RNA-Welt, DNA-Welt, XNA-Welt

Miller SL (1953) Production of Amino Acids Under Possible Primitive Earth Conditions. (PDF) In: Science. 117, 3046, 528. doi:10.1126/science.117.3046.528. PMID 13056598.

Watson JD, Crick FHC (1953) Molecular structure of nuclear acids. A structure for desoxyribose nucleic acid. Nature171, 737 http://www.nature.com/scitable/content/molecular-structure-of-nucleic-acids-a-structure-13997975

Miller SL, Urey HC (1959) Organic Compound Synthesis on the Primitive Earth. *Science*. 130, 3370, 245. doi:10.1126/science.130.3370.245. PMID 13668555.

Woese C (1967) The basic nature of the genetic code. The Genetic Code. Harper & Row, January ISBN 978-0060471767, 150-178.

Orgel LE (1968) Evolution of the genetic apparatus. J. Mol. Biol.. 38, 3, 381–93. PMID 5718557

Crick FH, Orgel LE (1973) Directed Panspermia. Icarus. 19, 341–348.

Kruger K, Grabowski PJ, Zaug AJ, Sands J, Gottschling DE, Cech TR (1982) Self-splicing RNA: autoexcision and autocyclization of the ribosomal RNA intervening sequence of Tetrahymena. Cell. 31, 1, 147–57. PMID 6297745.

Crick FHC (1986) The origin of the genetic code. J Mol Biol, 38, 367-79

Gilbert W (1986) **The RNA World**. Nature. 319, 618. doi:10.1038/319618a0.

DeDuve Ch (1994) Ursprung des Lebens. Spectrum http://www.amazon.de/Der-Ursprung-Lebens-Pr%C3%A4biotische-Entstehung/dp/3860251872

Böhler C, Nielsen PE, Orgel LE (1995) Template switching between PNA and RNA oligonucleotides. Nature. 376, 6541, 578–81. doi:10.1038/376578a0. PMID 7543656.

Unrau PJ, Bartel DP (1998) RNA-catalysed nucleotide synthesis. In: Nature. 395, 6699, 260–3. doi:10.1038/26193. PMID 9751052.

Schöning K, Scholz P, Guntha S, Wu X, Krishnamurthy R, Eschenmoser A (2000) Chemical etiology of nucleic acid structure: the alpha-threofuranosyl-(3'→2') oligonucleotide system. *Science*. 290, 5495, 1347–51. PMID 11082060

Nelson KE, Levy M, Miller SL (2000) Peptide nucleic acids rather than RNA may have been the first genetic molecule. Proc. Natl. Acad. Sci. USA. 97, 8, 3868–71. PMID 10760258. PMC: 18108

Johnston WK, Unrau PJ, Lawrence MS, Glasner ME, Bartel DP (2001) RNA-catalyzed RNA polymerization: accurate and general RNA-templated primer extension. Science. 292, 5520, 1319–25. doi:10.1126/science.1060786. PMID 11358999

Yusupov MM, Yusupova GZ, Baucom A, et al. (2001) Crystal structure of the ribosome at 5.5 A resolution. Science. 292, 5518, 883–96. doi:10.1126/science.1060089. PMID 11283358.

Szostak JW, Bartel DP, Luisi PL (2001) Synthesizing life. Nature. 409, 6818, 387–90. doi:10.1038/35053176. PMID 11201752.

Paul N, Joyce GF(2002) A self-replicating ligase ribozyme. PNAS, 99, 12733-40.

Yarus M 2002) Primordial genetics: phenotype of the ribocyte. Annu. Rev. Genet.. 36, 125–51. doi:10.1146/annurev.genet.36.031902.105056. PMID 12429689

Zhang L, Peritz A, Meggers E (2005) A simple glycol nucleic acid. J. Am. Chem. Soc.. 127, 12, 4174–5. doi:10.1021/ja042564z. PMID 15783191.

Ehrenfreund P, Rasmussen S, Cleaves J, Chen L (2006) Experimentally tracing the key steps in the origin of life: **The aromatic world**. In: Astrobiology. 6, 3, 490–520. doi:10.1089/ast.2006.6.490. PMID 16805704.

Lincoln TA, Joyce GF (2009) Self-sustained replication of an RNA enzyme. Science, 323, 1229-32.

Powner MW et al. (2009) Synthesis of activated pyrimidine ribonucleotides in prebiotically plausible conditions," Nature, 459, 239-42.

