2018). "CKD, Genetic Variation, and the Epigenome: Decrypting the Code." Am J Kidney Dis 72(2): 164-167.</p>
37	Coactivator code	The Coactivator/Corepressor/ Epigenetic Code	<p>Rosenfeld, M. G., V. V. Lunyak and C. K. Glass (2006). "Sensors and signals: a coactivator/corepressor/epigenetic code for integrating signal-dependent programs of transcriptional response." Genes Dev 20(11): 1405-1428.</p>
38	Cohesin code	The Cohesin-Dockerin Code	<p>Vera, A. M., A. Galera-Prat, M. Wojciechowski, B. Różycki, D. V. Laurents, M. Carrión-Vázquez, M. Cieplak and P. Tinnefeld (2021). "Cohesin-dockerin code in cellulosomal dual binding modes and its allosteric regulation by proline isomerization." Structure 29(6): 587-597.e588.</p>
39	Communication code	The Communication Code(s)	<p>Salmond, G. P., B. W. Bycroft, G. S. Stewart and P. Williams (1995). "The bacterial 'enigma': cracking the code of cell-cell communication." Mol Microbiol 16(4): 615-624.</p> <p>Fontanari, J. F. and L. I. Perlovsky (2008). "A game theoretical approach to the evolution of structured communication codes." Theory in Biosciences 127(3): 205-214.</p> <p>Li, P. and M. B. Elowitz (2019). "Communication codes in developmental signaling pathways." Development 146(12).</p> <p>Bonato, B., F. Peressotti, S. Guerra, Q. Wang and U. Castiello (2021). "Cracking the code: a comparative approach to plant communication." Communicative & Integrative Biology 14(1): 176-185.</p>
40	Compartment code	The Compartment Code	<p>Barbieri, M. (2003). The organic codes. An introduction to semantic biology., Cambridge University Press.</p> <p>Artmann, S. (2009). "Basic Semiosis as Code-Based Control." Biosemiotics 2(1): 31-38.</p>

			Maza, N. A., W. E. Schiesser and P. D. Calvert (2019). "An intrinsic compartmentalization code for peripheral membrane proteins in photoreceptor neurons." Journal of Cell Biology 218(11): 3753-3772.
41	Connexin code	The Connexin Code	Kelsell, D. P., J. Dunlop and M. B. Hodgins (2001). "Human diseases: clues to cracking the connexin code?" Trends Cell Biol 11(1): 2-6.
42	Cooperation codes	The Moral Cooperation Code	Proverbio, A. M., F. Riva, L. Paganelli, S. F. Cappa, N. Canessa, D. Perani and A. Zani (2011). "Neural coding of cooperative vs. affective human interactions: 150 ms to code the action's purpose." PLoS One 6(7): e22026. Efferson, C. and E. Fehr (2018). "Simple moral code supports cooperation." Nature 555(7695): 169-170.
43	Coregulator code	The Physiological Coregulator Code	Stallcup, M. R. and C. Poulard (2020). "Gene-Specific Actions of Transcriptional Coregulators Facilitate Physiological Plasticity: Evidence for a Physiological Coregulator Code." Trends Biochem Sci 45(6): 497-510.
44	Cryptic code	The Cryptic Amyotrophic Sclerosis Code	Akiyama, T., Y. Koike, L. Petrucelli and A. D. Gitler (2022). "Cracking the cryptic code in amyotrophic lateral sclerosis and frontotemporal dementia: Towards therapeutic targets and biomarkers." Clin Transl Med 12(5): e818.
45	CTD code	The C-Terminal Domain Code SEE also Phosphorylation Code	Buratowski, S. (2003). "The CTD code." Nat Struct Biol 10(9): 679-680. Tietjen, J. R., D. W. Zhang, J. B. Rodríguez-Molina, B. E. White, M. S. Akhtar, M. Heidemann, X. Li, R. D. Chapman, K. Shokat, S. Keles, D. Eick and A. Z. Ansari (2010). "Chemical-genomic dissection of the CTD code." Nat Struct Mol Biol 17(9): 1154-1161. Heidemann, M. and D. Eick (2012). "Tyrosine-1 and threonine-4 phosphorylation marks complete the RNA polymerase II CTD phospho-code." RNA Biol 9(9): 1144-1146. Meyer, P. A. and J. Fu (2012). "Mutual remodeling and conformation grid: a mediator code?" Structure 20(5): 755-757. Eick, D. and M. Geyer (2013). "The RNA polymerase II carboxy-terminal domain (CTD) code." Chem Rev 113(11): 8456-8490. Jeronimo, C., A. R. Bataille and F. Robert (2013). "The writers, readers, and functions of the RNA polymerase II C-terminal domain code." Chem Rev 113(11): 8491-8522.

			<p>Materne, P., J. Anandhakumar, V. Migeot, I. Soriano, C. Yague-Sanz, E. Hidalgo, C. Mignon, L. Quintales, F. Antequera and D. Hermand (2015). "Promoter nucleosome dynamics regulated by signalling through the CTD code." Elife 4: e09008.</p> <p>Corden, J. L. (2016). "Pol II CTD Code Light." Mol Cell 61(2): 183-184.</p> <p>Zhang, B., X. Zhong, M. Sauane, Y. Zhao and Z. L. Zheng (2020). "Modulation of the Pol II CTD Phosphorylation Code by Rac1 and Cdc42 Small GTPases in Cultured Human Cancer Cells and Its Implication for Developing a Synthetic-Lethal Cancer Therapy." Cells 9(3).</p> <p>Dieci, G. (2021). "Removing quote marks from the RNA polymerase II CTD 'code'." Biosystems 207: 104468.</p>
46	Cybernetic code	The Cybernetic (Cognition) Code	<p>Wells, A. (2019). "Breaking the Cybernetic Code: Understanding and Treating the Human Metacognitive Control System to Enhance Mental Health." Front Psychol 10: 2621.</p>
47	Cytokine code	The Cytokine Codes	<p>Ulloa, L. and K. J. Tracey (2005). "The "cytokine profile": a code for sepsis." Trends Mol Med 11(2): 56-63.</p> <p>Nickoloff, B. J. (2007). "Cracking the cytokine code in psoriasis." Nat Med 13(3): 242-244.</p> <p>Hartmann, B. M., N. Marjanovic, G. Nudelman, T. M. Moran and S. C. Sealfon (2014). "Combinatorial cytokine code generates anti-viral state in dendritic cells." Front Immunol 5: 73.</p> <p>Mustafa, M. I., A. H. Abdelmoneim, E. M. Mahmoud and A. M. Makhawi (2020). "Cytokine Storm in COVID-19 Patients, Its Impact on Organs and Potential Treatment by QTY Code-Designed Detergent-Free Chemokine Receptors." Mediators Inflamm 2020: 8198963.</p> <p>Hao, S., D. Jin, S. Zhang and R. Qing (2020). "QTY Code-designed Water-soluble Fc-fusion Cytokine Receptors Bind to their Respective Ligands." QRB Discov 1: e4.</p>
48	Cytoskeleton code	The Cytoskeleton Code	<p>Barbieri, M. (2003). The organic codes. An introduction to semantic biology., Cambridge University Press.</p>

			Gimona, M. (2008). Protein Linguistics and the Modular Code of the Cytoskeleton. The Codes of Life: The Rules of Macroevolution. M. Barbieri and J. Hoffmeyer. Dordrecht, Springer Netherlands: 189-206.
49	Dance code	The Honey Bee Dance Code	Rohrseitz, K. and J. Tautz (1999). "Honey bee dance communication: waggle run direction coded in antennal contacts?" Journal of Comparative Physiology A 184(4): 463-470.
50	Defense Code	The Host Defense Code	Medzhitov, R. (2001). "CpG DNA: security code for host defense." Nat Immunol 2(1): 15-16.
51	Differentiation code	The Differentiation Code	<p>Gu, X. and N. C. Spitzer (1997). "Breaking the code: regulation of neuronal differentiation by spontaneous calcium transients." Dev Neurosci 19(1): 33-41.</p> <p>Beaujean, D., C. Rosenbaum, H. W. Müller, J. J. Willemsen, J. Lenders and S. R. Bornstein (2003). "Combinatorial code of growth factors and neuropeptides define neuroendocrine differentiation in PC12 cells." Exp Neurol 184(1): 348-358.</p> <p>Pruszek, J., W. Ludwig, A. Blak, K. Alavian and O. Isacson (2009). "CD15, CD24, and CD29 define a surface biomarker code for neural lineage differentiation of stem cells." Stem Cells 27(12): 2928-2940.</p> <p>Kondoh, H. and Y. Kamachi (2010). "SOX-partner code for cell specification: Regulatory target selection and underlying molecular mechanisms." Int J Biochem Cell Biol 42(3): 391-399.</p> <p>Gordon, R. and N. K. Gordon (2019). "The differentiation code." Biosystems 184: 104013.</p> <p>Wang, N., X. Ji, Y. Wu, S. Zhou, H. Peng, J. Wang, S. Yu and J. Zhang (2021). "The Different Molecular Code in Generation of Dopaminergic Neurons from Astrocytes and Mesenchymal Stem Cells." Int J Mol Sci 22(22).</p>
52	Discriminator code	The Discriminator Codes	Kuncha, S. K., K. Suma, K. I. Pawar, J. Gogoi, S. B. Routh, S. Pottabathini, S. P. Kruparani and R. Sankaranarayanan (2018). "A discriminator code-based DTD surveillance ensures faithful glycine delivery for protein biosynthesis in bacteria." Elife 7.
53	DNA codes	The DNA Codes	Sternberg, R. V. (2008). "DNA codes and information: formal structures and relational causes." Acta Biotheor 56(3): 205-232.

54	DNA-binding code	The DNA-Binding Code	<p>Gursky, A. V., V. G. Tumanyan, A. S. Zasedatelev, A. L. Zhuze, S. L. Grokhovsky and B. P. Gottikh (1976). "A code controlling specific binding of regulatory proteins to DNA." Mol Biol Rep 2(5): 413-425.</p> <p>Rein, R., R. Garduno, J. T. Egan and S. Columbano (1977). "Elements of a DNA-polypeptide recognition code: electrostatic potential around the double helix, and a stereospecific model for purine recognition." Biosystems 9(2-3): 131-137.</p> <p>Choo, Y. and A. Klug (1994). "Toward a code for the interactions of zinc fingers with DNA: selection of randomized fingers displayed on phage." Proc Natl Acad Sci U S A 91(23): 11163-11167.</p> <p>Suzuki, M. (1994). "A framework for the DNA-protein recognition code of the probe helix in transcription factors: the chemical and stereochemical rules." Structure 2(4): 317-326.</p> <p>Suzuki, M. and N. Yagi (1994). "DNA recognition code of transcription factors in the helix-turn-helix, probe helix, hormone receptor, and zinc finger families." Proc Natl Acad Sci U S A 91(26): 12357-12361.</p> <p>Davis, R. L., P. F. Cheng, A. B. Lassar and H. Weintraub (1990). "The MyoD DNA binding domain contains a recognition code for muscle-specific gene activation." Cell 60(5): 733-746.</p> <p>Boch, J., H. Scholze, S. Schornack, A. Landgraf, S. Hahn, S. Kay, T. Lahaye, A. Nickstadt and U. Bonas (2009). "Breaking the code of DNA binding specificity of TAL-type III effectors." Science 326(5959): 1509-1512.</p> <p>Camas, F. M., E. J. Alm and J. F. Poyatos (2010). "Local gene regulation details a recognition code within the LacI transcriptional factor family." PLoS Comput Biol 6(11): e1000989.</p> <p>Puppin, C., D. Fabbro, L. Pellizzari and G. Damante (2011). "Using the recognition code to swap homeodomain target specificity in cell culture." Mol Biol Rep 38(8): 5349-5354.</p> <p>de Lange, O., T. Schreiber, N. Schandry, J. Radeck, K. H. Braun, J. Koszinowski, H. Heuer, A. Strauß and T. Lahaye (2013). "Breaking the DNA-binding code of Ralstonia solanacearum TAL effectors provides new possibilities to generate plant resistance genes against bacterial wilt disease." New Phytol 199(3): 773-786.</p>
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			<p>Hortschansky, P., E. Ando, K. Tuppatsch, H. Arikawa, T. Kobayashi, M. Kato, H. Haas and A. A. Brakhage (2015). "Deciphering the combinatorial DNA-binding code of the CCAAT-binding complex and the iron-regulatory basic region leucine zipper (bZIP) transcription factor HapX." J Biol Chem 290(10): 6058-6070.</p> <p>De Kumar, B., H. J. Parker, A. Paulson, M. E. Parrish, I. Pushel, N. P. Singh, Y. Zhang, B. D. Slaughter, J. R. Unruh, L. Florens, J. Zeitlinger and R. Krumlauf (2017). "HOXA1 and TALE proteins display cross-regulatory interactions and form a combinatorial binding code on HOXA1 targets." Genome Res 27(9): 1501-1512.</p> <p>Joerger, A. C. (2018). "Extending the Code of Sequence Readout by Gene Regulatory Proteins: The Role of Hoogsteen Base Pairing in p53-DNA Recognition." Structure 26(9): 1163-1165.</p>
55	Domain code	The Domain (Specificity) Codes	<p>Koide, A., R. N. Gilbreth, K. Esaki, V. Tereshko and S. Koide (2007). "High-affinity single-domain binding proteins with a binary-code interface." Proc Natl Acad Sci U S A 104(16): 6632-6637.</p> <p>Throckmorton, K., V. Vinnik, R. Chowdhury, T. Cook, M. G. Chevrette, C. Maranas, B. Pflieger and M. G. Thomas (2019). "Directed Evolution Reveals the Functional Sequence Space of an Adenylation Domain Specificity Code." ACS Chem Biol 14(9): 2044-2054.</p> <p>Iorio, M. T., F. D. Vogel, F. Koniuszewski, P. Scholze, S. Rehman, X. Simeone, M. Schnürch, M. D. Mihovilovic and M. Ernst (2020). "GABA(A) Receptor Ligands Often Interact with Binding Sites in the Transmembrane Domain and in the Extracellular Domain-Can the Promiscuity Code Be Cracked?" Int J Mol Sci 21(1).</p>
56	Ecological codes	The Ecological Codes	<p>Kull, K. (2010). "Ecosystems are Made of Semiotic Bonds: Consortia, Umwelten, Biophony and Ecological Codes." Biosemiotics 3(3): 347-357</p> <p>Farina, A. (2018). "Ecoacoustic codes and ecological complexity." Biosystems 164: 147-154.</p>
57	Endocrine codes	The Endocrine Signalling Codes	<p>Leong, D. A. and M. O. Thorner (1991). "A potential code of luteinizing hormone-releasing hormone-induced calcium ion responses in the regulation of luteinizing hormone secretion among individual gonadotropes." J Biol Chem 266(14): 9016-9022.</p> <p>Dygalo, N. N. (2010). "[Evolution of endocrine glands and neuroendocrine systems: the "humoral code"]." Ross Fiziol Zh Im I M Sechenova 96(7): 675-685.</p>

			<p>Burnstock, G. (2014). "Purinergic signalling in endocrine organs." Purinergic Signalling 10(1): 189-231.</p> <p>Gribble, F. M. and F. Reimann (2017). "Signalling in the gut endocrine axis." Physiology & Behavior 176: 183-188.</p> <p>Lee, S., J. Choi, J. Mohanty, L. P. Sousa, F. Tome, E. Pardon, J. Steyaert, M. A. Lemmon, I. Lax and J. Schlessinger (2018). "Structures of β-klotho reveal a 'zip code'-like mechanism for endocrine FGF signalling." Nature 553(7689): 501-505.</p> <p>Kuang, H. and J. D. Lin (2019). "GPNMB: expanding the code for liver-fat communication." Nature Metabolism 1(5): 507-508.</p>
58	Epigenetic code – A (general)	The Epigenetic (Chromatin) Code	<p>Benecke, A. (2006). "Chromatin code, local non-equilibrium dynamics, and the emergence of transcription regulatory programs." Eur Phys J E Soft Matter 19(3): 353-366.</p> <p>Fatemi, M. and P. A. Wade (2006). "MBD family proteins: reading the epigenetic code." J Cell Sci 119(Pt 15): 3033-3037.</p> <p>Lesne, A. (2006). "The chromatin regulatory code: beyond a histone code." Eur Phys J E Soft Matter 19(3): 375-377.</p> <p>Nightingale, K. P., L. P. O'Neill and B. M. Turner (2006). "Histone modifications: signalling receptors and potential elements of a heritable epigenetic code." Curr Opin Genet Dev 16(2): 125-136.</p> <p>Turner, B. M. (2007). "Defining an epigenetic code." Nature Cell Biology 9(1): 2-6.</p> <p>Lennartsson, A. and K. Ekwall (2009). "Histone modification patterns and epigenetic codes." Biochim Biophys Acta 1790(9): 863-868.</p> <p>Marx, V. (2012). "Epigenetics: Reading the second genomic code." Nature 491(7422): 143-147.</p> <p>The EPIC Planning Committee (2012). "Reading the second code: mapping epigenomes to understand plant growth, development, and adaptation to the environment." Plant Cell 24(6): 2257-2261.</p>

			<p>Treas, J. N., T. Tyagi and K. P. Singh (2012). "Effects of chronic exposure to arsenic and estrogen on epigenetic regulatory genes expression and epigenetic code in human prostate epithelial cells." PLoS One 7(8): e43880.</p> <p>Bronner, C., M. Krifa and M. Mousli (2013). "Increasing role of UHRF1 in the reading and inheritance of the epigenetic code as well as in tumorigenesis." Biochem Pharmacol 86(12): 1643-1649.</p> <p>Santoni, F. A. (2013). "EMdeCODE: a novel algorithm capable of reading words of epigenetic code to predict enhancers and retroviral integration sites and to identify H3R2me1 as a distinctive mark of coding versus non-coding genes." Nucleic Acids Res 41(3): e48.</p> <p>Gao, Q., J. Tang, J. Chen, L. Jiang, X. Zhu and Z. Xu (2014). "Epigenetic code and potential epigenetic-based therapies against chronic diseases in developmental origins." Drug Discov Today 19(11): 1744-1750.</p> <p>Infante, T., F. P. Mancini, A. Lanza, A. Soricelli, F. de Nigris and C. Napoli (2015). "Polycomb YY1 is a critical interface between epigenetic code and miRNA machinery after exposure to hypoxia in malignancy." Biochim Biophys Acta 1853(5): 975-986.</p> <p>Bensaddek, D. and A. I. Lamond (2016). "Unlocking the chromatin code by deciphering protein-DNA interactions." Mol Syst Biol 12(11): 887.</p> <p>Bayarsaihan, D. (2016). "Deciphering the Epigenetic Code in Embryonic and Dental Pulp Stem Cells." Yale J Biol Med 89(4): 539-563.</p> <p>Di Pietro, A. and K. L. Good-Jacobson (2018). "Disrupting the Code: Epigenetic Dysregulation of Lymphocyte Function during Infectious Disease and Lymphoma Development." J Immunol 201(4): 1109-1118.</p> <p>Biot, M. and B. de Massy (2020). "Reading the epigenetic code for exchanging DNA." Elife 9.</p> <p>Wang, M., V. Ngo and W. Wang (2021). "Deciphering the genetic code of DNA methylation." Brief Bioinform 22(5).</p> <p>Kong, S., Y. Lu, S. Tan, R. Li, Y. Gao, K. Li and Y. Zhang (2022). "Nucleosome-Omics: A Perspective on the Epigenetic Code and 3D Genome Landscape." Genes (Basel) 13(7).</p>
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59	Epigenetic code – B (behaviour)	The Epigenetic Behaviour Codes	<p>Gräff, J. and I. M. Mansuy (2008). "Epigenetic codes in cognition and behaviour." Behav Brain Res 192(1): 70-87.</p> <p>Maleszka, R. (2016). "Epigenetic code and insect behavioural plasticity." Curr Opin Insect Sci 15: 45-52.</p> <p>Fustin, J. M., R. Kojima, K. Itoh, H. Y. Chang, S. Ye, B. Zhuang, A. Oji, S. Gibo, R. Narasimamurthy, D. Virshup, G. Kurosawa, M. Doi, I. Manabe, Y. Ishihama, M. Ikawa and H. Okamura (2018). "Two Ck1δ transcripts regulated by m6A methylation code for two antagonistic kinases in the control of the circadian clock." Proc Natl Acad Sci U S A 115(23): 5980-5985.</p>
60	Epitranscriptomic code	The Epitranscriptomic Code	<p>Berlivet, S., J. Scutenaire, J. M. Deragon and C. Bousquet-Antonelli (2019). "Readers of the m(6)A epitranscriptomic code." Biochim Biophys Acta Gene Regul Mech 1862(3): 329-342.</p> <p>Deng, L., J. Kumar, R. Rose, W. McIntyre and D. Fabris (2022). "Analyzing RNA posttranscriptional modifications to decipher the epitranscriptomic code." Mass Spectrom Rev: e21798.</p>
61	Error correcting code	The Error Correcting Code	<p>Battail, G. (2007). Information Theory and Error-Correcting Codes In Genetics and Biological Evolution. Introduction to Biosemiotics: The New Biological Synthesis. M. Barbieri. Dordrecht, Springer Netherlands: 299-345.</p> <p>Faria, L. C., A. S. Rocha, J. H. Kleinschmidt, M. C. Silva-Filho, E. Bim, R. H. Herai, M. E. Yamagishi and R. Palazzo, Jr. (2012). "Is a genome a codeword of an error-correcting code?" PloS One 7(5): e36644.</p> <p>Ashlock, D., S. K. Houghten, J. A. Brown and J. Orth (2012). "On the synthesis of DNA error correcting codes." Biosystems 110(1): 1-8.</p> <p>Battail, G. (2019). "Error-correcting codes and information in biology." Biosystems 184: 103987.</p>
62	Export / Exit code	The Export & Exit Codes	<p>Nishimura, N., S. Bannykh, S. Slabough, J. Matteson, Y. Altschuler, K. Hahn and W. E. Balch (1999). "A di-acidic (DXE) code directs concentration of cargo during export from the endoplasmic reticulum." J Biol Chem 274(22): 15937-15946.</p>

			Wang, X., J. Matteson, Y. An, B. Moyer, J. S. Yoo, S. Bannykh, I. A. Wilson, J. R. Riordan and W. E. Balch (2004). "COPII-dependent export of cystic fibrosis transmembrane conductance regulator from the ER uses a di-acidic exit code." J Cell Biol 167(1): 65-74.
63	Folding code	The Protein Folding Code	<p>Alexander, P. A., Y. He, Y. Chen, J. Orban and P. N. Bryan (2009). "A minimal sequence code for switching protein structure and function." Proc Natl Acad Sci U S A 106(50): 21149-21154.</p> <p>Joo, H., A. G. Chavan, J. Phan, R. Day and J. Tsai (2012). "An amino acid packing code for α-helical structure and protein design." J Mol Biol 419(3-4): 234-254.</p> <p>Joo, H. and J. Tsai (2014). "An amino acid code for β-sheet packing structure." Proteins 82(9): 2128-2140.</p> <p>Carter, C. W., Jr. and R. Wolfenden (2015). "tRNA acceptor stem and anticodon bases form independent codes related to protein folding." Proc Natl Acad Sci U S A 112(24): 7489-7494.</p>
64	FoxO code	The Forkhead Transcription Factor Code	Calnan, D. R. and A. Brunet (2008). "The FoxO code." Oncogene 27(16): 2276-2288.
65	Genetic code – A (historical)	The Historical Papers on the Genetic Code	<p>Dounce, A. L. (1952). "[Duplicating mechanism for peptide chain and nucleic acid synthesis]." Enzymologia 15(5): 251-258.</p> <p>Dounce, A. L. (1953). "Nucleic Acid Template Hypotheses." Nature 172(4377): 541-541.</p> <p>Gamow, G. (1954). "Possible Relation between Deoxyribonucleic Acid and Protein Structures." Nature 173(4398): 318-318.</p> <p>Berg, P. and E. J. Offengand (1958). "An Enzymatic Mechanism for Linking Amino Acids to RNA." Proc Natl Acad Sci U S A 44(2): 78-86.</p> <p>Nirenberg, M. W. and J. H. Matthaei (1961). "The dependence of cell-free protein synthesis in E. coli upon naturally occurring or synthetic polyribonucleotides." Proceedings of the National Academy of Sciences 47(10): 1588-1602.</p> <p>Lengyel, P., J. F. Speyer and S. Ochoa (1961). "Synthetic polynucleotides and the amino acid code." Proc Natl Acad Sci U S A 47(12): 1936-1942.</p> <p>Speyer, J. F., P. Lengyel, C. Basilio, A. J. Wahba, R. S. Gardner and S. Ochoa (1963). "Synthetic Polynucleotides and the Amino Acid Code." Cold Spring Harbor Symposia on Quantitative Biology 28: 559-567.</p>

			<p>Nirenberg, M. and P. Leder (1964). "RNA Codewords and Protein Synthesis." Science 145(3639): 1399-1407.</p> <p>Nishimura, S., D. S. Jones and H. G. Khorana (1965). "Studies on polynucleotides. 48. The in vitro synthesis of a co-polypeptide containing two amino acids in alternating sequence dependent upon a DNA-like polymer containing two nucleotides in alternating sequence." J Mol Biol 13(1): 302-324.</p> <p>Woese, C. R. (1965). "Order in the genetic code." Proc Natl Acad Sci U S A 54(1): 71-75.</p> <p>Nirenberg, M., T. Caskey, R. Marshall, R. Brimacombe, D. Kellogg, B. Doctor, D. Hatfield, J. Levin, F. Rottman, S. Pestka, M. Wilcox and F. Anderson (1966). "The RNA code and protein synthesis." Cold Spring Harb Symp Quant Biol 31: 11-24.</p> <p>Khorana, H. G., H. Büuchi, H. Ghosh, N. Gupta, T. M. Jacob, H. Kössel, R. Morgan, S. A. Narang, E. Ohtsuka and R. D. Wells (1966). "Polynucleotide Synthesis and the Genetic Code." Cold Spring Harbor Symposia on Quantitative Biology 31: 39-49.</p>
66	Genetic code – B (research)	Research Papers on the Genetic Code	<p>Taylor, F. J. R. and D. Coates (1989). "The code within the codons." Biosystems 22(3): 177-187.</p> <p>Jukes, T. H. and S. Osawa (1990). "The genetic code in mitochondria and chloroplasts." Experientia 46(11-12): 1117-1126.</p> <p>Haig, D. and L. D. Hurst (1991). "A quantitative measure of error minimization in the genetic code." J Mol Evol 33(5): 412-417.</p> <p>Arquès, D. G. and C. J. Michel (1997). "A code in the protein coding genes." Biosystems 44(2): 107-134.</p> <p>Cebrat, S., P. Mackiewicz and M. R. Dudek (1998). "The role of the genetic code in generating new coding sequences inside existing genes." Biosystems 45(2): 165-176.</p> <p>Freeland, S. J. and L. D. Hurst (1998). "The Genetic Code Is One in a Million." Journal of Molecular Evolution 47(3): 238-248.</p> <p>Bollenbach, T., K. Vetsigian and R. Kishony (2007). "Evolution and multilevel optimization of the genetic code." Genome Res 17(4): 401-404.</p>

