MicroRNAs (II)

microRNA y enfermedades

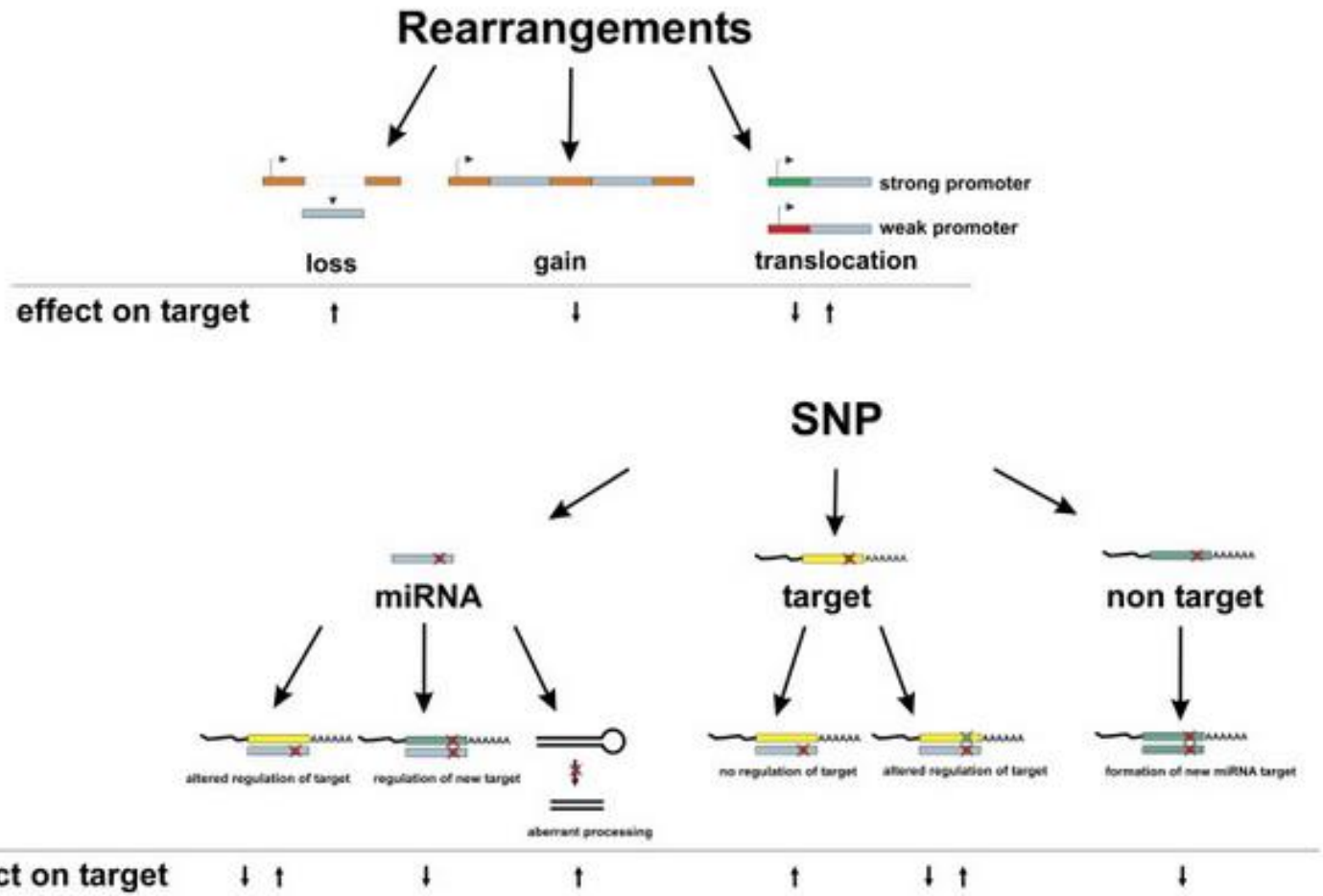


Figure 3.

