



UNIVERSITAS  
GADJAH MADA

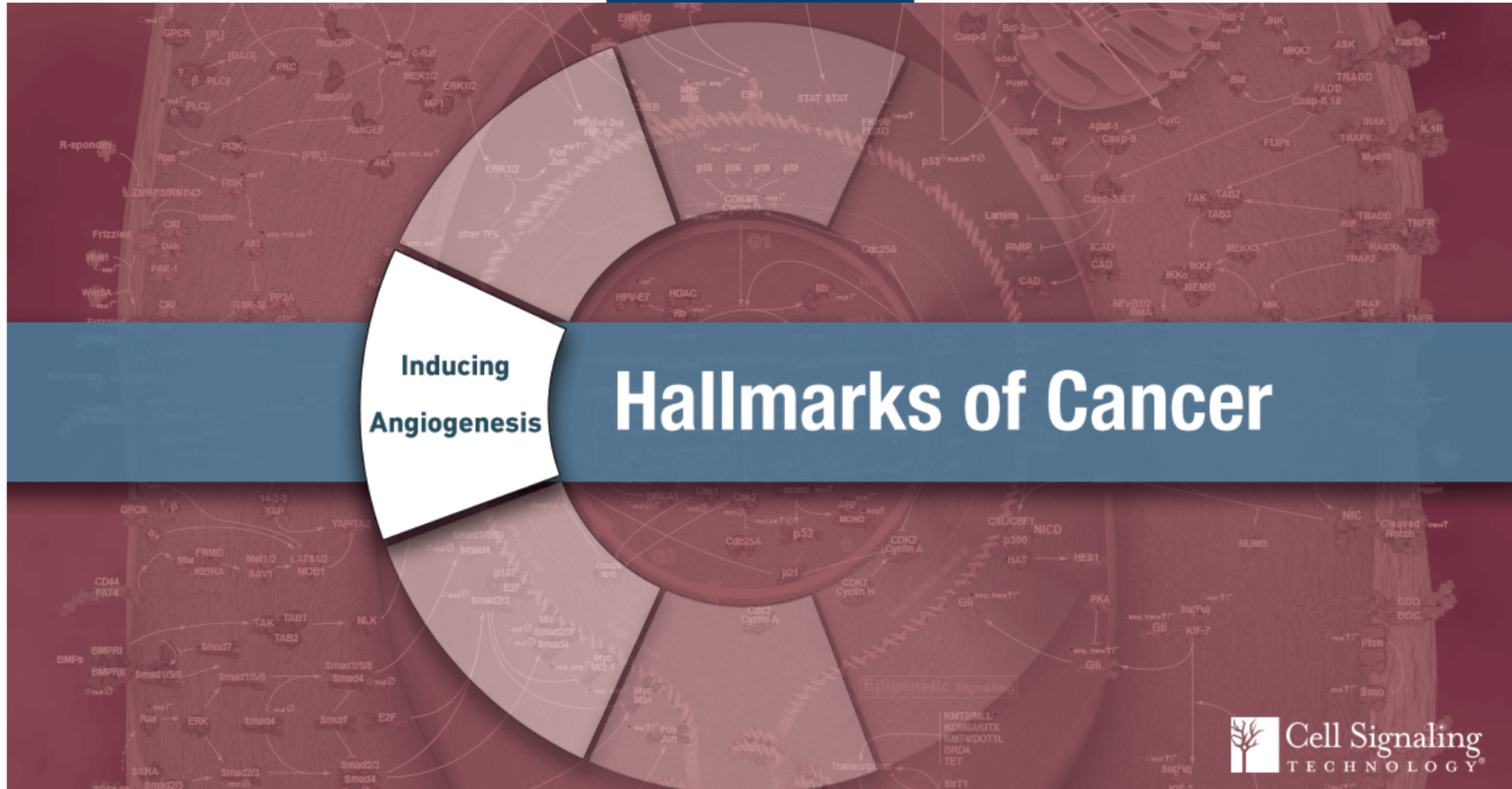
# Cancer and inducing angiogenesis

apt. Dyaningtyas Dewi PP., Ph.D



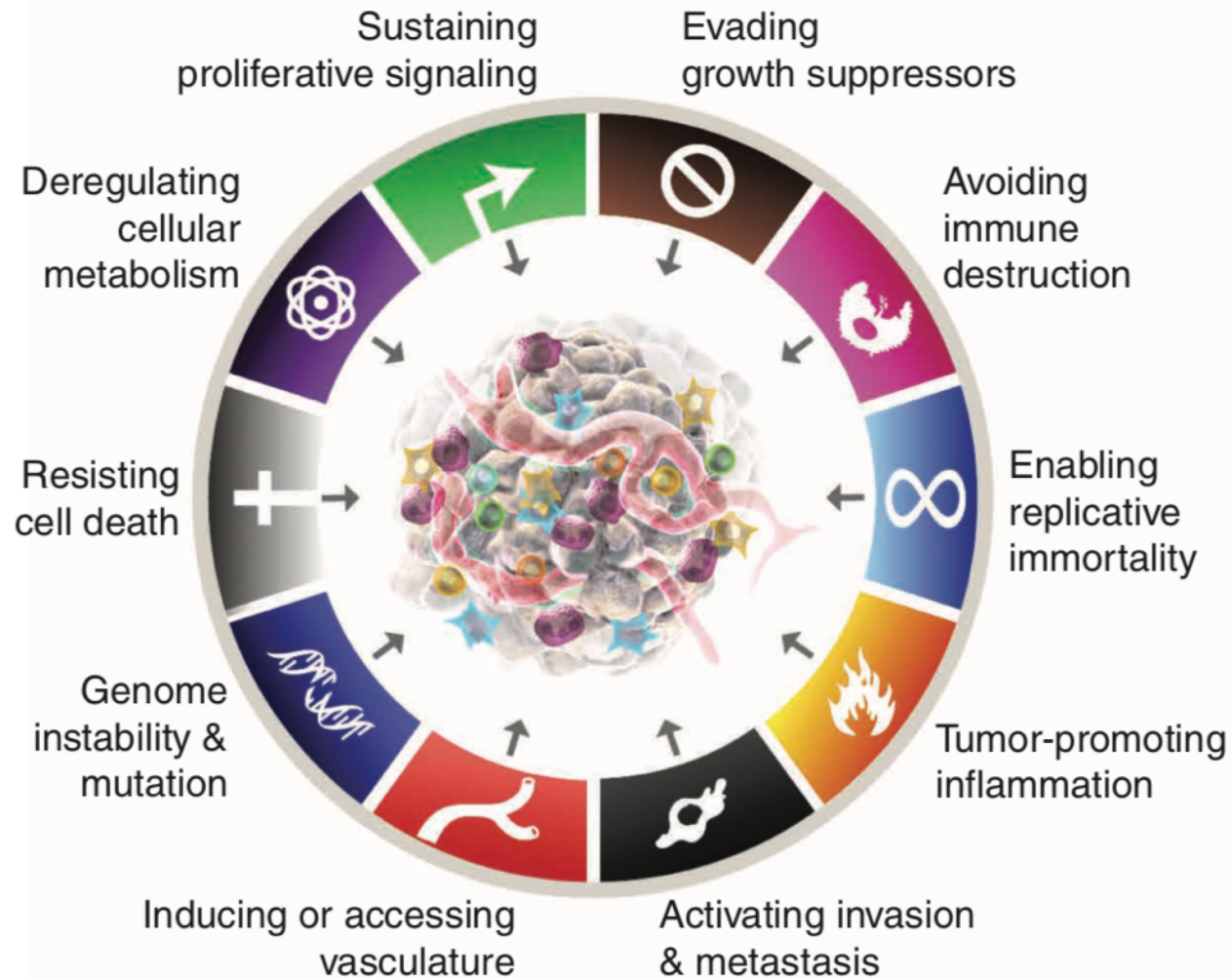
Inducing  
Angiogenesis

# Hallmarks of Cancer





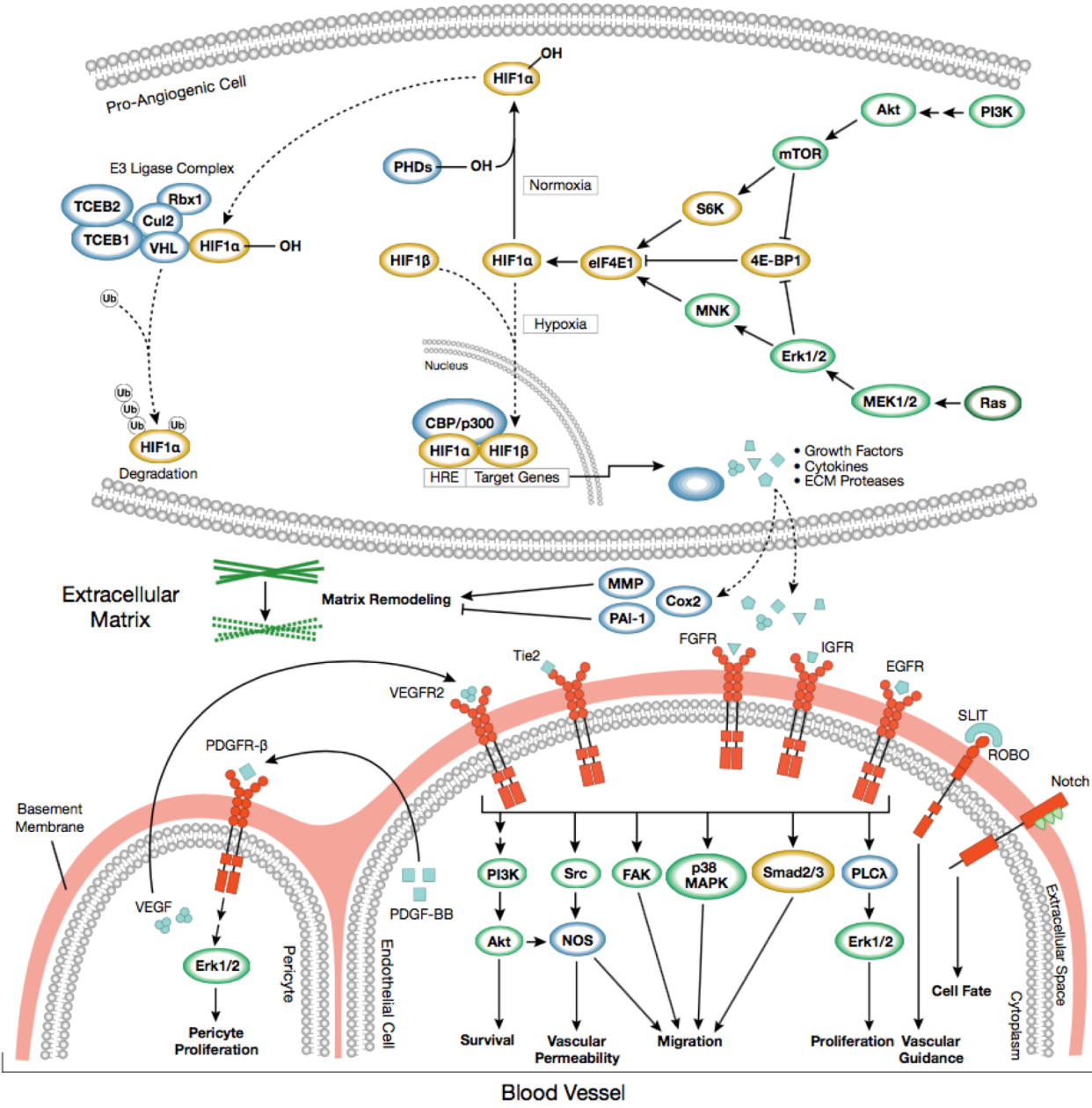