			<p>Kun, Á., S. Pongor, F. Jordán and E. Szathmáry (2008). Catalytic Propensity of Amino Acids and the Origins of the Genetic Code and Proteins. The Codes of Life: The Rules of Macroevolution. M. Barbieri and J. Hoffmeyer. Dordrecht, Springer Netherlands: 39-58.</p> <p>Di Giulio, M. (2008). Why the Genetic Code Originated: Implications for the Origin of Protein Synthesis. The Codes of Life: The Rules of Macroevolution. M. Barbieri and J. Hoffmeyer. Dordrecht, Springer Netherlands: 59-67.</p> <p>Guimarães, R. C., C. H. C. Moreira and S. T. de Farias (2008). Self-Referential Formation of the Genetic System. The Codes of Life: The Rules of Macroevolution. M. Barbieri and J. Hoffmeyer. Dordrecht, Springer Netherlands: 69-110.</p> <p>Gonzalez, D. L. (2008). The Mathematical Structure of the Genetic Code. The Codes of Life: The Rules of Macroevolution. M. Barbieri and J. Hoffmeyer. Dordrecht, Springer Netherlands: 111-152.</p> <p>shCherbak, V. (2008). The Arithmetical Origin of the Genetic Code. The Codes of Life: The Rules of Macroevolution. M. Barbieri and J. Hoffmeyer. Dordrecht, Springer Netherlands: 153-185.</p> <p>Rodin, A. S., E. Szathmáry and S. N. Rodin (2011). "On origin of genetic code and tRNA before translation." Biol Direct 6: 14.</p> <p>Seligmann, H. (2015). "Phylogeny of genetic codes and punctuation codes within genetic codes." Biosystems 129: 36-43.</p> <p>Barbieri, M. (2019). "Evolution of the genetic code: The ambiguity-reduction theory." Biosystems 185: 104024.</p> <p>Zolyan, S. (2021). "On the context-sensitive grammar of the genetic code." Biosystems 208: 104497.</p> <p>Michel, C. J. (2021). "Genes on the circular code alphabet." Biosystems 206: 104431.</p> <p>Karasev, V. A. (2022). "The Canonical Table of the Genetic Code as a periodic system of triplets." Biosystems 214: 104636.</p> <p>Rosandić, M. and V. Paar (2022). "Standard Genetic Code vs. Supersymmetry Genetic Code – Alphabetical table vs. physicochemical table." Biosystems 218: 104695.</p>
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			Samhita, L. (2022). "Re-reading the genetic code: The evolutionary potential of frameshifting in time." J Biosci 47.
67	Genetic Code – C (expanded)	The Expanded Genetic Code	<p>Moore, B., B. C. Persson, C. C. Nelson, R. F. Gesteland and J. F. Atkins (2000). "Quadruplet codons: implications for code expansion and the specification of translation step size." J Mol Biol 298(2): 195-209.</p> <p>Budisa, N. (2004). "Prolegomena to Future Experimental Efforts on Genetic Code Engineering by Expanding Its Amino Acid Repertoire." Angewandte Chemie International Edition 43(47): 6426-6463.</p> <p>Wang, L. and P. G. Schultz (2005). "Expanding the Genetic Code." Angewandte Chemie International Edition 44(1): 34-66.</p> <p>Cropp, T. A., J. C. Anderson and J. W. Chin (2007). "Reprogramming the amino-acid substrate specificity of orthogonal aminoacyl-tRNA synthetases to expand the genetic code of eukaryotic cells." Nat Protoc 2(10): 2590-2600.</p> <p>Liu, C. C., A. V. Mack, M. L. Tsao, J. H. Mills, H. S. Lee, H. Choe, M. Farzan, P. G. Schultz and V. V. Smider (2008). "Protein evolution with an expanded genetic code." Proc Natl Acad Sci U S A 105(46): 17688-17693.</p> <p>Bohlke, N. and N. Budisa (2014). "Sense codon emancipation for proteome-wide incorporation of noncanonical amino acids: rare isoleucine codon AUA as a target for genetic code expansion." FEMS Microbiol Lett 351(2): 133-144.</p> <p>Aerni, H. R., M. A. Shifman, S. Rogulina, P. O'Donoghue and J. Rinehart (2015). "Revealing the amino acid composition of proteins within an expanded genetic code." Nucleic Acids Res 43(2): e8.</p> <p>Oron-Gottesman, A., M. Sauert, I. Moll and H. Engelberg-Kulka (2016). "A Stress-Induced Bias in the Reading of the Genetic Code in Escherichia coli." mBio 7(6).</p> <p>Hoffman, K. S., A. Crnković and D. Söll (2018). "Versatility of Synthetic tRNAs in Genetic Code Expansion." Genes (Basel) 9(11).</p> <p>Su, H. J., T. J. Barkman, W. Hao, S. S. Jones, J. Naumann, E. Skippington, E. K. Wafula, J. M. Hu, J. D. Palmer and C. W. dePamphilis (2019). "Novel genetic code and record-setting AT-richness in the highly reduced plastid genome of the holoparasitic plant Balanophora." Proc Natl Acad Sci U S A 116(3): 934-943.</p>

			<p>Turmel, M., A. Lopes Dos Santos, C. Otis, R. Sergerie and C. Lemieux (2019). "Tracing the Evolution of the Plastome and Mitogenome in the Chloropicophyceae Uncovered Convergent tRNA Gene Losses and a Variant Plastid Genetic Code." <i>Genome Biol Evol</i> 11(4): 1275-1292.</p> <p>Kivenson, V. and S. J. Giovannoni (2020). "An Expanded Genetic Code Enables Trimethylamine Metabolism in Human Gut Bacteria." <i>mSystems</i> 5(5).</p> <p>Bag, S. S., I. Saraogi and J. Guo (2022). "Editorial: Expansion of the Genetic Code: Unnatural Amino Acids and their Applications." <i>Front Chem</i> 10: 958433.</p> <p>Reinkemeier, C. D. and E. A. Lemke (2023). "Synthetic Organelles for Multiple mRNA Selective Genetic Code Expansions in Eukaryotes." <i>Methods Mol Biol</i> 2563: 341-369.</p>
68	Genetic code – D (alternative)	The alternative Genetic Codes	<p>Doerfler, W. (1982). "In search of more complex genetic codes—can linguistics be a guide?" <i>Med Hypotheses</i> 9(6): 563-579.</p> <p>Parker, J. (1989). "Errors and alternatives in reading the universal genetic code." <i>Microbiol Rev</i> 53(3): 273-298.</p> <p>Osawa, S., D. Collins, T. Ohama, T. H. Jukes and K. Watanabe (1990). "Evolution of the mitochondrial genetic code. III. Reassignment of CUN codons from leucine to threonine during evolution of yeast mitochondria." <i>J Mol Evol</i> 30(4): 322-328.</p> <p>Suzuki, T., T. Ueda, T. Yokogawa, K. Nishikawa and K. Watanabe (1994). "Characterization of serine and leucine tRNAs in an asporogenic yeast <i>Candida cylindracea</i> and evolutionary implications of genes for tRNA(Ser)CAG responsible for translation of a non-universal genetic code." <i>Nucleic Acids Res</i> 22(2): 115-123.</p> <p>Lang-Unnasch, N. and D. P. Aiello (1999). "Sequence evidence for an altered genetic code in the <i>Neospora caninum</i> plastid." <i>Int J Parasitol</i> 29(10): 1557-1562.</p> <p>Wang, K., H. Neumann, S. Y. Peak-Chew and J. W. Chin (2007). "Evolved orthogonal ribosomes enhance the efficiency of synthetic genetic code expansion." <i>Nat Biotechnol</i> 25(7): 770-777.</p> <p>McCutcheon, J. P., B. R. McDonald and N. A. Moran (2009). "Origin of an alternative genetic code in the extremely small and GC-rich genome of a bacterial symbiont." <i>PLoS Genet</i> 5(7): e1000565.</p>

			<p>Castro-Chavez, F. (2010). "The rules of variation: amino acid exchange according to the rotating circular genetic code." J Theor Biol 264(3): 711-721.</p> <p>Cocquyt, E., G. H. Gile, F. Leliaert, H. Verbruggen, P. J. Keeling and O. De Clerck (2010). "Complex phylogenetic distribution of a non-canonical genetic code in green algae." BMC Evol Biol 10: 327.</p> <p>Matsumoto, T., S. A. Ishikawa, T. Hashimoto and Y. Inagaki (2011). "A deviant genetic code in the green alga-derived plastid in the dinoflagellate <i>Lepidodinium chlorophorum</i>." Mol Phylogenet Evol 60(1): 68-72.</p> <p>Sczepanski, J. T. and G. F. Joyce (2012). "Synthetic evolving systems that implement a user-specified genetic code of arbitrary design." Chem Biol 19(10): 1324-1332.</p> <p>Roukos, D. H. (2012). "Biotechnological, genomics and systems-synthetic biology revolution: redesigning genetic code for a pragmatic systems medicine." Expert Rev Med Devices 9(2): 97-101.</p> <p>Ma, N. J., C. F. Hemez, K. W. Barber, J. Rinehart and F. J. Isaacs (2018). "Organisms with alternative genetic codes resolve unassigned codons via mistranslation and ribosomal rescue." eLife 7: e34878.</p> <p>Fimmel, E. and L. Strüngmann (2019). "Linear codes and the mitochondrial genetic code." Biosystems 184: 103990.</p> <p>Meng, K., C. Z. Chung, D. Söll and N. Krahn (2022). "Unconventional genetic code systems in archaea." Front Microbiol 13: 1007832.</p>
69	Genome regulatory code	The Genomic Regulatory Code	<p>Rister, J. and C. Desplan (2010). "Deciphering the genome's regulatory code: the many languages of DNA." Bioessays 32(5): 381-384.</p> <p>Willis, N. A., E. Rass and R. Scully (2015). "Deciphering the Code of the Cancer Genome: Mechanisms of Chromosome Rearrangement." Trends Cancer 1(4): 217-230.</p> <p>Kelley, D. R., J. Snoek and J. L. Rinn (2016). "Basset: learning the regulatory code of the accessible genome with deep convolutional neural networks." Genome Res 26(7): 990-999.</p> <p>Istrail, S. (2019). "Eric Davidson's Regulatory Genome for Computer Science: Causality, Logic, and Proof Principles of the Genomic cis-Regulatory Code." J Comput Biol 26(7): 653-684.</p>

			Mozziconacci, J., M. Merle and A. Lesne (2020). "The 3D Genome Shapes the Regulatory Code of Developmental Genes." J Mol Biol 432(3): 712-723.
70	Genomic code	The Genomic Code	<p>Pennisi, E. (2004). "Searching for the genome's second code." Science 306(5696): 632-635.</p> <p>Segal, E., Y. Fondufe-Mittendorf, L. Chen, A. Thåström, Y. Field, I. K. Moore, J.-P. Z. Wang and J. Widom (2006). "A genomic code for nucleosome positioning." Nature 442(7104): 772-778.</p> <p>Lee, B., H. Song, K. Rizzoti, Y. Son, J. Yoon, K. Baek and Y. Jeong (2013). "Genomic code for Sox2 binding uncovers its regulatory role in Six3 activation in the forebrain." Dev Biol 381(2): 491-501.</p> <p>Ward, M. C. and Y. Gilad (2017). "Human genomics: Cracking the regulatory code." Nature 550(7675): 190-191.</p> <p>Bernardi, G. (2019). "The Genomic Code: A Pervasive Encoding/Molding of Chromatin Structures and a Solution of the "Non-Coding DNA" Mystery." BioEssays 41(12): 1900106.</p> <p>Riolo, J. and A. J. Steckl (2022). "Comparative analysis of genome code complexity and manufacturability with engineering benchmarks." Sci Rep 12(1): 2808.</p>
71	Gli code	The Gli Codes	<p>Ruiz i Altaba, A., V. Nguyễn and V. Palma (2003). "The emergent design of the neural tube: prepattern, SHH morphogen and GLI code." Curr Opin Genet Dev 13(5): 513-521.</p> <p>Ruiz i Altaba, A., C. Mas and B. Stecca (2007). "The Gli code: an information nexus regulating cell fate, stemness and cancer." Trends Cell Biol 17(9): 438-447.</p> <p>Devine, C. A., J. L. Sbrogna, B. Guner, M. Osgood, M. C. Shen and R. O. Karlstrom (2009). "A dynamic Gli code interprets Hh signals to regulate induction, patterning, and endocrine cell specification in the zebrafish pituitary." Dev Biol 326(1): 143-154.</p> <p>Stecca, B. and A. Ruiz i Altaba (2010). "Context-dependent regulation of the GLI code in cancer by HEDGEHOG and non-HEDGEHOG signals." J Mol Cell Biol 2(2): 84-95.</p> <p>Ruiz i Altaba, A. (2011). "Hedgehog signaling and the Gli code in stem cells, cancer, and metastases." Sci Signal 4(200): pt9.</p> <p>Matz-Soja, M., C. Rennert, K. Schönefeld, S. Aleithe, J. Boettger, W. Schmidt-Heck, T. S. Weiss, A. Hovhannisyanyan, S. Zellmer, N. Klötting, A. Schulz, J. Kratzsch, R. Guthke and R.</p>

			<p>Gebhardt (2016). "Hedgehog signaling is a potent regulator of liver lipid metabolism and reveals a GLI-code associated with steatosis." Elife 5.</p> <p>Timmis, A. J. and N. A. Riobo-Del Galdo (2020). "Another twist to the GLI code." Biochem J 477(22): 4343-4347.</p>
72	Glioma code	The Glioma Code	<p>Lowenstein, P. R., G. J. Baker and M. G. Castro (2014). "Cracking the glioma-NK inhibitory code: toward successful innate immunotherapy." Oncoimmunology 3(11): e965573.</p>
73	Glycomic code	The Glycomic Code	<p>Gupta, G. and A. Surolia (2012). Glycomics: An Overview of the Complex Glycocode. Biochemical Roles of Eukaryotic Cell Surface Macromolecules, New York, NY, Springer New York.</p> <p>Buckeridge, M. S. and A. P. de Souza (2014). "Breaking the "Glycomic Code" of Cell Wall Polysaccharides May Improve Second-Generation Bioenergy Production from Biomass." BioEnergy Research 7(4): 1065-1073.</p> <p>Buckeridge, M. S. (2018). "The evolution of the Glycomic Codes of extracellular matrices." Biosystems 164: 112-120.</p> <p>Banerjee, D. K., Ed. (2021). Glycome: The Hidden Code in Biology, Nova Science Publishers, Inc.</p>
74	Glycosylation code	The Glycocode	<p>Gama, C. I. and L. C. Hsieh-Wilson (2005). "Chemical approaches to deciphering the glycosaminoglycan code." Curr Opin Chem Biol 9(6): 609-619.</p> <p>Hebert, D. N., S. C. Garman and M. Molinari (2005). "The glycan code of the endoplasmic reticulum: asparagine-linked carbohydrates as protein maturation and quality-control tags." Trends Cell Biol 15(7): 364-370.</p> <p>Shental-Bechor, D. and Y. Levy (2009). "Folding of glycoproteins: toward understanding the biophysics of the glycosylation code." Current Opinion in Structural Biology 19(5): 524-533.</p> <p>Becer, C. R. (2012). "The glycopolymer code: synthesis of glycopolymers and multivalent carbohydrate-lectin interactions." Macromol Rapid Commun 33(9): 742-752.</p> <p>Ellis, C. R. and W. G. Noid (2014). "Deciphering the glycosylation code." J Phys Chem B 118(39): 11462-11469.</p>

			<p>Dumych, T., C. Bridot, S. G. Gouin, M. F. Lensink, S. Paryzhak, S. Szunerits, R. Blossey, R. Bilyy, J. Bouckaert and E. M. Krammer (2018). "A Novel Integrated Way for Deciphering the Glycan Code for the FimH Lectin." <i>Molecules</i> 23(11).</p> <p>Rodriguez, E., K. Boelaars, K. Brown, K. Madunić, T. van Ee, F. Dijk, J. Verheij, R. J. E. Li, S. T. T. Schetters, L. L. Meijer, T. Y. S. Le Large, E. Driehuis, H. Clevers, S. C. M. Bruijns, T. O'Toole, S. J. van Vliet, M. F. Bijlsma, M. Wuhrer, G. Kazemier, E. Giovannetti, J. J. Garcia-Vallejo and Y. van Kooyk (2022). "Analysis of the glyco-code in pancreatic ductal adenocarcinoma identifies glycan-mediated immune regulatory circuits." <i>Commun Biol</i> 5(1): 41.</p> <p>Wisnovsky, S. and C. R. Bertozzi (2022). "Reading the glyco-code: New approaches to studying protein-carbohydrate interactions." <i>Curr Opin Struct Biol</i> 75: 102395.</p>
75	Growth code	The Growth Codes	<p>Ottoson, D. (1999). "The unravelling of the code of nerve growth: a modern Saga of the dedication to science." <i>Brain Res Bull</i> 50(5-6): 473-474.</p> <p>Erland, L. A. E., C. E. Turi, P. K. Saxena and S. J. Murch (2020). "Metabolomics and hormonomics to crack the code of filbert growth." <i>Metabolomics</i> 16(5): 62.</p>
76	GRP code	The G-Protein-Coupled Receptor Codes	<p>Tan, E. S., E. S. Groban, M. P. Jacobson and T. S. Scanlan (2008). "Toward deciphering the code to aminergic G protein-coupled receptor drug design." <i>Chem Biol</i> 15(4): 343-353.</p> <p>Butcher, A. J., R. Prihandoko, K. C. Kong, P. McWilliams, J. M. Edwards, A. Bottrill, S. Mistry and A. B. Tobin (2011). "Differential G-protein-coupled receptor phosphorylation provides evidence for a signaling bar code." <i>J Biol Chem</i> 286(13): 11506-11518.</p> <p>Gough, N. R. (2011). "Focus issue: Cracking the G protein-coupled receptor code." <i>Sci Signal</i> 4(185): eg7.</p>
77	Hearing code	The Hearing Code	<p>Cremers, C. W. (2000). "Hearing: cracking the code." <i>J Laryngol Otol</i> 114(1): 6-16.</p>
78	Hidden protein code	The Hidden Code Within the Genetic Code	<p>Baker, M. (2010). "Hidden code in the protein code." <i>Nature Methods</i> 7(11): 874-874.</p> <p>Weatheritt, R. J. and M. M. Babu (2013). "The Hidden Codes That Shape Protein Evolution." <i>Science</i> 342(6164): 1325-1326.</p>

79	Hippocampal code	The Neuronal Hippocampal Codes	<p>Jensen, O. (2005). "Reading the hippocampal code by theta phase-locking." Trends Cogn Sci 9(12): 551-553.</p> <p>Tsanov, M. (2015). "Septo-hippocampal signal processing: breaking the code." Prog Brain Res 219: 103-120.</p>
80	Histone code – A (general)	The Histone Code (General Aspects)	<p>Strahl, B. D. and C. D. Allis (2000). "The language of covalent histone modifications." Nature 403(6765): 41-45.</p> <p>Turner, B. M. (2000). "Histone acetylation and an epigenetic code." Bioessays 22(9): 836-845.</p> <p>Jenuwein, T. and C. D. Allis (2001). "Translating the histone code." Science 293(5532): 1074-1080.</p> <p>Turner, B. M. (2002). "Cellular memory and the histone code." Cell 111(3): 285-291.</p> <p>Cosgrove, M. S., J. D. Boeke and C. Wolberger (2004). "Regulated nucleosome mobility and the histone code." Nature Structural & Molecular Biology 11(11): 1037-1043.</p> <p>Wang, Y., W. Fischle, W. Cheung, S. Jacobs, S. Khorasanizadeh and C. D. Allis (2004). "Beyond the double helix: writing and reading the histone code." Novartis Found Symp 259: 3-17; discussion 17-21, 163-169.</p> <p>de la Cruz, X., S. Lois, S. Sánchez-Molina and M. A. Martínez-Balbás (2005). "Do protein motifs read the histone code?" BioEssays 27(2): 164-175.</p> <p>Hartman, H. B., J. Yu, T. Alenghat, T. Ishizuka and M. A. Lazar (2005). "The histone-binding code of nuclear receptor co-repressors matches the substrate specificity of histone deacetylase 3." EMBO Rep 6(5): 445-45</p> <p>Ivanovska, I., T. Khandan, T. Ito and T. L. Orr-Weaver (2005). "A histone code in meiosis: the histone kinase, NHK-1, is required for proper chromosomal architecture in Drosophila oocytes." Genes Dev 19(21): 2571-2582.</p> <p>Margueron, R., P. Trojer and D. Reinberg (2005). "The key to development: interpreting the histone code?" Curr Opin Genet Dev 15(2): 163-176.</p> <p>Morris, K. V. (2005). "siRNA-mediated transcriptional gene silencing: the potential mechanism and a possible role in the histone code." Cell Mol Life Sci 62(24): 3057-3066.</p>

			<p>Yoon, H. G., Y. Choi, P. A. Cole and J. Wong (2005). "Reading and function of a histone code involved in targeting corepressor complexes for repression." <i>Mol Cell Biol</i> 25(1): 324-335.</p> <p>Iñiguez-Lluhí, J. A. (2006). "For a healthy histone code, a little SUMO in the tail keeps the acetyl away." <i>ACS Chem Biol</i> 1(4): 204-206.</p> <p>Valley, C. M., L. M. Pertz, B. S. Balakumaran and H. F. Willard (2006). "Chromosome-wide, allele-specific analysis of the histone code on the human X chromosome." <i>Hum Mol Genet</i> 15(15): 2335-2347.</p> <p>Turner, B. M. (2007). "Defining an epigenetic code." <i>Nature Cell Biology</i> 9(1): 2-6.</p> <p>Comeaux, C. A. and M. T. Duraisingh (2007). "Unravelling a histone code for malaria virulence." <i>Mol Microbiol</i> 66(6): 1291-1295.</p> <p>Yue, W. W., M. Hassler, S. M. Roe, V. Thompson-Vale and L. H. Pearl (2007). "Insights into histone code syntax from structural and biochemical studies of CARM1 methyltransferase." <i>Embo j</i> 26(20): 4402-4412.</p> <p>Boussouar, F., S. Rousseaux and S. Khochbin (2008). "A new insight into male genome reprogramming by histone variants and histone code." <i>Cell Cycle</i> 7(22): 3499-3502.</p> <p>Fillingham, J. and J. F. Greenblatt (2008). "A histone code for chromatin assembly." <i>Cell</i> 134(2): 206-208.</p> <p>Godde, J. S. and K. Ura (2008). "Cracking the enigmatic linker histone code." <i>J Biochem</i> 143(3): 287-293.</p> <p>Lukas, J. and J. Bartek (2008). "DNA damage: a histone-code mediator leaves the stage." <i>Nat Struct Mol Biol</i> 15(5): 430-432.</p> <p>Raychaudhuri, N., S. Raychaudhuri, M. Thamocharan and S. U. Devaskar (2008). "Histone code modifications repress glucose transporter 4 expression in the intrauterine growth-restricted offspring." <i>J Biol Chem</i> 283(20): 13611-13626.</p> <p>Sanchez Mde, L. and C. Gutierrez (2009). "Novel insights into the plant histone code: lessons from ORC1." <i>Epigenetics</i> 4(4): 205-208.</p>
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			<p>Koshibu, K., J. Gräff, M. Beullens, F. D. Heitz, D. Berchtold, H. Russig, M. Farinelli, M. Bollen and I. M. Mansuy (2009). "Protein phosphatase 1 regulates the histone code for long-term memory." J Neurosci 29(41): 13079-13089.</p> <p>Zippo, A., R. Serafini, M. Rocchigiani, S. Pennacchini, A. Krepelova and S. Oliviero (2009). "Histone crosstalk between H3S10ph and H4K16ac generates a histone code that mediates transcription elongation." Cell 138(6): 1122-1136.</p> <p>Sakabe, K., Z. Wang and G. W. Hart (2010). "Beta-N-acetylglucosamine (O-GlcNAc) is part of the histone code." Proc Natl Acad Sci U S A 107(46): 19915-19920.</p> <p>Cosgrove, M. S. (2012). "Writers and readers: deconvoluting the harmonic complexity of the histone code." Nat Struct Mol Biol 19(8): 739-740.</p> <p>Rusk, N. (2012). "Writing the histone code." Nat Methods 9(8): 777.</p> <p>Teng, L. and K. Tan (2012). "Finding combinatorial histone code by semi-supervised biclustering." BMC Genomics 13: 301.</p> <p>Crea, F. (2012). "Histone code, human growth and cancer." Oncotarget 3(1): 1-2.</p> <p>Chen, H., S. Lonardi and J. Zheng (2014). "Deciphering histone code of transcriptional regulation in malaria parasites by large-scale data mining." Comput Biol Chem 50: 3-10.</p> <p>Dehennaut, V., D. Leprince and T. Lefebvre (2014). "O-GlcNAcylation, an Epigenetic Mark. Focus on the Histone Code, TET Family Proteins, and Polycomb Group Proteins." Front Endocrinol (Lausanne) 5: 155.</p> <p>Inamochi, Y., K. Mochizuki and T. Goda (2014). "Histone code of genes induced by co-treatment with a glucocorticoid hormone agonist and a p44/42 MAPK inhibitor in human small intestinal Caco-2 cells." Biochim Biophys Acta 1840(1): 693-700.</p> <p>Kühn, S. and J.-H. S. Hofmeyr (2014). "Is the "Histone Code" an Organic Code?" Biosemiotics 7(2): 203-222.</p> <p>Zuchegna, C., F. Aceto, A. Bertoni, A. Romano, B. Perillo, P. Laccetti, M. E. Gottesman, E. V. Avvedimento and A. Porcellini (2014). "Mechanism of retinoic acid-induced transcription: histone code, DNA oxidation and formation of chromatin loops." Nucleic Acids Res 42(17): 11040-11055.</p>
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			<p>Fischle, W., H. D. Mootz and D. Schwarzer (2015). "Synthetic histone code." <i>Curr Opin Chem Biol</i> 28: 131-140.</p> <p>Sidoli, S. and B. A. Garcia (2015). "Properly reading the histone code by MS-based proteomics." <i>Proteomics</i> 15(17): 2901-2902.</p> <p>Soffers, J. H., X. Li, S. M. Abmayr and J. L. Workman (2016). "Reading and Interpreting the Histone Acylation Code." <i>Genomics Proteomics Bioinformatics</i> 14(6): 329-332.</p> <p>Wang, D., N. Kon and W. Gu (2016). "Acidic domains: "converse readers" for acetylation code." <i>Oncotarget</i> 7(49): 80101-80102.</p> <p>Chang, H. W. and V. M. Studitsky (2017). "Chromatin replication: TRANSMITTING the histone code." <i>J Nat Sci</i> 3(2).</p> <p>Salomé, P. A. (2017). "Know Your Histone (Zip) Code: Flowering Time and Phosphorylation of Histone H2A on Serine 95." <i>Plant Cell</i> 29(9): 2084-2085.</p> <p>Aldrich, J. C., A. Leibholz, M. S. Cheema, J. Ausió and P. M. Ferree (2017). "A 'selfish' B chromosome induces genome elimination by disrupting the histone code in the jewel wasp <i>Nasonia vitripennis</i>." <i>Sci Rep</i> 7: 42551.</p> <p>Prakash, K. and D. Fournier (2018). "Evidence for the implication of the histone code in building the genome structure." <i>Biosystems</i> 164: 49-59.</p> <p>Wang, C. and S. Zhang (2018). "Reveal cell type-specific regulatory elements and their characterized histone code classes via a hidden Markov model." <i>BMC Genomics</i> 19(Suppl 10): 903.</p> <p>Farrelly, L. A. and I. Maze (2019). "An emerging perspective on 'histone code' mediated regulation of neural plasticity and disease." <i>Curr Opin Neurobiol</i> 59: 157-163.</p> <p>Bano, D., P. Salomoni, D. Ehninger and P. Nicotera (2021). "The histone code in dementia: Transcriptional and chromatin plasticity fades away." <i>Curr Opin Pharmacol</i> 60: 117-122.</p> <p>von Grüning, H., M. Coradin, M. R. Mendoza, J. Reader, S. Sidoli, B. A. Garcia and L. M. Birkholtz (2022). "A Dynamic and Combinatorial Histone Code Drives Malaria Parasite Asexual and Sexual Development." <i>Mol Cell Proteomics</i> 21(3): 100199.</p>
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81	Histone code – B (enhancer)	The Histone Code – Enhancers	<p>Ay, A. and D. N. Arnosti (2010). "Nucleosome positioning: an essential component of the enhancer regulatory code?" Curr Biol 20(9): R404-406.</p> <p>Allende, M. L., M. Manzanares, J. J. Tena, C. G. Feijóo and J. L. Gómez-Skarmeta (2006). "Cracking the genome's second code: enhancer detection by combined phylogenetic footprinting and transgenic fish and frog embryos." Methods 39(3): 212-219.</p> <p>Rastegar, S., I. Hess, T. Dickmeis, J. C. Nicod, R. Ertzer, Y. Hadzhiev, W. G. Thies, G. Scherer and U. Strähle (2008). "The words of the regulatory code are arranged in a variable manner in highly conserved enhancers." Dev Biol 318(2): 366-377.</p> <p>Betancur, P., M. Bronner-Fraser and T. Sauka-Spengler (2010). "Genomic code for Sox10 activation reveals a key regulatory enhancer for cranial neural crest." Proc Natl Acad Sci U S A 107(8): 3570-3575.</p> <p>Lau, P. N. and P. Cheung (2011). "Histone code pathway involving H3 S28 phosphorylation and K27 acetylation activates transcription and antagonizes polycomb silencing." Proc Natl Acad Sci U S A 108(7): 2801-2806.</p> <p>Aksoy, I., R. Jauch, J. Chen, M. Dyla, U. Divakar, G. K. Bogu, R. Teo, C. K. Leng Ng, W. Herath, S. Lili, A. P. Hutchins, P. Robson, P. R. Kolatkar and L. W. Stanton (2013). "Oct4 switches partnering from Sox2 to Sox17 to reinterpret the enhancer code and specify endoderm." Embo j 32(7): 938-953.</p> <p>Zhou, J. and O. G. Troyanskaya (2016). "Probabilistic modelling of chromatin code landscape reveals functional diversity of enhancer-like chromatin states." Nat Commun 7: 10528.</p> <p>Wong, E. S., D. Zheng, S. Z. Tan, N. L. Bower, V. Garside, G. Vanwalleghem, F. Gaiti, E. Scott, B. M. Hogan, K. Kikuchi, E. McGlinn, M. Francois and B. M. Degnan (2020). "Deep conservation of the enhancer regulatory code in animals." Science 370(6517).</p> <p>Wolfe, J. C., L. A. Mikheeva, H. Hagrás and N. R. Zabet (2021). "An explainable artificial intelligence approach for decoding the enhancer histone modifications code and identification of novel enhancers in Drosophila." Genome Biol 22(1): 308.</p>
82	Histone code – C (trans)	The TransHistone Code	<p>Sims, J. K., S. I. Houston, T. Magazinnik and J. C. Rice (2006). "A trans-tail histone code defined by monomethylated H4 Lys-20 and H3 Lys-9 demarcates distinct regions of silent chromatin." J Biol Chem 281(18): 12760-12766.</p>