Mechanisms that Link miRNAs to Disease

There are two possible scenarios: (1) either the expression level of the miRNA changes due to genomic rearrangements; or (2) there is a gain or loss of an miRNA-target interaction due to a mutation in a 3′UTR or a mutation in the miRNA.

microRNA y cancer

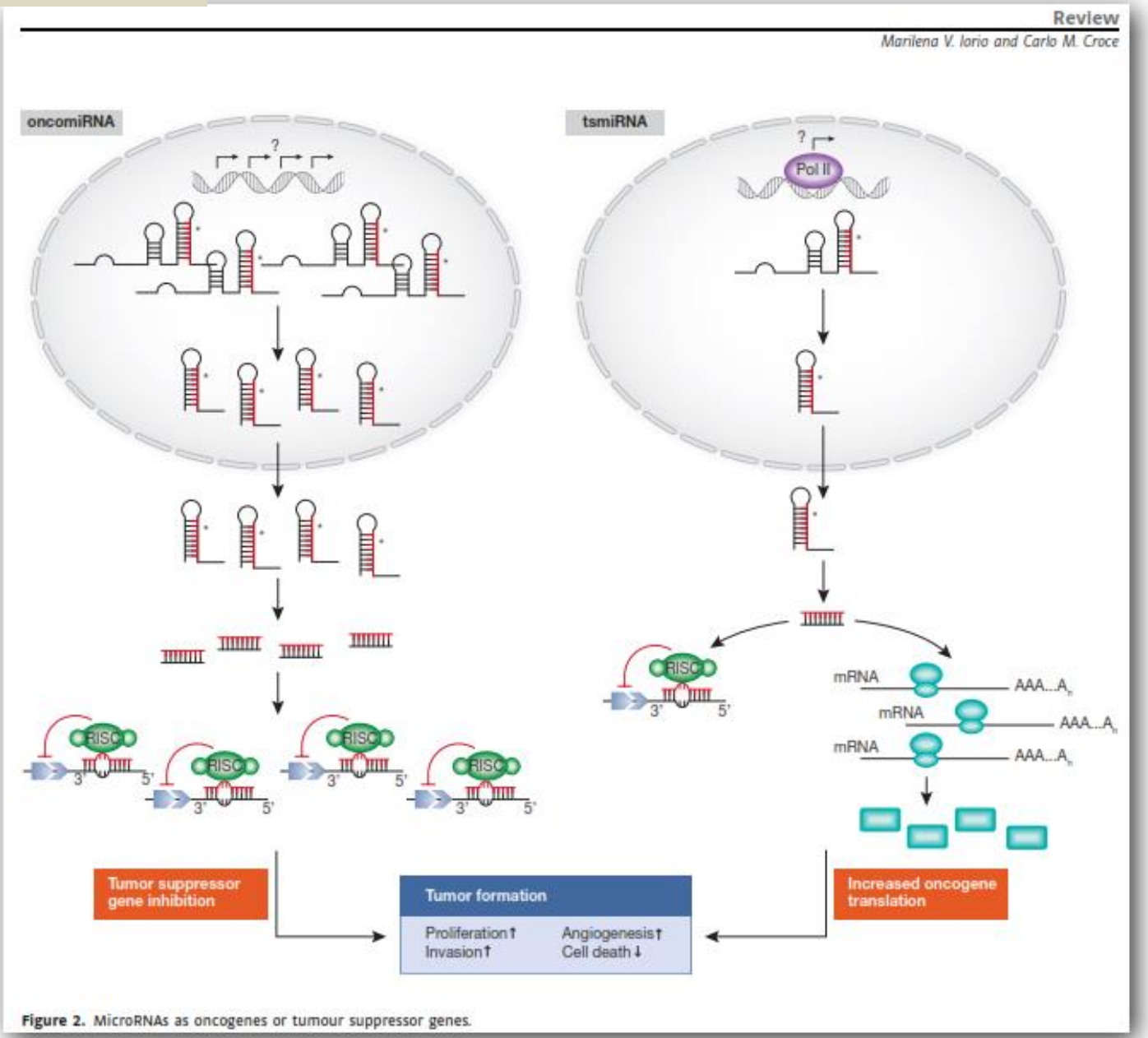
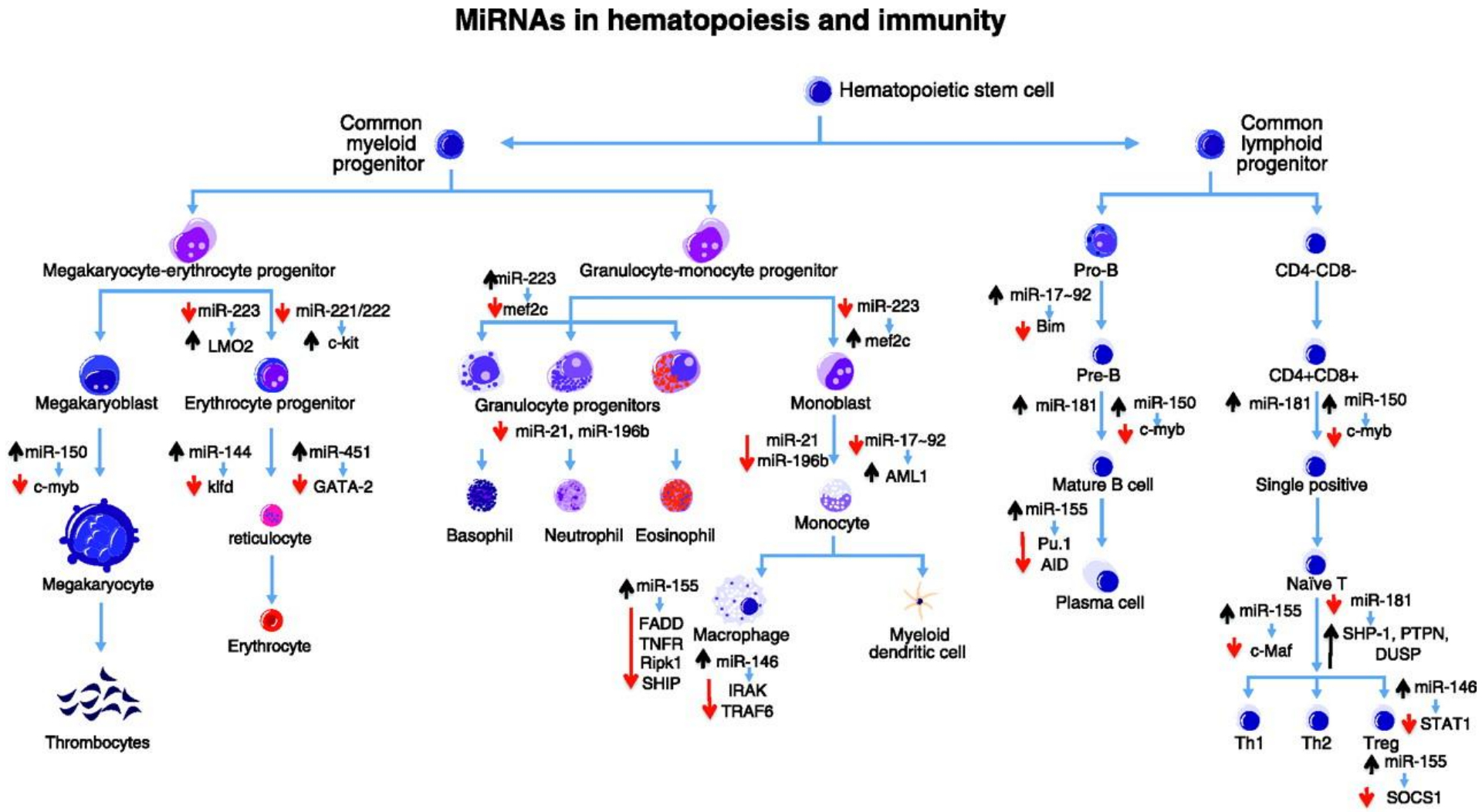