Lincoln TA, Joyce GF (2009) Self-sustained replication of an RNA enzyme. Science. 323, 5918, 1229–32. doi:10.1126/science.1167856. PMID 19131595. PMC: 2652413

Powner MW, Gerland B, Sutherland JD (2009) Synthesis of activated pyrimidine ribonucleotides in prebiotically plausible conditions. Nature. 459, 7244, 239–42. doi:10.1038/nature08013. PMID 19444213

Ritson D, Sutherland JD (2012) Prebiotic synthesis of simple sugars by photoredox systems chemistry," Nat Chem, 4, 895-99.

Szostak JW (2012) Attempts to define life do not help to understand the origin of life. J Biomol Struct Dyn, 29, 599-600.

Adamala K, Szostak JW (2013) Nonenzymatic template-directed RNA synthesis inside model protocells," Science, 342, 1098-1100

Vaidya N et al. (2013) Recycling of informational units leads to selection of replicators in a prebiotic soup," Chem Biol, 20, 241-52.

Bowler FR et al. (2013) Prebiotically plausible oligoribonucleotide ligation facilitated by chemoselective acetylation. Nat Chem, 5, 383-89.

Robertson MP, Joyce GF (2014) Highly efficient self-replicating RNA enzymes. Chem Biol, 21, 1-8.

Powner M (2014) RNA Origins.
http://www.the-scientist.com/?articles.view/articleNo/39289/title/RNA-Origins/

Chuong EB et al. (2016) Regulatory evolution of innate immunity through co-option of endogenous retroviruses. Science, doi:10.1126/science.aad5497.
http://science.sciencemag.org/content/351/6277/1083

➔ **Biogene Amine und Peptide** http://www.kabilahsystems.de/biogeneamineundpeptide.pdf

XMRV Virus und Chronic fatigue Syndrome

Lo S-C, Pripuzova N, Li B, Komaroff AL, Hung G-C, Wang R, Alter HJ, (2010) **Detection of MLV-related virus gene sequences in blood of patients with chronic fatigue syndrome and healthy blood donors.** PNAS vol. 107 no. 36 15874-15879

Carlowe J (2010) **Chronic fatigue syndrome is not caused by XMRV virus, study shows**. BMJ c7358.

Enserink M (2010) Chronic fatigue syndrome. New XMRV paper looks good, skeptics admit--yet doubts linger. Science 329(5995), 1000.

Enserink M (2010) Chronic fatigue syndrome. Conflicting papers on hold as XMRV frenzy reaches new heights. Science 329(5987), 18-9.

Lo S-C, Pripuzova N et al. (2011) **Retraction** for "Detection of MLV-related virus gene sequences in blood of patients with chronic fatigue syndrome and healthy blood donors," by Shyh-Ching Lo, Natalia Pripuzova, Bingjie Li, Anthony L. Komaroff, Guo-Chiuan Hung, Richard Wang, and Harvey J. Alter, which appeared in issue 36, September 7, 2010, of Proc Natl Acad Sci USA (107:15874–15879; first published August 23, 2010; 10.1073/pnas.1006901107). http://www.pnas.org/content/109/1/346.full

Tsibris AM (2011) **The end of the association between XMRV, MLV-like viruses and chronic fatigue syndrome.** Virulence 2(6), 493-4.

Steffen I, Tyrrell DL, Stein E, et al. (2011) **No evidence for XMRV nucleic acids, infectious virus or anti-XMRV antibodies in Canadian patients with chronic fatigue syndrome.** PLoS One 6(11), e27870.

Hanson MR, et al. (2011) Detection of MLV-like gag sequences in blood samples from a New York state CFS cohort. Retrovirology 8(Suppl 1), A234.

Shin CH, et al. (2011) **Absence of XMRV retrovirus and other murine leukemia virus-related viruses in patients with chronic fatigue syndrome**. J Virol 85, 7195–7202.

Simmons G, et al.; Blood XMRV Scientific Research Working Group (SRWG) (2011) **Failure to confirm XMRV/MLVs in the blood of patients with chronic fatigue syndrome: a multilaboratory study**. Science 334, 814–817 10.1126/science.1213841
.
Katzourakis A, Hué S, Kellam P, Towers GJ (2011) Phylogenetic analysis of murine leukemia virus sequences from longitudinally sampled chronic fatigue syndrome patients suggests PCR contamination rather than viral evolution. J Virol 85, 10909–10913.

Hohn O, Bannert N (2011) **Origin of XMRV and its demise as a human pathogen associated with chronic fatigue syndrome**. Viruses 3(8), 1312-9.

Cohen J (2011) Virology. The waning conflict over XMRV and chronic fatigue syndrome. Science 333(6051), 1810.