			<p>Sims, J. K. and J. C. Rice (2008). "PR-Set7 establishes a repressive trans-tail histone code that regulates differentiation." Mol Cell Biol 28(14): 4459-4468.</p> <p>Congdon, L. M., J. K. Sims, C. T. Tuzon and J. C. Rice (2014). "The PR-Set7 binding domain of Riz1 is required for the H4K20me1-H3K9me1 trans-tail 'histone code' and Riz1 tumor suppressor function." Nucleic Acids Res 42(6): 3580-3589.</p> <p>Bhanu, N. V., S. Sidoli, Z. F. Yuan, R. C. Molden and B. A. Garcia (2019). "Regulation of proline-directed kinases and the trans-histone code H3K9me3/H4K20me3 during human myogenesis." J Biol Chem 294(20): 8296-8308.</p>
83	Histone code – D (reader)	The Histone Code Readers	<p>Gao, C., J. M. Herold and D. Kireev (2012). "Assessment of free energy predictors for ligand binding to a methyllysine histone code reader." J Comput Chem 33(6): 659-665.</p> <p>Franz, H., H. Greschik, D. Willmann, L. Ozretić, C. A. Jilg, E. Wardelmann, M. Jung, R. Buettner and R. Schüle (2015). "The histone code reader SPIN1 controls RET signaling in liposarcoma." Oncotarget 6(7): 4773-4789.</p> <p>Kim, C. H., J. W. Kim, S. M. Jang, J. H. An, S. B. Seo and K. H. Choi (2015). "The chromodomain-containing histone acetyltransferase TIP60 acts as a code reader, recognizing the epigenetic codes for initiating transcription." Biosci Biotechnol Biochem 79(4): 532-538.</p> <p>Greschik, H., D. Duteil, N. Messaddeq, D. Willmann, L. Arrigoni, M. Sum, M. Jung, D. Metzger, T. Manke, T. Günther and R. Schüle (2017). "The histone code reader Spin1 controls skeletal muscle development." Cell Death Dis 8(11): e3173.</p> <p>Wei, W., J. J. Tao, H. W. Chen, Q. T. Li, W. K. Zhang, B. Ma, Q. Lin, J. S. Zhang and S. Y. Chen (2017). "A Histone Code Reader and a Transcriptional Activator Interact to Regulate Genes for Salt Tolerance." Plant Physiol 175(3): 1304-1320.</p> <p>Molnar, C., J. P. Heinen, J. Reina, S. Llamazares, E. Palumbo, A. Breschi, M. Gay, L. Villarreal, M. Vilaseca, G. Pollarolo and C. Gonzalez (2019). "The histone code reader PHD finger protein 7 controls sex-linked disparities in gene expression and malignancy in Drosophila." Sci Adv 5(8): eaaw7965.</p> <p>Li, D., J. Guo and R. Jia (2021). "Histone code reader SPIN1 is a promising target of cancer therapy." Biochimie 191: 78-86.</p>

84	Histone sub-code	The Histone Sub-Code	Lomberk, G., D. Bensi, M. E. Fernandez-Zapico and R. Urrutia (2006). "Evidence for the existence of an HP1-mediated subcode within the histone code." Nat Cell Biol 8(4): 407-415.
85	Homeokinetic code	The Homeokinetic Muscle Code	Que, C. L., G. Maksym and P. T. Macklem (2000). "Deciphering the homeokinetic code of airway smooth muscle." Am J Respir Crit Care Med 161(3 Pt 2): S161-163.
86	Hormone code	The Hormone Code	<p>Kodama, M. and T. Kodama (1994). "An essay on the nature of hormonal codes involved in the genesis of human neoplasias (review)." Anticancer research 14(6B): 2653-2665.</p> <p>Jorgensen, J. S., C. C. Quirk and J. H. Nilson (2004). "Multiple and Overlapping Combinatorial Codes Orchestrate Hormonal Responsiveness and Dictate Cell-Specific Expression of the Genes Encoding Luteinizing Hormone." Endocrine Reviews 25(4): 521-542.</p> <p>Bianco, A. C. (2011). "Minireview: Cracking the Metabolic Code for Thyroid Hormone Signaling." Endocrinology 152(9): 3306-3311.</p> <p>Russo, S. C., F. Salas-Lucia and A. C. Bianco (2021). "Deiodinases and the Metabolic Code for Thyroid Hormone Action." Endocrinology 162(8).</p>
87	HOX code – A (general)	The HOX Code (General)	<p>Kessel, M. and P. Gruss (1991). "Homeotic transformations of murine vertebrae and concomitant alteration of Hox codes induced by retinoic acid." Cell 67(1): 89-104.</p> <p>Marshall, H., S. Nonchev, M. H. Sham, I. Muchamore, A. Lumsden and R. Krumlauf (1992). "Retinoic acid alters hindbrain Hox code and induces transformation of rhombomeres 2/3 into a 4/5 identity." Nature 360(6406): 737-741.</p> <p>Bayascas, J. R., E. Castillo and E. Saló (1998). "Platyhelminthes have a Hox code differentially activated during regeneration, with genes closely related to those of spiralian protostomes." Development Genes and Evolution 208(8): 467-473.</p> <p>Pitera, J. E., V. V. Smith, P. Thorogood and P. J. Milla (1999). "Coordinated expression of 3' hox genes during murine embryonal gut development: an enteric Hox code." Gastroenterology 117(6): 1339-1351.</p> <p>Kawazoe, Y., T. Sekimoto, M. Araki, K. Takagi, K. Araki and K. Yamamura (2002). "Region-specific gastrointestinal Hox code during murine embryonal gut development." Dev Growth Differ 44(1): 77-84.</p>

			<p>Shimizu, T., Y. K. Bae and M. Hibi (2006). "Cdx-Hox code controls competence for responding to Fgfs and retinoic acid in zebrafish neural tissue." <i>Development</i> 133(23): 4709-4719.</p> <p>Ryan, J. F., M. E. Mazza, K. Pang, D. Q. Matus, A. D. Baxevanis, M. Q. Martindale and J. R. Finnerty (2007). "Pre-bilaterian origins of the Hox cluster and the Hox code: evidence from the sea anemone, <i>Nematostella vectensis</i>." <i>PLoS One</i> 2(1): e153.</p> <p>Liedtke, S., A. Buchheiser, J. Bosch, F. Bosse, F. Kruse, X. Zhao, S. Santourlidis and G. Kögler (2010). "The HOX Code as a "biological fingerprint" to distinguish functionally distinct stem cell populations derived from cord blood." <i>Stem Cell Research</i> 5(1): 40-50.</p> <p>Mukaigasa, K., C. Sakuma, T. Okada, S. Homma, T. Shimada, K. Nishiyama, N. Sato and H. Yaginuma (2017). "Motor neurons with limb-innervating character in the cervical spinal cord are sculpted by apoptosis based on the Hox code in chick embryo." <i>Development</i> 144(24): 4645-4657.</p> <p>Bálint, M., I. Horváth, N. Mészáros and C. Hetényi (2019). "Towards Unraveling the Histone Code by Fragment Blind Docking." <i>Int J Mol Sci</i> 20(2).</p> <p>Devi, M. S., R. Meiguilungpou, A. L. Sharma, C. Anjali, K. M. Devi, L. S. Singh and T. R. Singh (2019). "Spindlin docking protein (SPIN.DOC) interaction with SPIN1 (a histone code reader) regulates Wnt signaling." <i>Biochem Biophys Res Commun</i> 511(3): 498-503.</p> <p>Tomoyasu, Y. (2020). "Breaking bad in the rice field by breaking the Hox code." <i>Natl Sci Rev</i> 7(10): 1616.</p>
88	HOX code – B (Pattern)	The HOX Code Pattern Formation	<p>Hunt, P., J. Whiting, S. Nonchev, M.-H. Sham, H. Marshall, A. Graham, M. Cook, R. Allemann, P. W. J. Rigby, M. Gulisano, A. Faiella, E. Boncinelli and R. Krumlauf (1991). "The branchial Hox code and its implications for gene regulation, patterning of the nervous system and head evolution." <i>Development</i> 113(Supplement 2): 63-77.</p> <p>Hunt, P., J. D. Clarke, P. Buxton, P. Ferretti and P. Thorogood (1998). "Stability and plasticity of neural crest patterning and branchial arch Hox code after extensive cephalic crest rotation." <i>Dev Biol</i> 198(1): 82-104.</p> <p>Sekimoto, T., K. Yoshinobu, M. Yoshida, S. Kuratani, S. Fujimoto, M. Araki, N. Tajima, K. Araki and K. Yamamura (1998). "Region-specific expression of murine Hox genes</p>

			<p>implies the Hox code-mediated patterning of the digestive tract." Genes Cells 3(1): 51-64.</p> <p>Woltering, J. M., F. J. Vonk, H. Müller, N. Bardine, I. L. Tuduçe, M. A. de Bakker, W. Knöchel, I. O. Sirbu, A. J. Durston and M. K. Richardson (2009). "Axial patterning in snakes and caecilians: evidence for an alternative interpretation of the Hox code." Dev Biol 332(1): 82-89.</p> <p>Oulion, S., V. Borday-Birraux, M. Debiais-Thibaud, S. Mazan, P. Laurenti and D. Casane (2011). "Evolution of repeated structures along the body axis of jawed vertebrates, insights from the Scyliorhinus canicula Hox code." Evol Dev 13(3): 247-259.#</p> <p>Nishimoto, S., C. Minguillon, S. Wood and M. P. Logan (2014). "A combination of activation and repression by a colinear Hox code controls forelimb-restricted expression of Tbx5 and reveals Hox protein specificity." PLoS Genet 10(3): e1004245.</p> <p>Matsuda, R., C. Hosono, K. Saigo and C. Samakovlis (2015). "The intersection of the extrinsic hedgehog and WNT/wingless signals with the intrinsic Hox code underpins branching pattern and tube shape diversity in the drosophila airways." PloS Genet 11(1): e1004929.</p> <p>He, S., F. Del Viso, C. Y. Chen, A. Ikmi, A. E. Kroesen and M. C. Gibson (2018). "An axial Hox code controls tissue segmentation and body patterning in Nematostella vectensis." Science 361(6409): 1377-1380.</p>
89	Hox code -C (disease)	The Hox Disease Codes	<p>Cheng, S., S. Yang, Y. Shi, R. Shi, Y. Yeh and X. Yu (2021). "Neuroendocrine prostate cancer has distinctive, non-prostatic HOX code that is represented by the loss of HOXB13 expression." Sci Rep 11(1): 2778.</p>
90	Hypothalamic code	The Hypothalamic Code	<p>Bhumra, G. S. and R. E. Dyball (2010). "Reading between the spikes of the hypothalamic neural code." J Neuroendocrinol 22(12): 1239-1250.</p>
91	Identity code	The Identity Code	<p>Santa-Olalla, J., J. M. Baizabal, M. Fregoso, M. del Carmen Cárdenas and L. Covarrubias (2003). "The in vivo positional identity gene expression code is not preserved in neural stem cells grown in culture." Eur J Neurosci 18(5): 1073-1084.</p> <p>Serizawa, S., K. Miyamichi, H. Takeuchi, Y. Yamagishi, M. Suzuki and H. Sakano (2006). "A neuronal identity code for the odorant receptor-specific and activity-dependent axon sorting." Cell 127(5): 1057-1069</p>

			<p>Brill, M. S., M. Snapyan, H. Wohlfrom, J. Ninkovic, M. Jawerka, G. S. Mastick, R. Ashery-Padan, A. Saghatelian, B. Berninger and M. Götz (2008). "A dlx2- and pax6-dependent transcriptional code for periglomerular neuron specification in the adult olfactory bulb." J Neurosci 28(25): 6439-6452.</p> <p>Rhodes, G., E. Jaquet, L. Jeffery, E. Evangelista, J. Keane and A. J. Calder (2011). "Sex-specific norms code face identity." J Vis 11(1): 1.</p> <p>Menendez, J. A. and T. Alarcón (2016). "Nuclear reprogramming of cancer stem cells: Corrupting the epigenetic code of cell identity with oncometabolites." Mol Cell Oncol 3(6): e1160854.</p> <p>Guo, T., G. Liu, H. Du, Y. Wen, S. Wei, Z. Li, G. Tao, Z. Shang, X. Song, Z. Zhang, Z. Xu, Y. You, B. Chen, J. L. Rubenstein and Z. Yang (2019). "Dlx1/2 are Central and Essential Components in the Transcriptional Code for Generating Olfactory Bulb Interneurons." Cereb Cortex 29(11): 4831-4849.</p>
92	Immune code	The Immune Codes	<p>Jakobiec, F. A. and P. Henkind (1981). "The Graves' enigma: breaking an immunological code." Ophthalmology 88(6): 26a-27a.</p> <p>Prodi, G. (1988). Signs and Codes in Immunology. The Semiotics of Cellular Communication in the Immune System, Berlin, Heidelberg, Springer Berlin Heidelberg.</p> <p>Pakravan, N., A. T. Hassan and Z. M. Hassan (2007). "Naturally occurring self-reactive CD4+CD25+ regulatory T cells: universal immune code." Cell Mol Immunol 4(3): 197-201.</p> <p>Neuman, Y. (2008). The Immune Self Code: From Correspondence to Complexity. The Codes of Life: The Rules of Macroevolution. M. Barbieri and J. Hoffmeyer. Dordrecht, Springer Netherlands: 247-263.</p> <p>Sioud, M. (2009). "Deciphering the code of innate immunity recognition of siRNAs." Methods Mol Biol 487: 41-59.</p> <p>Belkaid, Y. and J. Grainger (2013). "Immunology. Mucus coat, a dress code for tolerance." Science 342(6157): 432-433.</p> <p>Harvey, C. J. and K. W. Wucherpfennig (2013). "Cracking the code of human T-cell immunity." Nat Biotechnol 31(7): 609-610.</p>

			<p>Xu, H., P. Dong, X. He, X. Ma, D. Xue, Y. Zhang and X. Zhang (2014). "B-cell-activating factor code and human cytomegalovirus infection in renal transplant recipients." <i>Microbiol Immunol</i> 58(8): 439-448.</p> <p>Kim, M.-S., W. Chuenchor, X. Chen, Y. Cui, X. Zhang, Z. H. Zhou, M. Gellert and W. Yang (2018). "Cracking the DNA Code for V(D)J Recombination." <i>Molecular Cell</i> 70(2): 358-370.e354.</p> <p>Assi, T. (2019). "Are targeted agents the key to unlock the code for immune checkpoint inhibitors in soft-tissue sarcomas?" <i>Future Oncol</i> 15(28): 3185-3187.</p> <p>Chi, X., Y. Li and X. Qiu (2020). "V(D)J recombination, somatic hypermutation and class switch recombination of immunoglobulins: mechanism and regulation." <i>Immunology</i> 160(3): 233-247.</p> <p>Griffin, T. M. and R. J. Lories (2020). "Cracking the code on the innate immune program in OA." <i>Osteoarthritis Cartilage</i> 28(5): 529-531.</p> <p>Aleahmad, M., M. Bozorgmehr, S. Nikoo, A. Ghanavatinejad, M. R. Shokri, S. Montazeri, F. Shokri and A. H. Zarnani (2021). "Endometrial mesenchymal stem/stromal cells: The Enigma to code messages for generation of functionally active regulatory T cells." <i>Stem Cell Res Ther</i> 12(1): 536.</p>
93	Importin code	The Importin Codes SEE also Transport Codes SEE also Translocation Codes	<p>Lu, M., J. Zak, S. Chen, L. Sanchez-Pulido, D. T. Severson, J. Endicott, C. P. Ponting, C. J. Schofield and X. Lu (2014). "A code for RanGDP binding in ankyrin repeats defines a nuclear import pathway." <i>Cell</i> 157(5): 1130-1145.</p> <p>Lever, M. B., A. Karpova and M. R. Kreutz (2015). "An Importin Code in neuronal transport from synapse-to-nucleus?" <i>Front Mol Neurosci</i> 8: 33.</p>
94	Imprinting code	The Epigenetic Imprinting Code	Vu, T. H., R. L. Jirtle and A. R. Hoffman (2006). "Cross-species clues of an epigenetic imprinting regulatory code for the IGF2R gene." <i>Cytogenetic and Genome Research</i> 113(1-4): 202-208.
95	Impulsive codes	The Impulsive Behaviour Codes	Tsutsui-Kimura, I., Y. Ohmura, T. Izumi, T. Matsushima, H. Amita, T. Yamaguchi, T. Yoshida and M. Yoshioka (2016). "Neuronal codes for the inhibitory control of impulsive actions in the rat infralimbic cortex." <i>Behavioural Brain Research</i> 296: 361-372.

96	Indole code	The Indole Physiological Code	Fu, S. F., J. Y. Wei, H. W. Chen, Y. Y. Liu, H. Y. Lu and J. Y. Chou (2015). "Indole-3-acetic acid: A widespread physiological code in interactions of fungi with other organisms." Plant Signal Behav 10(8): e1048052.
97	Inflammation code	The Skin Inflammation Code	Amagai, M. (2016). "Cracking the code of skin inflammation with CD1a." Nat Immunol 17(10): 1133-1134.
98	Invasion codes	The (Tuberculosis) Invasion Code	Aldhous, P. (1993). "Breaking the code for the tuberculosis invasion." Science 261(5127): 1390.
99	Ion channel code	The Ion Channel Code	Barakat, A. I., D. K. Lieu and A. Gojova (2006). "Secrets of the code: do vascular endothelial cells use ion channels to decipher complex flow signals?" Biomaterials 27(5): 671-678.
100	Irisin code	The Irisin (Muscle) Code	Ma, C., H. Ding, Y. Deng, H. Liu, X. Xiong and Y. Yang (2021). "Irisin: A New Code Uncover the Relationship of Skeletal Muscle and Cardiovascular Health During Exercise." Frontiers in Physiology 12.
101	Karyotype code	The Karyotype Code	Heng, H. H., G. Liu, J. B. Stevens, S. W. Bremer, K. J. Ye, B. Y. Abdallah, S. D. Horne and C. J. Ye (2011). "Decoding the genome beyond sequencing: the new phase of genomic research." Genomics 98(4): 242-252. Ye, C. J., L. Stilgenbauer, A. Moy, G. Liu and H. H. Heng (2019). "What Is Karyotype Coding and Why Is Genomic Topology Important for Cancer and Evolution?" Front Genet 10: 1082. Heng, J. and H. H. Heng (2021). "Karyotype coding: The creation and maintenance of system information for complexity and biodiversity." Biosystems 208: 104476.
102	Kinase code	Protein Kinase Codes	Tengholm, A. and T. Meyer (2002). "A PI3-kinase signaling code for insulin-triggered insertion of glucose transporters into the plasma membrane." Curr Biol 12(21): 1871-1876. Bou-Nader, C., J. M. Gordon, F. E. Henderson and J. Zhang (2019). "The search for a PKR code-differential regulation of protein kinase R activity by diverse RNA and protein regulators." Rna 25(5): 539-556.
103	Lamin code	The Lamin Code	Maraldi, N. M. (2018). "The lamin code." Biosystems 164: 68-75.

104	Language code	The Language Code	<p>Javier, R. A. and L. R. Marcos (1989). "The role of stress on the language-independence and code-switching phenomena." J Psycholinguist Res 18(5): 449-472.</p> <p>Baron-Cohen, S., D. A. Baldwin and M. Crowson (1997). "Do children with autism use the speaker's direction of gaze strategy to crack the code of language?" Child Dev 68(1): 48-57.</p> <p>McNealy, K., J. C. Mazziotta and M. Dapretto (2006). "Cracking the language code: neural mechanisms underlying speech parsing." J Neurosci 26(29): 7629-7639.</p> <p>Love, N. (2007). "Are languages digital codes?" Language Sciences 29(5): 690-709.</p> <p>Cowley, S. J. (2008). The Codes of Language: Turtles All the Way Up? The Codes of Life: The Rules of Macroevolution. M. Barbieri and J. Hoffmeyer. Dordrecht, Springer Netherlands: 319-345.</p> <p>Ng, S., C. Gonzalez and N. Y. Wicha (2014). "The fox and the cabra: an ERP analysis of reading code switched nouns and verbs in bilingual short stories." Brain Res 1557: 127-140.</p> <p>Guevara Erra, R. and J. Gervain (2016). "The Efficient Coding of Speech: Cross-Linguistic Differences." PLOS ONE 11(2): e0148861.</p> <p>Adler, R. M., J. R. Valdés Kroff and J. M. Novick (2020). "Does integrating a code-switch during comprehension engage cognitive control?" J Exp Psychol Learn Mem Cogn 46(4): 741-759.</p> <p>Emmorey, K., C. Li, J. Petrich and T. H. Gollan (2020). "Turning languages on and off: Switching into and out of code-blends reveals the nature of bilingual language control." J Exp Psychol Learn Mem Cogn 46(3): 443-454.</p> <p>Kheder, S. and E. Kaan (2021). "Cognitive control in bilinguals: Proficiency and code-switching both matter." Cognition 209: 104575.</p> <p>Blackburn, A. M. and N. Y. Y. Wicha (2022). "The Effect of Code-Switching Experience on the Neural Response Elicited to a Sentential Code Switch." Languages (Basel) 7(3).</p> <p>Gross, M. C. and M. Kaushanskaya (2022). "Language Control and Code-Switching in Bilingual Children With Developmental Language Disorder." J Speech Lang Hear Res 65(3): 1104-1127.</p>
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105	Latency code	The Latency Behaviour Codes	Sawtell, N. B., A. Williams, P. D. Roberts, G. von der Emde and C. C. Bell (2006). "Effects of sensing behavior on a latency code." J Neurosci 26(32): 8221-8234.
106	Life cycle code	Th Life Cycle Code	Liu, J. (2020). "The "life code": A theory that unifies the human life cycle and the origin of human tumors." Semin Cancer Biol 60: 380-397.
107	Light code	The Neuron Light Code	Moro, C., A. Liebert, C. Hamilton, N. Pasqual, G. Jeffery, J. Stone and J. Mitrofanis (2022). "The code of light: do neurons generate light to communicate and repair?" Neural Regen Res 17(6): 1251-1252.
108	Lipid code	The Lipid Codes	<p>Zhou, Y. and J. F. Hancock (2018). "Deciphering lipid codes: K-Ras as a paradigm." Traffic 19(3): 157-165.</p> <p>Platre, M. P., L. C. Noack, M. Doumane, V. Bayle, M. L. A. Simon, L. Maneta-Peyret, L. Fouillen, T. Stanislas, L. Armengot, P. Pejchar, M. C. Caillaud, M. Potocký, A. Čopič, P. Moreau and Y. Jaillais (2018). "A Combinatorial Lipid Code Shapes the Electrostatic Landscape of Plant Endomembranes." Dev Cell 45(4): 465-480.e411.</p> <p>Schuhmacher, M., A. T. Grasskamp, P. Barahtjan, N. Wagner, B. Lombardot, J. S. Schuhmacher, P. Sala, A. Lohmann, I. Henry, A. Shevchenko, Ü. Coskun, A. M. Walter and A. Nadler (2020). "Live-cell lipid biochemistry reveals a role of diacylglycerol side-chain composition for cellular lipid dynamics and protein affinities." Proceedings of the National Academy of Sciences 117(14): 7729-7738.</p> <p>Zhou, Y. and J. F. Hancock (2020). "A novel prenyl-polybasic domain code determines lipid-binding specificity of the K-Ras membrane anchor." Small GTPases 11(3): 220-224.</p>
109	Magnitude codes	The Magnitude Neuronal Codes	<p>Chiou, R. Y., E. C. Chang, O. J. Tzeng and D. H. Wu (2009). "The common magnitude code underlying numerical and size processing for action but not for perception." Exp Brain Res 194(4): 553-562.</p> <p>Nieder, A. (2017). "Magnitude Codes for Cross-Modal Working Memory in the Primate Frontal Association Cortex." Front Neurosci 11: 202.</p>
110	Meiosis codes	The Meiosis Codes	<p>Kim, J.-M., H. Liu, M. Tazaki, M. Nagata and F. Aoki (2003). "Changes in histone acetylation during mouse oocyte meiosis." Journal of Cell Biology 162(1): 37-46.</p> <p>Ivanovska, I., T. Khandan, T. Ito and T. L. Orr-Weaver (2005). "A histone code in meiosis: the histone kinase, NHK-1, is required for proper chromosomal architecture in Drosophila oocytes." Genes & Development 19(21): 2571-2582.</p>