# Revisiting the hallmarks of cancer



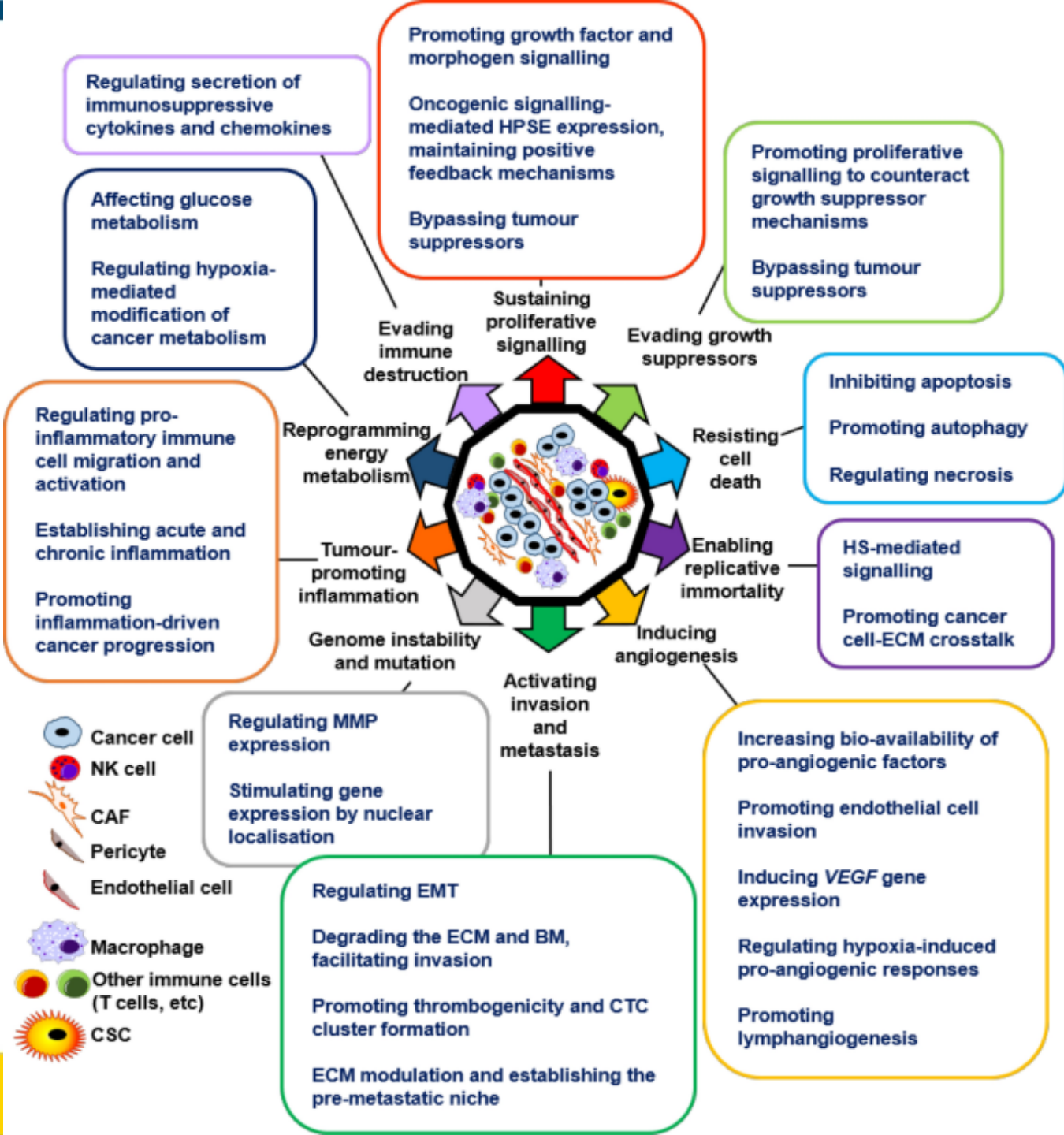
doi: 10.1158/2159-8290.CD-21-1059

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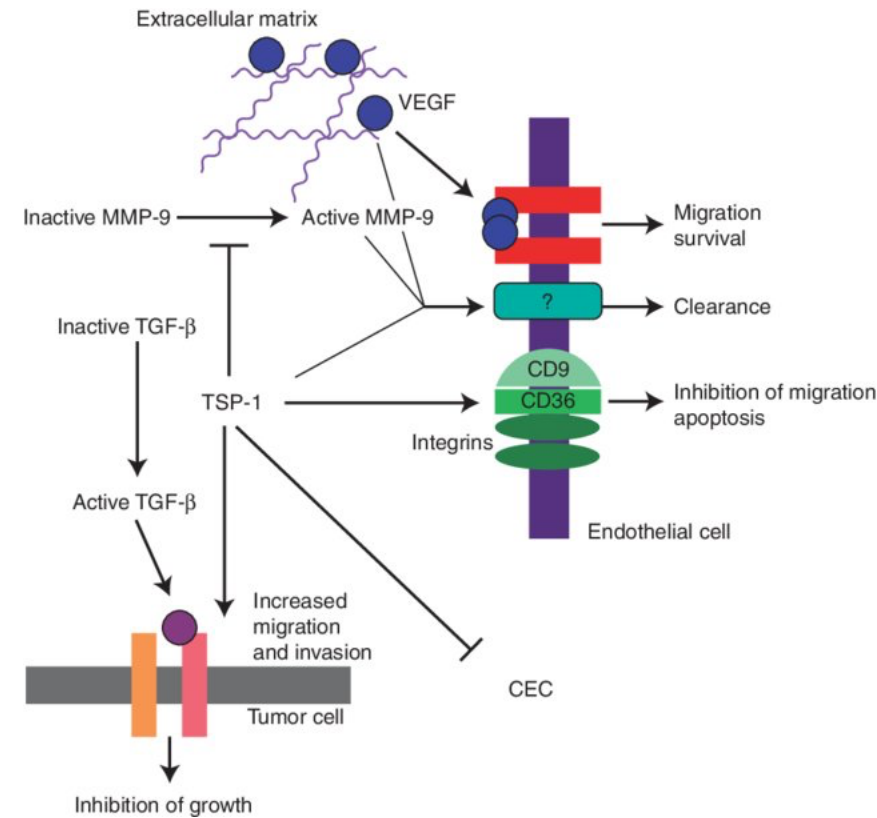
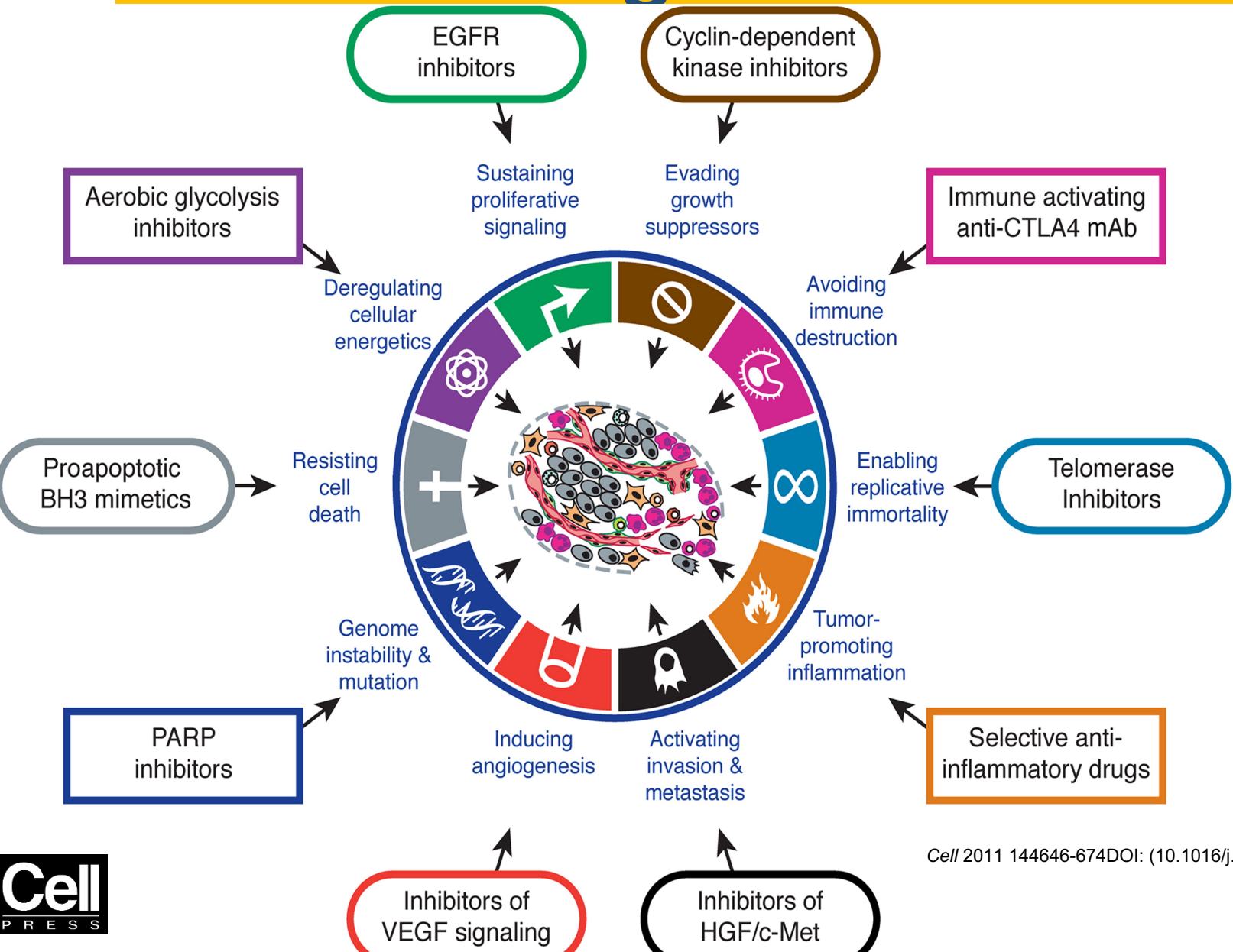