Figure 2. MicroRNAs as oncogenes or tumour suppressor genes.

microRNA y enfermedades



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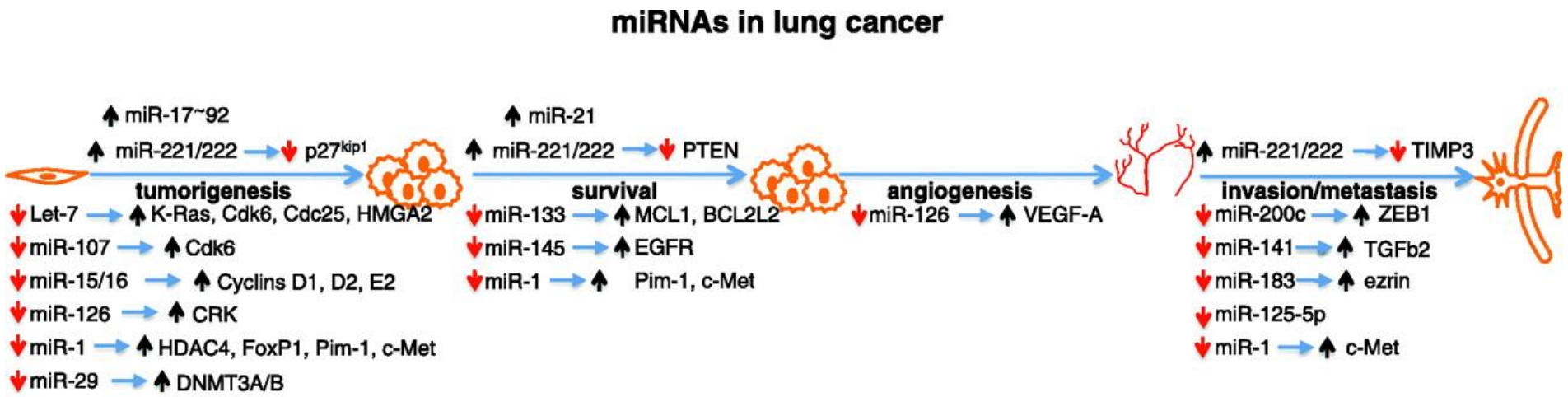
microRNA y enfermedades



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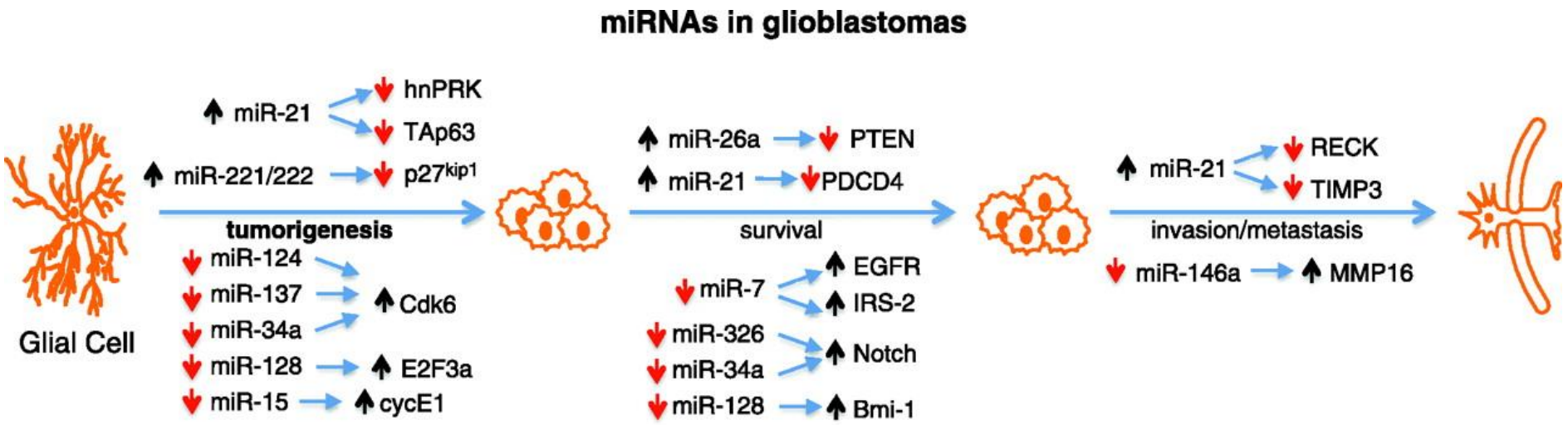