			<p>Xu, D., J. Bai, Q. Duan, M. Costa and W. Dai (2009). "Covalent modifications of histones during mitosis and meiosis." Cell Cycle 8(22): 3688-3694.</p> <p>Ishiguro, K.-i., J. Kim, S. Fujiyama-Nakamura, S. Kato and Y. Watanabe (2011). "A new meiosis-specific cohesin complex implicated in the cohesin code for homologous pairing." EMBO reports 12(3): 267-275.</p> <p>Wang, L., Z. Xu, M. B. Khawar, C. Liu and W. Li (2017). "The histone codes for meiosis." Reproduction 154(3): R65-R79.</p>
111	Melatonin codes	The Melatonin Codes SEE also Circadian codes	<p>Wayne, N. L., B. Malpoux and F. J. Karsch (1988). "How does melatonin code for day length in the ewe: duration of nocturnal melatonin release or coincidence of melatonin with a light-entrained sensitive period?" Biol Reprod 39(1): 66-75.</p> <p>Karsch, F. J., B. Malpoux, N. L. Wayne and J. E. Robinson (1988). "Characteristics of the melatonin signal that provide the photoperiodic code for timing seasonal reproduction in the ewe." Reprod Nutr Dev (1980) 28(2b): 459-472.</p> <p>Stehle, J. H., C. von Gall, C. Schomerus and H. W. Korf (2001). "Of rodents and ungulates and melatonin: creating a uniform code for darkness by different signaling mechanisms." J Biol Rhythms 16(4): 312-325.</p>
112	Membrane code	The Membrane Code	<p>Halbhuber, K. J., W. Linss, N. Zimmermann, H. Oehring and L. Pätzold (1986). "Cytochemical and cellbiological investigations of the signal function of the erythrocyte plasmalemma—the membrane structure as code for cell life span." Acta Histochem Suppl 33: 23-44.</p> <p>Lundin, C., H. Kim, I. Nilsson, S. H. White and G. von Heijne (2008). "Molecular code for protein insertion in the endoplasmic reticulum membrane is similar for N(in)-C(out) and N(out)-C(in) transmembrane helices." Proc Natl Acad Sci U S A 105(41): 15702-15707.</p> <p>Futerman, A. H. and M. Schuldiner (2010). "Lipids: The plasma membrane code." Nat Chem Biol 6(7): 487-488.</p> <p>Wells, J. (2013) The Membrane Code: A Carrier of Essential Biological Information That Is Not Specified by DNA and Is Inherited Apart from It. Biological Information: 474-488.</p> <p>Futerman, A. H. and M. Schuldiner (2010). "The plasma membrane code." Nature Chemical Biology 6(7): 487-488.</p>

			<p>Lamaze, C., N. Tardif, M. Dewulf, S. Vassilopoulos and C. M. Blouin (2017). "The caveolae dress code: structure and signaling." Curr Opin Cell Biol 47: 117-125.</p> <p>Salzer, U., J. Kostan and K. Djinović-Carugo (2017). "Deciphering the BAR code of membrane modulators." Cell Mol Life Sci 74(13): 2413-2438.</p> <p>Nwamba, O. C. (2020). "Membranes as the third genetic code." Mol Biol Rep 47(5): 4093-4097.</p> <p>Skilling, Q. M., B. Eniwaye, B. C. Clawson, J. Shaver, N. Ognjanovski, S. J. Aton and M. Zochowski (2021). "Acetylcholine-gated current translates wake neuronal firing rate information into a spike timing-based code in Non-REM sleep, stabilizing neural network dynamics during memory consolidation." PLoS Comput Biol 17(9): e1009424.</p> <p>Batrouni, A. G., N. Bag, H. T. Phan, B. A. Baird and J. M. Baskin (2022). "A palmitoylation code controls PI4KIIIα complex formation and PI(4,5)P2 homeostasis at the plasma membrane." J Cell Sci 135(5).</p>
113	Memory code	The Memory Code	<p>Eichenbaum, H. (2001). "The hippocampus and declarative memory: cognitive mechanisms and neural codes." Behavioural Brain Research 127(1): 199-207.</p> <p>Jensen, O. (2001). "Information transfer between rhythmically coupled networks: reading the hippocampal phase code." Neural Comput 13(12): 2743-2761.</p> <p>Wood, M. A., J. D. Hawk and T. Abel (2006). "Combinatorial chromatin modifications and memory storage: a code for memory?" Learn Mem 13(3): 241-244.</p> <p>Tsien, J. Z. (2007). "The memory code. Researchers are closing in on the rules that the brain uses to lay down memories. Discovery of this memory code could lead to the design of smarter computers and robots and even to new ways to peer into the human mind." Sci Am 297(1): 52-59.</p> <p>Snider, K. H., K. A. Sullivan and K. Obrietan (2018). "Circadian Regulation of Hippocampal-Dependent Memory: Circuits, Synapses, and Molecular Mechanisms." Neural Plast 2018: 7292540.</p> <p>Rawashdeh, O., R. Parsons and E. Maronde (2018). "Clocking In Time to Gate Memory Processes: The Circadian Clock Is Part of the Ins and Outs of Memory." Neural Plasticity 2018: 6238989.</p>

			Cattaneo, A. and M. Mainardi (2022). "Editorial: From Whole-Cell to Single Synapse Engrams – Breaking the Code for Memory Formation, Storage and Recall." Front Mol Neurosci 15: 845516.
114	MeshCODE	The Memory Code	<p>Goult, B. T. (2021). "The Mechanical Basis of Memory – the MeshCODE Theory." Frontiers in Molecular Neuroscience 14.</p> <p>Barnett, S. F. H. and B. T. Goult (2022). "The MeshCODE to scale – Visualising synaptic binary information." bioRxiv: 2022.2006.2016.496395.</p>
115	Meta code	The Metacode	Paredes, O., J. A. Morales, A. P. Mendizabal and R. Romo-Vázquez (2021). "Metacode: One code to rule them all." Biosystems 208: 104486.
116	Metabolic code	The Metabolic Code	<p>Tomkins, G. M. (1975). "The Metabolic Code." Science 189(4205): 760-763.</p> <p>Ruan, H.-B., J. P. Singh, M.-D. Li, J. Wu and X. Yang (2013). "Cracking the O-GlcNAc code in metabolism." Trends in Endocrinology & Metabolism 24(6): 301-309.</p> <p>Zhao, X. Y. and J. D. Lin (2015). "Long Noncoding RNAs: A New Regulatory Code in Metabolic Control." Trends Biochem Sci 40(10): 586-596.</p> <p>Korošak, D. and M. Slak Rupnik (2018). "Collective Sensing of β-Cells Generates the Metabolic Code." Front Physiol 9: 31.</p> <p>Neu, C., B. Ibrahim and P. Dittrich (2018). "Molecular Codes in Large Metabolic Network." MATCH Commun. Math. Comput. Chem. 80: 587-604.</p> <p>Korošak, D. and M. Slak Rupnik (2018). "Collective Sensing of β-Cells Generates the Metabolic Code." Front Physiol 9: 31.</p> <p>Bukowski, M., M. Kosecka-Strojek, A. Madry, R. Zagorski-Przybylo, T. Zadlo, K. Gawron and B. Wladyka (2022). "Staphylococcal saoABC Operon Codes for a DNA-Binding Protein SaoC Implicated in the Response to Nutrient Deficit." International Journal of Molecular Sciences 23(12): 6443.</p> <p>Campit, S. E., A. Meliki, N. A. Youngson and S. Chandrasekaran (2020). "Nutrient Sensing by Histone Marks: Reading the Metabolic Histone Code Using Tracing, Omics, and Modeling." Bioessays 42(9): e2000083.</p>

117	Methylation code	The DNA Methylation Code	Papin, C., A. Ibrahim, S. L. Gras, A. Velt, I. Stoll, B. Jost, H. Menoni, C. Bronner, S. Dimitrov and A. Hamiche (2017). "Combinatorial DNA methylation codes at repetitive elements." Genome Res 27(6): 934-946.
118	Microbiome code	The Microbiome Composition Code	Rosen, C. E. and N. W. Palm (2017). "Functional Classification of the Gut Microbiota: The Key to Cracking the Microbiota Composition Code: Functional classifications of the gut microbiota reveal previously hidden contributions of indigenous gut bacteria to human health and disease." Bioessays 39(12).
119	miRNA codes	The Micro-RNA Codes	Forman, J. J. and H. A. Collier (2010). "The code within the code: microRNAs target coding regions." Cell Cycle 9(8): 1533-1541. Shin, C., J. W. Nam, K. K. Farh, H. R. Chiang, A. Shkumatava and D. P. Bartel (2010). "Expanding the microRNA targeting code: functional sites with centered pairing." Mol Cell 38(6): 789-802. Pepe, S. (2012). "MicroRNAs in heart, lung and circulation (and beyond): life's ubiquitous code for regulating complex function." Heart Lung Circ 21(3): 127-128. Cora, D. and M. Caselle (2018). "The Epithelial-Mesenchymal Transition, as Hacked by a microRNA Combinatorial Code." Cell Syst 7(1): 3-4.
120	Mirror code	The Cholesterol Recognition/Mirror Code	Fantini, J., C. Di Scala, L. S. Evans, P. T. F. Williamson and F. J. Barrantes (2016). "A mirror code for protein-cholesterol interactions in the two leaflets of biological membranes." Scientific Reports 6(1): 21907. Sutter, M. L., L. Console, A. F. Fahner, S. L. Samodelov, Z. Gai, G. Ciarimboli, C. Indiveri, G. A. Kullak-Ublick and M. Visentin (2021). "The role of cholesterol recognition (CARC/CRAC) mirror codes in the allostereism of the human organic cation transporter 2 (OCT2, SLC22A2)." Biochem Pharmacol 194: 114840.
121	Mitochondrial genetic code	The Mitochondrial Genetic Code	Swire, J., O. P. Judson and A. Burt (2005). "Mitochondrial genetic codes evolve to match amino acid requirements of proteins." J Mol Evol 60(1): 128-139. Sengupta, S., X. Yang and P. G. Higgs (2007). "The Mechanisms of Codon Reassignments in Mitochondrial Genetic Codes." Journal of Molecular Evolution 64(6): 662-688.
122	Mitosis codes	The Mitosis Codes SEE also Tubulin codes	Bloom, K. S. (2008). "Beyond the code: the mechanical properties of DNA as they relate to mitosis." Chromosoma 117(2): 103-110.

			<p>Georgatos, S. D., Y. Markaki, A. Christogianni and A. S. Politou (2009). "Chromatin remodeling during mitosis: a structure-based code?" Front Biosci (Landmark Ed) 14(6): 2017-2027.</p> <p>Barisic, M. and H. Maiato (2015). "Cracking the (tubulin) code of mitosis." Oncotarget 6(23): 19356-19357.</p> <p>Ferreira, L. T., A. C. Figueiredo, B. Orr, D. Lopes and H. Maiato (2018). Chapter 3 – Dissecting the role of the tubulin code in mitosis. Methods in Cell Biology. H. Maiato and M. Schuh, Academic Press. 144: 33-74.</p> <p>Lopes, D. and H. Maiato (2020). "The Tubulin Code in Mitosis and Cancer." Cells 9(11): 2356.</p>
123	Mnemonic code	The Mnemonic codes	Patai, E. Z. and H. J. Spiers (2016). "Cracking the mnemonic code." Nat Neurosci 20(1): 8-9.
124	Modification code	The RNA Polymerase Modification Codes	Brookes, E. and A. Pombo (2012). "Code breaking: The RNAPII modification code in pluripotency." Cell Cycle 11(7): 1267-1268.
125	Modularity codes	The Modularity Codes	Prinz, R. (2022). "The modularity codes." Biosystems 219: 104735.
126	Molecular codes	The Molecular Codes	<p>Hessa, T., N. M. Meindl-Beinker, A. Bernsel, H. Kim, Y. Sato, M. Lerch-Bader, I. Nilsson, S. H. White and G. von Heijne (2007). "Molecular code for transmembrane-helix recognition by the Sec61 translocon." Nature 450(7172): 1026-1030.</p> <p>Raykhel, I., H. Alanen, K. Salo, J. Jurvansuu, V. D. Nguyen, M. Latva-Ranta and L. Ruddock (2007). "A molecular specificity code for the three mammalian KDEL receptors." J Cell Biol 179(6): 1193-1204.</p> <p>Park, Y. and V. Helms (2008). "MINS2: revisiting the molecular code for transmembrane-helix recognition by the Sec61 translocon." Bioinformatics 24(16): 1819-1820.</p> <p>Fingleton, B. and C. C. Lynch (2010). "A new dress code for MMPs: cleavage optional." Dev Cell 18(1): 3-4.</p> <p>De Beule, J., E. Hovig and M. Benson (2011). "Introducing Dynamics into the Field of Biosemiotics." Biosemiotics 4(1): 5-24.</p>

			<p>Görlich, D., S. Artmann and P. Dittrich (2011). "Cells as semantic systems." Biochimica et Biophysica Acta (BBA) – General Subjects 1810(10): 914-923.</p> <p>Görlich, D. and P. Dittrich (2013). "Molecular codes in biological and chemical reaction networks." PloS One 8(1): e54694.</p> <p>DiChiara, A. S., R. C. Li, P. H. Suen, A. S. Hosseini, R. J. Taylor, A. F. Weickhardt, D. Malhotra, D. R. McCaslin and M. D. Shoulders (2018). "A cysteine-based molecular code informs collagen C-propeptide assembly." Nat Commun 9(1): 4206.</p>
127	Morphogenetic code	The Morphogenetic Code	<p>Ruiz i Altaba, A., V. Nguyễn and V. Palma (2003). "The emergent design of the neural tube: prepattern, SHH morphogen and GLI code." Current Opinion in Genetics & Development 13(5): 513-521.</p> <p>Matsuda, K., H. Gotoh, Y. Tajika, T. Sushida, H. Aonuma, T. Niimi, M. Akiyama, Y. Inoue and S. Kondo (2017). "Complex furrows in a 2D epithelial sheet code the 3D structure of a beetle horn." Sci Rep 7(1): 13939.</p> <p>Tassinari, R., C. Cavallini, E. Olivi, V. Taglioli, C. Zannini and C. Ventura (2021). "Unveiling the morphogenetic code: A new path at the intersection of physical energies and chemical signaling." World J Stem Cells 13(10): 1382-1393.</p> <p>Tassinari, R., C. Cavallini, E. Olivi, F. Facchin, V. Taglioli, C. Zannini, M. Marcuzzi and C. Ventura (2022). "Cell Responsiveness to Physical Energies: Paving the Way to Decipher a Morphogenetic Code." Int J Mol Sci 23(6).</p>
128	Motor neuron code	The Motor Neuron Codes	<p>Lumsden, A. (1995). "Neural development. A 'LIM code' for motor neurons?" Curr Biol 5(5): 491-495.</p> <p>Thor, S., S. G. Andersson, A. Tomlinson and J. B. Thomas (1999). "A LIM-homeodomain combinatorial code for motor-neuron pathway selection." Nature 397(6714): 76-80.</p> <p>Glaze, C. M. and T. W. Troyer (2007). "Behavioral measurements of a temporally precise motor code for birdsong." J Neurosci 27(29): 7631-7639.</p> <p>Stein, W., O. Straub, J. Ausborn, W. Mader and H. Wolf (2008). "Motor pattern selection by combinatorial code of interneuronal pathways." J Comput Neurosci 25(3): 543-561.</p> <p>Igarashi, J., Y. Isomura, K. Arai, R. Harukuni and T. Fukai (2013). "A θ-γ oscillation code for neuronal coordination during motor behavior." J Neurosci 33(47): 18515-18530.</p>

			<p>Chaisanguanthum, K. S., M. Joshua, J. F. Medina, W. Bialek and S. G. Lisberger (2014). "The Neural Code for Motor Control in the Cerebellum and Oculomotor Brainstem." eNeuro 1(1).</p> <p>Behroozmand, R., S. Sangtian, O. Korzyukov and C. R. Larson (2016). "A temporal predictive code for voice motor control: Evidence from ERP and behavioral responses to pitch-shifted auditory feedback." Brain Res 1636: 1-12.</p> <p>Payne, H. L., R. L. French, C. C. Guo, T. B. Nguyen-Vu, T. Manninen and J. L. Raymond (2019). "Cerebellar Purkinje cells control eye movements with a rapid rate code that is invariant to spike irregularity." Elife 8.</p> <p>Rinnert, P. and A. Nieder (2021). "Neural Code of Motor Planning and Execution during Goal-Directed Movements in Crows." J Neurosci 41(18): 4060-4072.</p>
129	Musical code	The Musical Codes	<p>Reybrouck, M. (2008). The Musical Code between Nature and Nurture: Ecosemiotic and Neurobiological Claims. The Codes of Life: The Rules of Macroevolution. M. Barbieri and J. Hoffmeyer. Dordrecht, Springer Netherlands: 395-434.</p>
130	Mutalism code	The Mutualism Ant-Plant Code	<p>Letourneau, D. K. (1990). "Code of ant-plant mutualism broken by parasite." Science 248(4952): 215-217.</p>
131	Myelin code	The Myelin Code	<p>Farhadi, H. F., P. Lepage, R. Forghani, H. C. H. Friedman, W. Orfali, L. Jasmin, W. Miller, T. J. Hudson and A. C. Peterson (2003). "A Combinatorial Network of Evolutionarily Conserved Myelin Basic Protein Regulatory Sequences Confers Distinct Glial-Specific Phenotypes." The Journal of Neuroscience 23(32): 10214-10223.</p> <p>Wood, H. (2004). "A time code for myelin." Nature Reviews Neuroscience 5(1): 9-9.</p>
132	Navigation codes	The Navigation / Orientation / Movement Codes	<p>Camhi, J. M. and A. Levy (1989). "The code for stimulus direction in a cell assembly in the cockroach." J Comp Physiol A 165(1): 83-97.</p> <p>Frens, M. A., Y. Suzuki, H. Scherberger, K. Hepp and V. Henn (1998). "The collicular code of saccade direction depends on the roll orientation of the head relative to gravity." Exp Brain Res 120(3): 283-290.</p> <p>Erdi, P., Z. Huhn and T. Kiss (2005). "Hippocampal theta rhythms from a computational perspective: code generation, mood regulation and navigation." Neural Netw 18(9): 1202-1211.</p>

			<p>Bremner, A. J., D. Mareschal, S. Lloyd-Fox and C. Spence (2008). "Spatial localization of touch in the first year of life: early influence of a visual spatial code and the development of remapping across changes in limb position." J Exp Psychol Gen 137(1): 149-162.</p> <p>Nadler, J. W., M. Nawrot, D. E. Angelaki and G. C. DeAngelis (2009). "MT neurons combine visual motion with a smooth eye movement signal to code depth-sign from motion parallax." Neuron 63(4): 523-532.</p> <p>Takahashi, M., J. Lauwereyns, Y. Sakurai and M. Tsukada (2009). "A code for spatial alternation during fixation in rat hippocampal CA1 neurons." J Neurophysiol 102(1): 556-567.</p> <p>Khosravi-Hashemi, N. and M. J. Chacron (2012). "Bursts and isolated spikes code for opposite movement directions in midbrain electrosensory neurons." PloS One 7(6): e40339.</p> <p>Takahashi, M., H. Nishida, A. D. Redish and J. Lauwereyns (2014). "Theta phase shift in spike timing and modulation of gamma oscillation: a dynamic code for spatial alternation during fixation in rat hippocampal area CA1." J Neurophysiol 111(8): 1601-1614.</p> <p>Dewar, A. D. M., A. Wystrach, P. Graham and A. Philippides (2015). "Navigation-specific neural coding in the visual system of Drosophila." Biosystems 136: 120-127.</p> <p>Shine, J. P., J. P. Valdés-Herrera, M. Hegarty and T. Wolbers (2016). "The Human Retrosplenial Cortex and Thalamus Code Head Direction in a Global Reference Frame." J Neurosci 36(24): 6371-6381.</p> <p>Hardcastle, K., N. Maheswaranathan, S. Ganguli and L. M. Giocomo (2017). "A Multiplexed, Heterogeneous, and Adaptive Code for Navigation in Medial Entorhinal Cortex." Neuron 94(2): 375-387.e377.</p> <p>Johari, K. and R. Behroozmand (2017). "Premotor neural correlates of predictive motor timing for speech production and hand movement: evidence for a temporal predictive code in the motor system." Exp Brain Res 235(5): 1439-1453.</p> <p>Takahashi, S. (2018). "The Hippocampal Ensemble Code for Spatial Navigation and Episodic Memory." Adv Neurobiol 21: 49-70.</p>
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133	Neural codes – A (general)	The General Neural Codes	<p>Rose, G. J., M. Kawasaki and W. Heiligenberg (1988). "'Recognition units' at the top of a neuronal hierarchy? Pacemaker neurons in <i>Eigenmannia</i> code the sign of frequency differences unambiguously." J Comp Physiol A 162(6): 759-772.</p> <p>Bialek, W., F. Rieke, R. R. de Ruyter van Steveninck and D. Warland (1991). "Reading a neural code." Science 252(5014): 1854-1857.</p> <p>Ferster, D. and N. Spruston (1995). "Cracking the neuronal code." Science 270(5237): 756-757.</p> <p>Gawne, T. J., T. W. Kjaer and B. J. Richmond (1996). "Latency: another potential code for feature binding in striate cortex." J Neurophysiol 76(2): 1356-1360.</p> <p>Richmond, B. J., T. J. Gawne and G.-X. Jin (1997). "Neuronal codes: reading them and learning how their structure influences network organization." Biosystems 40(1): 149-157.</p> <p>Tsodyks, M. V. and H. Markram (1997). "The neural code between neocortical pyramidal neurons depends on neurotransmitter release probability." Proc Natl Acad Sci U S A 94(2): 719-723.</p> <p>Lábos, E. (2000). "Codes, operations, measurements and neural networks." Biosystems 58(1): 9-18.</p> <p>Lemon, W. C. and W. M. Getz (2000). "Rate code input produces temporal code output from cockroach antennal lobes." Biosystems 58(1): 151-158.</p> <p>Lewis, E. R., K. R. Henry and W. M. Yamada (2000). "Essential roles of noise in neural coding and in studies of neural coding." Biosystems 58(1): 109-115.</p> <p>Segundo, J. P. (2000). "Some thoughts about neural coding and spike trains1Supported by Trent H. Wells jr. Inc.1." Biosystems 58(1): 3-7.</p> <p>Liu, R. C., S. Tzonev, S. Rebrik and K. D. Miller (2001). "Variability and information in a neural code of the cat lateral geniculate nucleus." J Neurophysiol 86(6): 2789-2806.</p> <p>Steinmetz, P. N., A. Manwani and C. Koch (2001). "Variability and coding efficiency of noisy neural spike encoders." Biosystems 62(1): 87-97.</p> <p>Harris, C. M. (2002). "Temporal uncertainty in reading the neural code (proportional noise)." Biosystems 67(1-3): 85-94.</p>
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[Nicoletis M and Ribeiro S \(2006\) Seeking the Neural Code. Scientific American, 295, 70-77.](#)

[Ventriglia, F. \(2006\). "Global rhythmic activities in hippocampal neural fields and neural coding." Biosystems 86\(1\): 38-45.](#)

[Villa, A. E. P. \(2008\). Neural Coding in the Neuroheuristic Perspective. The Codes of Life: The Rules of Macroevolution. M. Barbieri and J. Hoffmeyer. Dordrecht, Springer Netherlands: 357-377.](#)

[Jacobs, A. L., G. Fridman, R. M. Douglas, N. M. Alam, P. E. Latham, G. T. Prusky and S. Nirenberg \(2009\). "Ruling out and ruling in neural codes." Proceedings of the National Academy of Sciences 106\(14\): 5936-5941.](#)

[MacGregor, D. J., T. F. Clayton and G. Leng \(2013\). "Information coding in vasopressin neurons—The role of asynchronous bistable burst firing." Biosystems 112\(2\): 85-93.](#)

[Stanley, G. B. \(2013\). "Reading and writing the neural code." Nat Neurosci 16\(3\): 259-263.](#)

[Turkheimer, F. E., R. Leech, P. Expert, L. D. Lord and A. C. Vernon \(2015\). "The brain's code and its canonical computational motifs. From sensory cortex to the default mode network: A multi-scale model of brain function in health and disease." Neurosci Biobehav Rev 55: 211-222.](#)

[Yamada, K., Y. Miyawaki and Y. Kamitani \(2015\). "Inter-subject neural code converter for visual image representation." Neuroimage 113: 289-297.](#)

[Joris, P. X. \(2016\). "Entracking as a Brain Stem Code for Pitch: The Butte Hypothesis." Adv Exp Med Biol 894: 347-354.](#)

[Tamura, S., Y. Nishitani, C. Hosokawa, T. Miyoshi, H. Sawai, T. Kamimura, Y. Yagi, Y. Mizuno-Matsumoto and Y. W. Chen \(2016\). "Spike Code Flow in Cultured Neuronal Networks." Comput Intell Neurosci 2016: 7267691.](#)

[Vyssotski, A. L., A. E. Stepien, G. B. Keller and R. H. Hahnloser \(2016\). "A Neural Code That Is Isometric to Vocal Output and Correlates with Its Sensory Consequences." PLoS Biol 14\(10\): e2000317.](#)

[Sievers, B., C. Lee, W. Haslett and T. Wheatley \(2019\). "A multi-sensory code for emotional arousal." Proc Biol Sci 286\(1906\): 20190513.](#)

			<p>Rousseau, P. F., S. Boukezzi, R. Garcia, T. Chaminade and S. Khalfa (2020). "Cracking the EMDR code: Recruitment of sensory, memory and emotional networks during bilateral alternating auditory stimulation." Aust N Z J Psychiatry 54(8): 818-831.</p> <p>Climer, J. R. and D. A. Dombeck (2021). "Information Theoretic Approaches to Deciphering the Neural Code with Functional Fluorescence Imaging." eNeuro 8(5).</p> <p>Lyll, E. H., D. P. Mossing, S. R. Pluta, Y. W. Chu, A. Dudai and H. Adesnik (2021). "Synthesis of a comprehensive population code for contextual features in the awake sensory cortex." Elife 10.</p> <p>Rossi, E., P. E. Dussias, M. Diaz, J. G. van Hell and S. Newman (2021). "Neural signatures of inhibitory control in intra-sentential code-switching: Evidence from fMRI." J Neurolinguistics 57.</p>
134	Neural Code – B (motion)	The Neural Motion Codes	<p>Frost, B. J. and K. Nakayama (1983). "Single visual neurons code opposing motion independent of direction." Science 220(4598): 744-745.</p> <p>Geisler, W. S. (1999). "Motion streaks provide a spatial code for motion direction." Nature 400(6739): 65-69.</p> <p>Lia, B., K. R. Dobkins, J. Palmer and D. Y. Teller (1999). "Infants code the direction of chromatic quadrature motion." Vision Res 39(10): 1783-1794.</p> <p>Inaba, N., S. Shinomoto, S. Yamane, A. Takemura and K. Kawano (2007). "MST neurons code for visual motion in space independent of pursuit eye movements." J Neurophysiol 97(5): 3473-3483.</p> <p>Clarke, S. E., A. Longtin and L. Maler (2014). "A neural code for looming and receding motion is distributed over a population of electrosensory ON and OFF contrast cells." J Neurosci 34(16): 5583-5594.</p> <p>McIntyre, S., I. Birnieks, R. M. Vickery, A. O. Holcombe and T. Seizova-Cajic (2016). "The tactile motion aftereffect suggests an intensive code for speed in neurons sensitive to both speed and direction of motion." J Neurophysiol 115(3): 1703-1712.</p> <p>Van Humberbeck, N., T. Putzeys and J. Wagemans (2016). "Apparent Motion Suppresses Responses in Early Visual Cortex: A Population Code Model." PLoS Comput Biol 12(10): e1005155.</p>

			<p>Turner, M. H., A. Krieger, M. M. Pang and T. R. Clandinin (2022). "Visual and motor signatures of locomotion dynamically shape a population code for feature detection in Drosophila." Elife 11.</p> <p>Zhang, Y., R. Huang, W. Nörenberg and A. B. Arrenberg (2022). "A robust receptive field code for optic flow detection and decomposition during self-motion." Curr Biol 32(11): 2505-2516.e2508.</p>
135	Neural Code – C (perception & recognition)	The Neural Perception & Recognition Codes	<p>Erickson, R. P. (1973). "Adaptation and the neural code for visual form." Brain Res 52: 374-377.</p> <p>Szeto, A. Y. (1982). "Electrocutaneous code pairs for artificial sensory communication systems." Ann Biomed Eng 10(4): 175-192.</p> <p>Hurlbert, A. (1991). "Visual perception. Deciphering the colour code." Nature 349(6306): 191-193.</p> <p>Johnson, B. R., R. Voigt, C. L. Merrill and J. Atema (1991). "Across-fiber patterns may contain a sensory code for stimulus intensity." Brain Res Bull 26(3): 327-331.</p> <p>Hart, A. C., S. Sims and J. M. Kaplan (1995). "Synaptic code for sensory modalities revealed by C. elegans GLR-1 glutamate receptor." Nature 378(6552): 82-85.</p> <p>Sejnowski, T. J. (1995). "Pattern recognition. Time for a new neural code?" Nature 376(6535): 21-22.</p> <p>Baddeley, R. (1996). "Visual perception. An efficient code in V1?" Nature 381(6583): 560-561.</p> <p>Buonomano, D. V. and M. Merzenich (1999). "A neural network model of temporal code generation and position-invariant pattern recognition." Neural Comput 11(1): 103-116.</p> <p>March, L., A. Cienfuegos, L. Goldbloom, W. Ritter, N. Cowan and D. C. Javitt (1999). "Normal time course of auditory recognition in schizophrenia, despite impaired precision of the auditory sensory ("echoic") memory code." J Abnorm Psychol 108(1): 69-75.</p> <p>Prins, N. and A. J. Mussap (2001). "Adaptation reveals a neural code for the visual location of orientation change." Perception 30(6): 669-680.</p>