# Angiogenesis



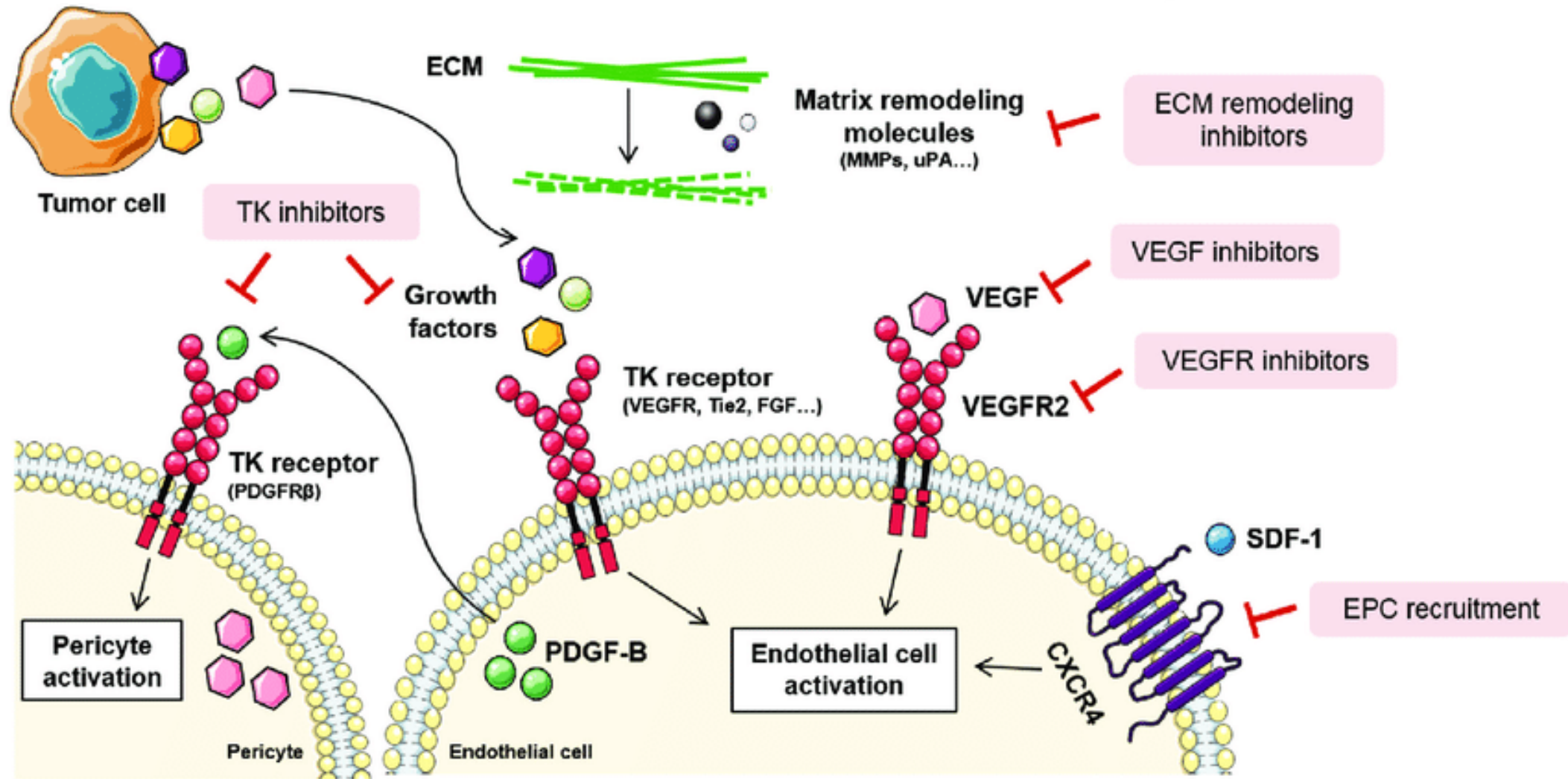
- |  |  |  |  |
|--|--|--|--|
|  | Acetylase                                  |  | Metabolic Enzyme                           |
|  | Adaptor                                    |  | Methyltransferase or G-protein             |