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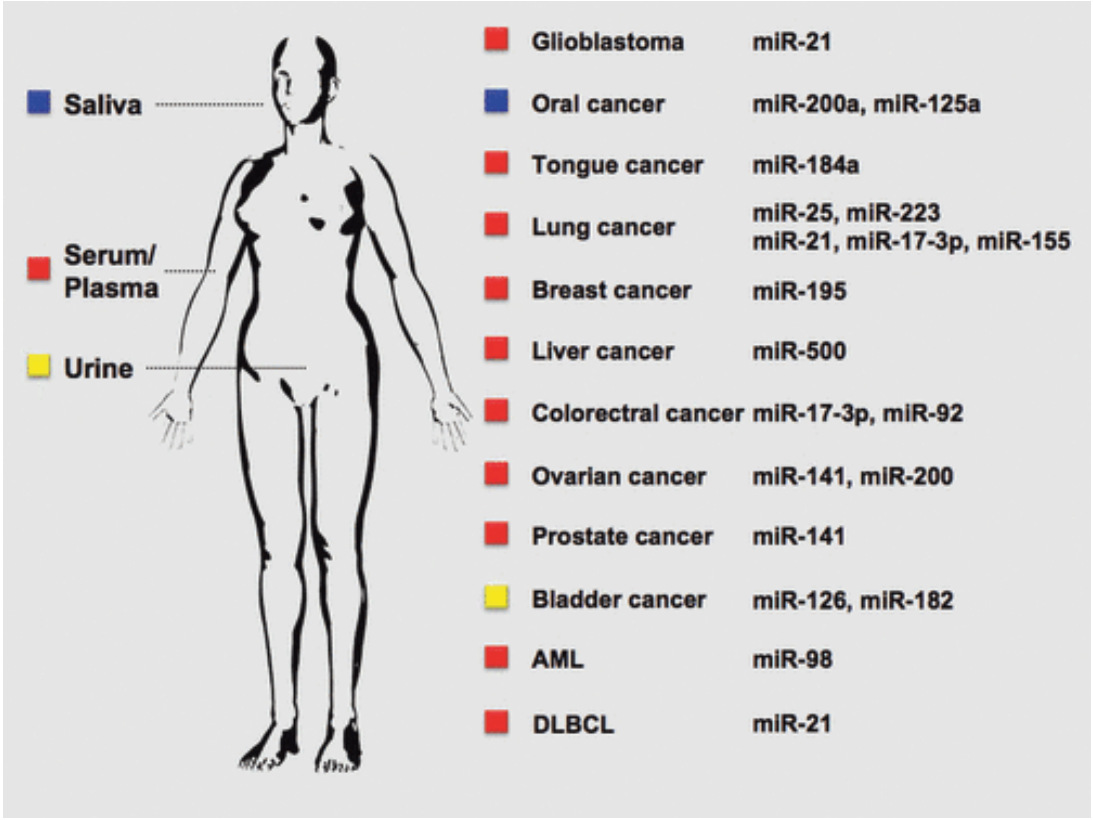
Circulating microRNAs in bodily fluids: a potential non-invasive biomarker for cancer diagnosis and prognosis



miRNAs in human body fluids are non-invasive diagnostic markers for cancers.
Many kinds of circulating miRNAs have been reported in various types of cancers. However, certain cancers cannot be diagnosed by known serum biomarkers. In such cases, circulating miRNAs in serum, saliva, and urine are good candidates for future use. AML, acute myeloid leukemia; DLBCL, diffuse large B-cell lymphoma

Cancer Science
Volume 101, Issue 10, pages 2087-2092, 18 JUN 2010 DOI: 10.1111/j.1349-7006.2010.01650.x
http://onlinelibrary.wiley.com/doi/10.1111/j.1349-7006.2010.01650.x/full#f1

What are exosomes?