[Nisly-Nagele, S. J. and G. S. Wasserman \(2001\). "Dissociating sensory and cognitive contributions to visual persistence I. Photoreceptor response duration as a function of flash intensity, adaptation state, and candidate code." Biol Cybern 85\(3\): 167-183.](#)

[Wasserman, G. S. and S. J. Nisly-Nagele \(2001\). "Dissociating sensory and cognitive contributions to visual persistence II. Photoreceptor integration of flash pairs as a function of interflash interval, intensity, integration site, and candidate code." Biol Cybern 85\(3\): 185-194.](#)

[Petersen, R. S., S. Panzeri and M. E. Diamond \(2002\). "The role of individual spikes and spike patterns in population coding of stimulus location in rat somatosensory cortex." Biosystems 67\(1\): 187-193.](#)

[Höltje, M. and R. Hustert \(2003\). "Rapid mechano-sensory pathways code leg impact and elicit very rapid reflexes in insects." J Exp Biol 206\(Pt 16\): 2715-2724.](#)

[Koch, I., B. Metin and S. Schuch \(2003\). "The role of temporal unpredictability for process interference and code overlap in perception-action dual tasks." Psychol Res 67\(4\): 244-252.](#)

[Turiel, A. and N. Parga \(2003\). "Role of statistical symmetries in sensory coding: an optimal scale invariant code for vision." J Physiol Paris 97\(4-6\): 491-502.](#)

[Wyss, R., P. König and P. F. Verschure \(2003\). "Invariant representations of visual patterns in a temporal population code." Proc Natl Acad Sci U S A 100\(1\): 324-329.](#)

[Hosokawa, T., K. Kato, M. Inoue and A. Mikami \(2004\). "Neurons in the orbitofrontal cortex code both visual shapes and reward types." Neuroreport 15\(9\): 1493-1496.](#)

[Krug, K. \(2004\). "A common neuronal code for perceptual processes in visual cortex? Comparing choice and attentional correlates in V5/MT." Philos Trans R Soc Lond B Biol Sci 359\(1446\): 929-941.](#)

[Melzer, P., G. C. Champney, M. J. Maguire and F. F. Ebner \(2006\). "Rate code and temporal code for frequency of whisker stimulation in rat primary and secondary somatic sensory cortex." Exp Brain Res 172\(3\): 370-386.](#)

[Tailby, C., S. G. Solomon, N. T. Dhruv, N. J. Majaj, S. H. Sokol and P. Lennie \(2007\). "A new code for contrast in the primate visual pathway." J Neurosci 27\(14\): 3904-3909.](#)

[Zwicker, T., T. Wachtler and R. Eckhorn \(2007\). "Coding the presence of visual objects in a recurrent neural network of visual cortex." Biosystems 89\(1\): 216-226.](#)

[Eyherabide, H. G., A. Rokem, A. V. Herz and I. Samengo \(2008\). "Burst firing is a neural code in an insect auditory system." Front Comput Neurosci 2: 3.](#)

[Gollisch, T. \(2009\). "Throwing a glance at the neural code: rapid information transmission in the visual system." Hfsp j 3\(1\): 36-46.](#)

[van den Berg, R., J. B. Roerdink and F. W. Cornelissen \(2010\). "A neurophysiologically plausible population code model for feature integration explains visual crowding." PLoS Comput Biol 6\(1\): e1000646](#)

[Clemens, J., O. Kutzki, B. Ronacher, S. Schreiber and S. Wohlgemuth \(2011\). "Efficient transformation of an auditory population code in a small sensory system." Proc Natl Acad Sci U S A 108\(33\): 13812-13817.](#)

[Dimitrov, A. G., G. I. Cummins, A. Baker and Z. N. Aldworth \(2011\). "Characterizing the fine structure of a neural sensory code through information distortion." J Comput Neurosci 30\(1\): 163-179.](#)

[de Lafuente, V. and R. Romo \(2011\). "Dopamine neurons code subjective sensory experience and uncertainty of perceptual decisions." Proc Natl Acad Sci U S A 108\(49\): 19767-19771.](#)

[Hallem, E. A., A. R. Dillman, A. V. Hong, Y. Zhang, J. M. Yano, S. F. DeMarco and P. W. Sternberg \(2011\). "A sensory code for host seeking in parasitic nematodes." Curr Biol 21\(5\): 377-383.](#)

[Lim, S. L., J. P. O'Doherty and A. Rangel \(2011\). "The decision value computations in the vmPFC and striatum use a relative value code that is guided by visual attention." J Neurosci 31\(37\): 13214-13223.](#)

[Nestor, A., D. C. Plaut and M. Behrmann \(2011\). "Unraveling the distributed neural code of facial identity through spatiotemporal pattern analysis." Proc Natl Acad Sci U S A 108\(24\): 9998-10003.](#)

[Lyons-Warren, A. M., M. Hollmann and B. A. Carlson \(2012\). "Sensory receptor diversity establishes a peripheral population code for stimulus duration at low intensities." J Exp Biol 215\(Pt 15\): 2586-2600.](#)

[Vergara, J., N. Rivera, R. Rossi-Pool and R. Romo \(2016\). "A Neural Parametric Code for Storing Information of More than One Sensory Modality in Working Memory." *Neuron* 89\(1\): 54-62.](#)

[Vass, L. K., M. S. Copara, M. Seyal, K. Shahlaie, S. T. Farias, P. Y. Shen and A. D. Ekstrom \(2016\). "Oscillations Go the Distance: Low-Frequency Human Hippocampal Oscillations Code Spatial Distance in the Absence of Sensory Cues during Teleportation." *Neuron* 89\(6\): 1180-1186.](#)

[Gau, P., A. Curtright, L. Condon, D. W. Raible and A. Dhaka \(2017\). "An ancient neurotrophin receptor code; a single Runx/Cbfb complex determines somatosensory neuron fate specification in zebrafish." *PLoS Genet* 13\(7\): e1006884.](#)

[Panzeri, S., C. D. Harvey, E. Piasini, P. E. Latham and T. Fellin \(2017\). "Cracking the Neural Code for Sensory Perception by Combining Statistics, Intervention, and Behavior." *Neuron* 93\(3\): 491-507.](#)

[Sabbah, S., J. A. Gemmer, A. Bhatia-Lin, G. Manoff, G. Castro, J. K. Siegel, N. Jeffery and D. M. Berson \(2017\). "A retinal code for motion along the gravitational and body axes." *Nature* 546\(7659\): 492-497.](#)

[Esfahany, K., I. Siergiej, Y. Zhao and I. M. Park \(2018\). "Organization of Neural Population Code in Mouse Visual System." *eNeuro* 5\(4\).](#)

[Follmann, R., C. J. Goldsmith and W. Stein \(2018\). "Multimodal sensory information is represented by a combinatorial code in a sensorimotor system." *PLoS Biol* 16\(10\): e2004527](#)

[Arguin, M., I. Marleau, M. Aubin, S. Zahabi and E. C. Leek \(2019\). "A surface-based code contributes to visual shape perception." *J Vis* 19\(11\): 6.](#)

[James, B., L. Darnet, J. Moya-Díaz, S. H. Seibel and L. Lagnado \(2019\). "An amplitude code transmits information at a visual synapse." *Nat Neurosci* 22\(7\): 1140-1147.](#)

[Kindel, W. F., E. D. Christensen and J. Zylberberg \(2019\). "Using deep learning to probe the neural code for images in primary visual cortex." *J Vis* 19\(4\): 29.](#)

[Downer, J. D., J. R. Verhein, B. C. Rapone, K. N. O'Connor and M. L. Sutter \(2021\). "An Emergent Population Code in Primary Auditory Cortex Supports Selective Attention to Spectral and Temporal Sound Features." *J Neurosci* 41\(36\): 7561-7577.](#)

			<p>Snyder, A. C., B. M. Yu and M. A. Smith (2021). "A Stable Population Code for Attention in Prefrontal Cortex Leads a Dynamic Attention Code in Visual Cortex." J Neurosci 41(44): 9163-9176.</p> <p>Sharma, D., K. K. W. Ng, I. Birznieks and R. M. Vickery (2022). "The burst gap is a peripheral temporal code for pitch perception that is shared across audition and touch." Sci Rep 12(1): 11014.</p> <p>Zhao, X., C. L. Hsu and N. Spruston (2022). "Rapid synaptic plasticity contributes to a learned conjunctive code of position and choice-related information in the hippocampus." Neuron 110(1): 96-108.e104.</p>
136	Neural code – D (tactile)	The Tactile Neural Codes	<p>Goodwin, A. W. (1993). "Touch: the code for roughness." Curr Biol 3(6): 378-379.</p> <p>Johansson, R. S. and I. Birznieks (2004). "First spikes in ensembles of human tactile afferents code complex spatial fingertip events." Nat Neurosci 7(2): 170-177.</p> <p>Vázquez, Y., E. Salinas and R. Romo (2013). "Transformation of the neural code for tactile detection from thalamus to cortex." Proc Natl Acad Sci U S A 110(28): E2635-2644.</p> <p>Rossi-Pool, R., E. Salinas, A. Zainos, M. Alvarez, J. Vergara, N. Parga and R. Romo (2016). "Emergence of an abstract categorical code enabling the discrimination of temporally structured tactile stimuli." Proc Natl Acad Sci U S A 113(49): E7966-e7975.</p> <p>Lieber, J. D., X. Xia, A. I. Weber and S. J. Bensmaia (2017). "The neural code for tactile roughness in the somatosensory nerves." J Neurophysiol 118(6): 3107-3117.</p> <p>Delhay, B. P., M. K. O'Donnell, J. D. Lieber, K. R. McLellan and S. J. Bensmaia (2019). "Feeling fooled: Texture contaminates the neural code for tactile speed." PLoS Biol 17(8): e3000431.</p> <p>Perks, K. M. and J. T. Pierce (2019). "A quantal code for touch intensity in C. elegans." J Gen Physiol 151(12): 1343-1346.</p> <p>Bollini, A., C. Campus, D. Esposito and M. Gori (2020). "The Magnitude Effect on Tactile Spatial Representation: The Spatial-Tactile Association for Response Code (STARC) Effect." Front Neurosci 14: 557063.</p>

			<p>Ng, K. K. W., C. Olausson, R. M. Vickery and I. Birznieks (2020). "Temporal patterns in electrical nerve stimulation: Burst gap code shapes tactile frequency perception." PLoS One 15(8): e0237440.</p> <p>Ng, K. K. W., I. N. Snow, I. Birznieks and R. M. Vickery (2021). "Burst gap code predictions for tactile frequency are valid across the range of perceived frequencies attributed to two distinct tactile channels." J Neurophysiol 125(2): 687-692.</p>
137	Neural code – E (specific)	The Other Specific Neural Codes	<p>Sakagami, M., K. Tsutsui, J. Lauwereyns, M. Koizumi, S. Kobayashi and O. Hikosaka (2001). "A code for behavioral inhibition on the basis of color, but not motion, in ventrolateral prefrontal cortex of macaque monkey." J Neurosci 21(13): 4801-4808.</p> <p>Meyer-Luehmann, M., J. F. Thompson, K. C. Berridge and J. W. Aldridge (2002). "Substantia nigra pars reticulata neurons code initiation of a serial pattern: implications for natural action sequences and sequential disorders." Eur J Neurosci 16(8): 1599-1608.</p> <p>Paz, R. and E. Vaadia (2004). "Specificity of sensorimotor learning and the neural code: neuronal representations in the primary motor cortex." J Physiol Paris 98(4-6): 331-348.</p> <p>Siddiqui, T. J., R. Pancaroglu, Y. Kang, A. Rooyakkers and A. M. Craig (2010). "LRRTMs and neuroligins bind neurexins with a differential code to cooperate in glutamate synapse development." J Neurosci 30(22): 7495-7506.</p> <p>Hu, Z., X. J. Tong and J. M. Kaplan (2013). "UNC-13L, UNC-13S, and Tomosyn form a protein code for fast and slow neurotransmitter release in Caenorhabditis elegans." Elife 2: e00967.</p> <p>Schlaffke, L., A. Golisch, L. M. Haag, M. Lenz, S. Heba, S. Lisek, T. Schmidt-Wilcke, U. T. Eysel and M. Tegenthoff (2015). "The brain's dress code: How The Dress allows to decode the neuronal pathway of an optical illusion." Cortex 73: 271-275.</p> <p>Li, M. and J. Z. Tsien (2017). "Neural Code-Neural Self-information Theory on How Cell-Assembly Code Rises from Spike Time and Neuronal Variability." Front Cell Neurosci 11: 236.</p> <p>Noborn, F. and F. H. Sterky (2021). "Role of neurexin heparan sulfate in the molecular assembly of synapses - Expanding the neurexin code?" FEBS J.</p>

138	Neuronal wiring code	The Neuronal Wiring Code	Kovalenko, A. and A. Yaron (2022). "Cracking the combinatorial code of neuronal wiring." Neuron 110(14): 2204-2206.
139	Neuropeptide code	The Neuropeptide Code	Das Gupta, R. R., L. Scheurer, P. Pelczar, H. Wildner and H. U. Zeilhofer (2021). "Neuron-specific spinal cord translatomes reveal a neuropeptide code for mouse dorsal horn excitatory neurons." Sci Rep 11(1): 5232.
140	NF-kappa-B code	The NF-kappa-B Code	Tkach, K. E., J. E. Oyler and G. Altan-Bonnet (2014). "Cracking the NF-κB code." Sci Signal 7(313): pe5.
141	Niche codes	The Cellular Niche Codes	Forsberg, E. C. and S. Smith-Berdan (2009). "Parsing the niche code: the molecular mechanisms governing hematopoietic stem cell adhesion and differentiation." Haematologica 94(11): 1477-1481.
142	Non-ribosomal code	The Non-Ribosomal Code	von Döhren, H., R. Dieckmann and M. Pavela-Vrancic (1999). "The nonribosomal code." Chem Biol 6(10): R273-279. Ackerley, D. F. (2016). "Cracking the Nonribosomal Code." Cell Chem Biol 23(5): 535-537.
143	Notch Code	The Notch Code	Cave, J. W., F. Loh, J. W. Surpris, L. Xia and M. A. Caudy (2005). "A DNA transcription code for cell-specific gene activation by notch signaling." Curr Biol 15(2): 94-104. Cave, J. W., L. Xia and M. A. Caudy (2009). "The Daughterless N-terminus directly mediates synergistic interactions with Notch transcription complexes via the SPS+A DNA transcription code." BMC Res Notes 2: 65. Kakuda, S. and R. S. Haltiwanger (2017). "Deciphering the Fringe-Mediated Notch Code: Identification of Activating and Inhibiting Sites Allowing Discrimination between Ligands." Dev Cell 40(2): 193-201.
144	Nuclear signalling code	The Nuclear Signalling Code	Maraldi, N. M. (2008). A Lipid-based Code in Nuclear Signalling. The Codes of Life: The Rules of Macroevolution. M. Barbieri and J. Hoffmeyer. Dordrecht, Springer Netherlands: 207-221.
145	Nucleoprotein code	The Nucleoprotein Code	Moreira É, A., A. Weber, H. Bolte, L. Kolesnikova, S. Giese, S. Lakdawala, M. Beer, G. Zimmer, A. García-Sastre, M. Schwemmler and M. Juozapaitis (2016). "A conserved influenza A virus nucleoprotein code controls specific viral genome packaging." Nat Commun 7: 12861.

146	Nucleosome code	The Nucleosome Code	<p>Segal, E., Y. Fondufe-Mittendorf, L. Chen, A. Thåström, Y. Field, I. K. Moore, J.-P. Z. Wang and J. Widom (2006). "A genomic code for nucleosome positioning." <i>Nature</i> 442(7104): 772-778.</p> <p>Segal, M. R. (2008). "Re-cracking the nucleosome positioning code." <i>Stat Appl Genet Mol Biol</i> 7(1): Article14.</p> <p>Choi, J. K. and Y. J. Kim (2009). "Implications of the nucleosome code in regulatory variation, adaptation and evolution." <i>Epigenetics</i> 4(5): 291-295.</p> <p>Cohanim, A. B. and T. E. Haran (2009). "The coexistence of the nucleosome positioning code with the genetic code on eukaryotic genomes." <i>Nucleic acids research</i> 37(19): 6466-6476.</p> <p>Clark, D. J. (2010). "Nucleosome positioning, nucleosome spacing and the nucleosome code." <i>J Biomol Struct Dyn</i> 27(6): 781-793.</p> <p>Jones, B. (2016). "Chromatin: Cracking the nucleosome code." <i>Nat Rev Genet</i> 17(7): 376-377.</p> <p>Zuiddam, M., R. Everaers and H. Schiessel (2017). "Physics behind the mechanical nucleosome positioning code." <i>Phys Rev E</i> 96(5-1): 052412.</p> <p>Colino-Sanguino, Y., S. J. Clark and F. Valdes-Mora (2022). "The H2A.Z-nucleosome code in mammals: emerging functions." <i>Trends Genet</i> 38(5): 516.</p>
147	Olfactory code	The Olfactory Code	<p>Amoore, J. E. (1967). "Specific anosmia: a clue to the olfactory code." <i>Nature</i> 214(5093): 1095-1098.</p> <p>Amoore, J. E. (1974). "Evidence for the chemical olfactory code in man." <i>Ann N Y Acad Sci</i> 237(0): 137-143.</p> <p>Menevse, A., G. H. Dodd, T. M. Poynder and D. Squirrel (1977). "A chemical-modification approach to the olfactory code." <i>Biochem Soc Trans</i> 5(1): 191-194.</p> <p>Menevse, A., G. Dodd and T. M. Poynder (1978). "A chemical-modification approach to the olfactory code. Studies with a thiol-specific reagent." <i>Biochem J</i> 176(3): 845-854.</p> <p>Mair, R. G. (1986). "Ontogeny of the olfactory code." <i>Experientia</i> 42(3): 213-223.</p>

[Menevşe, S. and A. Menevşe \(1989\). "A chemical modification approach to the olfactory code: vapor phase labeling using photoaffinity odorants." Jpn J Physiol 39\(5\): 779-784.](#)

[Lánský, P. and J.-P. Rospars \(1993\). "Coding of odor intensity." Biosystems 31\(1\): 15-38.](#)

[Av-Ron, E. and J.-F. Vibert \(1996\). "A model for temporal and intensity coding in insect olfaction by a network of inhibitory neurons." Biosystems 39\(3\): 241-250.](#)

[Lai, S. C., N. Vasilieva and R. E. Johnston \(1996\). "Odors providing sexual information in Djungarian hamsters: evidence for an across-odor code." Horm Behav 30\(1\): 26-36.](#)

[Getz, W. M. and R. P. Akers \(1997\). "Coding properties of peak and average response rates in American cockroach olfactory sensory cells." Biosystems 40\(1\): 55-63.](#)

[Vermeulen, A., P. Lánský, H. Tuckwell and J.-P. Rospars \(1997\). "Coding of odour intensity in a sensory neuron." Biosystems 40\(1\): 203-210.](#)

[Dudai, Y. \(1999\). "The smell of representations." Neuron 23\(4\): 633-635.](#)

[Galizia, C. G., S. Sachse, A. Rappert and R. Menzel \(1999\). "The glomerular code for odor representation is species specific in the honeybee *Apis mellifera*." Nat Neurosci 2\(5\): 473-478.](#)

[Sachse, S., A. Rappert and C. G. Galizia \(1999\). "The spatial representation of chemical structures in the antennal lobe of honeybees: steps towards the olfactory code." Eur J Neurosci 11\(11\): 3970-3982.](#)

[Galizia, C. G. and R. Menzel \(2000\). "Probing the olfactory code." Nat Neurosci 3\(9\): 853-854.](#)

[Johnson, B. A. and M. Leon \(2000\). "Odorant molecular length: one aspect of the olfactory code." J Comp Neurol 426\(2\): 330-338.](#)

[Rogers, M. E. and S. J. Firestein \(2001\). "Unlocking the DOR code." Neuron 30\(2\): 305-307.](#)

[Vickers, N. J., T. A. Christensen, T. C. Baker and J. G. Hildebrand \(2001\). "Odour-plume dynamics influence the brain's olfactory code." Nature 410\(6827\): 466-470.](#)

[Stensmyr, M. C., T. Dekker and B. S. Hansson \(2003\). "Evolution of the olfactory code in the *Drosophila melanogaster* subgroup." Proc Biol Sci 270\(1531\): 2333-2340.](#)

[Yu, D., A. Ponomarev and R. L. Davis \(2004\). "Altered representation of the spatial code for odors after olfactory classical conditioning; memory trace formation by synaptic recruitment." *Neuron* 42\(3\): 437-449.](#)

[Zufall, F. \(2005\). "Connexins and olfactory synchronicity: toward the olfactory code." *Neuron* 46\(5\): 693-694.](#)

[Ray, A., W. van der Goes van Naters and J. R. Carlson \(2008\). "A regulatory code for neuron-specific odor receptor expression." *PLoS Biol* 6\(5\): e125.](#)

[Furudono, Y., Y. Sone, K. Takizawa, J. Hirono and T. Sato \(2009\). "Relationship between peripheral receptor code and perceived odor quality." *Chem Senses* 34\(2\): 151-158.](#)

[Haddad, R., T. Weiss, R. Khan, B. Nadler, N. Mandairon, M. Bensafi, E. Schneidman and N. Sobel \(2010\). "Global features of neural activity in the olfactory system form a parallel code that predicts olfactory behavior and perception." *J Neurosci* 30\(27\): 9017-9026.](#)

[Nieberding, C. M., K. Fischer, M. Saastamoinen, C. E. Allen, E. A. Wallin, E. Hedenström and P. M. Brakefield \(2012\). "Cracking the olfactory code of a butterfly: the scent of ageing." *Ecol Lett* 15\(5\): 415-424.](#)

[Boyle, S. M., S. McInally and A. Ray \(2013\). "Expanding the olfactory code by in silico decoding of odor-receptor chemical space." *Elife* 2: e01120.](#)

[Campbell, R. A., K. S. Honegger, H. Qin, W. Li, E. Demir and G. C. Turner \(2013\). "Imaging a population code for odor identity in the *Drosophila* mushroom body." *J Neurosci* 33\(25\): 10568-10581.](#)

[Gruntman, E. and G. C. Turner \(2013\). "Integration of the olfactory code across dendritic claws of single mushroom body neurons." *Nat Neurosci* 16\(12\): 1821-1829.](#)

[Haddad, R., A. Lanjuin, L. Madisen, H. Zeng, V. N. Murthy and N. Uchida \(2013\). "Olfactory cortical neurons read out a relative time code in the olfactory bulb." *Nat Neurosci* 16\(7\): 949-957.](#)

[Schubert, M., B. S. Hansson and S. Sachse \(2014\). "The banana code-natural blend processing in the olfactory circuitry of *Drosophila melanogaster*." *Front Physiol* 5: 59.](#)

[Renou, M., V. Party, A. Rouyar and S. Anton \(2015\). "Olfactory signal coding in an odor background." *Biosystems* 136: 35-45.](#)

			<p>Grillet, M., D. Campagner, R. Petersen, C. McCrohan and M. Cobb (2016). "The peripheral olfactory code in Drosophila larvae contains temporal information and is robust over multiple timescales." Proc Biol Sci 283(1831).</p> <p>Wilson, C. D., G. O. Serrano, A. A. Koulakov and D. Rinberg (2017). "A primacy code for odor identity." Nat Commun 8(1): 1477.</p> <p>Grabe, V. and S. Sachse (2018). "Fundamental principles of the olfactory code." Biosystems 164: 94-101.</p> <p>Milinski, M. (2022). "A Review of Suggested Mechanisms of MHC Odor Signaling." Biology (Basel) 11(8).</p>
148	Omega Code	The Omega Leaf Code	Tomlinson, P. B., A. Ricciardi and B. A. Huggett (2018). "Cracking the omega code: hydraulic architecture of the cycad leaf axis." Ann Bot 121(3): 483-488.
149	Organogenesis code	The Regulatory Organogenesis Codes	Scully, K. M. and M. G. Rosenfeld (2002). "Pituitary development: regulatory codes in mammalian organogenesis." Science 295(5563): 2231-2235.
150	Orthographic code	The Orthographic Reading Code	<p>Davis, C. J. (2012). "Developing a universal model of reading necessitates cracking the orthographic code." Behav Brain Sci 35(5): 283-284.</p> <p>Wallot, S. (2014). "From "cracking the orthographic code" to "playing with language": toward a usage-based foundation of the reading process." Front Psychol 5: 891.</p> <p>Borleffs, E., B. A. M. Maassen, H. Lyytinen and F. Zwarts (2018). "Cracking the Code: The Impact of Orthographic Transparency and Morphological-Syllabic Complexity on Reading and Developmental Dyslexia." Front Psychol 9: 2534.</p>
151	Oscillation code	The neuronal Oscillatory /Frequency Codes	<p>Schyns, P. G., G. Thut and J. Gross (2011). "Cracking the code of oscillatory activity." PLoS Biol 9(5): e1001064.</p> <p>de la Prida, L. M. (2019). "The Theta Stone: 3 to 10 Hz Oscillations to Decipher the Human Brain Code." Epilepsy Curr 19(2): 126-128.</p>
152	Osteoarthritis code	The Osteoarthritis Codes	Cen, X., X. Q. Huang, W. T. Sun, Q. Liu and J. Liu (2017). "Long noncoding RNAs: a new regulatory code in osteoarthritis." Am J Transl Res 9(11): 4747-4755.
153	Osteoporosis code	The Osteoporosis Code	Wu, Q. Y., X. Li, Z. N. Miao, J. X. Ye, B. Wang, F. Zhang, R. S. Xu, D. L. Jiang, M. D. Zhao and F. L. Yuan (2018). "Long Non-coding RNAs: A New Regulatory Code for Osteoporosis." Front Endocrinol (Lausanne) 9: 587.