|  | Apoptosis/Autophagy Regulator              |  | Phosphatase                                |
|  | Cell Cycle Regulator                       |  | Protein Complex                            |
|  | Deacetylase or Cytoskeletal Protein        |  | Ubiquitin/SUMO Ligase or Deubiquitinase    |
|  | Growth Factor/Cytokine/Development Protein |  | Transcription Factor or Translation Factor |
|  | GTPase/GAP/GEF                             |  | Receptor                                   |
|  | Kinase                                     |  | Other                                      |
- 
- |  |                         |  |                              |
|--|-------------------------|--|------------------------------|
|  | Direct Process          |  | Tentative Process            |
|  | Translocation Process   |  | Inhibitory Modification      |
|  | Inhibitory Modification |  | Transcriptional Modification |



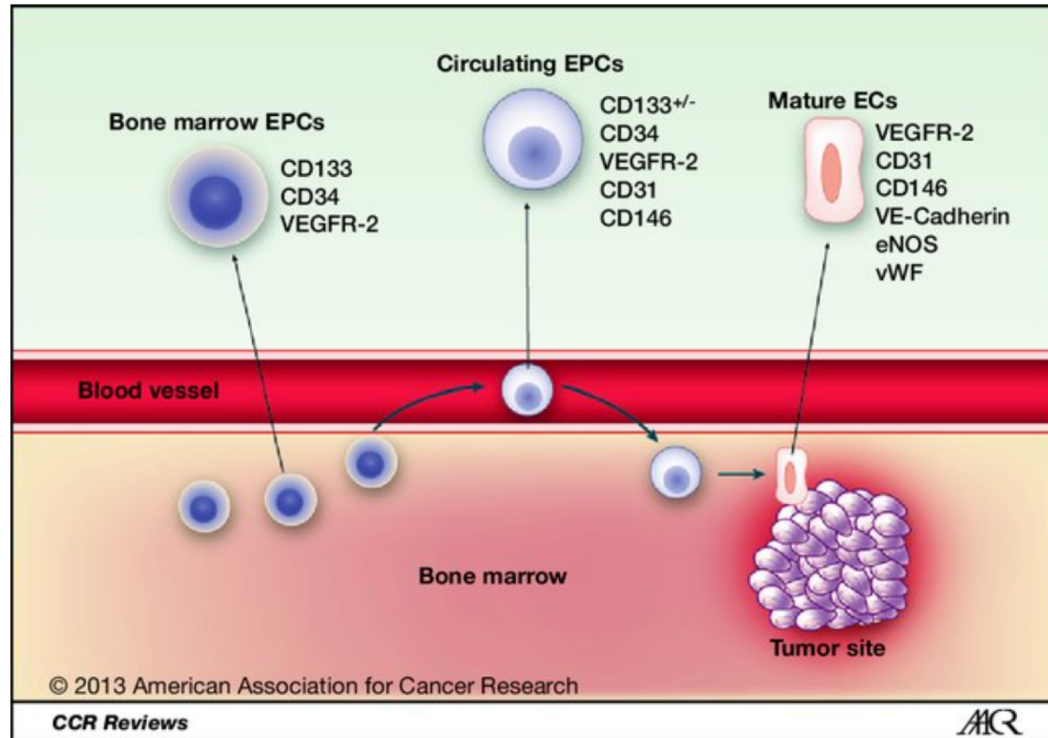
# Revisiting the hallmarks of cancer



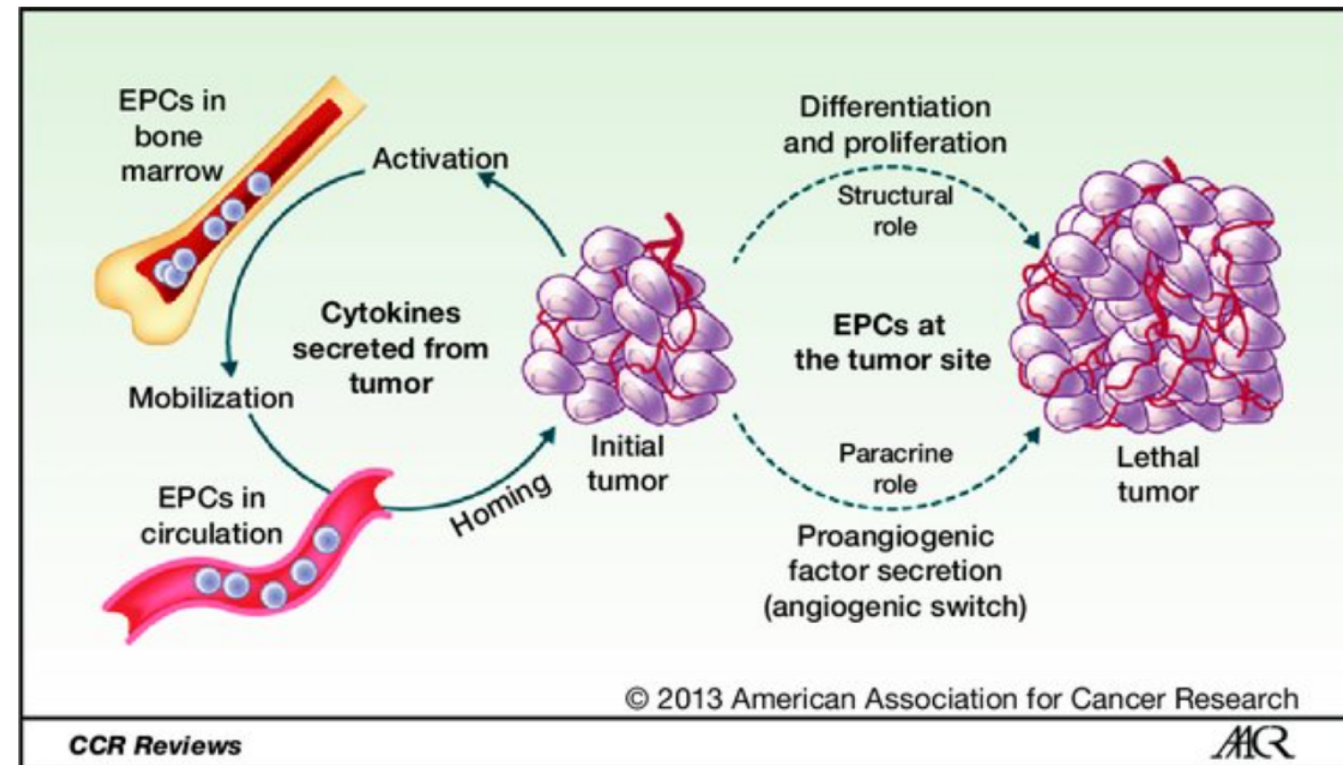
Cell 2011 144646-674DOI: (10.1016/j.cell.2011.02.013)