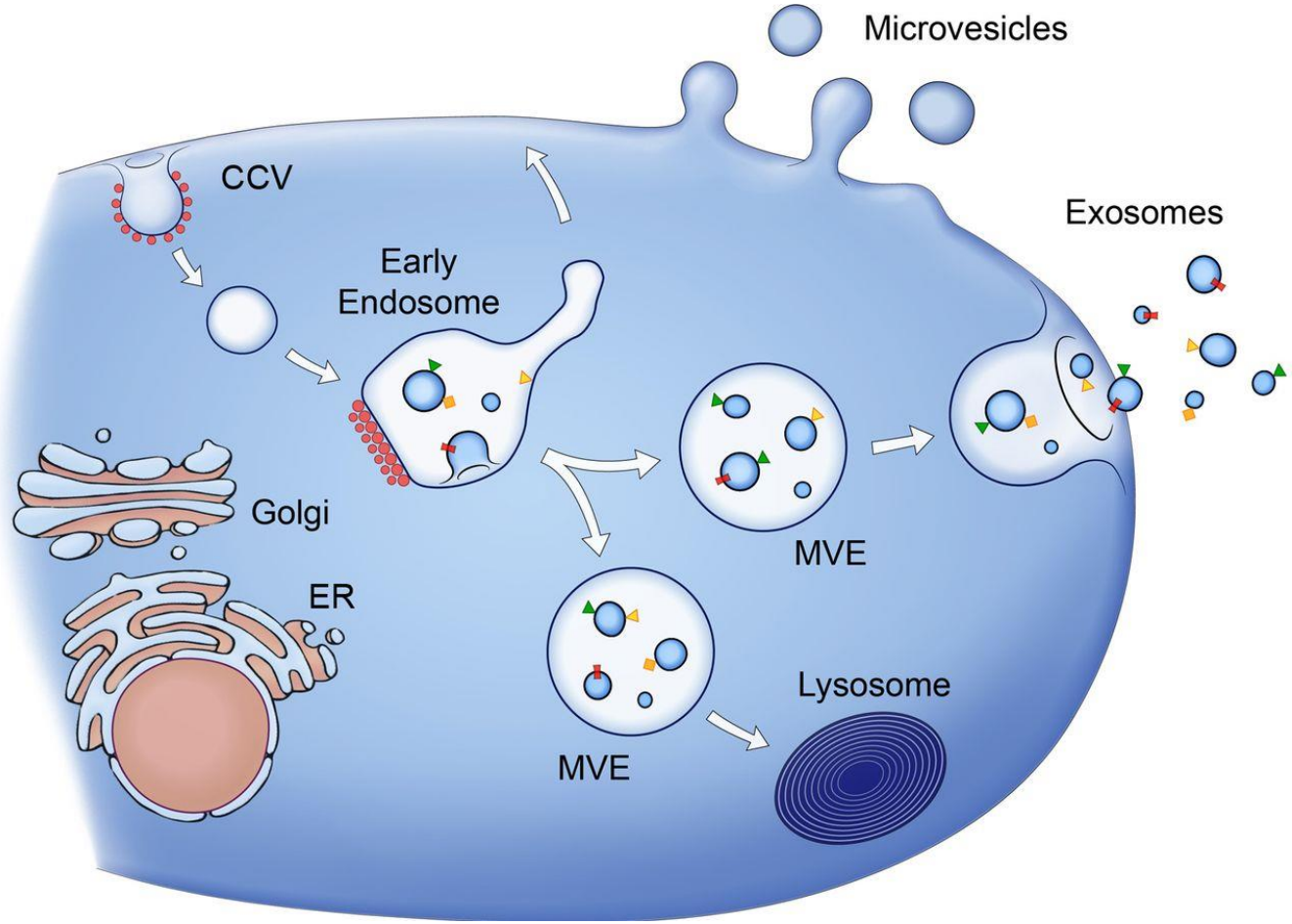


Figure 2.
Release of MVs and exosomes. MVs bud directly from the plasma membrane, whereas exosomes are represented by small vesicles of different sizes that are formed as the ILV by budding into early endosomes and MVEs and are released by fusion of MVEs with the plasma membrane. Other MVEs fuse with lysosomes. The point of divergence between these types of MVEs is drawn at early endosomes, but the existence of distinct early endosomes feeding into these two pathways cannot be excluded. Red spots symbolize clathrin associated with vesicles at the plasma membrane (clathrin-coated vesicles [CCV]) or bilayered clathrin coats at endosomes. Membrane-associated and transmembrane proteins on vesicles are represented as triangles and rectangles, respectively. Arrows represent proposed directions of protein and lipid transport between organelles and between MVEs and the plasma membrane for exosome secretion.

Release of MVs and exosomes.