154	Pattern code	The Pattern Formation Code	<p>Depew, M. J., C. A. Simpson, M. Morasso and J. L. Rubenstein (2005). "Reassessing the Dlx code: the genetic regulation of branchial arch skeletal pattern and development." J Anat 207(5): 501-561.</p> <p>Yakoby, N., C. A. Bristow, D. Gong, X. Schafer, J. Lembong, J. J. Zartman, M. S. Halfon, T. Schüpbach and S. Y. Shvartsman (2008). "A combinatorial code for pattern formation in Drosophila oogenesis." Dev Cell 15(5): 725-737.</p>
155	Phagocytic code	The Phagocytosis Codes	<p>Jubrail, J., N. Kurian and F. Niedergang (2017). "Macrophage phagocytosis cracking the defect code in COPD." Biomed J 40(6): 305-312.</p> <p>Bronte, V. (2019). "Deciphering Macrophage and Monocyte Code to Stratify Human Breast Cancer Patients." Cancer Cell 35(4): 538-539.</p> <p>Cockram, T. O. J., J. M. Dundee, A. S. Popescu and G. C. Brown (2021). "The Phagocytic Code Regulating Phagocytosis of Mammalian Cells." Front Immunol 12: 629979.</p>
156	Pheromone code	The Pheromone Codes	<p>Kostal, L., P. Lansky and J.-P. Rospars (2008). "Efficient Olfactory Coding in the Pheromone Receptor Neuron of a Moth." PLOS Computational Biology 4(4): e1000053.</p> <p>Carcaud, J., M. Giurfa and J. C. Sandoz (2015). "Differential combinatorial coding of pheromones in two olfactory subsystems of the honey bee brain." J Neurosci 35(10): 4157-4167.</p> <p>Wang, B., Y. Liu and G. R. Wang (2018). "Proceeding From in vivo Functions of Pheromone Receptors: Peripheral-Coding Perception of Pheromones From Three Closely Related Species, Helicoverpaarmigera, H. assulta, and Heliothisvirescens." Front Physiol 9: 1188.</p> <p>Tirindelli, R. (2021). "Coding of pheromones by vomeronasal receptors." Cell and Tissue Research 383(1): 367-386.</p>
157	Phenotype code	The Phenotype Codes	<p>Westerman, E. L., S. E. J. Bowman, B. Davidson, M. C. Davis, E. R. Larson and C. P. J. Sanford (2020). "Deploying Big Data to Crack the Genotype to Phenotype Code." Integr Comp Biol 60(2): 385-396.</p>
158	Phonological code	The Phonological Codes	<p>Foss, D. J. and M. A. Gernsbacher (1983). "Cracking the Dual Code: Toward a Unitary Model of Phoneme Identification." J Verbal Learning Verbal Behav 22(6): 609-632.</p> <p>Brybaert, M. and C. Praet (1992). "Reading isolated words: no evidence for automatic incorporation of the phonetic code." Psychol Res 54(2): 91-102.</p>

			<p>Reynolds, M. and D. Besner (2006). "Reading aloud is not automatic: processing capacity is required to generate a phonological code from print." J Exp Psychol Hum Percept Perform 32(6): 1303-1323.</p> <p>Jacquemot, C., E. Dupoux and A.-C. Bachoud-Lévi (2007). "Breaking the mirror: Asymmetrical disconnection between the phonological input and output codes." Cognitive Neuropsychology 24(1): 3-22.</p> <p>Denis-Noël, A., C. Pattamadilok, É. Castet and P. Colé (2020). "Activation time-course of phonological code in silent word recognition in adult readers with and without dyslexia." Ann Dyslexia 70(3): 313-338.</p>
159	Phosphatase code	The Phosphatase Code	<p>Roy, J. and M. S. Cyert (2009). "Cracking the phosphatase code: docking interactions determine substrate specificity." Sci Signal 2(100): re9.</p> <p>Heroes, E., B. Lesage, J. Görnemann, M. Beullens, L. Van Meervelt and M. Bollen (2013). "The PP1 binding code: a molecular-lego strategy that governs specificity." Febs j 280(2): 584-595.</p> <p>Choy, M. S., M. Hieke, G. S. Kumar, G. R. Lewis, K. R. Gonzalez-DeWhitt, R. P. Kessler, B. J. Stein, M. Hessenberger, A. C. Nairn, W. Peti and R. Page (2014). "Understanding the antagonism of retinoblastoma protein dephosphorylation by PNUITS provides insights into the PP1 regulatory code." Proc Natl Acad Sci U S A 111(11): 4097-4102.</p> <p>Masaki, T. and M. Shimada (2022). "Decoding the Phosphatase Code: Regulation of Cell Proliferation by Calcineurin." Int J Mol Sci 23(3).</p>
160	Phospholipid code	The Phospholipid Code	<p>Baxter, A. A., M. D. Hulett and I. K. Poon (2015). "The phospholipid code: a key component of dying cell recognition, tumor progression and host-microbe interactions." Cell Death Differ 22(12): 1893-1905.</p>
161	Phosphorylation code	The Phosphorylation Code	<p>Otto, J. C., P. Kelly, S. T. Chiou and J. D. York (2007). "Alterations in an inositol phosphate code through synergistic activation of a G protein and inositol phosphate kinases." Proc Natl Acad Sci U S A 104(40): 15653-15658.</p> <p>Ganguly, A. and H. T. Cho (2012). "The phosphorylation code is implicated in cell type-specific trafficking of PIN-FORMEDs." Plant Signal Behav 7(10): 1215-1218.</p> <p>Chen, Y. and J. Jiang (2013). "Decoding the phosphorylation code in Hedgehog signal transduction." Cell Res 23(2): 186-200.</p>

			<p>Örd, M., K. Möll, A. Agerova, R. Kivi, I. Faustova, R. Venta, E. Valk and M. Loog (2019). "Multisite phosphorylation code of CDK." Nature Structural & Molecular Biology 26(7): 649-658.</p> <p>Arif, A., J. Jia, B. Willard, X. Li and P. L. Fox (2019). "Multisite Phosphorylation of S6K1 Directs a Kinase Phospho-code that Determines Substrate Selection." Mol Cell 73(3): 446-457.e446.</p> <p>Murakami, Y. (2019). "Phosphorylation of repressive histone code readers by casein kinase 2 plays diverse roles in heterochromatin regulation." J Biochem 166(1): 3-6.</p> <p>Wang, B., A. N. Kettenbach, X. Zhou, J. J. Loros and J. C. Dunlap (2019). "The Phospho-Code Determining Circadian Feedback Loop Closure and Output in Neurospora." Mol Cell 74(4): 771-784.e773.</p> <p>Sluchanko, N. N. (2020). "Reading the phosphorylation code: binding of the 14-3-3 protein to multivalent client phosphoproteins." Biochem J 477(7): 1219-1225.</p> <p>Kervin, T. A. and M. Overduin (2021). "Regulation of the Phosphoinositide Code by Phosphorylation of Membrane Readers." Cells 10(5).</p> <p>Lee, H., A. Ganguly, S. Baik and H. T. Cho (2021). "Calcium-dependent protein kinase 29 modulates PIN-FORMED polarity and Arabidopsis development via its own phosphorylation code." Plant Cell 33(11): 3513-3531.</p> <p>Zhou, M. and J. Jiang (2022). "Gli Phosphorylation Code in Hedgehog Signal Transduction." Front Cell Dev Biol 10: 846927.</p>
162	Phosphoserine code	The Phosphoserine Code	Aragón, E., N. Goerner, A. I. Zaromytidou, Q. Xi, A. Escobedo, J. Massagué and M. J. Macias (2011). "A Smad action turnover switch operated by WW domain readers of a phosphoserine code." Genes Dev 25(12): 1275-1288.
163	Plant communication codes	The Plant Communication Codes	Bonato, B., F. Peressotti, S. Guerra, Q. Wang and U. Castiello (2021). "Cracking the code: a comparative approach to plant communication." Commun Integr Biol 14(1): 176-185.
164	Poly(A) code	The Poly(Adenylation) Code	Weng, L., Y. Li, X. Xie and Y. Shi (2016). "Poly(A) code analyses reveal key determinants for tissue-specific mRNA alternative polyadenylation." Rna 22(6): 813-821.
165	Polyketide code	The Polyketide Code	Hopwood, D. A. (2004). "Cracking the polyketide code." PloSBiol 2(2): E35.

166	Population codes	The Tactile Intensity, Population Codes	<p>Tsai, J. J. and J. D. Victor (2003). "Reading a population code: a multi-scale neural model for representing binocular disparity." Vision Res 43(4): 445-466.</p> <p>Bensmaia, S. J. (2008). "Tactile intensity and population codes." Behavioural Brain Research 190(2): 165-173.</p> <p>London, D., A. Fazl, K. Katlowitz, M. Soula, M. H. Pourfar, A. Y. Mogilner and R. Kiani (2021). "Distinct population code for movement kinematics and changes of ongoing movements in human subthalamic nucleus." Elife 10.</p>
167	Posttranslational codes	The Post-translational Modification Codes	<p>Appella, E. and C. W. Anderson (2000). "Signaling to p53: breaking the posttranslational modification code." Pathol Biol (Paris) 48(3): 227-245.</p> <p>Benayoun, B. A. and R. A. Veitia (2009). "A post-translational modification code for transcription factors: sorting through a sea of signals." Trends Cell Biol 19(5): 189-197.</p> <p>York, B., C. Yu, J. V. Sagen, Z. Liu, B. C. Nikolai, R. C. Wu, M. Finegold, J. Xu and B. W. O'Malley (2010). "Reprogramming the posttranslational code of SRC-3 confers a switch in mammalian systems biology." Proc Natl Acad Sci U S A 107(24): 11122-11127.</p> <p>Holdermann, I., N. H. Meyer, A. Round, K. Wild, M. Sattler and I. Sinning (2012). "Chromodomains read the arginine code of post-translational targeting." Nat Struct Mol Biol 19(2): 260-263.</p> <p>Creixell, P. and R. Linding (2012). "Cells, shared memory and breaking the PTM code." Mol Syst Biol 8: 598.</p> <p>Stojkovic, K., S. S. Wing and N. Cermakian (2014). "A central role for ubiquitination within a circadian clock protein modification code." Front Mol Neurosci 7: 69.</p> <p>Pankow, S., C. Bamberger and J. R. Yates, 3rd (2019). "A posttranslational modification code for CFTR maturation is altered in cystic fibrosis." Sci Signal 12(562).</p> <p>Wen, J. and D. Wang (2022). "Deciphering the PTM codes of the tumor suppressor p53." J Mol Cell Biol 13(11): 774-785.</p>
168	Prion code	The Prion Code	<p>Lesné, S. E. (2013). "Breaking the Code of Amyloid-β Oligomers." Int J Cell Biol 2013: 950783.</p>

			<p>Yahi, N. and J. Fantini (2014). "Deciphering the glycolipid code of Alzheimer's and Parkinson's amyloid proteins allowed the creation of a universal ganglioside-binding peptide." PLoS One 9(8): e104751.</p> <p>Ahmed, A. B. and A. V. Kajava (2013). "Breaking the amyloidogenicity code: methods to predict amyloids from amino acid sequence." FEBS Lett 587(8): 1089-1095.</p> <p>Myers, R., A. Cembran and P. Fernandez-Funez (2020). "Insight From Animals Resistant to Prion Diseases: Deciphering the Genotype - Morphotype - Phenotype Code for the Prion Protein." Front Cell Neurosci 14: 254.</p> <p>Coca, J. R., H. Eraña and J. Castilla (2021). "Biosemiotics comprehension of PrP code and prion disease." Biosystems 210: 104542.</p>
169	Protein folding code	The Protein Folding Code	<p>Epstein, C. J. (1966). "Role of the amino-acid "code" and of selection for conformation in the evolution of proteins." Nature 210(5031): 25-28.</p> <p>Liquori, A. M., P. De Santis, A. L. Kovacs and L. Mazzarella (1966). "Stereochemical code of amino-acid residues: the molecular conformation of gramicidine S." Nature 211(5053): 1039-1041.</p> <p>Robson, B. and R. H. Pain (1971). "Analysis of the code relating sequence to conformation in proteins: possible implications for the mechanism of formation of helical regions." J Mol Biol 58(1): 237-259.</p> <p>Robson, B. and R. H. Pain (1974). "Analysis of the code relating sequence to conformation in globular proteins. Development of a stereochemical alphabet on the basis of intra-residue information." Biochem J 141(3): 869-882.</p> <p>Robson, B. and R. H. Pain (1974). "Analysis of the code relating sequence to conformation in globular proteins. An informational analysis of the role of the residue in determining the conformation of its neighbours in the primary sequence." Biochem J 141(3): 883-897.</p> <p>Robson, B. and R. H. Pain (1974). "Analysis of the code relating sequence to conformation in globular proteins. The distribution of residue pairs in turns and kinks in the backbone chain." Biochem J 141(3): 899-904.</p> <p>Garnier, J. and J. M. Levin (1991). "The protein structure code: what is its present status?" Comput Appl Biosci 7(2): 133-142.</p>

			<p>Negrete, J. A., Y. Viñuales and J. Palau (1998). "Deciphering the structural code for proteins: helical propensities in domain classes and statistical multiresidue information in alpha-helices." Protein Sci 7(6): 1368-1379.</p> <p>Rumbley, J., L. Hoang, L. Mayne and S. W. Englander (2001). "An amino acid code for protein folding." Proc Natl Acad Sci U S A 98(1): 105-112.</p> <p>Uversky, V. N. (2002). "Cracking the folding code. Why do some proteins adopt partially folded conformations, whereas other don't?" FEBS Lett 514(2-3): 181-183.</p> <p>Goldbeck, R. A., R. M. Esquerra, J. M. Holt, G. K. Ackers and D. S. Kliger (2004). "The molecular code for hemoglobin allostery revealed by linking the thermodynamics and kinetics of quaternary structural change. 1. Microstate linear free energy relations." Biochemistry 43(38): 12048-12064.</p> <p>Hodges, J. A. and R. T. Raines (2005). "Stereo-electronic and steric effects in the collagen triple helix: toward a code for strand association." J Am Chem Soc 127(45): 15923-15932.</p> <p>Shestopalov, B. V. (2007). "The code-based physics of formation of alpha-helices and beta-hairpins in water-soluble proteins." Dokl Biochem Biophys 416: 245-247.</p> <p>Wallace, R. (2011). "Structure and dynamics of the 'protein folding code' inferred using Tlusty's topological rate distortion approach." Biosystems 103(1): 18-26.</p> <p>Grison, C. M., S. Robin and D. J. Aitken (2015). "The discovery of 9/8-ribbons, β/γ-peptides with curved shapes governed by a combined configuration-conformation code." Chem Commun (Camb) 51(90): 16233-16236.</p> <p>Joo, H., A. G. Chavan, K. J. Fraga and J. Tsai (2015). "An amino acid code for irregular and mixed protein packing." Proteins 83(12): 2147-2161.</p> <p>Fraga, K. J., H. Joo and J. Tsai (2016). "An amino acid code to define a protein's tertiary packing surface." Proteins 84(2): 201-216.</p> <p>Komar, A. A. (2021). "A Code Within a Code: How Codons Fine-Tune Protein Folding in the Cell." Biochemistry (Moscow) 86(8): 976-991.</p>
170	Proteomic code	The Proteomic Code	<p>Trifonov, E. N. and I. N. Berezovsky (2002). "Proteomic Code." Molecular Biology 36(2): 239-243.</p>

			<p>Biro, J. C. (2008). "Discovery of proteomic code with mRNA assisted protein folding." Int J Mol Sci 9(12): 2424-2446.</p> <p>Miller, A. D. (2015). "Sense-antisense (complementary) peptide interactions and the proteomic code; potential opportunities in biology and pharmaceutical science." Expert Opin Biol Ther 15(2): 245-267.</p>
171	Quantum code	The Biological Quantum Coherence Codes	Petoukhov, S. V. (2021). "Algebraic harmony and probabilities in genomes. Long-range coherence in quantum code biology." Biosystems 209: 104503.
172	Quasi-cyclic codes	The Regulatory Network Codes	Ravanmehr, V. and B. Vasić (2012). Quasi-cyclic codes exhibiting the gene regulatory network of the cell cycle. 2012 IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB).
173	Rag GTPase dimer code	The GTPase Code	Gollwitzer, P., N. Grützmacher, S. Wilhelm, D. Kümmel and C. Demetriades (2022). "A Rag GTPase dimer code defines the regulation of mTORC1 by amino acids." Nat Cell Biol 24(9): 1394-1406.
174	Reading code	The Neuronal Code for Reading	<p>Zecker, S. G. (1991). "The orthographic code: Developmental trends in reading-disabled and normally-achieving children." Ann Dyslexia 41(1): 178-192.</p> <p>Dehaene, S., L. Cohen, M. Sigman and F. Vinckier (2005). "The neural code for written words: a proposal." Trends Cogn Sci 9(7): 335-341.</p> <p>Goswami, U. and J. C. Ziegler (2006). "A developmental perspective on the neural code for written words." Trends in Cognitive Sciences 10: 142-143.</p> <p>Houghton, G. (2018). "Action and perception in literacy: A common-code for spelling and reading." Psychol Rev 125(1): 83-116.</p> <p>Agrawal, A., K. Hari and S. P. Arun (2020). "A compositional neural code in high-level visual cortex can explain jumbled word reading." Elife 9.</p>
175	Recognition code	The Molecular Recognition Code	<p>Freist, W. and F. Cramer (1976). "A binary code model for substrate recognition of aminoacyl-tRNA ligases." J Theor Biol 58(2): 401-416.</p> <p>Fellouse, F. A., B. Li, D. M. Compaan, A. A. Peden, S. G. Hymowitz and S. S. Sidhu (2005). "Molecular recognition by a binary code." J Mol Biol 348(5): 1153-1162.</p>
176	Recombination codes	The Genetic Recombination Codes	Jabbari, K., J. Wirtz, M. Rauscher and T. Wiehe (2019). "A common genomic code for chromatin architecture and recombination landscape." PloS One 14(3): e0213278.

			<p>Chen, H., H. Yang, X. Zhu, T. Yadav, J. Ouyang, S. S. Truesdell, J. Tan, Y. Wang, M. Duan, L. Wie, L. Zou, A. S. Levine, S. Vasudevan and L. Lan (2020). "m(5)C modification of mRNA serves a DNA damage code to promote homologous recombination." Nat Commun 11(1): 2834.</p> <p>Paulet, L., A. Trecourt, A. Leary, J. Peron, F. Descotes, M. Devouassoux-Shisheboran, K. Leroy, B. You and J. Lopez (2022). "Cracking the homologous recombination deficiency code: how to identify responders to PARP inhibitors." Eur J Cancer 166: 87-99.</p>
177	Regeneration code	The Regeneration Codes	<p>Steinhoff, G. (2021). "Deciphering the Code: Stem Cell-Immune Function and Cardiac Regeneration." Cells 10(3).</p>
178	Redox code	The Redox Code	<p>Helmann, J. D. (2002). "OxyR: a molecular code for redox sensing?" Sci STKE 2002(157): pe46.</p> <p>Jones, D. P. and H. Sies (2015). "The Redox Code." Antioxid Redox Signal 23(9): 734-746.</p>
179	Renal code	The Renal Codes	<p>Gawlik, A. and S. E. Quaggin (2004). "Deciphering the renal code: advances in conditional gene targeting." Physiology (Bethesda) 19: 245-252.</p> <p>Endre, Z. H. and M. Fernando (2016). "Unlocking the code: mining the urinary proteome after renal transplantation." Kidney Int 89(6): 1183-1185.</p>
180	Repair code	The DNA Repair / Damage Codes	<p>Hassa, P. O. and M. O. Hottiger (2005). "An epigenetic code for DNA damage repair pathways?" Biochem Cell Biol 83(3): 270-285.</p> <p>van Attikum, H. and S. M. Gasser (2005). "The histone code at DNA breaks: a guide to repair?" Nature Reviews Molecular Cell Biology 6(10): 757-765.</p> <p>Loizou, J. I., R. Murr, M. G. Finkbeiner, C. Sawan, Z.-Q. Wang and Z. Herceg (2006). "Epigenetic Information in Chromatin: the Code of Entry for DNA Repair." Cell Cycle 5(7): 696-701.</p> <p>Escargueil, A. E., D. G. Soares, M. Salvador, A. K. Larsen and J. A. P. Henriques (2008). "What histone code for DNA repair?" Mutation Research/Reviews in Mutation Research 658(3): 259-270.</p> <p>Corpet, A. and G. Almouzni (2009). "A histone code for the DNA damage response in mammalian cells?" Embo j 28(13): 1828-1830.</p>

			<p>DeMicco, A. and C. H. Bassing (2010). "Deciphering the DNA damage histone code." Cell Cycle 9(19): 3845.</p> <p>Vaissière, T. and Z. Herceg (2010). "Histone code in the cross-talk during DNA damage signaling." Cell Res 20(2): 113-115.</p> <p>Sartori, A. A. and M. Steger (2013). "Prolyl isomerization: A new PIN code for DSB repair." Cell Cycle 12(17): 2717-2718.</p> <p>Paquin, K. L. and N. G. Howlett (2018). "Understanding the Histone DNA Repair Code: H4K20me2 Makes Its Mark." Molecular Cancer Research 16(9): 1335-1345.</p> <p>Singh, J. K., S. M. Noordermeer, J. Jimenez-Sainz, D. G. Maranon and M. Altmeyer (2022). "Editorial: Protecting the code: DNA double-strand break repair pathway choice." Front Genet 13: 993889.</p>
181	Representation code	The Representation Codes	<p>Floyd, B., T. Santander and W. Weimer (2017). Decoding the Representation of Code in the Brain: An fMRI Study of Code Review and Expertise. 2017 IEEE/ACM 39th International Conference on Software Engineering (ICSE).</p>
182	Retina code	The Retinal Codes	<p>Easter, S. S., Jr. (1968). "Excitation in the goldfish retina: evidence for a non-linear intensity code." J Physiol 195(2): 253-271.</p> <p>Meister, M. and M. J. Berry, 2nd (1999). "The neural code of the retina." Neuron 22(3): 435-450.</p> <p>Puchalla, J. L., E. Schneidman, R. A. Harris and M. J. Berry (2005). "Redundancy in the population code of the retina." Neuron 46(3): 493-504.</p> <p>Frechette, E. S., A. Sher, M. I. Grivich, D. Petrusca, A. M. Litke and E. J. Chichilnisky (2005). "Fidelity of the ensemble code for visual motion in primate retina." J Neurophysiol 94(1): 119-135.</p> <p>Yamagata, M. and J. R. Sanes (2012). "Expanding the Ig superfamily code for laminar specificity in retina: expression and role of contactins." J Neurosci 32(41): 14402-14414.</p> <p>Ioffe, M. L. and M. J. Berry, 2nd (2017). "The structured 'low temperature' phase of the retinal population code." PLoS Comput Biol 13(10): e1005792.</p>

			<p>Berry li, M. J., F. Lebois, A. Ziskind and R. A. da Silveira (2019). "Functional Diversity in the Retina Improves the Population Code." Neural Comput 31(2): 270-311.</p> <p>Yang, X., B. Gong and J. W. Lu (2015). "Frequency spectrum might act as communication code between retina and visual cortex I." Int J Ophthalmol 8(6): 1107-1111.</p>
183	RNA code	The RNA Code	<p>Hou, Y. M. and P. Schimmel (1988). "A simple structural feature is a major determinant of the identity of a transfer RNA." Nature 333(6169): 140-145.</p> <p>Schimmel, P., R. Giegé, D. Moras and S. Yokoyama (1993). "An operational RNA code for amino acids and possible relationship to genetic code." Proceedings of the National Academy of Sciences 90(19): 8763-8768.</p> <p>José, M. V., E. R. Morgado and T. Govezensky (2006). "An Extended RNA Code and its Relationship to the Standard Genetic Code: An Algebraic and Geometrical Approach." Bulletin of Mathematical Biology 69(1): 215.</p> <p>Faria, M. (2007). RNA As Code Makers: A Biosemiotic View Of RNAi And Cell Immunity. Introduction to Biosemiotics: The New Biological Synthesis. M. Barbieri. Dordrecht, Springer Netherlands: 347-364.</p> <p>Shaul, S., D. Berel, Y. Benjamini and D. Graur (2010). "Revisiting the operational RNA code for amino acids: Ensemble attributes and their implications." Rna 16(1): 141-153.</p> <p>Müller, S. (2010). "Reading the code of single RNA molecules." Angew Chem Int Ed Engl 49(7): 1197-1199.</p> <p>Wright, J. E., D. Gaidatzis, M. Senften, B. M. Farley, E. Westhof, S. P. Ryder and R. Ciosk (2011). "A quantitative RNA code for mRNA target selection by the germline fate determinant GLD-1." Embo j 30(3): 533-545.</p> <p>Agris, P. F. (2015). "The importance of being modified: an unrealized code to RNA structure and function." Rna 21(4): 552-554.</p> <p>Brannan, K. W. and G. W. Yeo (2016). "From Protein-RNA Predictions toward a Peptide-RNA Code." Mol Cell 64(3): 437-438.</p> <p>Chi, K. R. (2017). "The RNA code comes into focus." Nature 542(7642): 503-506.</p>

			<p>Carter, C. W., Jr. and P. R. Wills (2018). "Hierarchical groove discrimination by Class I and II aminoacyl-tRNA synthetases reveals a palimpsest of the operational RNA code in the tRNA acceptor-stem bases." Nucleic Acids Res 46(18): 9667-9683.</p> <p>Kleiner, R. E. (2018). "Reading the RNA Code." Biochemistry 57(1): 11-12.</p> <p>Demongeot, J. and H. Seligmann (2020). "The primordial tRNA acceptor stem code from theoretical minimal RNA ring clusters." BMC Genet 21(1): 7.</p>
184	RNAi code	The RNA-Interference Codes	<p>Siomi, H. and M. C. Siomi (2009). "On the road to reading the RNA-interference code." Nature 457(7228): 396-404.</p>
185	RNA recognition code	The RNA Recognition Code	<p>Pitici, F., D. L. Beveridge and A. M. Baranger (2002). "Molecular dynamics simulation studies of induced fit and conformational capture in U1A-RNA binding: do molecular substates code for specificity?" Biopolymers 65(6): 424-435.</p> <p>Yeo, G. W., N. G. Coufal, T. Y. Liang, G. E. Peng, X. D. Fu and F. H. Gage (2009). "An RNA code for the FOX2 splicing regulator revealed by mapping RNA-protein interactions in stem cells." Nat Struct Mol Biol 16(2): 130-137.</p> <p>Yarus, M., J. J. Widmann and R. Knight (2009). "RNA-amino acid binding: a stereochemical era for the genetic code." J Mol Evol 69(5): 406-429.</p> <p>Filipovska, A., M. F. Razif, K. K. Nygård and O. Rackham (2011). "A universal code for RNA recognition by PUF proteins." Nat Chem Biol 7(7): 425-427.</p> <p>Chen, Y. and G. Varani (2011). "Finding the missing code of RNA recognition by PUF proteins." Chem Biol 18(7): 821-823.</p> <p>Barkan, A., M. Rojas, S. Fujii, A. Yap, Y. S. Chong, C. S. Bond and I. Small (2012). "A combinatorial amino acid code for RNA recognition by pentatricopeptide repeat proteins." PLoS Genet 8(8): e1002910.</p> <p>Cléry, A., J. Boudet and F. H. Allain (2013). "Single-stranded nucleic acid recognition: is there a code after all?" Structure 21(1): 4-6.</p> <p>Hennig, J., F. Gebauer and M. Sattler (2014). "Breaking the protein-RNA recognition code." Cell Cycle 13(23): 3619-3620.</p>

			<p>Campbell, Z. T., C. T. Valley and M. Wickens (2014). "A protein-RNA specificity code enables targeted activation of an endogenous human transcript." Nat Struct Mol Biol 21(8): 732-738.</p> <p>Nawy, T. (2014). "A protein code to target RNA." Nat Methods 11(9): 888-889.</p>
186	Scent codes	The Mammalian Scent Codes SEE also Olfactory codes	<p>Wright, G. A. and F. P. Schiestl (2009). "The evolution of floral scent: the influence of olfactory learning by insect pollinators on the honest signalling of floral rewards." Functional Ecology 23(5): 841-851.</p> <p>Ferrero, D. M. and S. D. Liberles (2010). "The secret codes of mammalian scents." WIREs Systems Biology and Medicine 2(1): 23-33.</p>
187	Segregation code	The Chromosome Segregation Code	<p>Monda, J. K. and I. M. Cheeseman (2015). "Chromosome Segregation: A Spatial Code to Correct Kinetochores-Microtubule Attachments." Curr Biol 25(14): R601-603.</p> <p>Nitzan, E., S. Krispin, E. R. Pfaltzgraff, A. Klar, P. A. Labosky and C. Kalcheim (2013). "A dynamic code of dorsal neural tube genes regulates the segregation between neurogenic and melanogenic neural crest cells." Development 140(11): 2269-2279.</p>
188	Semaphorin code	The Semaphoring Codes	<p>Cohen, S., L. Funkelstein, J. Livet, G. Rougon, C. E. Henderson, V. Castellani and F. Mann (2005). "A semaphorin code defines subpopulations of spinal motor neurons during mouse development." Eur J Neurosci 21(7): 1767-1776.</p> <p>Berke, B. and H. Keshishian (2011). "Cracking the combinatorial semaphorin code." Neuron 70(2): 175-177.</p> <p>Wu, Z., L. B. Sweeney, J. C. Ayoob, K. Chak, B. J. Andreone, T. Ohyama, R. Kerr, L. Luo, M. Zlatic and A. L. Kolodkin (2011). "A combinatorial semaphorin code instructs the initial steps of sensory circuit assembly in the Drosophila CNS." Neuron 70(2): 281-298.</p>
189	Sensory code	The Photoreceptor Sensory Code	<p>Felsten, G. and G. S. Wasserman (1979). "The photoreceptor sensory code for pattern identification during visual masking." Sens Processes 3(3): 230-239.</p>
190	SeqCode	The Nomenclatural Code	<p>Hedlund, B. P., M. Chuvochina, P. Hugenholtz, K. T. Konstantinidis, A. E. Murray, M. Palmer, D. H. Parks, A. J. Probst, A. L. Reysenbach, R. L. Rodriguez, R. Rossello-Mora, I. C. Sutcliffe, S. N. Venter and W. B. Whitman (2022). "SeqCode: a nomenclatural code for prokaryotes described from sequence data." Nat Microbiol 7(10): 1702-1708.</p>