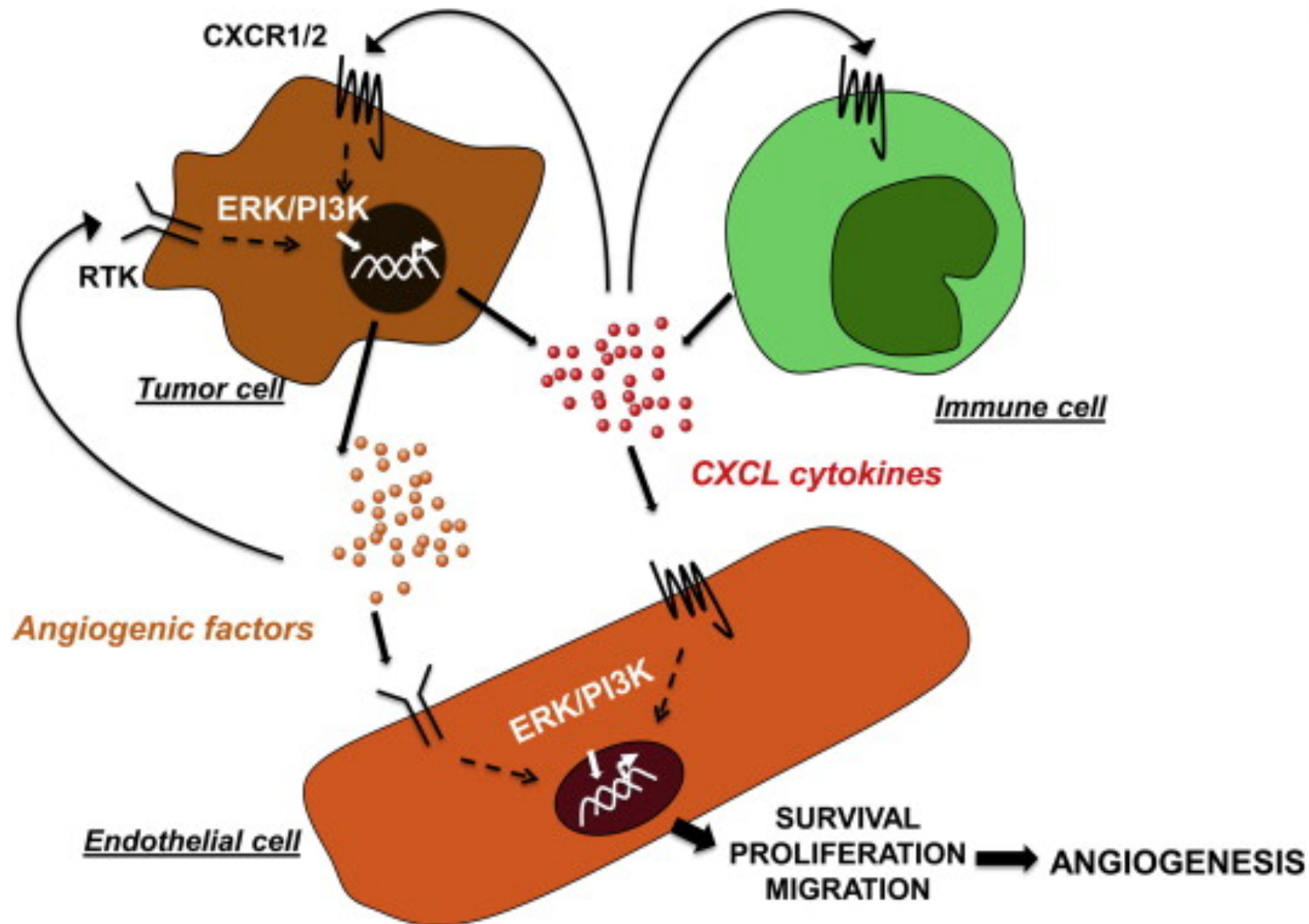
Expression of markers during the trafficking and differentiation of the EPCs to endothelial cells (EC).



## The role of EPCs in tumor angiogenesis







Crosstalk  
between tumor,  
immune and  
endothelial cells.