Ali MA, Dale JK, Kozak CA, et al. (2011) **Xenotropic murine leukemia virus-related virus is not associated with chronic fatigue syndrome in patients from different areas of the us in the 1990s.** Virol J 450.

Cool M, Bouchard N, Massé G, et al. (2011) **No detectable XMRV in subjects with chronic fatigue syndrome from Quebec.** Virology 420(1), 66-72.

Stone K (2011) Paper linking XMRV to chronic fatigue syndrome stirs controversy. Ann Neurol 70(3), A7-8.

Kaiser J (2011) Chronic fatigue syndrome. Studies point to possible contamination in XMRV findings. Science 331(6013), 17.

van Kuppeveld FJ, van der Meer JW (2012) **XMRV and CFS--the sad end of a story**. Lancet 2012 Feb 4, 379(9814), e27-8.

Groom HCT, Bishop KN (2012) The tale of xenotropic murine leukemia virus-related virus J. Gen. Virol. 93 (Pt_5) 915-924

Li Y et al. (2013) RNA interference functions as an antiviral immunity mechanism in mammals. Science, 342, 231-234.

Maillard PV et al. (2013) Antiviral RNA interference in mammalian cells, *Science.* 342, 235-238.

Heckenlively K, Mikovits J (2014) Plague: One Scientist's Intrepid Search for the Truth about Human Retroviruses and Chronic Fatigue Syndrome, Autism, and Other Diseases

http://www.amazon.com/Plague-Scientist%C2%92s-Intrepid-Retroviruses-Syndrome/dp/1626365652/ref=sr_1_1?ie=UTF8&qid=1393272103&sr=8-1&keywords=plague+heckenlively

IshimuraR, Nagy G, Dotu I et al. (2014) Ribosome stalling induced by mutation of a CNS-specific **tRNA** causes neurodegeneration. Science, doi:10.1038/nature13551.
http://www.sciencemag.org/content/345/6195/455
„Here, we discover that loss of GTPBP2, a novel binding partner of the ribosome recycling protein Pelota, in mice with a mutation in a tRNA gene that is specifically expressed in the central nervous system causes ribosome stalling and widespread neurodegeneration. Our results not only define GTPBP2 as a ribosome rescue factor but also unmask the disease potential of mutations in nuclear-encoded tRNA genes."
„Neurodegeneration is associated with a variety of different diseases, but its cellular roots are often obscure. Ishimura *et al.* find that mutant mice whose brain cells start to die rapidly soon after birth have lost the function of two vital cellular components (see the Perspective by Darnell). The first is a protein that releases stalled ribosomes stuck on messenger RNA (mRNA); the second is a transfer RNA (tRNA), which reads the code for arginine in the mRNA. This tRNA is expressed predominantly in the central nervous system. The lack of the tRNA leads to increased ribosomal stalling at arginine codons, which, when left uncorrected, blocks protein synthesis and proves fatal."

Kim G et al. (2014) **Genomic-scale exchange of mRNA between a parasitic plant and its hosts.** Science, doi:10.1126/science.1253122.
http://www.nbcnews.com/science/science-news/how-parasitic-plants-use-language-rna-their-victims-n180796
http://www.sciencemag.org/content/345/6198/808.short

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- **MSRV** http://www.erlebnishaft.de/multiplesklerose borreliose.pdf
- **MikroRNA** http://www.xerlebnishaft.de/krebsstammzelltherapie.pdf

XNA statt DNA, XNA instead of DNA

Pinheiro VB, Holliger P (2012) The **XNA World**: Progress towards Replication and Evolution of Synthetic Genetic Polymers. Current Opinion in Chemical Biology 16(2012), 245-252

Lenzen M (2013) **Das neue Alphabet des Lebens**. Bild der Wissenschaft. 12, 40-43

Malyshev DA et al. (2014) A semi-synthetic organism with an expanded genetic alphabet. Nature**, doi:10.1038/nature13314**
http://www.nature.com/nature/journal/v509/n7500/full/nature13314.html
http://www.readcube.com/articles/10.1038/nature13314

Engelking C (2014) **Nanomaterials. Expanding the Genetic Alphabet.**
http://blogs.discovermagazine.com/d-brief/2014/05/07/breakthrough-in-artificial-genetic-code-could-lead-to-custom-drugs/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A%20AllDiscovermagazinecomContent%20%28All%20DISCOVERmagazine.com%20stories%29#.U_MHpmMvwW5 Aus, from:
http://www.geneticliteracyproject.org/2014/05/08/dna-alphabet-expanded-opens-up-new-possibilities-for-synthetic-drugs/

- **Expanded genetic code** http://en.wikipedia.org/wiki/Expanded_genetic_code

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