191	Sequence codes	The Nucleotide Sequence Codes	<p>Trifonov, E. N. (1987). "Translation framing code and frame-monitoring mechanism as suggested by the analysis of mRNA and 16 S rRNA nucleotide sequences." <i>Journal of Molecular Biology</i> 194(4): 643-652.</p> <p>Trifonov, E. N. (1988). "Codes of nucleotide sequences." <i>Mathematical Biosciences</i> 90(1): 507-517.</p> <p>Trifonov, E. N. (1989). "The multiple codes of nucleotide sequences." <i>Bulletin of Mathematical Biology</i> 51(4): 417-432.</p> <p>Vogt, P. (1990). "Potential genetic functions of tandem repeated DNA sequence blocks in the human genome are based on a highly conserved "chromatin folding code"." <i>Hum Genet</i> 84(4): 301-336.</p> <p>Trifonov, E. N. (1999). "Elucidating sequence codes: three codes for evolution." <i>Ann N Y Acad Sci</i> 870: 330-338.</p> <p>Sotolongo, B. and W. S. Ward (2000). "DNA loop domain organization: the three-dimensional genomic code." <i>J Cell Biochem Suppl</i> 35: 23-26.</p> <p>Trifonov, E. N. (2008). <i>Codes of Biosequences. The Codes of Life: The Rules of Macroevolution.</i> M. Barbieri and J. Hoffmeyer. Dordrecht, Springer Netherlands: 3-14.</p> <p>Trifonov, E. N. (2011). "Thirty years of multiple sequence codes." <i>Genomics Proteomics Bioinformatics</i> 9(1-2): 1-6.</p> <p>Trifonov, E. N. (2011). "Cracking the chromatin code: precise rule of nucleosome positioning." <i>Phys Life Rev</i> 8(1): 39-50.</p> <p>Ciribilli, Y., P. Monti, A. Bisio, H. T. Nguyen, A. S. Ethayathulla, A. Ramos, G. Foggetti, P. Menichini, D. Menendez, M. A. Resnick, H. Viadiu, G. Fronza and A. Inga (2013). "Transactivation specificity is conserved among p53 family proteins and depends on a response element sequence code." <i>Nucleic Acids Res</i> 41(18): 8637-8653.</p> <p>Durán, E., S. Djebali, S. González, O. Flores, J. M. Mercader, R. Guigó, D. Torrents, M. Soler-López and M. Orozco (2013). "Unravelling the hidden DNA structural/physical code provides novel insights on promoter location." <i>Nucleic Acids Res</i> 41(15): 7220-7230.</p> <p>Herbert, A. (2019). "A Genetic Instruction Code Based on DNA Conformation." <i>Trends Genet</i> 35(12): 887-890.</p>
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			<p>Ling, J., K. Y. Umezawa, T. Scott and S. Small (2019). "Bicoid-Dependent Activation of the Target Gene hunchback Requires a Two-Motif Sequence Code in a Specific Basal Promoter." Mol Cell 75(6): 1178-1187.e1174.</p> <p>Marzec, M. (2021). "Uncovering the Mechanical Code of DNA Using 'Loop-seq'." Trends Genet 37(6): 494-495.</p> <p>Esposito, A., S. Bianco, A. M. Chiariello, A. Abraham, L. Fiorillo, M. Conte, R. Campanile and M. Nicodemi (2022). "Polymer physics reveals a combinatorial code linking 3D chromatin architecture to 1D chromatin states." Cell Rep 38(13): 110601.</p>
192	Sexual codes	The Sexual Dimorphic Codes	<p>Sallee, M. D., H. E. Littleford and I. Greenwald (2017). "A bHLH Code for Sexually Dimorphic Form and Function of the C. elegans Somatic Gonad." Curr Biol 27(12): 1853-1860.e1855.</p>
193	Signal integration code	The Signal Integration Codes	<p>Kim, J. H., J. M. Lee, H. J. Nam, H. J. Choi, J. W. Yang, J. S. Lee, M. H. Kim, S. I. Kim, C. H. Chung, K. I. Kim and S. H. Baek (2007). "SUMOylation of pontin chromatin-remodeling complex reveals a signal integration code in prostate cancer cells." Proc Natl Acad Sci U S A 104(52): 20793-20798.</p> <p>Aberger, F. and A. Ruiz i Altaba (2014). "Context-dependent signal integration by the GLI code: the oncogenic load, pathways, modifiers and implications for cancer therapy." Semin Cell Dev Biol 33(100): 93-104.</p>
194	Signal transduction code	The Signal Transduction Code	<p>Prank, K., F. Gabbiani and G. Brabant (2000). "Coding efficiency and information rates in transmembrane signaling." Biosystems 55(1): 15-22.</p> <p>Barbieri, M. (2003). The organic codes. An introduction to semantic biology., Cambridge University Press.</p> <p>Bruni, L. E. (2007). Cellular Semiotics And Signal Transduction. Introduction to Biosemiotics: The New Biological Synthesis. M. Barbieri. Dordrecht, Springer Netherlands: 365-408.</p> <p>Faria, M. (2008). Signal Transduction Codes and Cell Fate. The Codes of Life: The Rules of Macroevolution. M. Barbieri and J. Hoffmeyer. Dordrecht, Springer Netherlands: 265-283.</p>

			<p>Bengtsson, F. and H. Jörntell (2009). "Sensory transmission in cerebellar granule cells relies on similarly coded mossy fiber inputs." Proc Natl Acad Sci U S A 106(7): 2389-2394.</p> <p>Maraldi, N. M. (2019). "In search of a primitive signaling code." Biosystems 183: 103984.</p> <p>Madsen, R. R. and B. Vanhaesebroeck (2020). "Cracking the context-specific PI3K signaling code." Science Signaling 13(613): eaay2940.</p>
195	Social information code	The Neural, Social Information Code	<p>Knutson, B. and G. E. Wimmer (2007). "Splitting the difference: how does the brain code reward episodes?" Ann N Y Acad Sci 1104: 54-69.</p> <p>Kahnt, T., J. Heinzle, S. Q. Park and J. D. Haynes (2010). "The neural code of reward anticipation in human orbitofrontal cortex." Proc Natl Acad Sci U S A 107(13): 6010-6015.</p> <p>Hale, L. A., E. S. Lee, A. K. Pantazis, N. Chronis and S. H. Chalasani (2016). "Altered Sensory Code Drives Juvenile-to-Adult Behavioral Maturation in Caenorhabditis elegans." eNeuro 3(6).</p> <p>Ponsot, E., J. J. Burred, P. Belin and J. J. Aucouturier (2018). "Cracking the social code of speech prosody using reverse correlation." Proc Natl Acad Sci U S A 115(15): 3972-3977.</p> <p>Dabney, W., Z. Kurth-Nelson, N. Uchida, C. K. Starkweather, D. Hassabis, R. Munos and M. Botvinick (2020). "A distributional code for value in dopamine-based reinforcement learning." Nature 577(7792): 671-675.</p> <p>Salazar, V. and A. Silva (2022). "Neural processing: Cracking the code to extract relevant social information." Curr Biol 32(1): R32-r34.</p>
196	Socio-chemical codes	The Socio-Chemical Codes	<p>Mardon, J., S. M. Saunders, M. J. Anderson, C. Couchoux and F. Bonadonna (2010). "Species, gender, and identity: cracking petrels' sociochemical code." Chem Senses 35(4): 309-321.</p>
197	Sodium/calcium code	The Sodium/Calcium Channel Gating Code	<p>Lariccia, V., S. Piccirillo, A. Preziuso, S. Amoroso and S. Magi (2020). "Cracking the code of sodium/calcium exchanger (NCX) gating: Old and new complexities surfacing from the deep web of secondary regulations." Cell Calcium 87: 102169.</p>
198	Spatial code	The Neuronal, Spatial Codes	<p>Bertera, J. H. (1992). "Spatial code interference on directional responses." Spat Vis 6(2): 81-88.</p>

[O'Keefe, J. and N. Burgess \(1996\). "Geometric determinants of the place fields of hippocampal neurons." Nature 381\(6581\): 425-428.](#)

[Hafting, T., M. Fyhn, S. Molden, M. B. Moser and E. I. Moser \(2005\). "Microstructure of a spatial map in the entorhinal cortex." Nature 436\(7052\): 801-806.](#)

[O'Keefe, J. and N. Burgess \(2005\). "Dual phase and rate coding in hippocampal place cells: theoretical significance and relationship to entorhinal grid cells." Hippocampus 15\(7\): 853-866.](#)

[Brandon, M. P. and M. E. Hasselmo \(2009\). "Sources of the spatial code within the hippocampus." F1000 Biol Rep 1: 3.](#)

[Rocheffort, C., A. Arabo, M. André, B. Poucet, E. Save and L. Rondi-Reig \(2011\). "Cerebellum Shapes Hippocampal Spatial Code." Science 334\(6054\): 385-389.](#)

[Gombkőto, P., A. Rokszi, A. Berényi, G. Braunitzer, G. Utassy, G. Benedek and A. Nagy \(2011\). "Neuronal code of spatial visual information in the caudate nucleus." Neuroscience 182: 225-231.](#)

[Baj, G., V. D'Alessandro, L. Musazzi, A. Mallei, C. R. Sartori, M. Sciancalepore, D. Tardito, F. Langone, M. Popoli and E. Tongiorgi \(2012\). "Physical exercise and antidepressants enhance BDNF targeting in hippocampal CA3 dendrites: further evidence of a spatial code for BDNF splice variants." Neuropsychopharmacology 37\(7\): 1600-1611.](#)

[Weber, A. I., H. P. Saal, J. D. Lieber, J. W. Cheng, L. R. Manfredi, J. F. Dammann, 3rd and S. J. Bensmaia \(2013\). "Spatial and temporal codes mediate the tactile perception of natural textures." Proc Natl Acad Sci U S A 110\(42\): 17107-17112.](#)

[Chen, G., J. A. King, N. Burgess and J. O'Keefe \(2013\). "How vision and movement combine in the hippocampal place code." Proc Natl Acad Sci U S A 110\(1\): 378-383.](#)

[Wilms, C. D. and M. Häusser \(2015\). "Reading out a spatiotemporal population code by imaging neighbouring parallel fibre axons in vivo." Nat Commun 6: 6464.](#)

[Peyrache, A., N. Schieferstein and G. Buzsáki \(2017\). "Transformation of the head-direction signal into a spatial code." Nat Commun 8\(1\): 1752.](#)

[Jeffery, K. J. \(2021\). "How environmental movement constraints shape the neural code for space." Cogn Process 22\(Suppl 1\): 97-104.](#)

			Tomar, A. and T. J. McHugh (2022). "The impact of stress on the hippocampal spatial code." Trends Neurosci 45(2): 120-132.
199	Speech code	The Speech Code	<p>Kuhl, P. K. (2004). "Early language acquisition: cracking the speech code." Nature Reviews Neuroscience 5(11): 831-843.</p> <p>Papoutsj, M., J. A. de Zwart, J. M. Jansma, M. J. Pickering, J. A. Bednar and B. Horwitz (2009). "From Phonemes to Articulatory Codes: An fMRI Study of the Role of Broca's Area in Speech Production." Cerebral Cortex 19(9): 2156-2165.</p> <p>Sato, M., K. Grabski, M. Garnier, L. Granjon, J. L. Schwartz and N. Nguyen (2013). "Converging toward a common speech code: imitative and perceptuo-motor recalibration processes in speech production." Front Psychol 4: 422.</p> <p>Schuerman, W. L., A. S. Meyer and J. M. McQueen (2017). "Mapping the Speech Code: Cortical Responses Linking the Perception and Production of Vowels." Front Hum Neurosci 11: 161.</p>
200	Sperm code	The Sperm RNA Code	<p>Zhang, Y., J. Shi, M. Rassoulzadegan, F. Tuorto and Q. Chen (2019). "Sperm RNA code programmes the metabolic health of offspring." Nat Rev Endocrinol 15(8): 489-498.</p> <p>Zhang, Y. and Q. Chen (2020). "Human sperm RNA code senses dietary sugar." Nat Rev Endocrinol 16(4): 200-201.</p>
201	Spike code	The Neuronal Spike-Rate Code	<p>Eyherabide, H. G., A. Rokem, A. V. Herz and I. Samengo (2009). "Bursts generate a non-reducible spike-pattern code." Front Neurosci 3(1): 8-14.</p> <p>Li, M. and J. Z. Tsien (2017). "Neural Code—Neural Self-information Theory on How Cell-Assembly Code Rises from Spike Time and Neuronal Variability." Frontiers in Cellular Neuroscience 11.</p>
202	Splicing code	The Splicing Codes	<p>Manet, E., H. Gruffat, M. C. Trescol-Biemont, N. Moreno, P. Chambard, J. F. Giot and A. Sergeant (1989). "Epstein-Barr virus bicistronic mRNAs generated by facultative splicing code for two transcriptional trans-activators." Embo j 8(6): 1819-1826.</p> <p>Agorio, A., C. Chalar, S. Cardozo and G. Salinas (2003). "Alternative mRNAs arising from trans-splicing code for mitochondrial and cytosolic variants of Echinococcus granulosus thioredoxin Glutathione reductase." J Biol Chem 278(15): 12920-12928.</p> <p>Barbieri, M. (2003). The organic codes. An introduction to semantic biology., Cambridge University Press.</p>

- [Fu, X. D. \(2004\). "Towards a splicing code." Cell 119\(6\): 736-738.](#)
- [Grabowski, P. J. \(2004\). "A molecular code for splicing silencing: configurations of guanosine-rich motifs." Biochem Soc Trans 32\(Pt 6\): 924-927.](#)
- [Boucard, A. A., A. A. Chubykin, D. Comoletti, P. Taylor and T. C. Südhof \(2005\). "A splice code for trans-synaptic cell adhesion mediated by binding of neuroligin 1 to alpha- and beta-neurexins." Neuron 48\(2\): 229-236.](#)
- [Han, K., G. Yeo, P. An, C. B. Burge and P. J. Grabowski \(2005\). "A combinatorial code for splicing silencing: UAGG and GGGG motifs." PLoS Biol 3\(5\): e158.](#)
- [Matlin, A. J., F. Clark and C. W. J. Smith \(2005\). "Understanding alternative splicing: towards a cellular code." Nature Reviews Molecular Cell Biology 6\(5\): 386-398.](#)
- [Wang, G. S. and T. A. Cooper \(2007\). "Splicing in disease: disruption of the splicing code and the decoding machinery." Nat Rev Genet 8\(10\): 749-761.](#)
- [Wang, Z. and C. B. Burge \(2008\). "Splicing regulation: from a parts list of regulatory elements to an integrated splicing code." Rna 14\(5\): 802-813.](#)
- [Dhir, A., E. Buratti, M. A. van Santen, R. Lührmann and F. E. Baralle \(2010\). "The intronic splicing code: multiple factors involved in ATM pseudoexon definition." Embo j 29\(4\): 749-760.](#)
- [Wei, Z. and M. Zhang \(2010\). "A structural approach to decipher the neurexin and neuroligin splice isoform code." Neuron 67\(1\): 1-2.](#)
- [Liu, Y. and D. J. Elliott \(2010\). "Coupling genetics and post-genomic approaches to decipher the cellular splicing code at a systems-wide level." Biochem Soc Trans 38\(Pt 1\): 237-241.](#)
- [Barash, Y., J. A. Calarco, W. Gao, Q. Pan, X. Wang, O. Shai, B. J. Blencowe and B. J. Frey \(2010\). "Deciphering the splicing code." Nature 465\(7294\): 53-59.](#)
- [Reddy, A. S., M. F. Rogers, D. N. Richardson, M. Hamilton and A. Ben-Hur \(2012\). "Deciphering the plant splicing code: experimental and computational approaches for predicting alternative splicing and splicing regulatory elements." Front Plant Sci 3: 18.](#)
- [Xiong, H. Y., B. Alipanahi, L. J. Lee, H. Bretschneider, D. Merico, R. K. Yuen, Y. Hua, S. Gueroussov, H. S. Najafabadi, T. R. Hughes, Q. Morris, Y. Barash, A. R. Krainer, N. Jojic, S. W. Scherer, B. J. Blencowe and B. J. Frey \(2015\). "RNA splicing. The human splicing](#)

			<p>code reveals new insights into the genetic determinants of disease.” Science 347(6218): 1254806.</p> <p>Greenwald, S. H., J. A. Kuchenbecker, J. S. Rowlan, J. Neitz and M. Neitz (2017). "Role of a Dual Splicing and Amino Acid Code in Myopia, Cone Dysfunction and Cone Dystrophy Associated with L/M Opsin Interchange Mutations." Transl Vis Sci Technol 6(3): 2.</p> <p>Baralle, M. and F. E. Baralle (2018). “The splicing code.” Biosystems 164: 39-48.</p> <p>Bao, S., D. F. Moakley and C. Zhang (2019). “The Splicing Code Goes Deep.” Cell 176(3): 414-416.</p> <p>Colliva, A. and E. Tongiorgi (2021). "Distinct role of 5'UTR sequences in dendritic trafficking of BDNF mRNA: additional mechanisms for the BDNF splice variants spatial code." Mol Brain 14(1): 10.</p> <p>Saha, K., M. M. Fernandez, T. Biswas, S. Joseph and G. Ghosh (2021). "Discovery of a pre-mRNA structural scaffold as a contributor to the mammalian splicing code." Nucleic Acids Res 49(12): 7103-7121.</p>
203	Stem cell code	The (Cancer) Stem Cell Code	<p>Richard, V. and M. R. Pillai (2010). “The stem cell code in oral epithelial tumorigenesis: ‘the cancer stem cell shift hypothesis’.” Biochim Biophys Acta 1806(2): 146-162.</p>
204	Substrate specificity code	The Substrate Specificity Code	<p>Schneider, K., K. Hövel, K. Witzel, B. Hamberger, D. Schomburg, E. Kombrink and H. P. Stuiblé (2003). “The substrate specificity-determining amino acid code of 4-coumarate:CoA ligase.” Proc Natl Acad Sci U S A 100(14): 8601-8606.</p>
205	Sugar code	The Sugar Code	<p>Gabius, H. J. (2000). “Biological information transfer beyond the genetic code: the sugar code.” Naturwissenschaften 87(3): 108-121.</p> <p>Gabius, H.-J., S. André, H. Kaltner and H.-C. Siebert (2002). “The sugar code: functional lectinomics.” Biochimica et Biophysica Acta (BBA) – General Subjects 1572(2): 165-177.</p> <p>Gabius, H. J. (2004). "The sugar code in drug delivery." Adv Drug Deliv Rev 56(4): 421-424.</p> <p>Gabius, H. J., H. C. Siebert, S. André, J. Jiménez-Barbero and H. Rüdiger (2004). "Chemical biology of the sugar code." Chembiochem 5(6): 740-764.</p> <p>Holt, C. E. and B. J. Dickson (2005). “Sugar Codes for Axons?” Neuron 46(2): 169-172.</p>

			<p>Gabius, H.-J. (2008). Biological Information Transfer Beyond the Genetic Code: The Sugar Code. The Codes of Life: The Rules of Macroevolution. M. Barbieri and J. Hoffmeyer. Dordrecht, Springer Netherlands: 223-246.</p> <p>Lawrence, R., H. Lu, R. D. Rosenberg, J. D. Esko and L. Zhang (2008). "Disaccharide structure code for the easy representation of constituent oligosaccharides from glycosaminoglycans." Nat Methods 5(4): 291-292.</p> <p>Gabius H-J, ed. (2009) The Sugar Code. Fundamentals of Glycosciences. Wiley-Blackwell.</p> <p>Gabius, H. J., S. André, J. Jiménez-Barbero, A. Romero and D. Solís (2011). "From lectin structure to functional glycomics: principles of the sugar code." Trends Biochem Sci 36(6): 298-313.</p> <p>Murphy, P. V., S. André and H. J. Gabius (2013). "The third dimension of reading the sugar code by lectins: design of glycoclusters with cyclic scaffolds as tools with the aim to define correlations between spatial presentation and activity." Molecules 18(4): 4026-4053.</p> <p>Langford-Smith, A., A. J. Day, P. N. Bishop and S. J. Clark (2015). "Complementing the Sugar Code: Role of GAGs and Sialic Acid in Complement Regulation." Front Immunol 6: 25.</p> <p>Gabius, H.-J. and J. Roth (2017). "An introduction to the sugar code." Histochemistry and Cell Biology 147(2): 111-117.</p> <p>Taubenschmid, J., J. Stadlmann, M. Jost, T. I. Klock, C. D. Rillahan, A. Leibbrandt, K. Mechtler, J. C. Paulson, J. Jude, J. Zuber, K. Sandvig, U. Elling, T. Marquardt, C. Thiel, C. Koerner and J. M. Penninger (2017). "A vital sugar code for ricin toxicity." Cell Res 27(11): 1351-1364.</p> <p>Gabius, H. J. (2018). "The sugar code: Why glycans are so important." Biosystems 164: 102-111.</p> <p>Kaltner, H. and H. J. Gabius (2019). "Sensing Glycans as Biochemical Messages by Tissue Lectins: The Sugar Code at Work in Vascular Biology." Thromb Haemost 119(4): 517-533.</p>
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			<p>Kaltner, H., J. Abad-Rodríguez, A. P. Corfield, J. Kopitz and H. J. Gabius (2019). "The sugar code: letters and vocabulary, writers, editors and readers and biosignificance of functional glycan-lectin pairing." <i>Biochem J</i> 476(18): 2623-2655.</p> <p>Strasser, R., G. Seifert, M. S. Doblin, K. L. Johnson, C. Ruprecht, F. Pfrengle, A. Bacic and J. M. Estevez (2021). "Cracking the "Sugar Code": A Snapshot of N- and O-Glycosylation Pathways and Functions in Plants Cells." <i>Front Plant Sci</i> 12: 640919.</p> <p>Wanke, A., M. Malisic, S. Wawra and A. Zuccaro (2021). "Unraveling the sugar code: the role of microbial extracellular glycans in plant-microbe interactions." <i>J Exp Bot</i> 72(1): 15-35.</p> <p>Gabius, H. J., M. Cudic, T. Diercks, H. Kaltner, J. Kopitz, K. H. Mayo, P. V. Murphy, S. Oscarson, R. Roy, A. Schedlbauer, S. Toegel and A. Romero (2022). "What is the Sugar Code?" <i>Chembiochem</i> 23(13): e202100327.</p>
206	Sulfation code	The Sulfation Code	<p>Habuchi, H., O. Habuchi and K. Kimata (2004). "Sulfation pattern in glycosaminoglycan: does it have a code?" <i>Glycoconj J</i> 21(1-2): 47-52.</p> <p>Gama, C. I., S. E. Tully, N. Sotogaku, P. M. Clark, M. Rawat, N. Vaidehi, W. A. Goddard, A. Nishi and L. C. Hsieh-Wilson (2006). "Sulfation patterns of glycosaminoglycans encode molecular recognition and activity." <i>Nature Chemical Biology</i> 2(9): 467-473.</p> <p>Yamada, M. and T. Hamaguchi (2018). "The sulfation code for propagation of neurodegeneration." <i>J Biol Chem</i> 293(27): 10841-10842.</p> <p>Mah, D., J. Zhao, X. Liu, F. Zhang, J. Liu, L. Wang, R. Linhardt and C. Wang (2021). "The Sulfation Code of Tauopathies: Heparan Sulfate Proteoglycans in the Prion Like Spread of Tau Pathology." <i>Front Mol Biosci</i> 8: 671458.</p> <p>Holmes, S. G., B. Nagarajan and U. R. Desai (2022). "3-O-Sulfation induces sequence-specific compact topologies in heparan sulfate that encode a dynamic sulfation code." <i>Computational and Structural Biotechnology Journal</i> 20: 3884-3898.</p>
207	Sulfur code	The Sulfur Code	<p>Shim, H. S. and V. D. Longo (2015). "A protein restriction-dependent sulfur code for longevity." <i>Cell</i> 160(1-2): 15-17.</p>
208	SUMO code	The SUMOylation Codes	<p>Kim, K. I. and S. H. Baek (2006). "SUMOylation code in cancer development and metastasis." <i>Mol Cells</i> 22(3): 247-253.</p>

			Yang, Z., Y. Zhang and S. Sun (2019). "Deciphering the SUMO code in the kidney." J Cell Mol Med 23(2): 711-719.
209	Surface code	The Cell Surface Codes	Xie, Q., J. Li, H. Li, N. D. Udeshi, T. Svinkina, D. Orlin, S. Kohani, R. Guajardo, D. R. Mani, C. Xu, T. Li, S. Han, W. Wei, S. A. Shuster, D. J. Luginbuhl, S. R. Quake, S. E. Murthy, A. Y. Ting, S. A. Carr and L. Luo (2022). "Transcription factor Acj6 controls dendrite targeting via a combinatorial cell-surface code." Neuron 110(14): 2299-2314.e2298.
210	Survival code	The Survival/Autophagy Codes	Füllgrabe, J., N. Heldring, O. Hermanson and B. Joseph (2014). "Cracking the survival code: autophagy-related histone modifications." Autophagy 10(4): 556-561.
211	Synaptic code	The Synaptic / Adhesive Code	Shapiro, L. and D. R. Colman (1999). "The diversity of cadherins and implications for a synaptic adhesive code in the CNS." Neuron 23(3): 427-430. Boudkkazi, S., E. Carlier, N. Ankri, O. Caillard, P. Giraud, L. Fronzaroli-Molinieres and D. Debanne (2007). "Release-dependent variations in synaptic latency: a putative code for short- and long-term synaptic dynamics." Neuron 56(6): 1048-1060. Berretta, N., R. Nisticò, G. Bernardi and N. B. Mercuri (2008). "Synaptic plasticity in the basal ganglia: a similar code for physiological and pathological conditions." Prog Neurobiol 84(4): 343-362. Itzkovitz, S., L. Baruch, E. Shapiro and E. Segal (2008). "Geometric constraints on neuronal connectivity facilitate a concise synaptic adhesive code." Proc Natl Acad Sci U S A 105(27): 9278-9283. Szabo, G. G. and I. Soltesz (2015). "Pass-Through Code of Synaptic Integration." Neuron 87(6): 1124-1126. Diering, G. H. and R. L. Huganir (2018). "The AMPA Receptor Code of Synaptic Plasticity." Neuron 100(2): 314-329.
212	Targeting code	The (Genome) Targeting / Integration Codes	Santoni, F. A., O. Hartley and J. Luban (2010). "Deciphering the code for retroviral integration target site selection." PLoS Comput Biol 6(11): e1001008.
213	Taste code	The Neuronal Taste Code	Di Lorenzo, P. M. (2000). "The neural code for taste in the brain stem: Response profiles." Physiology & Behavior 69(1): 87-96. Di Lorenzo, P. M. and C. H. Lemon (2000). "The neural code for taste in the nucleus of the solitary tract of the rat: effects of adaptation." Brain Res 852(2): 383-397.