Raposo G , and Stoorvogel W J Cell Biol 2013;200:373-383

JCB

Exosome delivered proteins and RNA molecules can be functional in the recipient cell

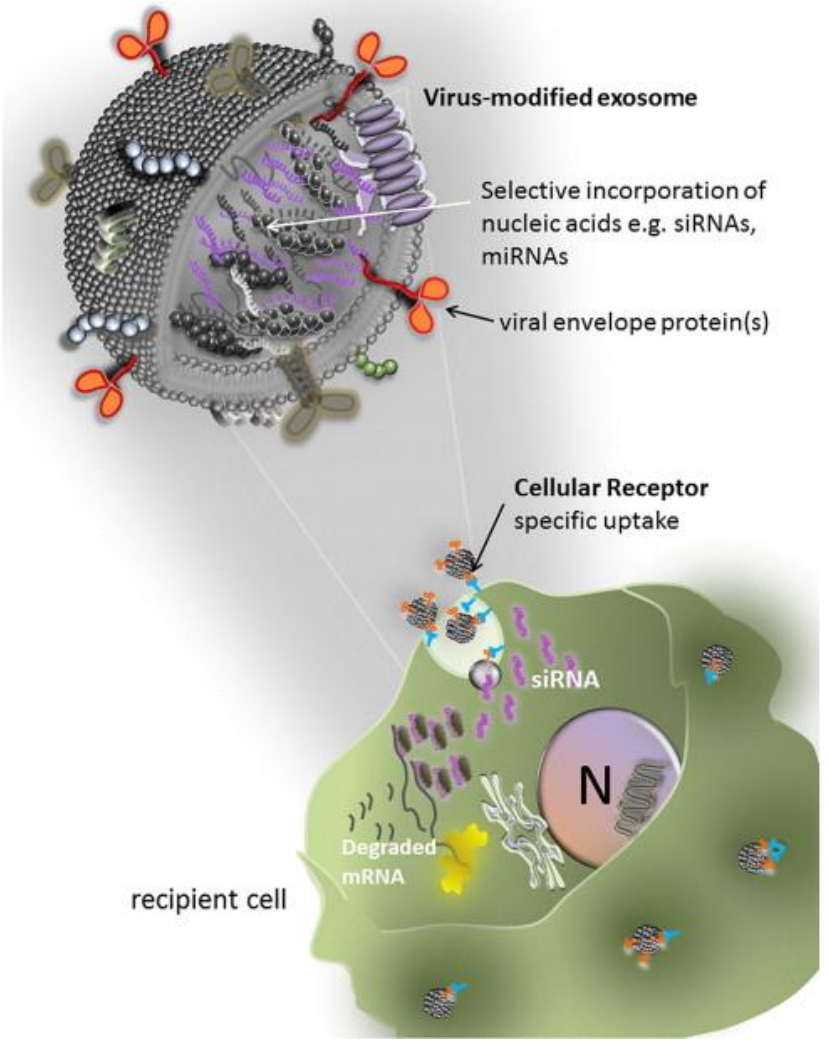


Figure:
Extracellular exosomes, expressing a defined set of proteins and lipids, deliver small non-coding RNA to a target cell. When exosomes leave the cell of origin, some will enter the blood stream or other bodily fluids where they can be taken up by other cells as a means of cell-to-cell communication. Depending on a targeting strategy, bioengineered or virus-modified exosomes are destined to engage cell-specific receptors. Exosomes that are taken up by endocytosis will fuse with the endosomal membrane to release their genetic cargo into the cytoplasm where they might associate with the RNAi (RISC) machinery to block mRNA translation into protein. (Nucleus, N).

Functional delivery of viral miRNAs via exosomes

D. Michiel Pegtel[a,1], Katherine Cosmopoulos[b], David A. Thorley-Lawson[b], Monique A. J. van Eijndhoven[a], Erik S. Hopmans[a], Jelle L. Lindenberg[c], Tanja D. de Gruijl[c], Thomas Würdinger[d,e], and Jaap M. Middeldorp[a]

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Edited* by Elliott Kieff, Harvard Medical School and Brigham and Women's Hospital, Boston, MA, and approved January 29, 2010 (received for review January 5, 2010)

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Exosomes; a key to delivering genetic materials

Virus-modified exosomes for targeted RNA delivery; A new approach in nanomedicine ☆

Danijela Koppers-Lalic, Marye M. Hogenboom, Jaap M. Middeldorp, D. Michiel Pegtel