			<p>Bradbury, J. (2004). "Taste perception: cracking the code." PloS Biol 2(3): E64.</p> <p>Hallock, R. M. and P. M. Di Lorenzo (2006). "Temporal coding in the gustatory system." Neurosci Biobehav Rev 30(8): 1145-1160.</p> <p>Escanilla, O. D., A. Hajnal, K. Czaja and P. M. Di Lorenzo (2022). "The Neural Code for Taste in the Nucleus of the Solitary Tract of Rats with Obesity Following Roux-En-Y Gastric Bypass Surgery." Nutrients 14(19).</p>
214	T-cell code	The Immune T-cell Codes	<p>Boothby, M. (2010). "CRACKing the code without Rosetta: molecular regulation of calcium-stimulated gene transcription after T cell activation." J Immunol 185(9): 4969-4971.</p> <p>Engelhardt, B. and R. M. Ransohoff (2012). "Capture, crawl, cross: the T cell code to breach the blood-brain barriers." Trends in Immunology 33(12): 579-589.</p> <p>Engelhardt, B. and R. M. Ransohoff (2012). "Capture, crawl, cross: the T cell code to breach the blood-brain barriers." Trends Immunol 33(12): 579-589.</p> <p>Harvey, C. J. and K. W. Wucherpfennig (2013). "Cracking the code of human T-cell immunity." Nature Biotechnology 31(7): 609-610.</p> <p>Dustin, M. L. and L. C. Kam (2016). "Tapping out a mechanical code for T cell triggering." J Cell Biol 213(5): 501-503.</p> <p>Wu, J. and H. Shi (2017). "Unlocking the epigenetic code of T cell exhaustion." Transl Cancer Res 6(Suppl 2): S384-s387.</p>
215	Temporal codes	The Temporal Signalling Codes	<p>Behar, M. and A. Hoffmann (2010). "Understanding the temporal codes of intra-cellular signals." Curr Opin Genet Dev 20(6): 684-693.</p>
216	Terpene code	The Terpene Biosynthesis Code	<p>Igne, C., M. H. Raadam, A. Koutsaviti, Y. Zhao, Y. T. Duan, M. Harizani, K. Miettinen, P. Georgantea, M. Rosenfeldt, S. E. Viejo-Ledesma, M. A. Petersen, W. L. P. Bredie, D. Staerk, V. Roussis, E. Ioannou and S. C. Kampranis (2022). "Expanding the terpene biosynthetic code with non-canonical 16 carbon atom building blocks." Nat Commun 13(1): 5188.</p>
217	Thermal code	The Thermal / Temperature Neuronal Codes	<p>Schingnitz, G. and J. Werner (1980). "Thalamic burst firing--a neuronal code for temperature information\$." Brain Res 195(2): 467-470.</p>

			Nagel, M. and C. J. Kleineidam (2015). "Two cold-sensitive neurons within one sensillum code for different parameters of the thermal environment in the ant <i>Camponotus rufipes</i>." Front Behav Neurosci 9: 240.
218	Tight junction code	Tight Junction Codes	Gupta, I. R. and A. K. Ryan (2010). "Claudins: unlocking the code to tight junction function during embryogenesis and in disease." Clin Genet 77(4): 314-325.
219	Tissue code	The Tissue Code	Irwin, D. and I. D. Dauphinais (1979). "A tissue-specific code based on the abundance of SDS-solubilized proteins." Anal Biochem 92(1): 193-198.
220	Tissue memory code	The Tissue Memory Code	Berlanga-Acosta, J., M. Fernandez-Mayola, Y. Mendoza-Mari, A. Garcia-Ojalvo, I. Martinez-Jimenez, N. Rodriguez-Rodriguez, D. Garcia Del Barco Herrera and G. Guillén-Nieto (2022). "Cell-Free Filtrates (CFF) as Vectors of a Transmissible Pathologic Tissue Memory Code: A Hypothetical and Narrative Review." Int J Mol Sci 23(19).
221	Toll-like receptor codes	The Toll-like Receptor Codes	Cunha, C., L. Romani and A. Carvalho (2010). "Cracking the Toll-like receptor code in fungal infections." Expert Rev Anti Infect Ther 8(10): 1121-1137.
222	Toxin code	The (Saxi)Toxin Code	Chen, Z., S. Zakrzewska, H. S. Hajare, A. Alvarez-Buylla, F. Abderemane-Ali, M. Bogan, D. Ramirez, L. A. O'Connell, J. Du Bois and D. L. Minor, Jr. (2022). "Definition of a saxitoxin (STX) binding code enables discovery and characterization of the anuran saxiphilin family." Proc Natl Acad Sci U S A 119(44): e2210114119.
223	Toxin resistance code	The Toxin Resistance Codes	Tabashnik, B. E. (2001). "Breaking the code of resistance." Nat Biotechnol 19(10): 922-924.
224	Transcription factor code	The Transcription Factor Code	<p>Jessell, T. M. (2000). "Neuronal specification in the spinal cord: inductive signals and transcriptional codes." Nature Reviews Genetics 1(1): 20-29.</p> <p>Kobayashi, A., H. Yamagiwa, H. Hoshino, A. Muto, K. Sato, M. Morita, N. Hayashi, M. Yamamoto and K. Igarashi (2000). "A combinatorial code for gene expression generated by transcription factor Bach2 and MAZR (MAZ-related factor) through the BTB/POZ domain." Mol Cell Biol 20(5): 1733-1746.</p> <p>Marquardt, T. and S. L. Pfaff (2001). "Cracking the Transcriptional Code for Cell Specification in the Neural Tube." Cell 106(6): 651-654.</p> <p>Allan, D. W., S. E. St Pierre, I. Miguel-Aliaga and S. Thor (2003). "Specification of neuropeptide cell identity by the integration of retrograde BMP signaling and a combinatorial transcription factor code." Cell 113(1): 73-86.</p>

[Ness, S. A. \(2003\). "Myb protein specificity: evidence of a context-specific transcription factor code." Blood Cells Mol Dis 31\(2\): 192-200.](#)

[Okamura, H., K. Yokoyama, H. Koike, M. Yamada, A. Shimowasa, M. Kabasawa, T. Kawashima and M. Suzuki \(2007\). "A structural code for discriminating between transcription signals revealed by the feast/famine regulatory protein DM1 in complex with ligands." Structure 15\(10\): 1325-1338.](#)

[Rothbacher, U., V. Bertrand, C. Lamy and P. Lemaire \(2007\). "A combinatorial code of maternal GATA, Ets and beta-catenin-TCF transcription factors specifies and patterns the early ascidian ectoderm." Development 134\(22\): 4023-4032.](#)

[Bhati, M., C. Lee, A. L. Nancarrow, M. Lee, V. J. Craig, I. Bach, J. M. Guss, J. P. Mackay and J. M. Matthews \(2008\). "Implementing the LIM code: the structural basis for cell type-specific assembly of LIM-homeodomain complexes." Embo j 27\(14\): 2018-2029.](#)

[Hochstim, C., B. Deneen, A. Lukaszewicz, Q. Zhou and D. J. Anderson \(2008\). "Identification of positionally distinct astrocyte subtypes whose identities are specified by a homeodomain code." Cell 133\(3\): 510-522.](#)

[Pimanda, J. E., W. Y. Chan, N. K. Wilson, A. M. Smith, S. Kinston, K. Knezevic, M. E. Janes, J. R. Landry, A. Kolb-Kokocinski, J. Frampton, D. Tannahill, K. Ottersbach, G. A. Follows, G. Lacaud, V. Kouskoff and B. Göttgens \(2008\). "Endoglin expression in blood and endothelium is differentially regulated by modular assembly of the Ets/Gata hemangioblast code." Blood 112\(12\): 4512-4522.](#)

[Megraw, M., F. Pereira, S. T. Jensen, U. Ohler and A. G. Hatzigeorgiou \(2009\). "A transcription factor affinity-based code for mammalian transcription initiation." Genome Res 19\(4\): 644-656.](#)

[Pearson, J. C., M. T. Juarez, M. Kim, Drivenes and W. McGinnis \(2009\). "Multiple transcription factor codes activate epidermal wound-response genes in Drosophila." Proceedings of the National Academy of Sciences 106\(7\): 2224-2229.](#)

[Kowenz-Leutz, E., O. Pless, G. Dittmar, M. Knoblich and A. Leutz \(2010\). "Crosstalk between C/EBPbeta phosphorylation, arginine methylation, and SWI/SNF/Mediator implies an indexing transcription factor code." Embo j 29\(6\): 1105-1115.](#)

			<p>Sevana, M., C. Goetz, D. Goeke, C. Wimmer, C. Berens, W. Hillen and Y. A. Muller (2012). "An exclusive α/β code directs allostery in TetR-peptide complexes." J Mol Biol 416(1): 46-56.</p> <p>Aranguren, X. L., X. Agirre, M. Beerens, G. Coppiello, M. Uriz, I. Vandersmissen, M. Benkheil, J. Panadero, N. Aguado, A. Pascual-Montano, V. Segura, F. Prósper and A. Luttun (2013). "Unraveling a novel transcription factor code determining the human arterial-specific endothelial cell signature." Blood 122(24): 3982-3992.</p> <p>Del Barrio, M. G., S. Bourane, K. Grossmann, R. Schüle, S. Britsch, D. D. O'Leary and M. Goulding (2013). "A transcription factor code defines nine sensory interneuron subtypes in the mechanosensory area of the spinal cord." PLoS One 8(11): e77928.</p> <p>Dubois, L., J. L. Frendo, H. Chanut-Delalande, M. Crozatier and A. Vincent (2016). "Genetic dissection of the Transcription Factor code controlling serial specification of muscle identities in Drosophila." Elife 5.</p> <p>Guo, X., C. Yin, F. Yang, Y. Zhang, H. Huang, J. Wang, B. Deng, T. Cai, Y. Rao and R. Xi (2019). "The Cellular Diversity and Transcription Factor Code of Drosophila Enteroendocrine Cells." Cell Rep 29(12): 4172-4185.e4175.</p> <p>Hörmann, N., T. Schilling, A. H. Ali, E. Serbe, C. Mayer, A. Borst and J. Pujol-Martí (2020). "A combinatorial code of transcription factors specifies subtypes of visual motion-sensing neurons in Drosophila." Development 147(9).</p> <p>Deng, W., E. C. Jacobson, A. J. Collier and K. Plath (2021). "The transcription factor code in iPSC reprogramming." Curr Opin Genet Dev 70: 89-96.</p> <p>Torcal Garcia, G. and T. Graf (2021). "The transcription factor code: a beacon for histone methyltransferase docking." Trends Cell Biol 31(10): 792-800.</p> <p>Trerotola, M., L. Antolini, L. Beni, E. Guerra, M. Spadaccini, D. Verzulli, A. Moschella and S. Alberti (2022). "A deterministic code for transcription factor-DNA recognition through computation of binding interfaces." NAR Genom Bioinform 4(1): lqac008.</p>
225	Transcriptional codes	The Transcription Codes	<p>Beato, M. (1985). "Modulation of gene expression through DNA-binding proteins: is there a regulatory code?" Haematol Blood Transfus 29: 217-223.</p> <p>Harbison, C. T., D. B. Gordon, T. I. Lee, N. J. Rinaldi, K. D. Macisaac, T. W. Danford, N. M. Hannett, J. B. Tagne, D. B. Reynolds, J. Yoo, E. G. Jennings, J. Zeitlinger, D. K. Pokholok, M. Kellis, P. A. Rolfe, K. T. Takusagawa, E. S. Lander, D. K. Gifford, E. Fraenkel and R. A.</p>

[Young \(2004\). "Transcriptional regulatory code of a eukaryotic genome." Nature 431\(7004\): 99-104.](#)

[Markstein, M., R. Zinzen, P. Markstein, K. P. Yee, A. Erives, A. Stathopoulos and M. Levine \(2004\). "A regulatory code for neurogenic gene expression in the Drosophila embryo." Development 131\(10\): 2387-2394.](#)

[Barrera, L. O. and B. Ren \(2006\). "The transcriptional regulatory code of eukaryotic cells--insights from genome-wide analysis of chromatin organization and transcription factor binding." Curr Opin Cell Biol 18\(3\): 291-298.](#)

[Flames, N., R. Pla, D. M. Gelman, J. L. Rubenstein, L. Puellas and O. Marín \(2007\). "Delineation of multiple subpallial progenitor domains by the combinatorial expression of transcriptional codes." J Neurosci 27\(36\): 9682-9695.](#)

[Gillespie, M. N. and G. L. Wilson \(2007\). "Bending and breaking the code: dynamic changes in promoter integrity may underlie a new mechanism regulating gene expression." Am J Physiol Lung Cell Mol Physiol 292\(1\): L1-3.](#)

[Walther, D., R. Brunnemann and J. Selbig \(2007\). "The regulatory code for transcriptional response diversity and its relation to genome structural properties in A. thaliana." PLoS Genet 3\(2\): e11.](#)

[Frith, M. C., E. Valen, A. Krogh, Y. Hayashizaki, P. Carninci and A. Sandelin \(2008\). "A code for transcription initiation in mammalian genomes." Genome Res 18\(1\): 1-12.](#)

[Stark, A. \(2009\). "Learning the transcriptional regulatory code." Mol Syst Biol 5: 329.](#)

[Fakhouri, W. D., A. Ay, R. Sayal, J. Dresch, E. Dayringer and D. N. Arnosti \(2010\). "Deciphering a transcriptional regulatory code: modeling short-range repression in the Drosophila embryo." Mol Syst Biol 6: 341.](#)

[Ford, E. and D. Thanos \(2010\). "The transcriptional code of human IFN-beta gene expression." Biochim Biophys Acta 1799\(3-4\): 328-336.](#)

[Kulakovskiy, I. V., A. A. Belostotsky, A. S. Kasianov, N. G. Esipova, Y. A. Medvedeva, I. A. Eliseeva and V. J. Makeev \(2011\). "A deeper look into transcription regulatory code by preferred pair distance templates for transcription factor binding sites." Bioinformatics 27\(19\): 2621-2624.](#)

			<p>Batut, P. J. and T. R. Gingeras (2017). "Conserved noncoding transcription and core promoter regulatory code in early Drosophila development." Elife 6.</p> <p>Ezer, D., S. J. K. Shepherd, A. Brestovitsky, P. Dickinson, S. Cortijo, V. Charoensawan, M. S. Box, S. Biswas, K. E. Jaeger and P. A. Wigge (2017). "The G-Box Transcriptional Regulatory Code in Arabidopsis." Plant Physiol 175(2): 628-640.</p> <p>Cohen, E., Z. Zafrir and T. Tuller (2018). "A code for transcription elongation speed." RNA Biol 15(1): 81-94.</p> <p>Zrimec, J., F. Buric, M. Kokina, V. Garcia and A. Zelezniak (2021). "Learning the Regulatory Code of Gene Expression." Front Mol Biosci 8: 673363.</p>
226	Translation code	The Translation Codes	<p>Ito, K., L. Frolova, A. Seit-Nebi, A. Karamyshev, L. Kisselev and Y. Nakamura (2002). "Omnipotent decoding potential resides in eukaryotic translation termination factor eRF1 of variant-code organisms and is modulated by the interactions of amino acid sequences within domain 1." Proc Natl Acad Sci U S A 99(13): 8494-8499.</p> <p>Piqué, M., J. M. López, S. Foissac, R. Guigó and R. Méndez (2008). "A combinatorial code for CPE-mediated translational control." Cell 132(3): 434-448.</p> <p>Richter, J. D. (2008). "Breaking the code of polyadenylation-induced translation." Cell 132(3): 335-337.</p> <p>Dai, X. X., J. C. Jiang, Q. Q. Sha, Y. Jiang, X. H. Ou and H. Y. Fan (2019). "A combinatorial code for mRNA 3'-UTR-mediated translational control in the mouse oocyte." Nucleic Acids Res 47(1): 328-340.</p> <p>Burke, P. C., H. Park and A. R. Subramaniam (2022). "A nascent peptide code for translational control of mRNA stability in human cells." Nat Commun 13(1): 6829.</p>
227	Translocation code	The Protein Translocation Code	<p>Shental-Bechor, D., S. J. Fleishman and N. Ben-Tal (2006). "Has the code for protein translocation been broken?" Trends Biochem Sci 31(4): 192-196.</p> <p>Nilsson, I., P. Lara, T. Hessa, A. E. Johnson, G. von Heijne and A. L. Karamyshev (2015). "The code for directing proteins for translocation across ER membrane: SRP cotranslationally recognizes specific features of a signal sequence." J Mol Biol 427(6 Pt A): 1191-1201.</p> <p>Hoernes, T. P., N. Clementi, K. Faserl, H. Glasner, K. Breuker, H. Lindner, A. Hüttenhofer and M. D. Erlacher (2016). "Nucleotide modifications within bacterial messenger RNAs</p>

			regulate their translation and are able to rewire the genetic code." Nucleic Acids Res 44(2): 852-862.
228	Transport codes	The Transport / Trafficking Codes	<p>Zhu, J., B. Gomez, I. Watanabe and W. B. Thornhill (2005). "Amino acids in the pore region of Kv1 potassium channels dictate cell-surface protein levels: a possible trafficking code in the Kv1 subfamily." Biochem J 388(Pt 1): 355-362.</p> <p>Marelli-Berg, F. M., L. Cannella, F. Dazzi and V. Mirenda (2008). "The highway code of T cell trafficking." J Pathol 214(2): 179-189.</p> <p>Roy, G., E. M. Chalfin, A. Saxena and X. Wang (2010). "Interplay between ER exit code and domain conformation in CFTR misprocessing and rescue." Mol Biol Cell 21(4): 597-609.</p> <p>Drepper, C. and M. Sendtner (2011). "A new postal code for dendritic mRNA transport in neurons." EMBO Rep 12(7): 614-616.</p> <p>Muslimov, I. A., M. V. Patel, A. Rose and H. Tiedge (2011). "Spatial code recognition in neuronal RNA targeting: role of RNA-hnRNP A2 interactions." J Cell Biol 194(3): 441-457.</p> <p>Ellis, B. E. (2012). "Postal code for a plant MAPK." Biochem J 446(2): e5-7.</p> <p>Carambia, A. and J. Herkel (2014). "Deciphering the highway code for lymphocyte traffic along the gut - liver axis." J Hepatol 60(6): 1110-1111.</p> <p>Lecona, E. and O. Fernandez-Capetillo (2016). "A SUMO and ubiquitin code coordinates protein traffic at replication factories." Bioessays 38(12): 1209-1217.</p> <p>Nie, C., H. Wang, R. Wang, D. Ginsburg and X. W. Chen (2018). "Dimeric sorting code for concentrative cargo selection by the COPII coat." Proc Natl Acad Sci U S A 115(14): E3155-e3162.</p> <p>Paolillo, M., S. Comincini and S. Schinelli (2021). "Fostering "Education": Do Extracellular Vesicles Exploit Their Own Delivery Code?" Cells 10(7).</p>
229	Trans-regulatory	The Trans-Regulatory Code	Beccari, L., R. Marco-Ferreres, N. Tabanera, A. Manfredi, M. Souren, B. Wittbrodt, I. Conte, J. Wittbrodt and P. Bovolenta (2015). "A trans-Regulatory Code for the Forebrain Expression of Six3.2 in the Medaka Fish." J Biol Chem 290(45): 26927-26942.
230	Tubulin code	The Tubulin Code	Verhey, K. J. and J. Gaertig (2007). "The tubulin code." Cell Cycle 6(17): 2152-2160.

			<p>Yu, I., C. P. Garnham and A. Roll-Mecak (2015). "Writing and Reading the Tubulin Code." J Biol Chem 290(28): 17163-17172.</p> <p>Barisic, M. and H. Maiato (2016). "The Tubulin Code: A Navigation System for Chromosomes during Mitosis." Trends Cell Biol 26(10): 766-775.</p> <p>Chakraborti, S., K. Natarajan, J. Curiel, C. Janke and J. Liu (2016). "The emerging role of the tubulin code: From the tubulin molecule to neuronal function and disease." Cytoskeleton (Hoboken) 73(10): 521-550.</p> <p>Gadadhar, S., S. Bodakuntla, K. Natarajan and C. Janke (2017). "The tubulin code at a glance." J Cell Sci 130(8): 1347-1353.</p> <p>Amargant, F., M. Barragan, R. Vassena and I. Vernos (2019). "Insights of the tubulin code in gametes and embryos: from basic research to potential clinical applications in humans†." Biol Reprod 100(3): 575-589.</p> <p>Roll-Mecak, A. (2020). "The Tubulin Code in Microtubule Dynamics and Information Encoding." Dev Cell 54(1): 7-20.</p> <p>Lopes, D. and H. Maiato (2020). "The Tubulin Code in Mitosis and Cancer." Cells 9(11).</p> <p>Akella, J. S. and M. M. Barr (2021). "The tubulin code specializes neuronal cilia for extracellular vesicle release." Dev Neurobiol 81(3): 231-252.</p> <p>Müller, M., L. Gorek, N. Kamm and R. Jacob (2022). "Manipulation of the Tubulin Code Alters Directional Cell Migration and Ciliogenesis." Front Cell Dev Biol 10: 901999.</p> <p>Gadadhar, S., T. Hirschmugl and C. Janke (2022). "The tubulin code in mammalian sperm development and function." Semin Cell Dev Biol.</p> <p>Ferreira, L. T., A. C. Figueiredo, B. Orr, D. Lopes and H. Maiato (2018). "Dissecting the role of the tubulin code in mitosis." Methods Cell Biol 144: 33-74.</p> <p>Magiera, M. M. (2022). "The tubulin code: Empowering microtubules." Semin Cell Dev Biol. S1084-9521(22)00250-6.</p> <p>Wethekam, L. C. and J. K. Moore (2022). "Microtubule cytoskeleton: Revealing new readers of the tubulin code." Curr Biol 32(18): R960-r962.</p>
231	Twist box code	The Twist Box p53 code	<p>Piccinin, S., E. Tonin, S. Sessa, S. Demontis, S. Rossi, L. Pecciarini, L. Zanatta, F. Pivetta, A. Grizzo, M. Sonogo, C. Rosano, A. P. Dei Tos, C. Doglioni and R. Maestro (2012). "A</p>

			"twist box" code of p53 inactivation: twist box: p53 interaction promotes p53 degradation." Cancer Cell 22(3): 404-415.
232	Ubiquitin code	The Ubiquitin Code	<p>Lauwers, E., Z. Erpapazoglou, R. Haguenauer-Tsapis and B. André (2010). "The ubiquitin code of yeast permease trafficking." Trends Cell Biol 20(4): 196-204.</p> <p>Trempe, J. F. (2011). "Reading the ubiquitin postal code." Curr Opin Struct Biol 21(6): 792-801.</p> <p>Komander, D. and M. Rape (2012). "The ubiquitin code." Annu Rev Biochem 81: 203-229.</p> <p>Williamson, A., A. Werner and M. Rape (2013). "The Colossus of ubiquitylation: decrypting a cellular code." Mol Cell 49(4): 591-600.</p> <p>Heride, C., S. Urbé and M. J. Clague (2014). "Ubiquitin code assembly and disassembly." Curr Biol 24(6): R215-220.</p> <p>Stanley, M. and S. Virdee (2016). "Chemical ubiquitination for decrypting a cellular code." Biochem J 473(10): 1297-1314.</p> <p>Kwon, Y. T. and A. Ciechanover (2017). "The Ubiquitin Code in the Ubiquitin-Proteasome System and Autophagy." Trends Biochem Sci 42(11): 873-886.</p> <p>Mattern, M., J. Sutherland, K. Kadimisetty, R. Barrio and M. S. Rodriguez (2019). "Using Ubiquitin Binders to Decipher the Ubiquitin Code." Trends Biochem Sci 44(7): 599-615.</p> <p>Sewduth, R. N., M. F. Baietti and A. A. Sablina (2020). "Cracking the Monoubiquitin Code of Genetic Diseases." Int J Mol Sci 21(9).</p> <p>Orosa-Puente, B. and S. H. Spoel (2022). "Harnessing the ubiquitin code to respond to environmental cues." Essays Biochem 66(2): 111-121.</p>
233	Visual code	The Visual Code	Kovács-Öller, T., K. Dedek and D. Hillier (2022). "Editorial: Visual code: From the retina to the brain." Front Cell Neurosci 16: 1018229.
234	Wnt code	The Wnt Embryogenesis Code	Guder, C., I. Philipp, T. Lengfeld, H. Watanabe, B. Hobmayer and T. W. Holstein (2006). "The Wnt code: cnidarians signal the way." Oncogene 25(57): 7450-7460.
235	Wobbling code	The Wobbling Base Pairing Code	Alkatib, S., L. B. Scharff, M. Rogalski, T. T. Fleischmann, A. Matthes, S. Seeger, M. A. Schöttler, S. Ruf and R. Bock (2012). "The contributions of wobbling and superwobbling to the reading of the genetic code." PLoS Genet 8(11): e1003076.

236	Word code	The Written Word Code	Hannagan, T., A. Agrawal, L. Cohen and S. Dehaene (2021). "Emergence of a compositional neural code for written words: Recycling of a convolutional neural network for reading." Proc Natl Acad Sci U S A 118(46).
237	Zip code	The DNA Zip Code / Peripheral Targeting Code	<p>O'Brate, A. and P. Giannakakou (2003). "The importance of p53 location: nuclear or cytoplasmic zip code?" Drug Resist Updat 6(6): 313-322.</p> <p>Conley, M. P., M. K. Jang, J. A. DeGiorgis and E. L. Bearer (2004). "Anterograde Transport of Peptide-Conjugated Fluorescent Beads in the Squid Giant Axon Identifies a Zip-Code for the Synapse." Biol Bull 207(2): 164.</p> <p>Satpute-Krishnan, P., J. A. DeGiorgis, M. P. Conley, M. Jang and E. L. Bearer (2006). "A peptide zipcode sufficient for anterograde transport within amyloid precursor protein." Proc Natl Acad Sci U S A 103(44): 16532-16537.</p> <p>Ahmed, S., D. G. Brickner, W. H. Light, I. Cajigas, M. McDonough, A. B. Froysheter, T. Volpe and J. H. Brickner (2010). "DNA zip codes control an ancient mechanism for gene targeting to the nuclear periphery." Nat Cell Biol 12(2): 111-118.</p> <p>Light, W. H., D. G. Brickner, V. R. Brand and J. H. Brickner (2010). "Interaction of a DNA zip code with the nuclear pore complex promotes H2A.Z incorporation and INO1 transcriptional memory." Mol Cell 40(1): 112-125.</p> <p>Brickner, D. G., S. Ahmed, L. Meldi, A. Thompson, W. Light, M. Young, T. L. Hickman, F. Chu, E. Fabre and J. H. Brickner (2012). "Transcription factor binding to a DNA zip code controls interchromosomal clustering at the nuclear periphery." Dev Cell 22(6): 1234-1246.</p> <p>Langford-Smith, A., T. D. Keenan, S. J. Clark, P. N. Bishop and A. J. Day (2014). "The role of complement in age-related macular degeneration: heparan sulphate, a ZIP code for complement factor H?" J Innate Immun 6(4): 407-416.</p> <p>Das, S., S. Biswas, S. Chaudhuri, A. Bhattacharyya and B. Das (2019). "A Nuclear Zip Code in SKS1 mRNA Promotes Its Slow Export, Nuclear Retention, and Degradation by the Nuclear Exosome/DRN in Saccharomyces cerevisiae." J Mol Biol 431(19): 3626-3646.</p> <p>Chaudhuri, A., S. Das and B. Das (2020). "Localization elements and zip codes in the intracellular transport and localization of messenger RNAs in Saccharomyces cerevisiae." WIREs RNA 11(4): e1591.</p>

			<p>Bisio, H., R. B. Chaabene, R. Sabitzki, B. Maco, J. B. Marg, T. W. Gilberger, T. Spielmann and D. Soldati-Favre (2020). "The ZIP Code of Vesicle Trafficking in Apicomplexa: SEC1/Munc18 and SNARE Proteins." mBio 11(5).</p> <p>S Mogre, S., A. I. Brown and E. F. Koslover (2020). "Getting around the cell: physical transport in the intracellular world." Physical Biology 17(6): 061003.</p>
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